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Road vehicles — Standardized access to automotive repair and maintenance information (RMI) —

Part 6: L-Category vehicle specific RMI use cases and requirements

Véhicules routiers — Normalisation de l'accès aux informations relatives à la réparation et à la maintenance pour l'automobile (RMI) —

Partie 6: Exigences et cas d'usage RMI spécifiques aux véhicules de catégorie L

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, 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.

This document was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 301, *Road vehicles* in collaboration with ISO/TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of parts in the ISO 18541 series can be found on the ISO website.

This corrected version of ISO 18541-6:2018 incorporates the following corrections:

— Figure 9 has been replaced with the correct figure.

Introduction

This document includes the requirements to be fulfilled by Repair and Maintenance Information (RMI) systems as applied by Reference [6].

This mandate relates to the EC type-approval system for vehicles falling into the scopes of Reference [9], Reference [7] and Reference [8] and, in particular, to requirements for access to vehicle repair and maintenance information by independent operators.

The purpose of Reference [6] is to develop a standard or set of standards which specify the requirements to provide "standardized access to repair and maintenance information (RMI)" for independent operators.

This document covers the access to repair and maintenance information for L-category vehicles (two-wheel or three-wheel vehicles and quadricycles) based on Reference [11] and related delegated and implementing acts.

The information included in this document derives from the legislative requirements on European level in the field of repair and maintenance information and related security requirements and can be referenced by legislation in other countries.

Road vehicles — Standardized access to automotive repair and maintenance information (RMI) —

Part 6:
L-Category vehicle specific RMI use cases and requirements

1 Scope

This document contains all elements (definitions, use cases, technical requirements, functional user interfaces requirements and conformance test cases) applicable for the standardized access to repair and maintenance information for two-wheeled and three-wheeled vehicles and quadricycles (L-category vehicles)

The development of this document has been based on ISO 18541-1, ISO 18541-2, ISO 18541-3 and ISO 18541-4. This document constitutes an adaptation of standardized access to RMI prescriptions for passenger cars to L-category vehicles keeping the objectives and principles of the mandate M/421 from the European commission.

This document references the usage of a Digital Annex of standardized search terms for RMI. The provision of such a Digital Annex will follow the process described in ISO 18542.

CEN will nominate a Registration Authority according to ISO 18542 for the creation and maintenance of an appropriate Digital Annex.

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 18541-1:2014, *Road vehicles — Standardized access to automotive repair and maintenance information (RMI) — Part 1: General information and use case definition*

ISO 18541-2:2014, *Road vehicles — Standardized access to automotive repair and maintenance information (RMI) — Part 2: Technical requirements*

ISO 18541-3:2014, *Road vehicles — Standardized access to automotive repair and maintenance information (RMI) — Part 3: Functional user interface requirements*

ISO 18541-4:2015, *Road vehicles — Standardized access to automotive repair and maintenance information (RMI) — Part 4: Conformance test*

ISO 22900-2, *Road vehicles — Modular vehicle communication interface (MVCI) — Part 2: Diagnostic protocol data unit application programming interface (D-PDU API)*

SAE J2534-1[1)], *Recommended Practice for Pass-Thru Vehicle Programming*

SAE J2534-2[1)], *Optional Pass-Thru Features*

1) http://store.sae.org/

3 Terms, definitions and abbreviated terms

3.1 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

3.1.1
access levels
one of the levels of access to RMI

Note 1 to entry: Two access levels are defined by this document: an access to RMI relevant to security and another one to RMI not relevant to security.

EXAMPLE One can consider an access to RMI relevant to security and another one to RMI not relevant to security. They represent two different access levels.

3.1.2
accessories
supplementary features and components selected by a vehicle owner to enhance safety, performance, comfort, etc. and whose fitting does not impact the vehicle approval

3.1.3
alternate fuel
type of fuel that is either gaseous at atmospheric temperature and pressure or substantially non-mineral oil derived

3.1.4
alternative fuels retrofit systems
engine systems mounted on an already registered *vehicle* (3.1.54) for the purpose of operation with alternative fuels

3.1.5
alternative fuels system manufacturer
manufacturer (3.1.29) of an engine system operating with an alternative fuel

3.1.6
appropriate software level
applicable software version for the individual *vehicle* (3.1.54)

3.1.7
authorized repairer
AR
provider of repair and maintenance services for motor vehicles operating within the distribution system set up by a supplier of motor vehicles

Note 1 to entry: See Reference [10].

3.1.8
base vehicle
type-approved motor vehicle used at the initial stage of a multi-stage type-approval process

Note 1 to entry: A base vehicle may be a complete or an *incomplete vehicle* (3.1.18).

3.1.9
certificate
electronic document which uses a digital signature to bind a public key with an identity

3.1.10
complete vehicle
vehicle (3.1.54) which needs not to be completed in order to meet the relevant technical requirements for type-approval in the European Union

Note 1 to entry: Adopted from Reference [11].

Note 2 to entry: Requirements for European type-approval may be in Reference [11] or in any of the delegated or implementing acts adopted pursuant to this Regulation where those acts make express provision for so doing.

3.1.11
completed vehicle
vehicle (3.1.54), resulting from the process of multi-stage type-approval, which meets the relevant technical requirements for type-approval in the European Union

Note 1 to entry: A completed vehicle is also a *complete vehicle* (3.1.10).

Note 2 to entry: Adopted from Reference [11].

Note 3 to entry: Requirements for European type-approval may be in Reference [11] or in any of the delegated or implementing acts adopted pursuant to this Regulation where those acts make express provision for so doing.

3.1.12
component
device subject to the requirements for type-approval in the European Union or any of the delegated or implementing acts adopted pursuant to this Regulation, which is intended to be part of a *vehicle* (3.1.54) and which can be type-approved independently of a vehicle in accordance with this Regulation and the delegated or implementing acts adopted pursuant to this Regulation where those acts make express provision for so doing

Note 1 to entry: Adopted from Reference [11].

Note 2 to entry: Requirements for European type-approval may be in Reference [11] or in any of the delegated or implementing acts adopted pursuant to this Regulation where those acts make express provision for so doing.

3.1.13
detailed diagnosis
diagnostic process that identifies, with precision, potential malfunction causes

Note 1 to entry: A precise diagnosis may be achieved in several steps, whereby the user may be requested to perform test actions on the vehicle or to enter symptoms.

3.1.14
diagnostic information
description of an error or symptom and a list of potential causes or hints for further investigation to the same level and content as provided to AR

3.1.15
diagnostic trouble code
DTC
numeric or alphanumeric identifier which identifies or labels a malfunction[SOURCE: Reference [12], modified]

3.1.16
electronic maintenance history
digital *information package* (3.1.23) with virtual stamps that confirms the execution of the prescribed maintenance actions according to the VM's schedule

3.1.17
final manufacturer
manufacturer (3.1.29) responsible for the type approval of a *complete vehicle* (3.1.10) or *completed vehicle* (3.1.11) in a multi-stage type-approval

3.1.18
incomplete vehicle
vehicle (3.1.54) which undergoes at least one further stage of completion in order to meet the relevant technical requirements for type-approval in the European Union

Note 1 to entry: Adopted from Reference [11].

Note 2 to entry: The technical requirements for type-approval in the European Union may be in Reference [11] or in any of the delegated or implementing acts adopted pursuant to this Regulation where those acts make express provision for so doing.

3.1.19
independent operator
IO
undertakings other than authorized dealers and repairers which are directly or indirectly involved in the repair and maintenance of motor vehicles, in particular repairers, *manufacturers* (3.1.29) or distributors of repair equipment, tools or spare parts, publishers of technical information, automobile clubs, roadside assistance operators, operators offering inspection and testing services, operators offering training for installers, manufacturers and repairers of equipment for alternative fuel vehicles

Note 1 to entry: Undertaking is to be understood as the company or legal entity.

3.1.20
IO approval
process by which, upon payment of a reasonable and proportionate fee, the CAB sanctions or approves a legitimate commercial enterprise to engage in security-related RMI activities

3.1.21
IO authorization
process based on the inspection performed by the CAB that assesses an individual employee of an approved IO company is entitled to be given access to security-related RMI and to be provided with a securehardware token containing a personal digital certificate and a PIN issued by a designated Trust Center

Note 1 to entry: As part of this authorization, the individual employee will be allocated, upon payment of a (reasonable and proportionate) fee, a secure hardware token containing a personal digital *certificate* (3.1.9) and a PIN that will be supplied by the Trust Centre.

3.1.22
IO legal representative
natural person empowered to legally represent the IO in all aspects of the access to vehicle RMI

3.1.23
information package
collection of information provided by the *MA RMI system* (3.1.30) in response to a specific request

3.1.24
information type
category, group or set of information

EXAMPLE *Workshop procedures* (3.1.57) (for body repair, temporary repair, periodic technical inspection), wiring diagrams, *technical service bulletins* (3.1.52), recall information and maintenance information.

3.1.25
integrated diagnostics
process which interprets via an integrated application the memory content of ECUs and provides a diagnostic and repair recommendation

Note 1 to entry: Diagnostic application and *MA RMI system* (3.1.30) cooperate online, so technical information is provided during the diagnostics process and used for the diagnostic steps.

3.1.26
IO employee
natural person employed by the *IO* (3.1.19)

3.1.27
maintenance history
history of the performed, prescribed actions for maintaining a *vehicle* (3.1.54)

EXAMPLE Oil changes and other periodic maintenance.

3.1.28
maintenance schedule
prescribed sequence of maintenance actions for a *vehicle* (3.1.54) following the requirements of the *manufacturer* (3.1.29)

3.1.29
manufacturer
MA
any natural or legal person who is responsible to the approval authority for all aspects of the type-approval or authorisation process, for ensuring conformity of production and who is also responsible for market surveillance concerns for the *vehicles* (3.1.54), systems, *components* (3.1.12) and *separate technical units* (3.1.49) produced, whether or not the natural or legal person is directly involved in all stages of the design and construction of the vehicle, system, component or separate technical unit which is the subject of the approval process[SOURCE: Reference [11], modified]

3.1.30
manufacturer repair and maintenance information system
MA RMI system
information system by which the *manufacturer* (3.1.29) provides access to RMI through a website

3.1.31
multi-stage vehicle
complete vehicle (3.1.10) manufactured and type-approved in two or more stages by usually different *manufacturers* (3.1.29) per stage

3.1.32
on-board diagnostics
OBD
system on board of a *vehicle* (3.1.54) or engine which has the capability of detecting malfunctions, and, if applicable, of indicating their occurrence by means of an alert system, of identifying the likely area of the malfunctions by means of information stored in computer memory, and/or communicating that information off-board

3.1.33
p-code
standardized DTC for powertrain errors

Note 1 to entry: According to ISO 15031-6.

3.1.34
partnered accessories
accessories (3.1.2) which have been tested, quality assured and certified by the *MA* (3.1.29) and for which the MA assumes product liability

3.1.35
potential repair descriptions
list of potential causes and possible actions recommended to fix a problem

3.1.36
product identifier
manufacturer (3.1.29)-specific code or number to identify a system, *component* (3.1.12) or *separate technical unit* (3.1.49)

Note 1 to entry: Vehicle manufacturers identify their product by the *vehicle identification number (VIN)* (3.1.56).

3.1.37
product features
features of a specific *vehicle* (3.1.54) that may be used for navigation through the *MA RMI system* (3.1.30)

EXAMPLE Model name (CBR1000RR), model code (SC59), model year, ccm (1 000) engine type (two stroke cycle, four stroke cycle, etc.), transmission type (manual/automatic/CVT), final drive type (chain, shaft drive, belt, etc.).

3.1.38
product structure
inter-related set of units and sub-units in which a *vehicle* (3.1.54) can be divided

Note 1 to entry: The product structure is *manufacturer* (3.1.29)-specific.

3.1.39
periodic technical inspection service
PTI service
particular procedure for testing a *vehicle* (3.1.54) during a PTI

EXAMPLE Procedure for testing brake lights.

3.1.40
recall
process where a *MA* (3.1.29) notifies all owners of a specific *vehicle* (3.1.54) of a condition or defect that could affect safety, safe operation or environmental issues of the vehicle

3.1.41
redistributor
IO offering RMI within their own internal (closed) network

EXAMPLE RAC, ADAC, garage networks.

3.1.42
remanufacturing
process of overhauling an engine, major assembly or *component* (3.1.12), to return the engine, major assembly or component to the *MA* (3.1.29) original specification

3.1.43
repair and maintenance information
RMI
all information required for diagnosis, servicing, inspection, periodic monitoring, repair, re-programming or re-initialising of a *vehicle* (3.1.54) and which *manufacturers* (3.1.29) provide to their authorized dealers and repairers, including all subsequent amendments and supplements to such information

Note 1 to entry: That information includes all information required for fitting of parts and equipment on vehicles.

[SOURCE: Reference [11], modified]

3.1.44
republisher
IO who publishes RMI to an external network using the RMI of the *MA* (3.1.29)

3.1.45
security framework
set of processes, roles and technical devices for access to security-related RMI recommended by the EC Forum on Vehicle RMI to the EC as mandated in Reference [11]

Note 1 to entry: The framework is based on the approval and authorization of *independent operators* (3.1.19) by certified entities to access *security-related RMI* (3.1.46) at the *MA RMI system* (3.1.30). The physical access to the MA RMI system for security-related RMI is bound to a digital *certificate* (3.1.9).

3.1.46
security-related RMI
RMI subject to protection measures in the *security framework* (3.1.45)

3.1.47
security repair and maintenance information
SERMI
de-facto association founded by *IO* (3.1.19) and *MA* (3.1.29) organisations to act as the owner for the process and scheme defined in the *EC Forum for Access to Vehicle RMI, Report on Access to security-related RMI, version 1.1*

3.1.48
selection methods
possible methods to select RMI

EXAMPLE Searches for a term in the document titles, *information type* (3.1.24), document ID or other criteria.

3.1.49
separate technical unit
device subject to the relevant technical requirements for type-approval in the European Union or any of the delegated or implementing acts adopted pursuant to this Regulation and intended to be part of a *vehicle* (3.1.54), which may be type-approved separately, but only in relation to one or more specified types of vehicle, where those acts make express provision for so doing

Note 1 to entry: Adopted from Reference [11].

Note 2 to entry: The technical requirements for type-approval in the European Union may be in Reference [11] or in any of the delegated or implementing acts adopted pursuant to this Regulation where those acts make express provision for so doing.

3.1.50
standardized non-proprietary VCI functionality
current standards for communication with a *vehicle* (3.1.54)

EXAMPLE ISO 22900-2 and SAE J2534–1/-2.

3.1.51
system
assembly of devices combined to perform one or more specific functions in a *vehicle* (3.1.54) and which is subject to the requirements of the European Union or any of the delegated or implementing acts adopted pursuant to this regulation

Note 1 to entry: Adopted from Reference [11].

Note 2 to entry: The technical requirements for type-approval in the European Union may be in Reference [11] or in any of the delegated or implementing acts adopted pursuant to this Regulation where those acts make express provision for so doing.

3.1.52
technical service bulletin
TSB
bulletin issued by the *manufacturer* (3.1.29) detailing a fix for a known concern

Note 1 to entry: The bulletin is for informational purposes only.

3.1.53
temporary repair procedure
temporary solution to a problem that is usually made available to roadside services

EXAMPLE Change the brake light.

3.1.54
vehicle
any vehicle falling under the categories L1 to L7

3.1.55
vehicle communication interface functionality
VCI functionality
set of functions to provide communication between vehicle systems and a software application for diagnostics or reprogramming according to the technical requirements specified in this document

3.1.56
vehicle identification number
VIN
unique 17 characters serial number, given by the vehicle *manufacturer* (3.1.29) to identify individual motor vehicles

3.1.57
workshop procedure
information provided by a *manufacturer* (3.1.29) describing a specific repair and maintenance

EXAMPLE Repair procedures, working advices or other instructions.

3.2 Abbreviated terms

API	application programming interface
AR	authorized repairer
BP	basic principle
CAB	conformity assessment body
CSP	certificate status protocol
DB	database
DLC	data link cable
DLL	dynamic link library
D-PDU	diagnostic – protocol data unit
DTC	diagnostic trouble code
DVD	optical disc storage media format
ECU	electronic control unit

FAQ	frequently asked questions
FREQ-	functional user interface requirement
GB	gigabyte
GHz	gigahertz
GMT	Greenwich mean time
GUI	graphical user interface
HMI	human machine interface
IO	independent operator
IR	independent repairer
IT	information technology
LAN	local area network
MA	manufacturer
MI	malfunction indicator
MVCI	modular vehicle communication interface
NAT	network address translation
OBD	on-board diagnostic
OCSP	online certificate status protocol
PC	personal computer
PIN	personal identification number
PKCS	public key certificate status
PTI	periodic technical inspection
PTT	pass-thru tool
RMI	repair and maintenance information
RP	recommended practice
RS232	recommended standard 232
SERMI	security repair and maintenance information
TC	trust centre
TMC	Technology and Maintenance Council of the American Trucking Association (ATA)
TREQ-	technical requirement
TSB	technical service bulletin
USB	universal serial bus

VAT No.	value added tax number
VCI	vehicle communication interface
VIN	vehicle identification number
VM	vehicle manufacturer
WWH-OBD	world-wide harmonized on-board diagnostics

4 Document overview and structure

This document provides an implementer with all specifications and references required to support the implementation of the requirements related to standardized access to L-category vehicles repair and maintenance information in accordance with the requirements set forth in Reference [6]. The standardized access to RMI shall be implemented by the vehicle manufacturers in their RMI systems.

— General information and basic principles

  This clause provides an overview of the concepts and basic principles for the implementation of the standardized access to L-Category vehicles repair and maintenance information.

— Use case definitions (functional requirements)

  This clause provides the functional requirements for a VM RMI system as a set of use case definitions

— Technical requirements

  This clause specifies all technical requirements related to a VM RMI system. These requirements will reflect the deriving needs from the use cases.

  The following are examples (not a complete list):

  — access-related data administration;
  — IT architecture;
  — external interfaces;
  — technical infrastructure recommendations;
  — operations.

— Functional user interface requirements

  This clause specifies all functional user interface requirements related to a VM RMI system. These requirements will reflect the deriving needs from the use cases.

  The following is an example (not a complete list):

  — Navigational pathway and user guidance;

— Conformance test cases for a self-conformance test by the provider of the VM RMI system

  The conformance test cases will follow the use case definition, as well as the technical and functional user interface requirements.

  The purpose of this document is to provide information to the VM RMI system provider to build and test the VM RMI system against the conformance test cases. This final step in the development process of the VM RMI system is an enabler for all providers that their VM RMI system meets a high degree of functional requirements expected by the end user.

5 General information

5.1 Access to vehicle RMI

This document specifies use cases and requirements to be supported by VM RMI systems.

Figure 1 illustrates a typical example of an implementation scenario of a VM RMI, Diagnostics and Flash Programming Web-based server environment. The Independent Operators use RMI clients which shall have access to the Internet.

Multiple VM RMI system configuration scenarios related to the server and client software architecture are possible and a purely online solution is not precluded. It is the VM's responsibility to support an RMI system configuration scenario which meets the requirements and objective of "Standardized Access to RMI for L-category vehicles" from a user's point of view.

VM RMI system configuration scenarios are described in Clause 8. The following VM RMI system configuration scenarios are examples and should not be considered a complete list of possible configurations to satisfy the use cases and requirements.

— Configuration scenario #1 describes the following server and client installation.

  — Server(s): VM RMI Web system, VM Diagnostic software and configuration data for download by all clients, VM Flash Programming software and ECU files for download by all clients.

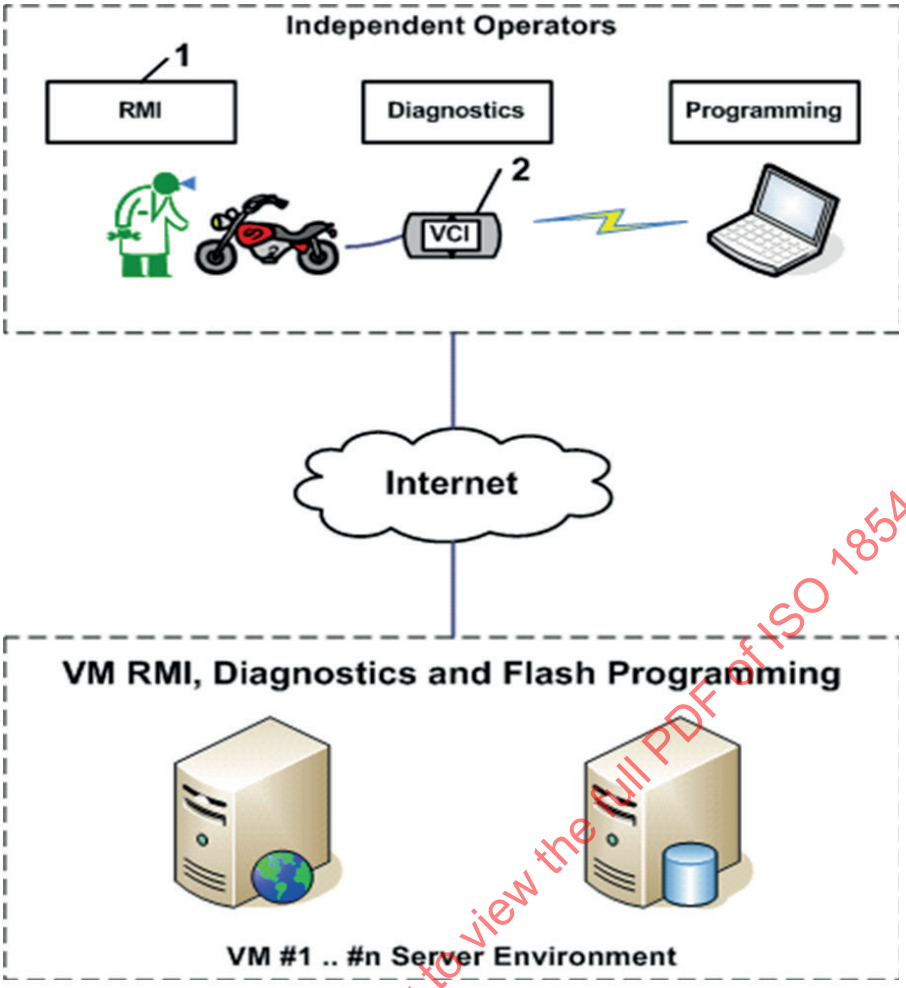
  — Client(s): Browser capable computing hardware platform, diagnostic software installation downloaded from the server, Flash Programming software installation downloaded from the server, VCI connected to vehicle and computing hardware platform with vehicle communication protocol support to retrieve data from the vehicle through the diagnostic connector, Diagnostics and Flash Programming executed on the client computing hardware platform.

— Configuration scenario #2 describes the following server and client installation.

  — Server(s): VM RMI Web system, VM Diagnostic software and configuration data for download by all clients, VM Flash Programming software and ECU files for download by all clients, Diagnostics and Flash Programming executed on the server for all clients.

  — Client(s): Browser capable computing hardware platform, Diagnostic software installation downloaded from the server, Flash Programming software installation downloaded from the server, VCI connected to vehicle and computing hardware platform with vehicle communication protocol support to retrieve data from the vehicle through the diagnostic connector, the Diagnostics and Flash Programming user interface is separated from the server applications and executed on the client computing hardware platform.

Figure 1 depicts a typical example of the access to vehicle RMI.



Key

1 repair and maintenance information

2 vehicle communication interface

Figure 1 — Typical example of access to vehicle RMI

5.2 Standardized access to RMI benefit examples

5.2.1 Independent operators

The following benefits are applicable to the independent repairers:

— similar functional GUI for all vehicle brands;

— same functional RMI search terminology;

— functionally equivalent RMI navigational pathway;

— single PC connected to Internet to access RMI of all vehicle brands.

5.2.2 Vehicle manufacturers

The following benefits are applicable to the vehicle manufacturer service department and repair shops:

— improved sales of RMI to Independent Operators;

— streamlines access to RMI to a single method;

— standard may simplify RMI future system development;

— standard may provide a consistent interface between RMI, diagnostics and other information.

5.3 L-Category and subcategories

The vehicles in the L-Category present a broad spectrum of characteristics.

In the type-approval regulations, a classification into subcategories is made to cope with the substantial differences among the vehicles. The applicability of RMI access requirements will need to also consider the subcategories.

The provisions of this document for most sub-categories strongly resemble the provisions for passenger cars and light commercial vehicles where one single vehicle manufacturer is responsible for the type-approval and directly for the RMI of the complete vehicle.

However, for sub-categories for which a multi-stage type-approval is allowed, the prescriptions will be more analogous to the ones for heavy duty vehicles and are described in the next section.

5.4 Multi stage and RMI

Within European Union, all L-vehicles which are registered have a vehicle type-approval or individual approval according to Reference [11].

For specified sub-categories, a type-approval can be obtained in one or multiple stages depending on the vehicle's stage of completion. The multi-stage approval is allowed for the sub-categories referred to in Reference [11], Article 25, paragraph 6, namely L2e -U, L4e, L5e-B, L6e-BU and L7e-CU.

Figure 2 depicts a typical one-stage situation. The vehicle is made in one stage by one manufacturer and is delivered with type-approval for the complete vehicle.

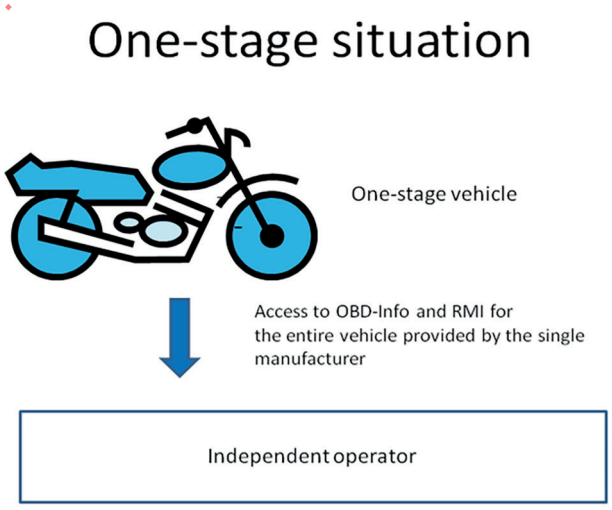


Figure 2 — Example for a typical one-stage situation

Figure 3 depicts a typical multi stage situation. A typical example for a multi-stage vehicle is a commercial tricycle. The first manufacturer delivers the driveline, cab and chassis under its brand name

with type-approval for the incomplete base vehicle. Another manufacturer (or many manufacturers) adds additional equipment and delivers the resulting vehicle with type-approval for the completed tricycle.

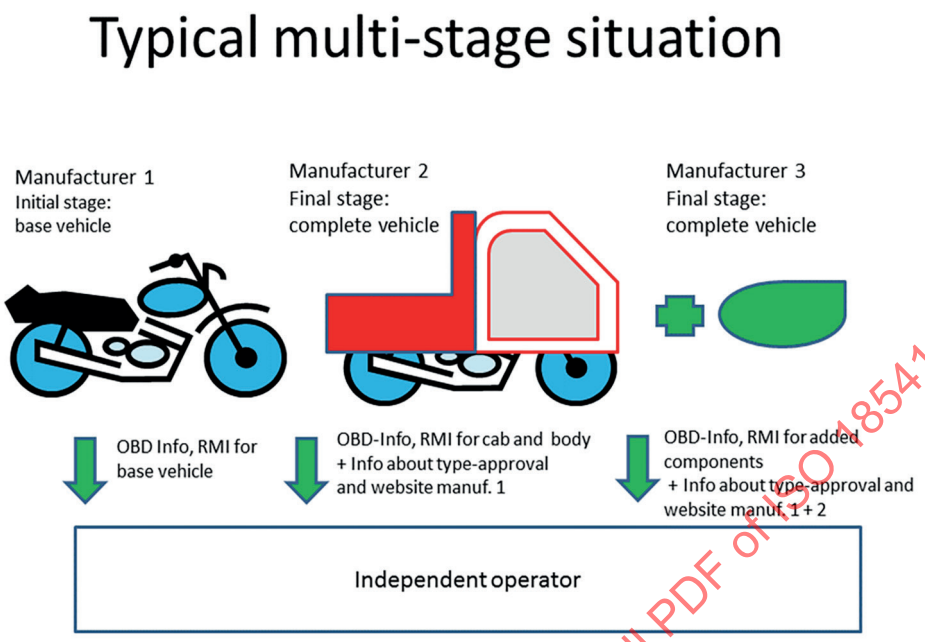


Figure 3 — Example for a typical multi-stage situation

Each manufacturer responsible for a particular stage or stages of a vehicle type-approval is responsible for providing to IO access to repair and maintenance information regarding the stage(s) of type-approval for which he is responsible for. This responsibility applies irrespective of the procedure followed to obtain the type-approval for this stage(s).

The final manufacturer of a multi-stage type approved vehicle has to provide links to the manufacturers' websites providing RMI for the previous stages.

6 Basic principles, use case and requirement overview

6.1 Basic principles

Basic principles have been established as guidelines to define the RMI use cases, technical requirements, functional user interface requirements and conformance test cases.

6.1.1 Basic principles for use case definition

— BP1: RMI use cases describe the interaction between an independent operator and the VM websites for RMI access.

— BP2: The use cases in the RMI Standard define a common way to organize VM websites for RMI access.

— BP3: The content of the technical information provided by the VM website for RMI and the quality of the access implementation is the responsibility of the VM.

— BP4: Actors for the use cases are independent operators as defined in Reference [12] VM RMI system and VM.

— BP5: Security use cases are a subset of RMI use cases.

— BP6: The primary purpose of the RMI standard is to support the existing relevant European legislation for access to RMI. In addition, it has been developed in a way that can be referenced by legislation in other countries.

— BP7: The VM is required to provide for the purposes of repair and maintenance the same information that it provides to its authorized repairers in a non-discriminatory manner. If the VM does not have authorized dealers or repairers, then the VM is required to provide RMI according to Reference [11].

— BP8: The VM is only expected to provide the VM RMI system and information in the languages as provided to its authorized repairers.

— BP9: When a use case is classified as mandatory, this means that the use case shall be implemented in the VM RMI system according to the defined requirements in the use case, except where the VM RMI does not exist, e.g. due to the nature of the product.

— BP10: Applicability for L subcategories needs to be specified in use cases and requirements.

— BP11: Elements adopted from ISO 18541-1, ISO 18541-2, ISO 18541-3 and ISO 18541-4 shall be considered at any revision of this document to ensure consistency with revised versions of the ISO 18541 referenced parts.

6.1.2 Basic principles for requirements definition

— BP12: The technical requirements shall not specify any implementation details.

— BP13: Requirements shall be expressed in terms of performance rather than design or descriptive characteristics. This approach leaves maximum freedom to technical development.

— BP14: A requirement is identified by a TREQ-xx, where 'xx' is the requirement number. Each requirement consists of a "main title", "Requirement definition", "Requirement description", "Explanatory/Example" and "Classification".

— BP15: The requirements in clusters 4 and 5 in this document have been formulated with the aim of minimizing the number of IO clients (PC, Laptop, etc.) required to access different VM RMI systems.

6.1.3 Basic principles for functional user interface requirements definition

— BP16: The requirements shall allow for flexible navigational pathways for practical and state of the art access to RMI in the VM websites.

— BP17: The requirements shall allow for concepts to be able to implement navigational principles to minimize the impact to the existing VM RMI systems.

6.1.4 Basic principles for conformance test definition

— BP18: The primary objective of the conformance test is to support a "VM assessment of self-conformance" of the VM RMI system. The conformance test is not limited to usage by VMs. Some test cases may not be performed by third parties due to the nature of the test cases.

— BP19: The person performing the conformance test shall be qualified, i.e. test experience, knowledge about vehicle coverage in VM RMI system, familiarity and understanding of the relevant ISO 18541 documents, and shall have a keen understanding of the business application of the VM RMI system.

— BP20: The conformance test addresses the access behaviour to automotive RMI and not the VM RMI system implementation.

— BP21: The conformance test is a positive test in order to test the proper functioning of the VM RMI system, i.e. correct input data provides correct output data.

— BP22: The person performing the conformance test shall verify that the purpose of the use case is achieved following the descriptions of the VM regarding the implementation of the use case and the steps to enter the input and to obtain the output according to FREQ 5 in Clause 9.

— BP23: The name of the test case should be the same as the name of the use case (see Clause 7) or requirement (see Clause 8 and Clause 9).

— BP24: Each test case should have a preamble (setup state).

— BP25: Classification for each test case is included in order to support the classification criteria specified for use cases and requirements.

— BP26: A test case is only applicable if the use case or requirement is supported by the VM RMI system.

— BP27: Some test cases may require payment or a valid subscription before processing the next step.

CAUTION — The person performing the conformance test is responsible for entering valid data and correctly executing necessary actions in order to maintain integrity of the VM RMI system and the vehicle.

6.2 Use case clusters

Table 1 provides an overview of the main RMI use cases. A main RMI use case cluster may have one or more use cases.

Table 1 — Main use case clusters

#	Main title of use case cluster	Brief description	Use case reference
1	User authentication, authorization and administration	The use cases belonging to this cluster describe how to obtain a license to use the VM RMI system, keep user data and access level up to date, protect RMI against misuse and how to get access to the VM RMI system.	UC 1.1 Register IO for use of the VM RMI system UC 1.2 Register IO employee for use of the VM RMI system UC 1.3 Maintain IO status UC 1.4 Maintain user status UC 1.5 Request to de-register IO employee UC 1.6 Login to VM RMI system UC 1.7 Grant access to security-related RMI
2	Payment for RMI	The use cases belonging to this cluster describe the handling of payments.	UC 2 Payment for RMI
3	Vehicle identification	The use cases belonging to this cluster describe how to identify a specific vehicle, vehicle summary and type of vehicle. The identification methods are — by VIN search, and/or — product feature.	UC 3.1 Vehicle identification through product identifier UC 3.2 Vehicle type identification via product features

Table 1 *(continued)*

#	Main title of use case cluster	Brief description	Use case reference
4	Provide selection methods for RMI	The use cases belonging to this cluster describe how to choose the preferred method to locate and select information. The VM RMI system presents a list of all selection methods supported by the system. A combination of methods shall be possible. The user can, for instance, request for a term in document titles of a single type. The different access methods are alternative ways to find the same documents in the VM system. The purpose of these use cases is to enable the user to find the required information. There shall be ways to find this information by at least one of the predefined selection methods. The selection methods supported are — by information types, — by standardized terms, — by product structure and — by document identifier.	UC 4.1 Select information type UC 4.2 Search by standardized terms UC 4.3 Navigate using product structure UC 4.4 Select by document identifier
5	Retrieve information packages	The use cases belonging to this cluster describe the retrieval of selected repair and maintenance information packages. The user selects one of many documents in the search result list. The VM RMI system displays the selected package of information which are — workshop procedures (temporary repair, periodic technical inspection), — wiring diagrams, — technical service bulletins, — recall information, — maintenance information, and — etc.	UC 5.1 Workshop procedures UC 5.2 Wiring diagrams UC 5.3 Technical service bulletin UC 5.4 Recall information UC 5.5 Maintenance schedule UC 5.6 Spare parts UC 5.7 Accessories UC 5.8 Labour times UC 5.9 Special tools UC 5.10 Type-approval related information
6	Vehicle diagnostics	The use cases belonging to this cluster describe the support for — DTC resolution, — symptom resolution and — integrated diagnostics.	UC 6.1 DTC resolution UC 6.2 VM symptom resolution UC 6.3 Integrated diagnostics
7	Updating, replacing and tuning of modules (ECUs)	The use cases belonging to this cluster describe the support of the legitimate update or replacement of vehicle modules/ECUs to return to an operational state after repair or tuning with a VM application using approved and known VCIs which meet the standards required by legislation.	UC 7 Updating and replacing modules (ECUs)
8	Electronic maintenance history	The use cases belonging to this cluster describe how to get access and to update the history of VM prescribed maintenance actions.	UC 8 Electronic maintenance history

Table 1 *(continued)*

#	Main title of use case cluster	Brief description	Use case reference
9	Repair assistance, Technical support	The use cases belonging to this cluster describe how to get advice from the VM if repair assistance or technical support is needed.	UC 9 Repair assistance technical support
10	Request contact information	The use cases belonging to this cluster describe how to request contact information in order to receive information about — electronic tool, — diagnostics, — VCI, — training material, and — etc.	UC 10.1 Electronic tool information (Diagnostic, Reprogramming, VCI) UC 10.2 Test equipment and diagnostic tool manufacturers UC 10.3 Training material (delegate information) UC 10.4 Redistributors UC 10.5 Republishers UC 10.6 Inspection and testing services UC 10.7 Alternative fuels retrofit systems UC 10.8 Engine and components remanufacturing UC 10.9 Component and parts manufacturers UC 10.10 Validation of independently developed non-proprietary VCIs
11	Courses and training information	The use cases belonging to this cluster describe how to get information regarding training course availability (online or Web-based training).	UC 11 Courses and training information

Figure 4 illustrates all use case clusters and associated use cases. The detailed definition of each use case is defined in Clause 7.

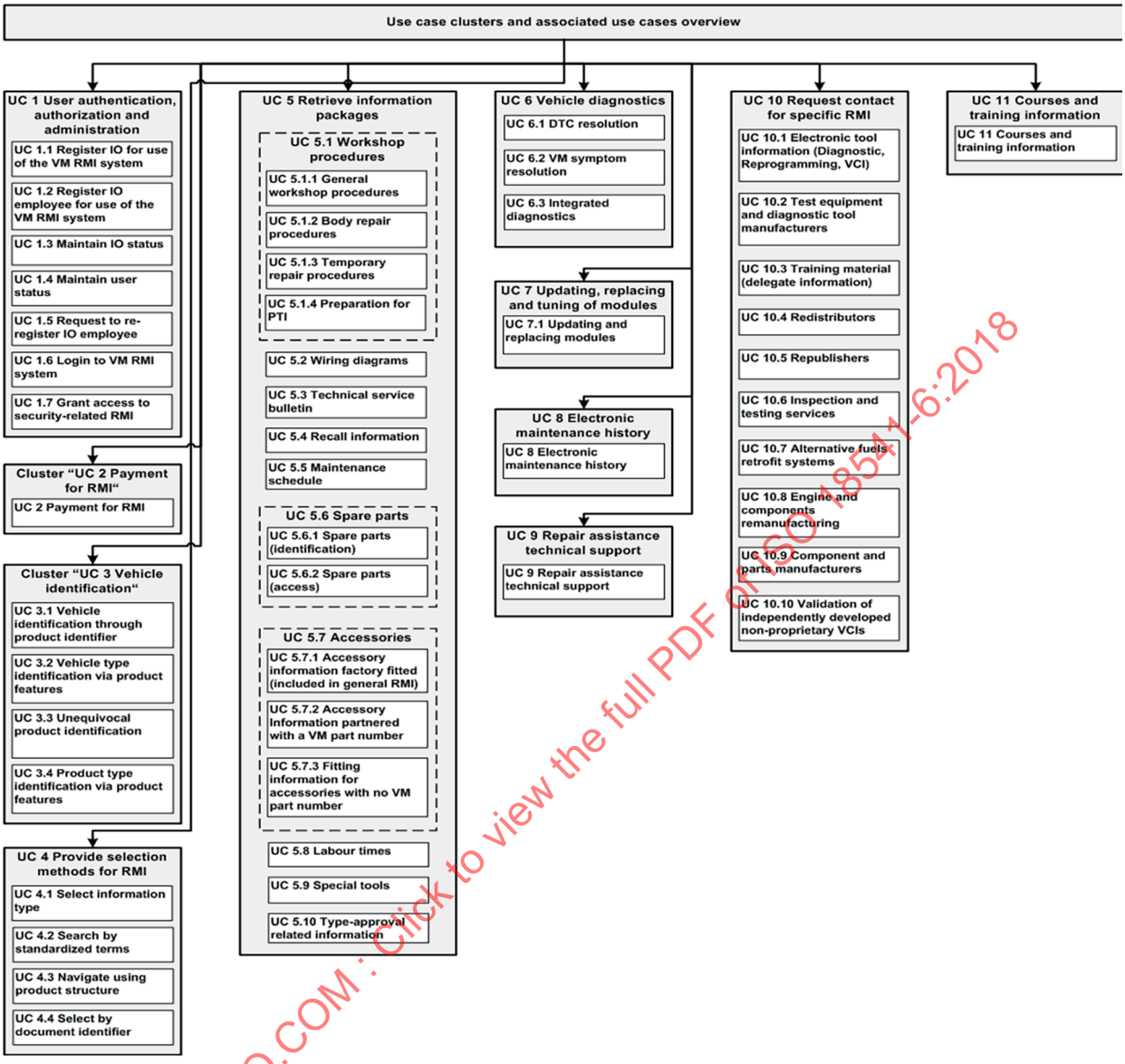


Figure 4 — Use case clusters and associated use cases overview

6.3 Requirements clusters

Table 2 provides an overview of the main categories of standardized access to automotive RMI requirements. A requirement category shall have at least one requirement.

Table 2 — Main requirements clusters

# - Main title of cluster	Brief description	Technical requirements [TREQ] reference
1 – Access-related data administration	Describes the main data types to be administered by the VM RMI system and the requirements for the appropriate management procedures in order to comply with the standardized access to RMI. RMI requirements related to cluster access-related data administration are — requirements for the administration of IO data by the VM, — requirements for the administration IO employee data by the VM, — requirements for the administration of payment data by the VM; — requirements for the administration of access event data by the VM, and — requirements for the administration of access event data to security-related RMI by the VM.	[TREQ-1] General access-related data administration [TREQ-2] Administration of IO data by the VM [TREQ-3] Administration of IO employee data by the VM [TREQ-4] Administration of payment data by the VM [TREQ-5] Administration of access event data by the VM [TREQ-6] Administration of access event data to security-related RMI by the VM
2 – IT architecture	Describes requirements for the main IT components and interfaces at the different IT architectural levels. RMI requirements related to cluster IT architecture are — requirements for the conceptual architecture, and — requirements for the implementation principles.	[TREQ-7] Conceptual architecture [TREQ-8] Implementation principles
3 – External interfaces	Describes the requirements for communication interfaces other than the user interface. RMI requirements related to cluster external interfaces are — requirements for the vehicle communication interface (VCI), — requirements for the trust centre (certificate management), — requirements for the parts ordering for security-related features, and — requirements for the partnered accessory provider systems.	[TREQ-9] Vehicle communication interface (VCI) [TREQ-10] Trust centre (certificate management) [TREQ-11] Parts ordering for security-related features [TREQ-12] Partnered accessory provider systems

Table 2 *(continued)*

# - Main title of cluster	Brief description	Technical requirements [TREQ] reference
4 – Technical infrastructure	Compatibility conditions, minimum requirements for components and internet connection parameters to give an acceptable performance. This cluster intends to define minimal development guiding rules that shall be followed by the VM in order to ensure compatibility between VM RMI systems. Compatibility issues that may occur shall be managed by the Forum SERMI. This requirements cluster specifies the technical infrastructure recommendations which are — requirements related to type of device; — requirements related to hardware features; — requirements related to operating systems, runtime languages, libraries; — requirements related to Web browsers; — requirements related to presentation formats for information packages; — requirements related to internet connection; — requirements related to performance of the VM RMI system.	[TREQ-13] Type of device [TREQ-14] Hardware features [TREQ-15] Operating systems [TREQ-16] Web browsers [TREQ-17] Presentation formats for information packages [TREQ-18] Internet connection [TREQ-19] Performance of the VM RMI system
5 – Co-existence of VM software on IO client	This requirements cluster specifies the co-existence of VM software on the IO client. — Requirements for installing VM-specific software on the IO client. — Requirements for updating VM-specific software on the IO client. — Requirements for the operation of VM-specific software on the IO client. — Requirements for the uninstalling of VM-specific software on the IO client. — Requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client. The VM software shall be developed according to acknowledged quality criteria for the co-existence of VM applications installed on the client side.	[TREQ-20] Requirements for installing VM-specific software on the IO client [TREQ-21] Requirements for updating of installed VM data and applications on the IO client [TREQ-22] Requirements for the operation of VM-specific software on the IO client [TREQ-23] Requirements for the uninstalling of VM-specific software on the IO client [TREQ-24] Requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client
6 – Operations	This requirements cluster specifies the RMI requirements related to the cluster operations are — requirements related to the VM RMI system availability time; — requirements related to the support for the usage of the VM RMI system; — requirements related to the operation of the IO PC.	[TREQ-25] VM RMI system availability time [TREQ-26] Support for the usage of the VM RMI system [TREQ-27] Operation of the IO PC
7 – Functional user interface	This requirement cluster includes the reference to the ISO 18541-3 functional user interface of the VM RMI system.	[TREQ-28] Requirements cluster 7 – Functional user interface

Figure 5 illustrates the technical requirements clusters. Figure 5 shall provide an overview of all technical requirements clusters and the specific technical requirements. Each technical requirement

is identified by the mnemonic "TREQ-" and an alpha-numeric number. The name of the technical requirement is descriptive for the area.

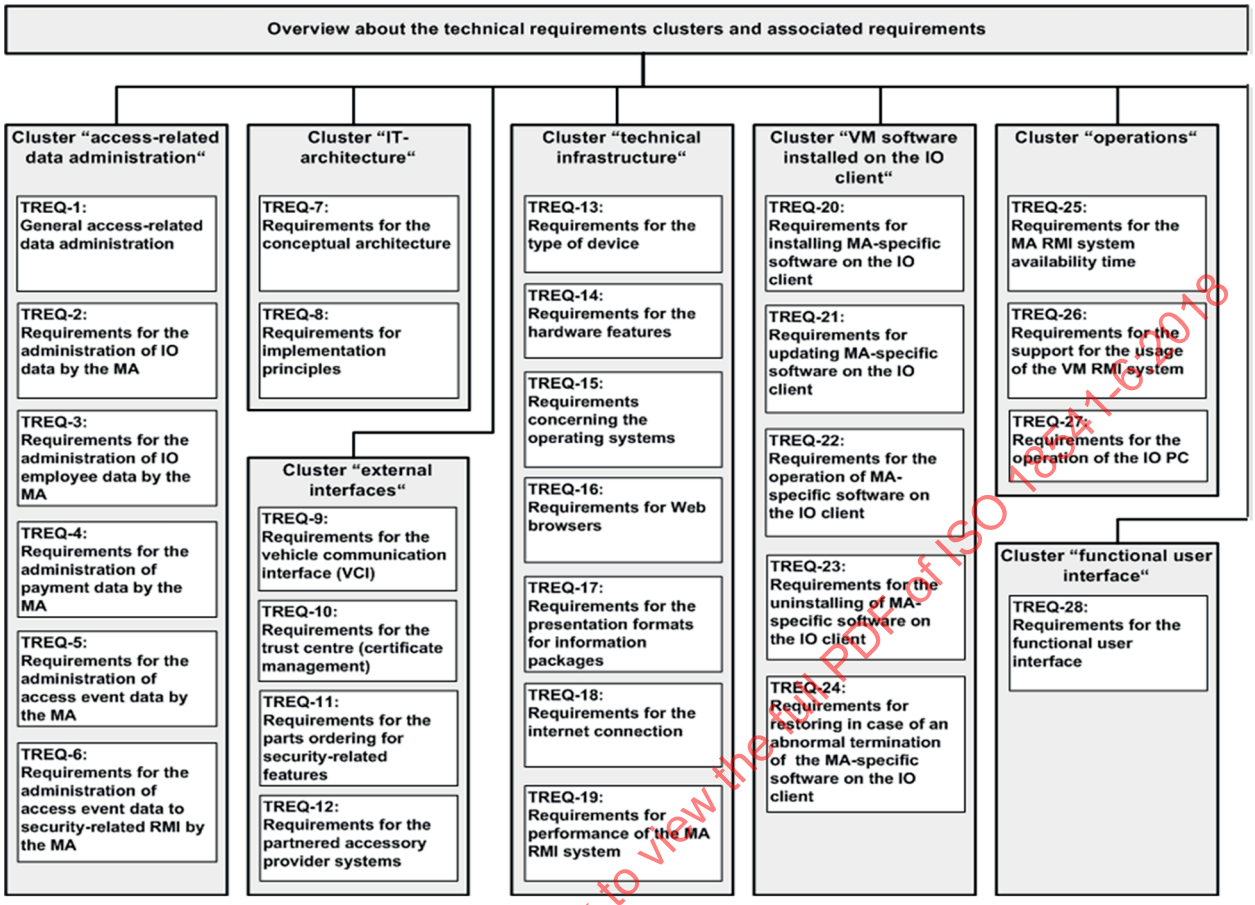


Figure 5 — Overview of the technical requirements clusters

6.4 Functional user interface requirements clusters

Table 3 provides an overview of the main categories of standardized access to automotive RMI requirements. A requirement category shall have at least one requirement.

Table 3 — Main requirements clusters

# - Main title of cluster	Brief description	Functional user interface requirements [FREQ] reference
8 – Standardized access mode	This requirements cluster describes the functional user entry point for standard access to automotive RMI and registration and login support. Requirements related to cluster standardized access mode are — requirements for the chapter 7 RMI access mode; — requirements for the registration and login support.	[FREQ-1] RMI access mode [FREQ-2] Registration and login support
9 – Use cases map	This requirements cluster describes which use cases have been implemented within the VM RMI system and the requirements for the download area according to Clause 9. Requirements related to cluster use cases map are requirements for the VM RMI system implemented use cases requirements for the download area.	[FREQ-3] VM RMI system implemented use cases map [FREQ-4] Download area
10 – Navigational pathway	This requirements cluster describes how the user is able to navigate to the implemented use cases including the desired information. Requirements related to cluster navigational pathway are requirements for the use case-based interactive navigation pathway.	[FREQ-5] Navigational pathway

Figure 6 illustrates the functional user interface requirements clusters. Figure 6 shall provide an overview of all functional user interface requirements clusters and the specific functional user interface requirements. Each functional user interface requirement is identified by the mnemonic "FREQ-" and an alpha-numeric number. The name of the functional user interface requirement is descriptive for the area the requirement is related to.

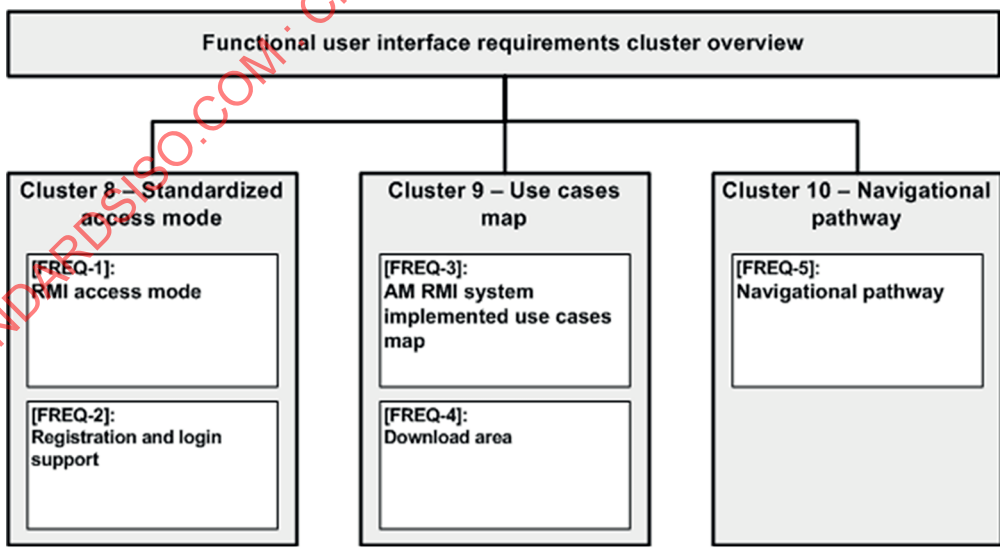


Figure 6 — Overview of functional user interface requirements clusters

6.5 Conformance test clustering

6.5.1 General

6.5.2 provides an overview of all conformance test clusters and the associated test cases for mandatory and optional use cases and requirements. Test cases for optional use cases and requirements will only be possible if the VM RMI system has implemented them. Each test case is assigned to one conformance test cluster. The clusters cover technical areas, where the assigned test case(s) apply.

Each test case is identified by the mnemonic "[RMI-CT_UCx.y], [RMI-CT_TREQ-m], [RMI-CT_FREQ-n]" combined with an alpha-numeric number. The name of the test case is descriptive.

6.5.2 Main conformance test case clusters

Table 4 defines the main conformance test case clusters.

Table 4 — Main conformance test case clusters

# - Main title of cluster	Brief description	Test case reference
1 – Test technical infrastructure	This cluster describes the test cases that check the behaviour of the VM RMI system to support the technical requirements, i.e. client hardware and software installation and configuration is correct, as stated in Clause 8.	[RMI-CT_TREQ-13, 14, 15, 16, 18, Annex B] Test client configuration [RMI-CT_TREQ-17] Test presentation formats for information packages
2 – Test client's external interfaces	This cluster describes the test cases that check the behaviour of the VM RMI system to support the technical requirements, i.e. client communication to the vehicle, as stated in Clause 8.	[RMI-CT_TREQ-9] Test vehicle communication interface (VCI) [RMI-CT_TREQ-11] Test parts ordering for security-related features [RMI-CT_TREQ-12] Test partnered accessory provider systems
3 – Test user authentication, authorization and administration	This cluster describes the test cases that check the behaviour of the VM RMI system to obtain a license to use, keep user data and access level up to date, protect RMI against misuse and to access the VM RMI system, as stated in Clause 7.	[RMI-CT_UC1.1] Test to register IO for use of the VM RMI system [RMI-CT_UC1.2_A] Test to register IO employee for use of the VM RMI system – Scenario A [RMI-CT_UC1.2_B] Test to register IO employee for use of the VM RMI system – Scenario B [RMI-CT_UC1.3] Test to maintain IO status [RMI-CT_UC1.4] Test to maintain user status [RMI-CT_UC1.5] Test to de-register an IO employee [RMI-CT_UC1.6] Test login to VM RMI system [RMI-CT_UC1.7] Test for granting access to security-related RMI
4 – Test functional user interface implementation	This cluster describes the test cases that check the behaviour of the VM RMI system to support the requirements of the functional user interface as stated in Clause 9.	[RMI-CT_FREQ-1] Test for RMI access mode [RMI-CT_FREQ-2] Test for registration and login support [RMI-CT_FREQ-3] Test for implemented use cases map [RMI-CT_FREQ-4] Test for download area [RMI-CT_FREQ-5] Test for navigational pathway

Table 4 *(continued)*

5 – Test payment for RMI	This cluster describes the test cases that check the behaviour of the VM RMI system to support the handling of payments as stated in Clause 8.	[RMI-CT_UC2] Test payment for RMI
6 –Test for vehicle identification	This cluster describes the test cases that test the behaviour of the VM RMI system to support the identification of a specific vehicle and type of vehicle as stated in Clause 7.	[RMI-CT_UC3.1] Test vehicle identification through product identifier [RMI-CT_UC3.2] Test vehicle identification via product features
7 – Test selection methods for RMI	This cluster describes the test cases that check the behaviour of the VM RMI system to support the selection methods — by information types, — by standardized terms, — by product structure, and — by document identifier, as stated in Clause 7.	[RMI-CT_UC4.1] Test selection of information type [RMI-CT_UC4.2] Test search by standardized terms [RMI-CT_UC4.3] Test navigation using product structure [RMI-CT_UC4.4] Test selection by document identifier

Table 4 *(continued)*

8 – Test retrieval of information packages	This cluster describes the test cases that check the behaviour of the VM RMI system to support the retrieval of selected repair and Maintenance information packages — workshop procedures (for body repair temporary repair, periodic technical inspection), — wiring diagrams, — technical service bulletins, — recall information, and — maintenance information, as stated in Clause 7.	[RMI-CT_UC5.1.1] Test retrieval of general workshop procedures [RMI-CT_UC5.1.2] Test retrieval of body repair procedures [RMI-CT_UC5.1.3] Test retrieval of temporary repair procedures [RMI-CT_UC5.1.4] Test retrieval of preparation for PTI [RMI-CT_UC5.2] Test retrieval of wiring diagrams [RMI-CT_UC5.3] Test retrieval of technical service bulletin [RMI-CT_UC5.4] Test retrieval of recall information [RMI-CT_UC5.5] Test retrieval of maintenance schedule [RMI-CT_UC5.6.1] Test retrieval of spare parts (identification) [RMI-CT_UC5.6.2] Test retrieval of spare parts (access) [RMI-CT_UC5.7.1] Test retrieval of accessory information factory fitted (included in general RMI) [RMI-CT_UC5.7.2] Test retrieval of accessory information partnered with a VM part number [RMI-CT_UC5.7.3] Test retrieval of fitting information for accessories with no VM part number [RMI-CT_UC5.8] Test retrieval of labour times [RMI-CT_UC5.9] Test retrieval of special tool information

Table 4 *(continued)*

9 – Test vehicle diagnostics	This cluster describes the test cases that check the behaviour of DTC resolution, symptom resolution or integrated diagnostics as stated in Clause 7.	[RMI-CT_UC6.1] Test DTC resolution [RMI-CT_UC6.2] Test VM symptom resolution [RMI-CT_UC6.3] Test integrated diagnostics
10 – Test updating and replacing of modules (ECUs)	This cluster describes the test cases that check the behaviour of the VM RMI system to support the legitimate update or replacement of vehicle modules/ECUs to return to an operational state after repair or tuning with a VM application as stated in Clause 7 using a known VCI and approved by the VM which meet the standards required by legislation.	[RMI-CT_UC7] Test updating and replacing modules information
11 – Test electronic maintenance history	This cluster describes the test cases that check the behaviour of the VM RMI system to get access and to update the history of VM prescribed maintenance actions for a specific vehicle as identified by the VIN as stated in Clause 7.	[RMI-CT_UC8] Test electronic maintenance history
12 – Test repair assistance, technical support	This cluster describes the test cases that check the behaviour of the VM RMI system to get advice from the VM if repair assistance or technical support is needed as stated in Clause 7.	[RMI-CT_UC9] Test repair assistance technical support

13 – Test request for contact information	This cluster describes the test cases that check the behaviour of the VM RMI system to support the request contact information in order to receive information about — electronic tool, — diagnostics, — VCI, — training material, and — etc., as stated in Clause 7.	[RMI-CT_UC10.1] Test for retrieval of electronic tool information (Diagnostic, Reprogramming, VCI) [RMI-CT_UC10.2] Test for retrieval of test equipment and diagnostic tool manufacturers information [RMI-CT_UC10.3] Test for retrieval of training material (delegate information) [RMI-CT_UC10.4] Test for retrieval of redistributor contact information [RMI-CT_UC10.5] Test for retrieval of republisher information [RMI-CT_UC10.6] Test for retrieval of inspection and testing services information [RMI-CT_UC10.7] Test for retrieval of alternative fuels retrofit system information [RMI-CT_UC10.8] Test for retrieval of engine and components remanufacturing information [RMI-CT_UC10.9] Test for retrieval of component and parts manufacturer information [RMI-CT_UC10.10] Test for retrieval of validation of independently developed non-proprietary VCI information

Table 4 *(continued)*

14 – Test courses and training information	This cluster describes the test cases that check the behaviour of the VM RMI system to get information regarding training course availability (online or Web-based training) as stated in Clause 7.	[RMI-CT_UC11] Test for courses and training information
15 – Test data administration requirements	This cluster describes the test cases that check the behaviour of the VM RMI system whether the managing of data are according to Clause 8.	[RMI-CT_TREQ-1] Test general access-related data administration [RMI-CT_TREQ-2] Test administration of IO data by the VM [RMI-CT_TREQ-3] Test administration of IO employee data by the VM [RMI-CT_TREQ-4] Test administration of payment data by VM [RMI-CT_TREQ-5] Test administration of access event data by VM [RMI-CT_TREQ-6] Test administration of access event data to security-related RMI by VM
16 – Test VM software installation on the IO client	This cluster describes the test cases that check the behaviour of the VM RMI system to check that the VM software installed on the "off-the-shelf" PC behaves according to the requirement as specified in Clause 8.	[RMI-CT_TREQ-20] Test for requirements for installing VM-specific software on the IO client [RMI-CT_TREQ-21] Test for requirements for updating of installed VM data and applications on the IO client [RMI-CT_TREQ-22] Test for requirements for the operation of VM-specific software on the IO client [RMI-CT_TREQ-23] Test for requirements for the uninstalling of VM-specific software on the IO client [RMI-CT_TREQ-24] Test for requirements for restoring in case of an abnormal termination of the VM specific software on the IO client
17 – Test VM RMI operations	This cluster describes the test cases that check the behaviour of the VM RMI system to check that the VM RMI system is operational except for scheduled maintenance downtime and whether the VM offers support for the usage of the VM RMI system as stated in Clause 8.	[RMI-CT_TREQ-25] Test for VM RMI system availability time [RMI-CT_TREQ-26] Test for support for the usage of the VM RMI system
18 – Test trust centre (certificate management)	This cluster describes the test cases that check the behaviour of the VM RMI system to check that the client has installed the software driver to support the digital certificate and that the infrastructure processes the certificate content as stated in Clause 8.	[RMI-CT_TREQ-10] Test for trust centre (certificate management)

7 Use cases

7.1 UC 1 User authentication, authorization and administration

7.1.1 UC 1.1 Register IO for use of the VM RMI system

Table 5 specifies the applicable use case to meet the requirements.

Table 5 — UC 1.1 Register IO for use of the VM RMI system

Actor	IO legal representative
Goal	To register the IO for use of the VM RMI system
Use case input	IO data: — IO name; — IO postal address; — country; — postal address for invoicing if different from IO postal address; — inter-community VAT No.; — first name, family name of the IO legal representative; — e-mail address for communication with the IO legal representative in all aspects of the VM RMI system usage; — preferred language; — choice of an User ID and password of the IO legal representative (the User ID shall be unique in the VM system); — optionally, a confirmation of the IO approval, according to the SERMI scheme, if the IO wants to request access to security-related RMI; — optionally, in addition to the already accepted Terms and Conditions, an IO commercial re-user completes a declaration of intent (template). The declaration of intent is only applicable, if the VM RMI system does not offer navigation via product features. Further input may be requested in recognition of local legislation. Agreement to — terms and conditions, and — registration fee if applicable
Use case output	Notification of — contract agreement between IO and VM established or rejected, — IO legal representative registered or rejected, and — acceptance or rejection of the IO approval to access security-related RMI. Justification in case of rejection.

Table 5 *(continued)*

Brief description	The VM validates the identity and the legitimacy of the requester. The implemented validation mechanism is VM-specific and has to follow local legal requirements. If the data entered by the IO is incorrect or the identity and the legitimacy of the requester cannot be validated, then the VM has the right to reject the requested registration and the VM shall inform the requester of the reason in a prompt and traceable manner. In case of rejection, the IO has the right to remedy, rectify, correct or re-input the data according to the reason for rejection. If the IO wants to request access to security-related RMI, the VM checks the validity of the confirmation of IO's approval. — In addition to the previously accepted Terms and Conditions, the IO commercial re-user completes a declaration of intent (template). The IO commercial re-user then receives access via VIN (UC 3.1 Vehicle identification through product identifier) and Product Features (UC 3.2 Vehicle type identification via product features) to the website. — Based on the declaration of intent, an extended contract may be necessary for republishing. The contract details are negotiated and agreed between IO and VM. IO legal representative formally agrees with the Terms and Conditions for VM RMI system use. The VM accepts IO's legal representative as a user. The VM RMI system asks the user to choose a User ID and assigns a first password to the user or allows them to enter one that satisfies the VM ´s password security requirements. VM may charge a reasonable registration fee to the IO.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.1.2 UC 1.2 Register IO employee for use of the VM RMI system

Table 6 specifies the applicable use case to meet the requirements.

Table 6 — UC 1.2 Register IO employee for use of the VM RMI system

Actor	IO legal representative or IO employee
Goal	To register IO employee for use of the VM RMI system as defined by the IO legal representative.
Use case input	Either: — request from the IO legal representative person to register a new IO employee, and — user id and password of the IO legal representative person, or — an IO employee's request, indicating that they are associated with an IO, and are requesting confirmation from the IO legal representative to complete registration. — in that case, company identification data are additionally required as input. Both: — an email-address for communication with the user in all aspects of the VM RMI system usage, — preferred language, and — choice of an User ID and a password (the User ID shall be unique in the VM system). Further input may be requested in recognition of local legislation.
Use case output	IO's employee registered as an authorized user in the VM RMI system.

Table 6 *(continued)*

Brief description	The VM requests the IO legal representative to confirm the validity of the IO data. The VM accepts IO's employee as a user and communicates this to the user. The VM RMI system asks the user to choose a User ID and either assigns an initial password to the user or allows them to enter one that satisfies the VM's password security requirements. VM may charge a reasonable registration fee to the IO.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.1.3 UC 1.3 Maintain IO status

Table 7 specifies the applicable use case to meet the requirements.

Table 7 — UC 1.3 Maintain IO status

Actor	IO legal representative
Goal	Keep IO data up to date.
Use case input	Request to change IO data.
Use case output	Updated IO data.
Brief description	On IO request, the VM RMI system or the VM administrator updates the IO data. Some changes may require a new validation or even a new registration of the IO (e.g. new company name and type). A clear policy statement on the conditions for a new validation or registration is reflected in the Terms and Conditions on the VM RMI system.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.1.4 UC 1.4 Maintain user status

Table 8 specifies the applicable use case to meet the requirements.

Table 8 — UC 1.4 Maintain user status

Actor	IO employee
Goal	Keep user data up to date.
Use case input	— Password — Preferred language — Email address
Use case output	Updated user data.
Brief description	Only changes of password, the preferred language and the user email address can be requested. The VM RMI system or the VM administrator updates the user data or rejects the request. Finally, the VM RMI system or the VM administrator communicates the result to the user. In case of rejection, the actor has the right to remedy, rectify, correct or re-input the data according to the reason for rejection.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.1.5 UC 1.5 Request to de-register IO employee

Table 9 specifies the applicable use case to meet the requirements.

Table 9 — UC 1.5 Request to de-register IO employee

Actor	IO legal representative
Goal	Request to de-register an IO employee
Use case input	IO legal representative requests to de-register an IO employee
Use case output	IO employee account(s) is de-activated
Brief description	The IO legal representative requests to de-register an IO employee account(s). The VM RMI system processes the request. The IO legal representative is notified of the result of the de-activation of the IO employee account(s).
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.1.6 UC 1.6 Login to VM RMI system

Table 10 specifies the applicable use case to meet the requirements.

Table 10 — UC 1.6 Login to VM RMI system

Actor	Independent Operator (IO legal representative and/or IO employee)
Goal	Access to the VM RMI system.
Use case input	— User ID — Password
Use case output	Successful login into the VM RMI system.
Brief description	The VM RMI system offers the possibility to enter User ID and password. After a successful authentication, the first user-specific navigation level is displayed. Access to security-related information and operations requires an appropriate access level, which is bound to a certificate.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.1.7 UC 1.7 Grant access to security-related RMI

Table 11 specifies the applicable use case to meet the requirements.

Table 11 — UC 1.7 Grant access to security-related RMI

Actor	IO employee, IO legal representative
Goal	To obtain access to security-related RMI for an IO employee or an IO legal representative.
Use case input	— Request of a registered IO employee or IO legal representative for access to security-related RMI. — A digital certificate according to the SERMI scheme.
Use case output	Access level for security-related RMI is granted according to the presented digital certificate, and IO authorization for the IO employee or the IO legal representative. The request for access to security-related RMI shall only be accepted if the IO employee/IO legal representative is already registered for access to the VM RMI system, the IO authorization of the IO employee is valid, and the IO for which the requester is registered has a valid IO approval.

Table 11 *(continued)*

Brief description	The VM checks the IO approval of the IO for which the actor is registered, and the validity of the IO employee's certificate and IO authorization via request to the trust centre that issued the certificate. The access level is determined by the VM and communicated to the actor. In the case that the actor is not the IO legal representative, then the access level is also communicated to the IO legal representative. VM may charge a reasonable fee to the IO.
Classification	Mandatory if security-related RMI exists
Applicability	This use case is applicable for all L subcategories

7.2 UC 2 Payment for RMI

Table 12 specifies the applicable use case to meet the requirements.

Table 12 — UC 2 Payment for RMI

Actor	Independent Operator
Goal	Handling of payments
Use case input	— Select subscription — Select payment arrangement — Payment-relevant data (card data, account id, etc.)
Use case output	— Subscription activated — Receipt — User can start using the VM RMI system
Brief description	The VM RMI system displays a page showing all valid subscriptions (hourly, daily, weekly, monthly and yearly access) to the different access levels and the VM-supported payment arrangements. In addition to time-based access, VMs may establish and make available fees per transaction. All payment shall be in accordance with the Terms and Conditions for the VM RMI system. The user selects the desired subscription and the preferred payment arrangement. The VM RMI system requests the user to enter the necessary data to process the payment arrangement. The VM RMI system validates the input, activates the corresponding subscription and issues a receipt.
Classification	Mandatory for VMs who charge for RMI
Applicability	This use case is applicable for all L subcategories

7.3 UC 3 Vehicle identification

7.3.1 UC 3.1 Vehicle identification through product identifier

Table 13 specifies the applicable use case to meet the requirements.

Table 13 — UC 3.1 Vehicle identification through product identifier

Actor	Independent Operator
Goal	Unequivocal vehicle identification and summary.
Use case input	— VIN — Product identifier (optional)

Table 13 *(continued)*

Use case output	— Vehicle or vehicle stage model — Product features — Factory fitted optional equipment — Identified vehicle or vehicle stage for further RMI system use purposes
Brief description	After entering the VIN and optionally the product identification number for completed vehicles, the RMI system displays the output and memorizes the identified vehicle or vehicle stage for use in subsequent use cases during the session. If a VIN entered is not applicable, then a notification to the user shall be provided. The following describes the use case output responsibility dependent on the vehicle type approval method. Case 1: The complete vehicle is type approved by a single vehicle manufacturer. This vehicle manufacturer shall take the responsibility for providing the use case output for the complete vehicle. Case 2: The vehicle is type approved by more than a single vehicle manufacturer, i.e. multi-stage type approval. Each vehicle manufacturer shall take the responsibility for providing the use case output for that manufacturers' own type approved stage and in addition the information according to UC 5.10.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.3.2 UC 3.2 Vehicle type identification via product features

Table 14 specifies the applicable use case to meet the requirements.

Table 14 — UC 3.2 Vehicle type identification via product features

Actor	Independent Operator
Goal	Identification of a vehicle type or vehicle types.
Use case input	Product features selection filter, e.g. — model name (CBR1000RR), model code (SC59), — model year, — capacity (ccm), — power (kW), — engine type (two stroke cycle, four stroke cycle, etc.), — transmission type (manual/automatic/CVT), and — final drive type (chain, shaft drive, belt, etc.).
Use case output	Identified vehicle type or vehicle types according to selected product features for subsequent VM RMI system use purposes.

Table 14 *(continued)*

Brief description	The VM RMI system behaviour depends on the policy followed by the VM regarding product feature support for authorized repairers. — For a VM RMI system that offers product features. The VM RMI system from a VM that offers product features to his authorized repairers presents information types according to the selection filter set by the IO. The access shall be possible for the information types specified in the following use cases[a] according to the use case classification, except for those use cases that explicitly require VIN input[b]. The identified vehicle type or vehicle types is/are noted by the VM RMI system, so that the requested information can be provided for this vehicle type or these vehicle types in subsequent Use Cases. — For a VM RMI system that does not offer product features. The VM RMI system from a VM that does not offer product features to his authorized repairers enables access to information related to selected product features for an IO that is registered as an IO commercial re-user and that has completed a declaration of intent (template). An extended contract may be needed for republishing of RMI in their products and services. The access shall be possible for the information types specified in the following use cases[a] according to the use case classification, except for those use cases that explicitly require VIN input[b]. The offered mechanism to enable this access is VM specific. The identified vehicle type or vehicle types is/are noted by the VM RMI system, so that the requested information can be provided for this vehicle type or these vehicle types in subsequent Use Cases.

Table 14 *(continued)*

Classification	Mandatory
Applicability	Applicable for L subcategories allowing only a single-stage type-approval
a Information types accessible with Product Features are specified in the following use cases: — UC 5.1.1 General workshop procedures; — UC 5.1.2 Body repair procedures; — UC 5.1.3 Temporary repair procedures; — UC 5.1.4 Preparation for PTI; — UC 5.2 Wiring diagrams; — UC 5.3 Technical service bulletin (if provided to AR via Product Features); — UC 5.5 Maintenance schedule; — UC 5.6.1 Spare parts (identification); — UC 5.6.2 Spare parts (access); — UC 5.7.1 Accessory information factory fitted (included in general RMI); — UC 5.7.2 Accessory information partnered with a VM part number; — UC 5.7.3 Fitting information for accessories with no VM part number; — UC 5.8 Labour times; — UC 6.2 VM symptom resolution (only if provided to the AR). b Information types that explicitly require VIN input are as follows: — UC 5.4 Recall information; — UC 6.1 DTC resolution; — UC 6.3 Integrated diagnostics; — UC 7 Updating and replacing modules (ECUs); — UC 8 Electronic Maintenance history.	

7.4 UC 4 Provide selection methods for RMI

7.4.1 UC 4.1 Select information type

Table 15 specifies the applicable use case to meet the requirements.

Table 15 — UC 4.1 Select information type

Actor	Independent Operator
Goal	Select relevant information types for the request.
Use case input	Ask for information types.
Use case output	Display of information types available for the identified vehicle, e.g.: — General workshop procedures; — Temporary repair procedures; — Preparation for PTI; — Wiring diagrams; — Technical service bulletin; — Recall information; — Maintenance schedule. Selected information type(s) is retained in the VM RMI system for subsequent use case(s).

Table 15 *(continued)*

Brief description	The VM RMI system issues a list of information types. This list varies by VM but is the same list as the VM offers to the AR. The user selects at least one information type. The selected information type(s) are retained in the VM RMI system for subsequent use case(s).
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.4.2 UC 4.2 Search by standardized terms

Table 16 specifies the applicable use case to meet the requirements.

Table 16 — UC 4.2 Search by standardized terms

Actor	Independent Operator
Goal	Find information to a standardized term.
Use case input	One standardized term or a combination of standardized terms.
Use case output	All Information packages containing the term(s) in the title or in the tags.
Brief description	The VM RMI system searches all information packages titles and tags and not within documents for the requested terms and finally displays a list of all matching documents. Search by the standardized terms that are defined in a Digital Annex according to ISO 18542.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.4.3 UC 4.3 Navigate using product structure

Table 17 specifies the applicable use case to meet the requirements.

Table 17 — UC 4.3 Navigate using product structure

Actor	Independent Operator
Goal	Find information by navigating through the product structure.
Use case input	Select the items in the presented product structure.
Use case output	Either a next detail level in the product structure or finally a list of available information for the chosen component.
Brief description	The VM RMI system displays the different levels in the same product structure offered to the VM´s AR and finally displays a list of existing information packages for the finally selected item.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.4.4 UC 4.4 Select by document identifier

Table 18 specifies the applicable use case to meet the requirements.

Table 18 — UC 4.4 Select by document identifier

Actor	Independent Operator
Goal	Find information by document identifier.
Use case input	Exact document identifier.
Use case output	Display document.

Table 18 *(continued)*

Brief description	The VM RMI system displays the requested document.
Classification	Optional but mandatory if provided by VM to VM AR.
Applicability	This use case is applicable for all L subcategories

7.5 UC 5 Retrieve information packages

7.5.1 UC 5.1 Workshop procedures

7.5.1.1 UC 5.1.1 General workshop procedures

Table 19 specifies the applicable use case to meet the requirements.

Table 19 — UC 5.1.1 General workshop procedures

Actor	Independent Operator
Goal	Access to the workshop procedures
Use case input	Select the title of one of the workshop procedures:
Use case output	Display the selected workshop procedures:
Brief description	The user selects one of many workshop procedures in the search result list. The VM RMI system displays the selected package of information.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.5.1.2 UC 5.1.2 Body repair procedures

Table 20 specifies the applicable use case to meet the requirements.

Table 20 — UC 5.1.2 Body repair procedures

Actor	Independent Operator
Goal	Access to body repair procedures.
Use case input	Select the title of one of the body repair procedures.
Use case output	Display the selected body repair procedure. Examples: — information on correct removal of parts and systems.; — information on correct procedures for field replacement of parts including welding, and, chemical and mechanical bonding; — information for re-alignment; — information on reinstatement of corrosion resistance process.
Brief description	The VM is free to choose the place in the VM RMI system, where to provide this information. The user selects one of many body repair procedures in the search result list. The VM RMI system displays the selected package of information.
Classification	Optional but mandatory if the repair information exists.
Applicability	This use case is applicable for all L subcategories

7.5.1.3 UC 5.1.3 Temporary repair procedures

Table 21 specifies the applicable use case to meet the requirements.

Table 21 — UC 5.1.3 Temporary repair procedures

Actor	Independent Operator
Goal	Affect a temporary fix to alleviate the customer's problem pending full repair.
Use case input	— Vehicle identification — Symptom — Complaint as above
Use case output	Instructions to affect a temporary fix or remote activation.
Brief description	The VM is free to choose the place in the VM RMI system, where to provide this information. The user selects one of many temporary repair procedures in the search result list. The VM RMI system displays the selected package of information.
Classification	Optional but mandatory if provided by VM to VM AR.
Applicability	This use case is applicable for all L subcategories

7.5.1.4 UC 5.1.4 Preparation for PTI

Table 22 specifies the applicable use case to meet the requirements.

Table 22 — UC 5.1.4 Preparation for PTI

Actor	Independent Operator
Goal	To obtain information to prepare a PTI according to current legislation.
Use case input	Request for information for preparation of a PTI according to current legislation.
Use case output	Country-specific PTI information according to current legislation.
Brief description	The Independent Operator requests information for the preparation of a PTI according to country-specific legislation. The VM RMI system displays the requested information or offers access to PTI services.
Classification	Optional but mandatory if provided by VM to VM AR.
Applicability	This use case is applicable for all L subcategories

7.5.2 UC 5.2 Wiring diagrams

Table 23 specifies the applicable use case to meet the requirements.

Table 23 — UC 5.2 Wiring diagrams

Actor	Independent Operator
Goal	Access to the wiring diagrams.
Use case input	Select the desired wiring diagram or view.
Use case output	Display the selected wiring diagrams.
Brief description	The user selects one of many wiring diagrams in the search result list. The VM RMI system displays the selected package of information.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.5.3 UC 5.3 Technical service bulletin

Table 24 specifies the applicable use case to meet the requirements.

Table 24 — UC 5.3 Technical service bulletin

Actor	Independent Operator
Goal	Access to the technical service bulletins.
Use case input	Select the title of one of the technical service bulletins. Might only be accessible with a VIN.
Use case output	Display the selected technical service bulletin.
Brief description	The user selects one of many technical service bulletins in the search result list. The VM RMI system displays the selected package of information.
Classification	Optional but mandatory if provided by VM to VM AR.
Applicability	This use case is applicable for all L subcategories

7.5.4 UC 5.4 Recall information

Table 25 specifies the applicable use case to meet the requirements.

Table 25 — UC 5.4 Recall information

Actor	Independent Operator
Goal	Identify if a recall is required on a vehicle.
Use case input	VIN Select recall information alert;
Use case output	Title of the recall and a message. Indication for the IO that the VM would provide a free of charge repair through their authorized network.
Brief description	The VM RMI system displays an alert after a VIN input. The VM RMI system displays the title of the recall and a message. The message includes the brief description as provided to VM´s AR. The VM RMI system informs the IO that the VM would provide a free of charge repair through their authorized network.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.5.5 UC 5.5 Maintenance schedule

Table 26 specifies the applicable use case to meet the requirements.

Table 26 — UC 5.5 Maintenance schedule

Actor	Independent Operator
Goal	Access to Maintenance schedule for the vehicle.
Use case input	Vehicle identification: — VIN, or — product features.
Use case output	Maintenance schedule for the vehicle.
Brief description	The VM RMI system provides programs and descriptions for the selected vehicle (see C1). The link between maintenance schedule and relevant procedures (see C2).
Classification	C1 Mandatory (related to use case) C2 Optional but mandatory if provided by VM to VM AR.
Applicability	This use case is applicable for all L subcategories

7.5.6 UC 5.6 Spare parts

7.5.6.1 UC 5.6.1 Spare parts (identification)

Table 27 specifies the applicable use case to meet the requirements.

Table 27 — UC 5.6.1 Spare parts (identification)

Actor	Independent Operator
Goal	Locate the required spare part information.
Use case input	— select the content of one of the information packages, or — locate link to spare parts catalogue;
Use case output	— display the selected document, or — provide an access path to a spare parts catalogue;
Brief description	The VM RMI system either provides spare parts information or routes the user to the spare parts information system. The VM RMI system may offer access to spare part information also through the repair information packages. The spare part information shall be to the same level and content as provided by VM to VM AR.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.5.6.2 UC 5.6.2 Spare parts (access)

Table 28 specifies the applicable use case to meet the requirements.

Table 28 — UC 5.6.2 Spare parts (access)

Actor	Independent Operator
Goal	Spare part information.
Use case input	Access spare parts catalogue direct.
Use case output	Display spare parts catalogue.
Brief description	Displays spare parts catalogue home page. For a particular part, the specific part number and version (if applicable) shall be displayed in the spare parts catalogue. This may be in the form of a link from the VM RMI system to an independent catalogue.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.5.7 UC 5.7 Accessories

7.5.7.1 UC 5.7.1 Accessory information factory fitted (included in general RMI)

Table 29 specifies the applicable use case to meet the requirements.

Table 29 — UC 5.7.1 Accessory information factory fitted (included in general RMI)

Actor	Independent Operator
Goal	Repair information.
Use case input	Select the information package.

Table 29 *(continued)*

Use case output	Display repair information.
Brief description	The VM RMI system provides accessory information for VM built-in accessories.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.5.7.2 UC 5.7.2 Accessory information partnered with a VM part number

Table 30 specifies the applicable use case to meet the requirements.

Table 30 — UC 5.7.2 Accessory information partnered with a VM part number

Actor	Independent Operator
Goal	Fitting and/or repair information.
Use case input	Select the information package.
Use case output	Display fitting and/or repair information.
Brief description	The VM RMI system either provides accessory information or routes the user to accessory information system for partnered accessories. The user is at least redirected to the third party responsible for the accessory.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.5.7.3 UC 5.7.3 Fitting information for accessories with no VM part number

Table 31 specifies the applicable use case to meet the requirements.

Table 31 — UC 5.7.3 Fitting information for accessories with no VM part number

Actor	Independent Operator
Goal	Information on fitting interfaces (mechanical, electrical or electronic).
Use case input	Request information on fitting interfaces.
Use case output	Display information for fitting interfaces.
Brief description	The VM only provides information on published (service manual) or AR available interfaces (mechanical, electrical or electronic) that can be used by an accessory provider. Whenever additional information is available to AR, it shall be provided to the IO.
Classification	Optional but mandatory if provided by VM to VM AR.
Applicability	This use case is applicable for all L subcategories

7.5.8 UC 5.8 Labour times

Table 32 specifies the applicable use case to meet the requirements.

Table 32 — UC 5.8 Labour times

Actor	Independent Operator
Goal	Identify vehicle-specific labour times.
Use case input	Select specific labour times.
Use case output	Display the selected labour times.
Brief description	The VM RMI system provides labour times.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.5.9 UC 5.9 Special tools

Table 33 specifies the applicable use case to meet the requirements.

Table 33 — UC 5.9 Special tools

Actor	Independent Operator
Goal	Access to the special tool information.
Use case input	Select the title of one of the information packages, e.g. identification of tool, picture and instructions.
Use case output	Display the selected information package.
Brief description	The VM RMI system enables easy identification of special tools. The VM RMI system offers access to special tool information either identification of tool and/or through the repair information package.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.5.10 UC 5.10 Type-approval related information

Table 34 specifies the applicable use case to meet the requirements.

Table 34 — UC 5.10 Type-approval related information

Actor	Independent Operator
Goal	Access to type-approval related information
Use case input	— VIN or product identifier — Request type-approval related information
Use case output	— Type-approval number of the vehicle or product type the Manufacturer is responsible for. A vehicle manufacturer responsible for a particular subsequent stage of a multi-stage type-approved vehicle shall provide in addition: — Website address of the vehicle manufacturer or vehicle manufacturers responsible for the previous stage or stages The final manufacturer of a multi-stage type-approved vehicle shall provide, in addition, the following: — name and address of the manufacturer or manufacturers responsible for the previous stage or stages; — type-approval number of the previous stage or stages; — engine number (directly or via a link to the relevant previous manufacturer).
Brief description	The RMI system displays the type-approval related information relevant to the manufacturer's product.
Classification	Mandatory
Applicability	This use case is only applicable for L subcategories for which a multi-stage type-approval is allowed

7.6 UC 6 Vehicle diagnostics

7.6.1 UC 6.1 DTC resolution

Table 35 specifies the applicable use case to meet the requirements.

Table 35 — UC 6.1 DTC resolution

Actor	Independent Operator
Goal	Provide DTC information.
Use case input	— DTC — Vehicle identification by VIN (mandatory) — Potentially a module
Use case output	Diagnostic information related to the entered DTC if it is relevant to the vehicle and module.
Brief description	The VM RMI system provides a description of the DTC (including P-Codes) if it is relevant to the vehicle and module. The VM RMI system delivers a list of potential causes or hints for further investigation, to the same level and content as provided to AR.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.6.2 UC 6.2 VM symptom resolution

Table 36 specifies the applicable use case to meet the requirements.

Table 36 — UC 6.2 VM symptom resolution

Actor	Independent Operator
Goal	Provide diagnosis and repair requirements.
Use case input	— Symptoms — Vehicle identification by VIN (Mandatory) or by product features (only if provided to the ARs)
Use case output	— Diagnostic information — Potential repair descriptions
Brief description	The user enters or selects a VM symptom as found by reading the published technical documentation. The VM RMI system delivers a list of potential causes or hints for further investigation, to the same level and content as provided to AR.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.6.3 UC 6.3 Integrated diagnostics

Table 37 specifies the applicable use case to meet the requirements.

Table 37 — UC 6.3 Integrated diagnostics

Actor	Independent Operator
Goal	Provide precise diagnosis and repair requirements.
Use case input	— Vehicle linked via standardized non-proprietary VCI functionality to VM RMI system — VIN
Use case output	— Precise diagnostics results — Repair recommendation

Table 37 *(continued)*

Brief description	This use case is optional; however, if provided to AR, then it shall be provided at the same level to IO. The user links the vehicle via standardized non-proprietary VCI functionality to VM RMI system using a non-proprietary IO client (hardware and software) as defined in Clause 9. The VM RMI system interprets via an integrated application the memory contents of ECUs and gives a diagnostic and repair recommendation. This can be done through many steps, whereby the user may be requested to perform test actions on the vehicle or to enter symptoms. The diagnostic application may run on a local device or on a central device accessed via Web. Mixed solutions with co-operating local and central components are also possible.
Classification	Optional but mandatory if provided by VM to VM AR.
Applicability	This use case is applicable for all L subcategories

7.7 UC 7 Updating and replacing modules (ECUs)

Table 38 specifies the applicable use case to meet the requirements.

Table 38 — UC 7 Updating and replacing modules

Actor	Independent Operator
Goal	Support the legitimate update or replacement of vehicle modules to return to an operational state after repair, with a VM application using approved and known VCIs.
Use case input	— VIN selection — User selects necessary action for re-programming single/multiple or all re-programmable ECUs — User selects necessary actions to configure or enable replaced modules
Use case output	Vehicle updated to the appropriate software level and functional or service parts correctly programmed and configured.
Brief description	The user links the vehicle to the VM RMI system via standardized non-proprietary VCI functionality [as defined in [TREQ-9] Vehicle communication interface (VCI)]. The user requests the necessary action for updating or replacing modules. Security measures, i.e. approval/authorization to protect against vehicle theft or emission control and engine calibration tampering may be required. The VM RMI system identifies the required software versions for the individual vehicle. Update the ECU software according to the valid configuration. Electronic preparation, validation and verification of the vehicle before and after the re-programming shall be done according to the VM RMI system instructions. The system logs all reprogramming tasks performed during the session. Only independent service parts that have the same functional performance and durability as VM service parts shall be allowed and updated. In the event of an update to this independent part being unsuccessful, the VM carries no responsibility or liability for returning the vehicle to an operational state. The updating and replacing of modules using VM service parts and VM validated VCI solutions will be supported (first line and subsequent second line) by the VM. The VM shall provide a list on the VM RMI system validated VCI solutions.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.8 UC 8 Electronic Maintenance history

Table 39 specifies the applicable use case to meet the requirements.

Table 39 — UC 8 Electronic maintenance history

Actor	Independent Operator
Goal	Access and update the history of VM prescribed maintenance actions.
Use case input	— VIN — Electronic Maintenance history selection — Digital signature using a certificate according to ISO 20828 (X509.V3) and Reference [7].
Use case output	Updated maintenance history
Brief description	The VM RMI system provides the vehicle history of VM prescribed maintenance. The IO provides the requested parameters and is able to view and print the entire maintenance history under the same conditions as ARs. After performing the maintenance, the IO acknowledges that the maintenance actions have been performed by submission of the digitally signed maintenance history update according to ISO 20828 (X509.V3). A print out of the maintenance actions that have been performed shall be provided as proof to the customer that the maintenance history of the vehicle has been updated.
Classification	Optional but mandatory if provided as the only record of maintenance. Mandatory for the IO to update the electronic maintenance history in instances where the electronic maintenance history is the only documentation of the maintenance.
Applicability	This use case is applicable for all L subcategories

7.9 UC 9 Repair assistance technical support

Table 40 specifies the applicable use case to meet the requirements.

Table 40 — UC 9 Repair assistance technical support

Actor	Independent Operator
Goal	Get advice from VM experts.
Use case input	Request for repair assistance and technical support.
Use case output	Request accepted and routed to the VM experts.
Brief description	The VM RMI system presents contact data. The Technical Support Service is only available to registered users of the VM RMI system. The level of service and the mechanism to deliver the service will also be determined by the VM (telephone, e-mail, payment, etc.) in a non-discriminatory manner.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.10 UC 10 Request contact for specific RMI

7.10.1 UC 10.1 Electronic tool information (Diagnostic, Reprogramming, VCI)

Table 41 specifies the applicable use case to meet the requirements.

Table 41 — UC 10.1 Electronic tool information (Diagnostic, Reprogramming, VCI)

Actor	Independent Operator
Goal	Collect information on how to obtain manufacturer's diagnostic tool, reprogramming tool, VCI and vehicle connection adapter (in case the vehicle connector is proprietary).
Use case input	Request VM's contact information and information about manufacturer's diagnostic tool, reprogramming tool, VCI and vehicle connection adapter (in case the vehicle connector is proprietary).
Use case output	VM's contact information for: — description of manufacturer's diagnostic tool, VCI and vehicle connection adapter (in case the vehicle connector is proprietary); — available list of contacts (country by country) where diagnostic tools, VCI and vehicle connection adapter can be purchased.
Brief description	The independent operator requests information about the VM's diagnostic tool, VCI and vehicle connection adapter (in case the vehicle connector is proprietary). The VM RMI system either displays information about the VM's diagnostic tool, VCI, vehicle connection adapter (in case the vehicle connector is proprietary) and relevant ordering information or links the user to the VM tool supplier website containing the information about the VM's diagnostic tool, VCI, vehicle connection adapter (in case the vehicle connector is proprietary) and relevant ordering information, which in either case will be supplied in a manner which is non-discriminatory compared to the provision given or access granted to authorized dealers and repairers. This can be contact information to a vehicle manufacturer supplier.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.10.2 UC 10.2 Test equipment and diagnostic tool manufacturers

Table 42 specifies the applicable use case to meet the requirements.

Table 42 — UC 10.2 Test equipment and diagnostic tool manufacturers

Actor	Test equipment and diagnostic tool manufacturers
Goal	Find necessary OBD-related and vehicle repair and maintenance information to design and manufacture test equipment or diagnostic tools.
Use case input	Request VM's contact information and information about test equipment and diagnostic tools for the requested vehicle types including the vehicle connector pin configuration (in case the vehicle connector is proprietary).
Use case output	VM's contact information and process for test equipment and diagnostic tool manufacturers.
Brief description	The test equipment or diagnostic tool manufacturer requests information to enable the development of tools. The VM RMI system displays contact data and process information on how to obtain the requested information. Provision of material is subject to individual contractual agreement between test equipment or diagnostic tool manufacturers and VM. In case the vehicle connector is proprietary, the connector pin configuration details shall be provided free of charge.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.10.3 UC 10.3 Training material (delegate information)

Table 43 specifies the applicable use case to meet the requirements.

Table 43 — UC 10.3 Training material (delegate information)

Actor	Independent training provider
Goal	Training material (delegate information).
Use case input	Request VM's contact information and information on training materials.
Use case output	VM's contact information for training Material.
Brief description	The VM RMI system provides the relevant contact for training materials. The contact may be market specific. Provision of material is subject to individual contractual agreement between the independent training provider and the VM.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.10.4 UC 10.4 Redistributors

Table 44 specifies the applicable use case to meet the requirements.

Table 44 — UC 10.4 Redistributors

Actor	Redistributor
Goal	To obtain RMI for redistribution within their own closed network, e.g. RAC, ADAC, garage networks.
Use case input	Request VM's contact information and identification of desired information and request for redistribution.
Use case output	VM's contact information for contractual agreement to redistribute the desired information.
Brief description	The VM RMI system provides the relevant contact for redistribution of the desired information. The contact may be market specific. Provision of material is subject to individual contractual agreement between the redistributor and the VM for the agreed material.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.10.5 UC 10.5 Republishers

Table 45 specifies the applicable use case to meet the requirements.

Table 45 — UC 10.5 Republishers

Actor	Republisher
Goal	To obtain permission for re-publication and distribution of RMI to an external network.
Use case input	Request VM's contact information and identification of desired information and request for republishing.
Use case output	VM's contact information for contractual agreement to republish the desired information.
Brief description	The VM RMI system provides the relevant contact for republishing. The contact may be market specific. Provision of material is subject to individual contractual agreement between the republisher and the VM.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.10.6 UC 10.6 Inspection and testing services

Table 46 specifies the applicable use case to meet the requirements.

Table 46 — UC 10.6 Inspection and testing services

Actor	Operator offering inspection and testing services
Goal	Find necessary OBD-related and repair and maintenance information to create inspection and testing services according to country-specific legislation.
Use case input	Request VM's contact information and information to create inspection and testing services.
Use case output	VM's contact information and process for operators offering inspection and testing services. This may be country specific.
Brief description	The operator offering inspection and testing services officially/formally mandated by a Member State requests information to enable the development of services for an inspection according to country-specific legislation. The VM RMI system displays contact data and the process on how to obtain the requested information. Provision of material is subject to individual contractual agreement between operators, offering inspection and testing services, and VM.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.10.7 UC 10.7 Alternative fuels retrofit systems

Table 47 specifies the applicable use case to meet the requirements.

Table 47 — UC 10.7 Alternative fuels retrofit systems

Actor	Alternative fuels system manufacturer
Goal	To obtain emissions-related OBD and repair and maintenance information to properly manufacture or design alternative fuels retrofit systems.
Use case input	Request VM's contact information and emissions-related OBD and repair and maintenance information for building alternative fuels system.
Use case output	VM's contact information for emissions-related OBD and repair and maintenance information for building alternative fuels system.
Brief description	This use case is only mandatory if the VM allows such an alternative fuel system and if this information is not otherwise available in the VM RMI system. The VM RMI system provides the relevant contact data for emissions-related OBD and repair and maintenance information concerning alternative fuels retrofit systems. Provision of material is subject to individual contractual agreement between operators offering alternative fuels retrofit systems and VM.
Classification	Mandatory (with restrictions, see brief description)

7.10.8 UC 10.8 Engine and components remanufacturing

Table 48 specifies the applicable use case to meet the requirements.

Table 48 — UC 10.8 Engine and components remanufacturing

Actor	Remanufacturer
Goal	To obtain engine and component remanufacturing OBD-related and repair and maintenance information.
Use case input	Request VM's contact information and specific engine or component OBD-related and repair and maintenance information necessary for remanufacturing purposes.
Use case output	VM's contact information for engine or component OBD-related and repair and maintenance information for remanufacturing.
Brief description	This use case is mandatory only if the VM supports remanufacturing and if this information is not otherwise available in the VM RMI system. The VM RMI system provides the relevant contact for engine or component OBD-related and repair and maintenance information for remanufacturing. Provision of material is subject to individual contractual agreement between the remanufacturer and the VM for the agreed material.
Classification	Mandatory (with restrictions, see brief description)
Applicability	This use case is applicable for all L subcategories

7.10.9 UC 10.9 Component and parts manufacturers

Table 49 specifies the applicable use case to meet the requirements.

Table 49 — UC 10.9 Information for component and parts manufacturers

Actor	Component and parts manufacturers.
Goal	To obtain information for the manufacturing or design of emissions-related OBD system-relevant alternative components and replacement parts.
Use case input	Request VM''s contact information and information for manufacturing or designing of emissions-related OBD system-relevant alternative parts and components.
Use case output	VM's contact information for building emissions-related OBD system-relevant alternative parts and components. Including any parameterisation information and/or interfaces in order for the part to operate correctly.
Brief description	The component or parts manufacturer requests information to enable the development of emissions-related OBD system-relevant alternative parts and components. The VM RMI system displays contact data and process information on how to obtain the requested information. Provision of material is subject to individual contractual agreement between component and parts manufacturer and VM.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.10.10 UC 10.10 Validation of independently developed non-proprietary VCIs

Table 50 specifies the applicable use case to meet the requirements.

Table 50 — UC 10.10 Validation of independently developed non-proprietary VCIs

Actor	Manufacturer of independently developed non-proprietary VCIs
Goal	Find VM's contact person or necessary information for the validation of the compatibility of the manufacturer-specific application and the independently developed non-proprietary VCIs complying with ISO 18541-2.
Use case input	Request contact for information about validation of independently developed non-proprietary VCIs.
Use case output	Manufacturer's contact information for the validation process of independently developed non-proprietary VCIs or the information required for a VCI manufacturer to conduct such validation himself.
Brief description	The manufacturer of independently developed non-proprietary VCIs requests information for validation of its independently developed non-proprietary VCIs. The VM RMI system displays contact data for the request to participate in the VM validation process of independently developed non-proprietary VCIs or process information on how to obtain the information required for a VCI manufacturer to conduct such validation himself. This information may be an implementation guide containing VM specific data (e.g. parameters, settings, timings, initialization procedures and pin assignment), a test specification (e.g. preconditions and tests to be conducted for the purpose of validation) and the availability of a test environment (e.g. the definition and loan of any special hardware) to be used for the purpose of validation. The participation in the VM validation process and the provision of information are subject to an individual agreement between the manufacturer of independently developed non-proprietary VCIs and the VM.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

7.11 UC 11 Courses and training information

Table 51 specifies the applicable use case to meet the requirements.

Table 51 — UC 11 Courses and training information

Actor	Independent Operator
Goal	Get information regarding training courses availability and/or online or web-based training.
Use case input	Request VM's contact information and training courses information and/or online or web-based training.
Use case output	VM's contact information for training contact information for each market and/or provision of online or web-based training in a non-discriminatory manner with regard to the ARs.
Brief description	The VM RMI system provides a list of relevant contacts (e.g. e-mail, phone/fax number) for the specific user market area. The IO gets the wanted information and individual or group booking options by contacting the selected address. Additionally, where online or web-based training is available, the user shall be able to access the courses in a non-discriminatory manner as regard to the ARs.
Classification	Mandatory
Applicability	This use case is applicable for all L subcategories

8 Technical requirements

8.1 Requirements cluster 1 — Access-related data administration

8.1.1 [TREQ-1] General access-related data administration

Table 52 defines the requirements for the general access-related data administration.

Table 52 — [TREQ-1] General access-related data administration

REQ #	TREQ-1
Main title	General access-related data administration
Requirement definition	The VM allows access to the RMI system depending on the storage of some data: — for user registration; — agreement to terms and conditions; — any other data required by local legislation; — for user login and access data recovery; — for invoicing; — for physical delivery of material if needed; — for logging of any access to security-related RMI (see Reference [14]); — for logging of any access to ECU replacing/update (in case of liability issues); — to be able to disable a user (see Clause 7) use case UC 1.5 Request to de-register IO employee. The administration of this data shall be according to data and privacy protection legislation.
Brief description	The VM has to administer data on users, on payment, on access events to security-related RMI and on access events to general RMI content.
Classification	Mandatory

8.1.2 Administration of IO and IO employee data by the VM

8.1.2.1 [TREQ-2] Administration of IO data by the VM

Table 53 defines the requirements for the administration of IO data by the VM.

Table 53 — [TREQ-2] Administration of IO data by the VM

REQ #	TREQ-2
Main title	Requirements for the administration of IO data by the VM
Requirement definition	IO data shall be administered by the VM to enable user access, access data reset and to facilitate written communication with the IO.
Brief description	The following list of IO data shall be administered by the VM: — IO name; — IO postal address; — country; — postal address for invoicing if different from IO postal address; — inter-community VAT No.; — first name, family name of the IO legal representative; — e-mail address for communication with the IO legal representative in all aspects of the VM RMI system usage; — preferred language; — User ID and password of the IO legal representative (the User ID shall be unique in the VM system); — optionally, a confirmation of the IO approval according to the SERMI scheme if the IO wants to request access to security-related RMI.
Classification	Mandatory

8.1.2.2 [TREQ-3] Administration of IO employee data by the VM

Table 54 defines the requirements for the administration of IO employee data by the VM.

Table 54 — [TREQ-3] Administration of IO employee data by the VM

REQ #	TREQ-3
Main title	Requirements for the administration of IO employee data by the VM
Requirement definition	IO employee data shall be administered by the VM to enable user access, access data reset and to facilitate written communication with the IO employee.
Brief description	The following list of user data shall be administered by the VM: — IO name (see ISO 18541-1:2013, 3.1.14); — e-mail address for communication with the employee in all aspects of the VM RMI system usage; — preferred language; — User ID and password of the IO employee (the User ID shall be unique in the VM system); — optionally, a digital certificate ID according to the SERMI scheme if the IO employee wants to request access to security-related RMI; — optionally, the access level granted for security-related RMI.
Classification	Mandatory

8.1.3 [TREQ-4] Administration of payment data by the VM

Table 55 defines the requirements for the administration of payment data by the VM.

Table 55 — [TREQ-4] Administration of payment data by the VM

REQ #	TREQ-4
Main title	Requirements for the administration of payment data by the VM
Requirement definition	User data shall be administered by the VM to allow the VM to invoice the user.
Brief description	The following user data shall be administered by the VM for the purposes of invoicing for use of the VM RMI system: — type of subscription; — method of payment; — subscription period; — invoicing address; — inter-community VAT No.
Classification	Mandatory

8.1.4 [TREQ-5] Administration of access event data by the VM

Table 56 defines the requirements for the administration of access event data by the VM.

Table 56 — [TREQ-5] Administration of access event data by the VM

REQ #	TREQ-5
Main title	Requirements for the administration of access event data by the VM
Requirement definition	Access event data shall be administered by the VM to monitor use of the VM RMI system and take appropriate action if necessary.
Brief description	The following access event data shall be administered by the VM: — user ID — log on and off times; — period of non-use.
Classification	Mandatory

8.1.5 [TREQ-6] Administration of access event data to security-related RMI by the VM

Table 57 defines the requirements for the administration of access event data to security-related RMI by the VM.

Table 57 — [TREQ-6] Administration of access event data to security-related RMI by the VM

REQ #	TREQ-6
VMin title	Requirements for the administration of access event data to security-related RMI by the VM
Requirement definition	Access event data to security-related RMI shall be administered by the VM to support enquiries in case of liability issues.
Brief description	The following access event data shall be administered by the VM: — user ID; — log on and off times; — type of security-related RMI accessed; — VIN of the related vehicle; — affected ECU (if possible).
Classification	Mandatory

8.2 Requirements cluster 2 – IT architecture

8.2.1 [TREQ-7] Conceptual architecture

Table 58 defines the requirements for the conceptual architecture.

Table 58 — [TREQ-7] Conceptual architecture

REQ #	TREQ-7
Main title	Requirements for the conceptual architecture
Requirement definition	The implementation of the RMI system shall be according to a standardized conceptual architecture.
Brief description	The standardized conceptual architecture is described in Figure 7. The IO is responsible for the provision of client hardware (PC, Laptop, etc.) and a VCI according to the detailed requirements in 8.3. The VM is responsible for the availability of the RMI system and the authorized/purchased software and data components. The VM shall facilitate the successful download to the IO client once the IO has registered, logged-in and prompted the download. In case the VM only offers a proprietary connector, an adaptor shall be provided by the VM on request in a non-discriminating manner.
Classification	Mandatory

Figure 7 shows all IT systems potentially involved in the execution of the repair and maintenance use cases defined in Clause 7.

— The RMI applications will be implemented as distributed software on a client device at the location of the independent operator (Independent Operator System) and a server in the VM premises (Vehicle Manufacturer/RMI system). The software distribution may follow different patterns depending on the overall design decision taken by the application builders to achieve an optimum performance (see 8.2.2).

— Client and server communicate via Internet.

— The RMI application may communicate with other applications for the execution of single use cases.

— The user is offered access to repair and maintenance information via the client device with standard navigation, communication and display facilities.

— The vehicle acts as an IT system communicating with the other systems for use cases like updating and replacing modules or integrated diagnostics.

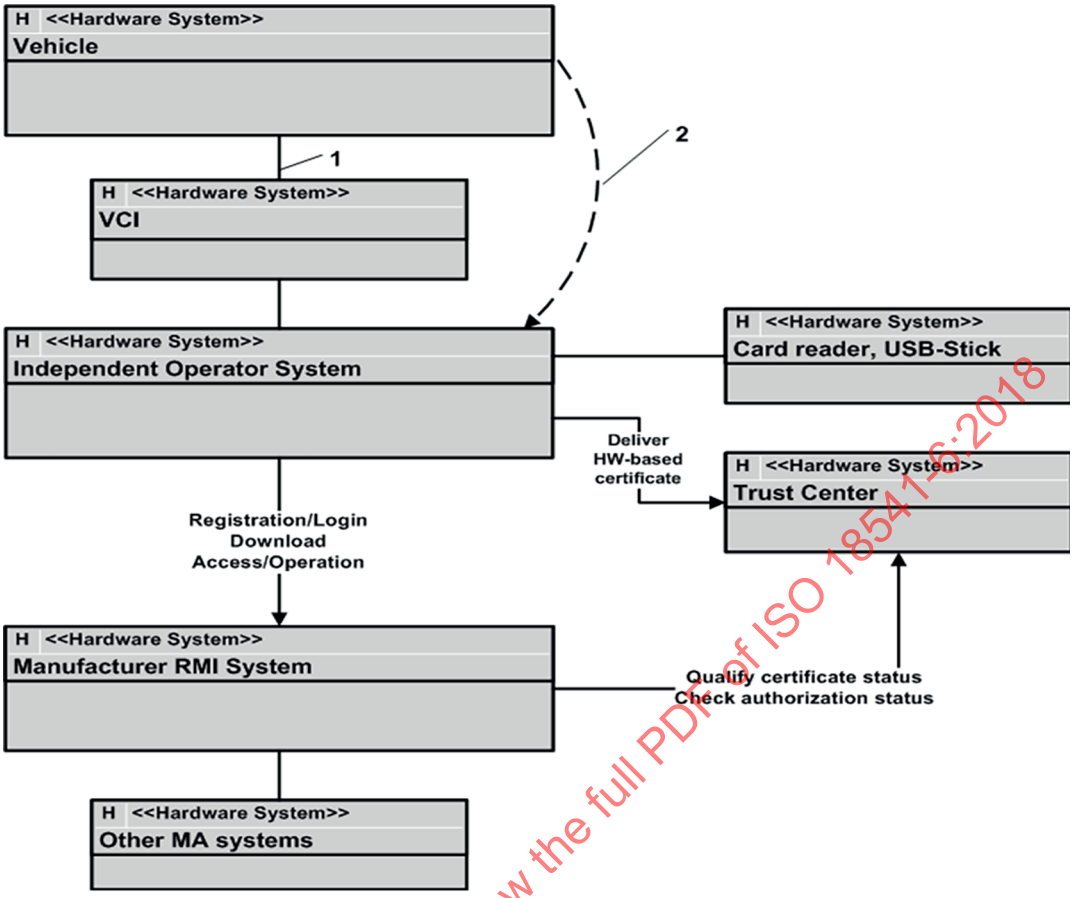
— For the communication with the VM RMI applications, for the purposes of diagnostics and reprogramming, two alternatives are possible:

  — Alternative 1: the vehicle is connected via a pluggable, standardized, non-proprietary vehicle communication interface; the vehicle manufacturer shall provide a connection adapter in a non-discriminating manner in case the vehicle only offers a proprietary connector;

  — Alternative 2: the vehicle is connected via an in-build wireless, standardized, non-proprietary vehicle communication interface.

  — Both alternatives shall either support the ISO 22900-2 or SAE J2534 (or both) standards.

— For access to security-related RMI, additional hardware for the management of a user certificate on the IO client is required. A secure connection to the trust centre is required by both the IO client and the VM RMI system.



Key

1 wired/wireless connection between “vehicle” and “Independent Operator System” with VCI Protocol Module

2 alternative means of connection as defined in TREQ-8 between “vehicle” and “Independent Operator System” without VCI Protocol Module

Figure 7 — Conceptual architecture for access to vehicle RMI

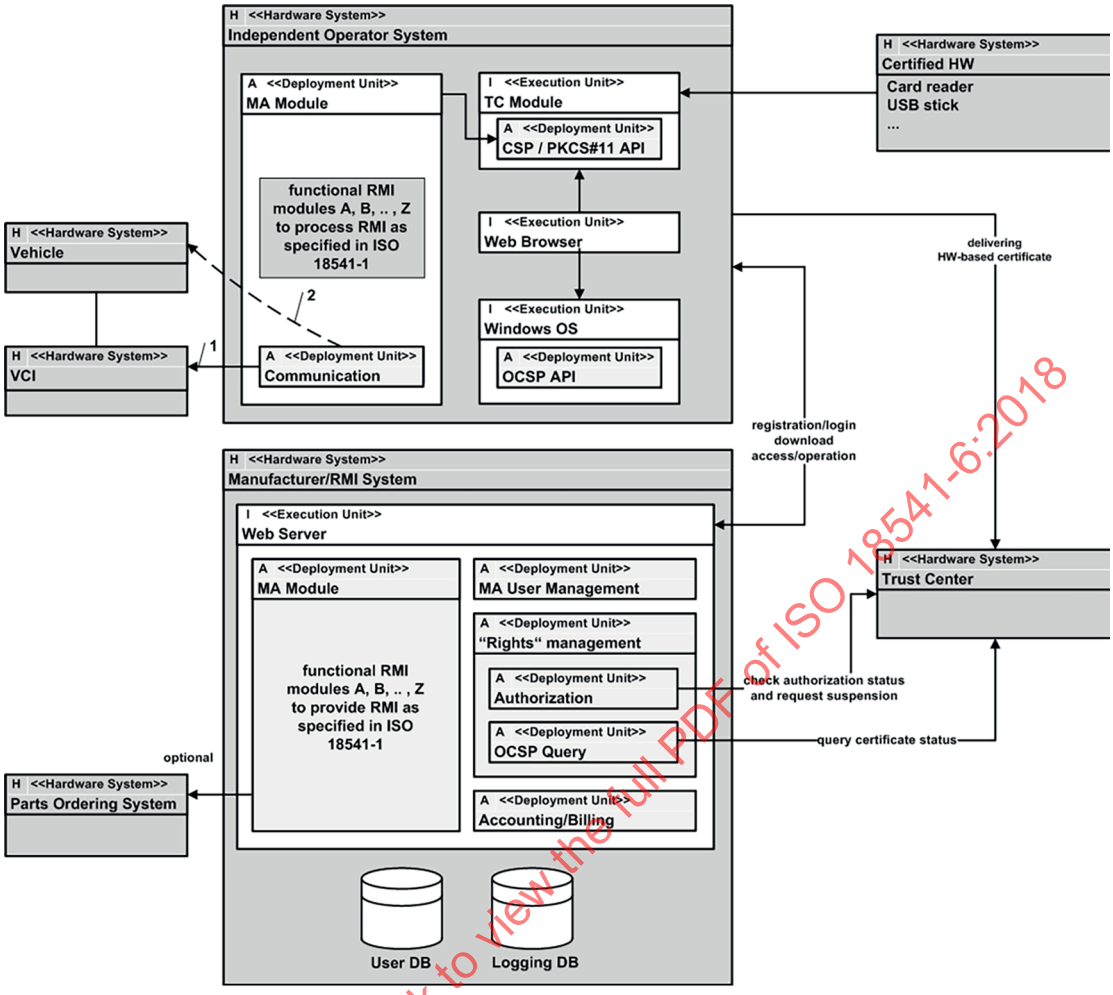
8.2.2 [TREQ-8] Implementation principles

Table 59 defines the requirements for the implementation principles.

Table 59 — [TREQ-8] Implementation principles

REQ #	TREQ-8
Main title	Requirements for implementation principles
Requirement definition	The implementation of the VM RMI architecture may vary as long as it remains within the conceptual architecture.
Brief description	The VM will decide on the option for implementation to follow: — 'thin' client, — 'thick' client, or — any other implementation strategies following state-of-the-art software technology. There are minimum requirements for the software infrastructure to be supported by the implemented application. See requirements cluster 4, 9.4 for detailed specification. Figure 8 shows an example for 'thick' client architecture. Figure 9 shows an example for 'thin' client architecture.
Classification	Mandatory

Figure 8 illustrates an example for the implementation of a VM RMI application following a so called "thick client" software distribution pattern. Substantial parts of the application software is downloaded to the client system and executed there. Some use cases are executed completely in the client system while others are executed in cooperation between the client and the server application software parts.



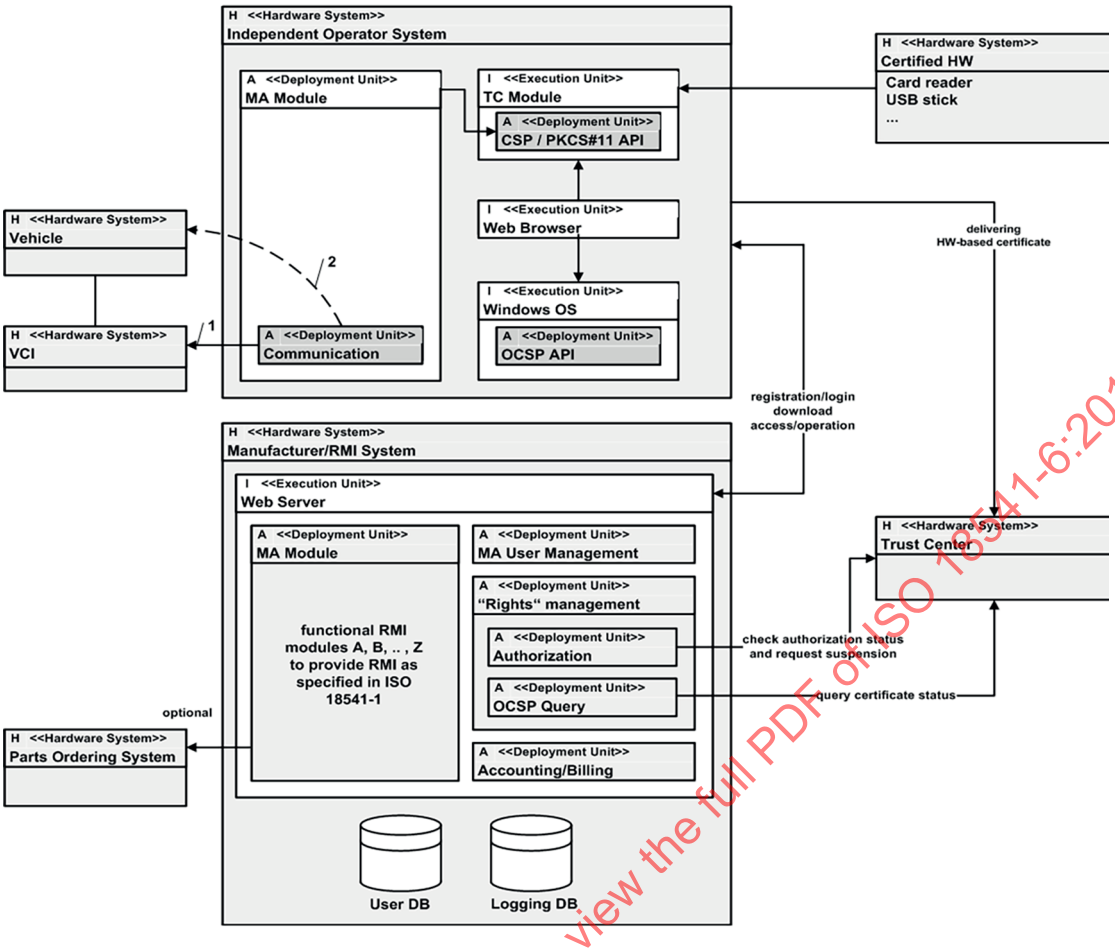
Key

1 wired/wireless connection between “vehicle” and “Independent Operator System” with VCI Protocol Module

2 alternative means of connection as defined in TREQ-8 between “vehicle” and “Independent Operator System” without VCI Protocol Module

Figure 8 — Example for thick client architecture

Figure 9 illustrates an example for the implementation of a VM RMI application following a so called “thin client” software distribution pattern. The application software resides only on the server and is not downloaded to the client. In the client system, only modules for web-based navigation, display and communication with the server, the vehicle, the certificate hardware and the trust centre are implemented. All use cases are executed using the server application software.



Key

1 wired/wireless connection between "vehicle" and "Independent Operator System" with VCI Protocol Module

2 alternative means of connection as defined in TREQ-8 between "vehicle" and "Independent Operator System" without VCI Protocol Module

Figure 9 — Example for thin client architecture

8.3 Requirements cluster 3 – External interfaces

8.3.1 [TREQ-9] Vehicle communication interface (VCI)

Table 60 defines the requirements for the vehicle communication interface.

Table 60 — [TREQ-9] Vehicle communication interface (VCI)

REQ #	TREQ-9
Main title	Requirements for the vehicle communication interface (VCI)
Requirement definition	The vehicle shall be connected to the diagnostics or programming application via a vehicle communication interface (VCI) either compliant to the Modular Vehicle Communication Interface (MVCI) according to ISO 22900-2 D-PDU API or SAE J2534 Pass-Thru according to SAE J2534–1 and SAE J2534–2 for diagnosis according to use case 6.3 and updating and replacing modules according to use case 7 in Clause 7. The diagnostic and programming application may be integrated in the RMI system or run separately.
Brief description	The VM RMI website shall inform the user about the VCI standards supported under the relevant use cases. When the VM RMI system supports the ISO 22900-2 standard, then the VM RMI system will support the D-PDU API as specified in the ISO 22900-2 standard (D-PDU API), so that different MVCI providers can communicate via this API with the VM RMI system application for updating and replacing modules and integrated diagnostics. A software driver for the specific MVCI shall be provided by the MVCI tool manufacturer and shall be installed in the IO PC in addition to the VM RMI system software. Figure 10 illustrates the ISO 22900-2 structure, components and interfaces. When the VM RMI system supports the SAE J2534 Pass-Thru standard, then the VM RMI system will support the Pass-Thru API as specified in the SAE J2534–1 and SAE J2534–2 recommended practice, so that different Pass-Thru VCI providers can communicate via this API with the VM RMI system application for updating and replacing modules and integrated diagnostics. A software driver for the specific SAE J2534 Pass-Thru VCI shall be provided by the Pass-Thru device tool manufacturer and shall be installed in the IO PC in addition to the VM RMI system software. Figure 11 illustrates the SAE J2534 structure, components and interfaces. There may be many MVCI/Pass-Thru VCI providers for the vehicles and RMI system of one VM. It is up to the IO to make a provider choice. NOTE It is the VCI tool manufacturer's decision which vehicle communication protocols are implemented in the VCI. In addition to the above interfaces, Ethernet, serial cable or LAN interface and alternative media like CD, DVD or memory stick may also be used for infotainment systems (e.g. navigation systems, telephone) but on the condition that no proprietary communication software (e.g. drivers or plugins) and hardware is required.
Classification	Mandatory

Figure 10 illustrates the ECU programming/diagnostic runtime system as part of the VM's RMI system with support for the ISO 22900-2 MVCI D-PDU API-compatible VCI.

The ECU programming/diagnostic runtime system consists of the following.

— At least one application e.g. ECU programming.

— An ISO 22900-2 MVCI D-PDU API compatible Microsoft Windows™ DLL provided by the VCI tool manufacturer.

— Alternative '1':

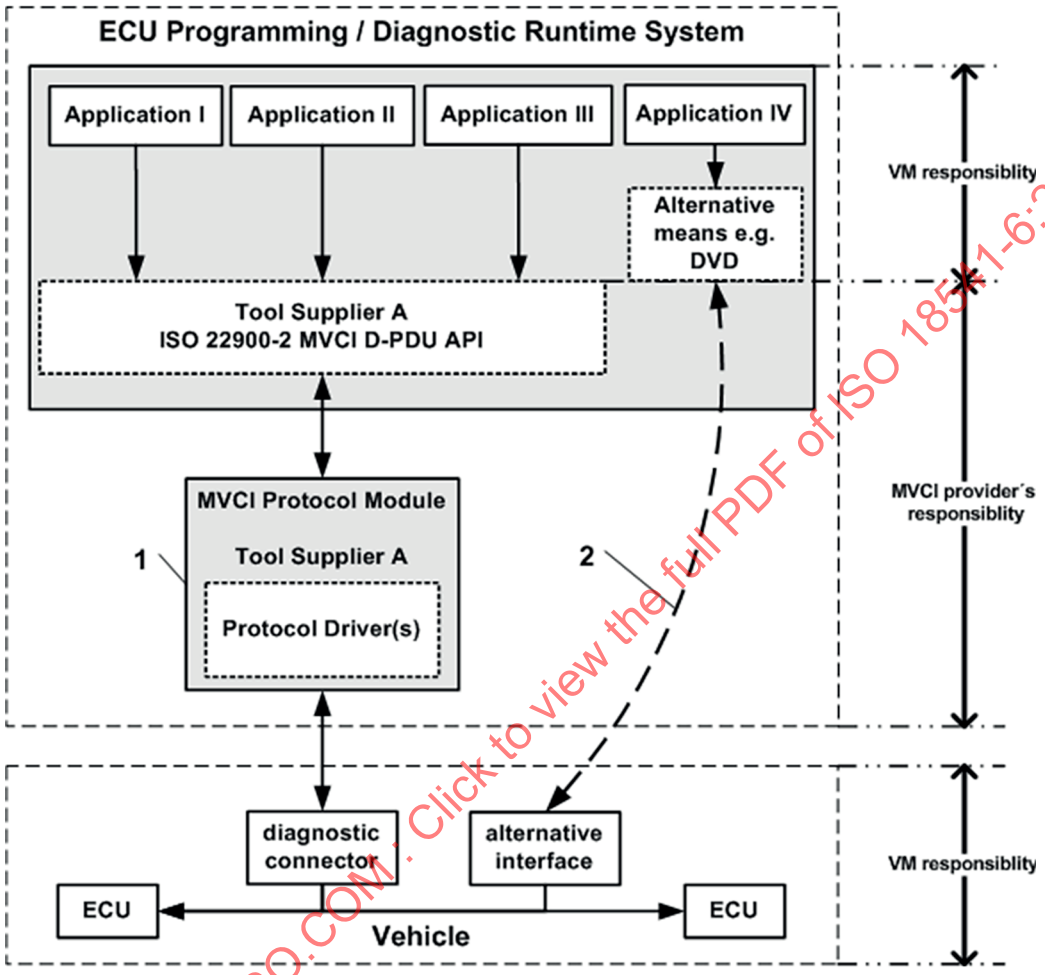
  — An MVCI Protocol Module with vehicle communication protocols (see Note in Table 60) provided by the VCI tool manufacturer.

  — An MVCI Protocol Module with a standardized diagnostic connector to connect to the vehicle. The standardized diagnostic connector shall be according to the requirements specified in the country-specific legislation, e.g. the ISO 15031-3 compatible diagnostic connector as used

for light passenger cars. In case the vehicle only offers a proprietary connector, the VM shall provide an adaptor on request in a non-discriminating manner.

— Alternative '2':

  — Alternative means of connection as defined in TREQ-8 between "vehicle" and "Independent Operator System" without VCI Protocol Module.



Key

1 wired/wireless connection between "vehicle" and "Independent Operator System" with VCI Protocol Module

2 alternative means of connection as defined in TREQ-8 between "vehicle" and "Independent Operator System" without VCI Protocol Module

Figure 10 — ISO 22900-2 MVCI D-PDU API-compatible VCI

Figure 11 illustrates the ECU programming/diagnostic runtime system as part of the VM's RMI system with support for the SAE J2534 Pass-Thru API-compatible VCI.

The ECU programming/diagnostic runtime system consists of the following.

— At least one application e.g. ECU programming.

— An SAE J2534-1 and SAE J2534-2 Pass-Thru API compatible Microsoft Windows™ DLL provided by the VCI tool manufacturer.

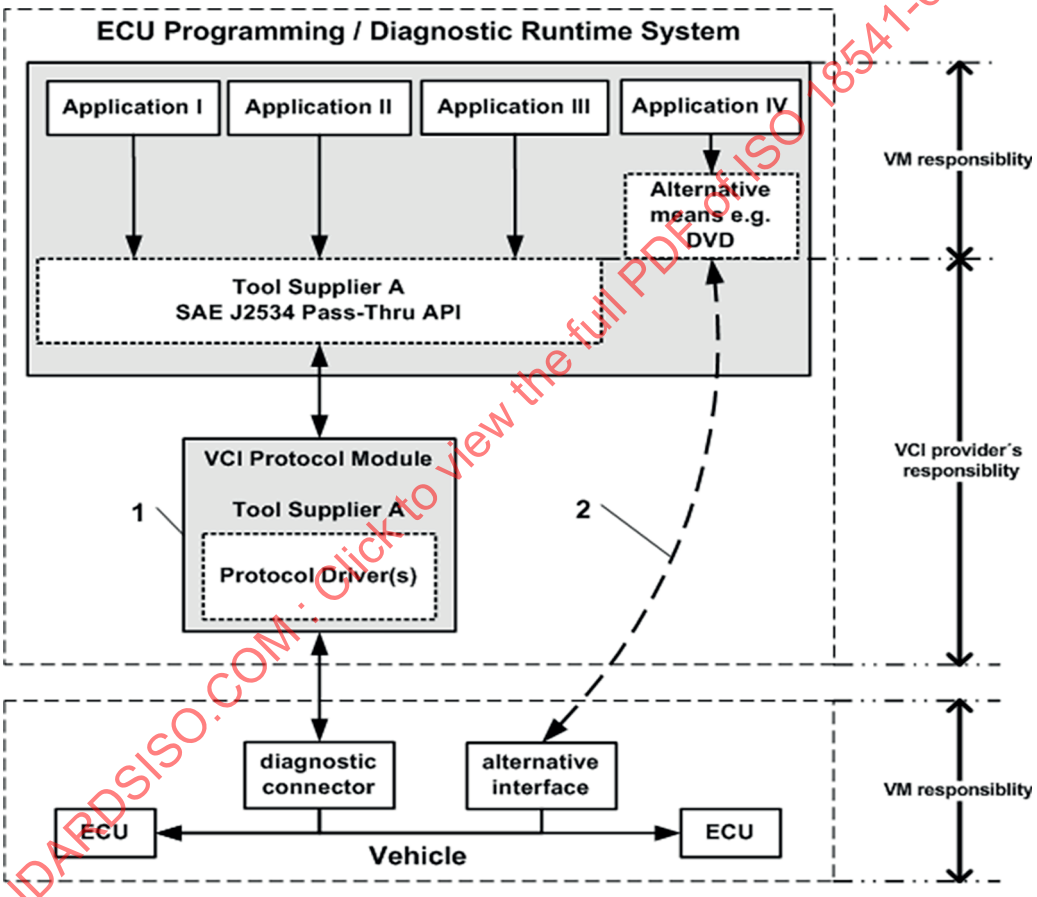
— Alternative '1':

  — A Pass-Thru Protocol Module with vehicle communication protocols (see Note in Table 60) provided by the VCI tool manufacture.

  — An SAE J2534 Pass-Thru API-compatible VCI with a standardized diagnostic connector to connect to the vehicle. The standardized diagnostic connector shall be according to the requirements specified in the country-specific legislation, e.g. the ISO 15031-3 compatible diagnostic connector as used for light passenger cars. In case the vehicle only offers a proprietary connector the VM shall provide an adaptor on request in a non-discriminating manner.

— Alternative '2':

  — Alternative means of connection as defined in TREQ-8 between "vehicle" and "Independent Operator System" without Pass-Thru Protocol Module.



Key

1 wired/wireless connection between "vehicle" and "Independent Operator System" with VCI Protocol Module

2 alternative means of connection as defined in TREQ-8 between "vehicle" and "Independent Operator System" without VCI Protocol Module

Figure 11 — SAE J2534 Pass-Thru API-compatible VCI

8.3.2 [TREQ-10] Trust centre (certificate management)

Table 61 defines the requirements for the trust centre (certificate management).

Table 61 — [TREQ-10] Trust centre (certificate management)

REQ #	TREQ-10
Main title	Requirements for the trust centre (certificate management)
Requirement definition	The VM RMI system shall support an online interface to the trust centre. Via this interface, the VM shall check the validity status of the digital certificate presented by the IO and shall verify the IO's authorization status to obtain access to security-related RMI.
Brief description	See Reference [14].
Classification	Mandatory

8.3.3 [TREQ-11] Parts ordering for security-related features

Table 62 defines the requirements for the parts ordering for security-related features.

Table 62 — [TREQ-11] Parts ordering for security-related features

REQ #	TREQ-11
Main title	Requirements for the parts ordering for security-related features
Requirement definition	In cases where ordering of security-related parts is needed, this ordering shall be facilitated either online or offline, where appropriate.
Brief description	If and only if security-related parts (pre-programmed or programmable, e.g. keys and ECUs) can be ordered online then an interface from the VM RMI system shall be provided to facilitate the ordering. This interface shall only be accessible for an IO with a digital certificate and authorization according to the SERMI scheme [14]. The ordering process to be followed will be VM-specific. Some VMs may provide access to online parts ordering system, other VMs may require this ordering process to be conducted via the authorized repair network. There are different ways and concepts for the implementation of security-related features so that the repair doesn't require the ordering of pre-programmed or programmable parts, e.g. keys and ECUs.
Classification	Mandatory

8.3.4 [TREQ-12] Partnered accessory provider systems

Table 63 defines the requirements for the partnered accessory provider systems.

Table 63 — [TREQ-12] Partnered accessory provider systems

REQ #	TREQ-12
Main title	Requirements for the partnered accessory provider systems
Requirement definition	The VM RMI system shall support an interface or offer a link to a system of the accessory provider for RMI for the accessories.
Brief description	For the purposes of meeting the requirement, a minimum interface would be a relevant URL.
Classification	Mandatory if the information is not contained in the VM RMI system

8.4 Requirements cluster 4 — Technical infrastructure

8.4.1 [TREQ-13] Type of device

Table 64 defines the requirements for the type of device.

Table 64 — [TREQ-13] Type of device

REQ #	TREQ-13
Main title	Requirements for the type of device
Requirement definition	The VM RMI system shall support IO PCs and laptops which fulfil TREQ-13, TREQ-14 and TREQ-15 as client interfaces that are connected to the Internet.
Brief description	The devices shall be able to communicate via Internet. Other types of devices may be considered in the future depending on the overall technological evolution.
Classification	Mandatory

8.4.2 [TREQ-14] Hardware features

Table 65 defines the requirements for the hardware features.

Table 65 — [TREQ-14] Hardware features

REQ #	TREQ-14
Main title	Requirements for hardware features
Requirement definition	The VM RMI system shall support a “fit for purpose” commercially available PC.
Brief description	As a “fit for purpose” commercially available PC, laptop, etc., a configuration is considered to be equivalent to at least the specification as detailed in Annex B.
Classification	Mandatory

8.4.3 [TREQ-15] Operating systems

Table 66 defines the requirements for the operating systems.

Table 66 — [TREQ-15] Operating systems

REQ #	TREQ-15
Main title	Requirements concerning operating systems
Requirement definition	The VM shall ensure that the VM applications running on the IO client are able to run on at least one of the operating systems listed in Annex B. The application shall be able to support at least the minimum version of the runtime languages and libraries as specified in Annex B.
Brief description	Annex B is maintained by the association SERMI[14].
Classification	Mandatory

8.4.4 [TREQ-16] Web browsers

Table 67 defines the requirements for the Web browsers.

Table 67 — [TREQ-16] Web browsers

REQ #	TREQ-16
Main title	Requirements for Web browsers
Requirement definition	The VM RMI system shall support at least one web browser in at least the minimum version capable to run on the operating systems specified in Annex B with a major usage level in the market place.
Brief description	A major usage level is considered sufficient when the browser has a yearly average market share of more than 15 % according to the acknowledged publisher of statistical usage data, e.g. “StatCounter GlobalStats”, “W3Counter”. The supported web browser version shall be freely available and downloadable from the web browser supplier site.
Classification	Mandatory

8.4.5 [TREQ-17] Presentation formats for information packages

Table 68 defines the requirements for the presentation formats for information packages.

Table 68 — [TREQ-17] Presentation formats for information packages

REQ #	TREQ-17
Main title	Requirements for the presentation formats for information packages
Requirement definition	The information packages shall be presented using open text and graphic formats or formats that can be viewed and printed using only standard software plug-ins that are freely available, easy to install, and that run under computer operating systems, as listed in Table 66.
Brief description	PDF, HTML, JPG, PNG are examples of open text and open graphic formats as implied by the requirements.
Classification	Mandatory

8.4.6 [TREQ-18] Internet connection

Table 69 defines the requirements for the internet connection

Table 69 — [TREQ-18] Internet connection

REQ #	TREQ-18
Main title	Requirements for the internet connection
Requirement definition	VM recommendations for Internet connection parameters shall be published by each VM. The VM application shall use known standard communication ports for any standard external protocols used within the application, e.g. http (80), https (443), ftp (21); for reference, see ports up to 1023 in the standard ports list (RFC 1700). For internal communication local to the IO Client, any port above 1023 can be used. VM software shall work with Network Address Translation (NAT) if the IO uses NAT.
Brief description	See requirement definition.
Classification	Mandatory

8.4.7 [TREQ-19] Performance of the VM RMI system

Table 70 defines the requirements for the performance of the VM RMI system.

Table 70 — [TREQ-19] Performance of the VM RMI system

REQ #	TREQ-19
Main title	Requirements for the performance of the VM RMI system
Requirement definition	The performance of the VM RMI system for an IO shall be equivalent to the performance for an AR taking into account the performance implications of using the internet connection and the specification for the PC (see Annex B).
Brief description	See requirement definition.
Classification	Mandatory

8.5 Requirements cluster 5 – Co-existence of VM software on IO client

8.5.1 [TREQ-20] Requirements for installing VM-specific software on the IO client

Table 71 defines the requirements for installing VM -specific software on the IO client.

Table 71 — [TREQ-20] Requirements for installing VM-specific software on the IO client

REQ #	TREQ-20
Main title	Requirements for installing VM -specific software on the IO client
Requirement definition	If any VM -specific software is to be installed on the IO client, it shall act in such a way that the functionality of the IO PC/Laptop is unaffected when the VM software is not running, except for VM installed software files. In cases where the VM software installations on the IO client side cannot be performed without IO cooperation, the IO shall take the necessary steps to facilitate the installation following the instructions from the VM.
Brief description	The VM has to check at least the following properties for the support of their software (if there's no specific VM software to be installed, VM has only to check for support of a standard operating software as listed): — If connected devices (card reader, MVCI, Pass-Thru VCI, etc.) are used, they have to be applied with the tool manufacturer's driver unit. — If runtime-languages/script languages are used, which can be installed in different versions in parallel, these different runtime-languages versions can be installed. Configurations shall be VM made per application. Global configurations shall not be overwritten. — If runtime-languages/script languages are used which cannot be installed in all version levels at the same time, the minimum version (see Annex B) shall be used. Configurations shall be made per application. Global configurations shall not be overwritten. — If additional standard software packages are installed which need general PC resources (e.g. Operating System services, Apache Web server), they have to be set up in order to be used by several applications (e.g. the Task Scheduler: existing configurations shall not be overwritten but adjusted). — No system libraries/runtime environment modified, except for the update to a newer version. — No system initialization files modified. — No autorun entries added without user's confirmation. — The installation shall be contained either in a single folder named uniquely or follow the platform recommendation (e.g. Microsoft, Java). — If the VM application requires registry keys' modifications, these shall be done either in the local user section or follow the platform recommendation (e.g. Microsoft, .NET).
Classification	Mandatory

8.5.2 [TREQ-21] Requirements for updating of installed VM data and applications on the IO client

Table 72 defines the requirements for updating VM-specific software on the IO client.

Table 72 — [TREQ-21] Requirements for updating of installed VM data and applications on the IO client

REQ #	TREQ-21
Main title	Requirements for updating VM-specific software on the IO client
Requirement definition	Installed VM data and applications on the IO client shall be maintained by checking the validity of the data and application when the application is running, and, where necessary, providing updates to the application but only with user consent. In addition to the actual VM applications, web browser plugins or further base software components might be updated by the VM. Updates of the VM-specific software on the IO client shall follow the same requirements as installation of software onto the IO PC as set out in TREQ-20.
Brief description	The following installed VM data and applications and, optionally, also plugins and other base software components at the IO site shall be administered by the VM based on the following: — installed application version at the IO site; — current version information available; — downloaded data validity. In cases where the VM software installations and updates on the client side cannot be performed without IO cooperation, the IO shall take the necessary steps to facilitate the installation or update following the instructions from the VM.
Classification	Mandatory

8.5.3 [TREQ-22] Requirements for the operation of VM-specific software on the IO client

Table 73 defines the requirements for the operation of VM -specific software on the IO client.

Table 73 — [TREQ-22] Requirements for the operation of VM-specific software on the IO client

REQ #	TREQ-22
Main title	Requirements for the operation of VM -specific software on the IO client
Requirement definition	Any VM-specific software on the IO client shall be responsible for resetting the PC/Laptop system configuration to the same state as it was before it started, excepting the VM-specific software configuration and general purpose services and processes.
Brief description	If changes are made to the configuration of the IO PC/Laptop, these changes shall be reset at the end of the execution of the VM-specific software. E.g. screen resolution, disabling of browser functions. Used resources shall be released when the VM-specific software completes execution and is closed wherever possible, unless the user agreed otherwise during the application installation or via user specific configuration, e.g. connection to VCI device, communication port, use of libraries: — VM application-specific processes and services shall not be running once the actual VM application's execution is terminated; — VM application shall not terminate generic processes and services in the IO client (e.g. TOMCAT, Apache, antivirus); — TCP/UDP ports for VM specific processes and services shall not be in use once the VM application is terminated; — no system libraries/runtime environment modified, except for the update to a newer version; — no system initialization files modified.
Classification	Mandatory

8.5.4 [TREQ-23] Requirements for the uninstalling of VM-specific software on the IO client

Table 74 defines the requirements for the uninstalling of VM-specific software on the IO client.

Table 74 — [TREQ-23] Requirements for the uninstalling of VM-specific software on the IO client

REQ #	TREQ-23
Main title	Requirements for the uninstalling of VM-specific software on the IO client
Requirement definition	The VM-specific software is responsible for removing VM installed software files, data, registry entries and folders when the user requests to uninstall the VM software.
Brief description	The VM-specific software shall include a procedure for a complete removing of VM-installed software files, data, registry entries and folders when the user requests to uninstall. User specific data shall only be removed if confirmed by the user except VM RMI-specific adjustments or preferences of the VM RMI-specific software. If additional standard software packages were installed which need general PC resources (e.g. Operating System services, Apache Web server), they shall not be removed if required by other applications.
Classification	Mandatory

8.5.5 [TREQ-24] Requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client

Table 75 defines the requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client.

Table 75 — [TREQ-24] Requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client

REQ #	TREQ-24
Main title	Requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client
Requirement definition	In case of an abnormal termination, the VM-specific software shall make best endeavours to restore the PC/Laptop system configuration to the same state as after a normal termination, at the next invocation/call of the VM-specific software.
Brief description	At the start of VM-specific software, it shall be possible to recognize that there has been an abnormal termination in order to attempt to restore a consistent configuration state with regards to VM-specific installed software services and configuration files. The user will be informed about the actions put in place to this aim.
Classification	Mandatory

8.6 Requirements cluster 6 – Operations

8.6.1 [TREQ-25] VM RMI system availability time

Table 76 defines the requirements related to the VM RMI system availability time.

Table 76 — [TREQ-25] VM RMI system availability time

REQ #	TREQ-25
Main title	Requirements for the VM RMI system availability time
Requirement definition	The system shall be available except for scheduled maintenance downtime for the system or part of the system.
Brief description	The system shall be available 24 hours, 7 days a week except for scheduled maintenance downtime for the system or part of the system. The scheduled maintenance downtime notification period for the VM RMI system shall be the same for both an AR and an IO. IOs accessing the system during this time period should get the notification, that some operations like re-programming may be interrupted by the maintenance downtime. The period of maintenance will depend on the type being carried out but will also form part of the notification, e.g. maintenance on June 21, 2011 for 2 h starting at 22:00 (CET). Date, time and time zone shall be indicated. Where possible, this maintenance should be carried out outside of normal working hours. Emergency maintenance or failure of the VM RMI system shall be notified 'normal service will be resumed as soon as possible' or text with a similar meaning. It is the user's responsibility to continue to try and connect to the service as it is not possible to notify in this instance.
Classification	Mandatory

8.6.2 [TREQ-26] Support for the usage of the VM RMI system

Table 77 defines the requirements for the support for the usage of the VM RMI system.

Table 77 — [TREQ-26] Support for the usage of the VM RMI system

REQ #	TREQ-26
Main title	Requirements for the support for the usage of the VM RMI system
Requirement definition	The VM shall offer a support to assist the users in the usage of his RMI system.
Brief description	A "user manual" shall be made available online or for download from the VM RMI website homepage. Alternatively the VM can provide a context sensitive online help. Online support in the form of a FAQ shall be available to assist the user. This shall be accessible from the VM RMI website. Email contact shall be available for registered users for issues not covered or understood within the FAQ. Additional support, e.g. user help desk, only if provided to authorized repairers and to the same level and conditions.
Classification	Mandatory with one optional part

8.6.3 [TREQ-27] Operation of the IO PC

Table 78 defines the requirements for the operation of the IO PC.

Table 78 — [TREQ-27] Operation of the IO PC

REQ #	TREQ-27
Main title	Requirements for the operation of the IO PC
Requirement definition	The IO shall keep the PC or laptop in an adequate state to allow the proper execution of the RMI functionality.
Brief description	Recommendations for the operation of the IO PC: — The IO PC shall be connected to the Internet and be dedicated to operations required for the servicing and maintenance of vehicles. This is to avoid security threats, application conflicts and performance loss. — A virus' scanner shall be installed and shall be kept up-to-date. — The system firewall shall be activated and the IO shall ensure that any firewall settings shall not interfere with the installation process and are in accordance with the technical settings for the firewall access issued by each VM. — The IO PC operating system and other relevant software infrastructure shall be kept up-to-date by the IO, i.e. migrating to the requirements in TREQ-13 to TREQ-17. During data transfer operations, the computer shall be dedicated to this task as there is a danger of an interruption in communication resulting in a failed operation. IO shall comply with VM-specific requirements for the administration of downloaded VM data at the IO location, e.g. as documented in the VM's terms and conditions.
Classification	Mandatory

8.7 [TREQ-28] Requirements cluster 7 – Functional user interface

Table 79 includes the reference to Clause 10 functional user interface requirements.

Table 79 — [TREQ-28] Requirements cluster 7 – Functional user interface

REQ #	TREQ-28
Main title	Requirements for the functional user interface
Requirement definition	This requirements cluster includes the reference to Clause 9 functional user interface of the VM RMI system.
Brief description	See requirement definition.
Classification	Mandatory

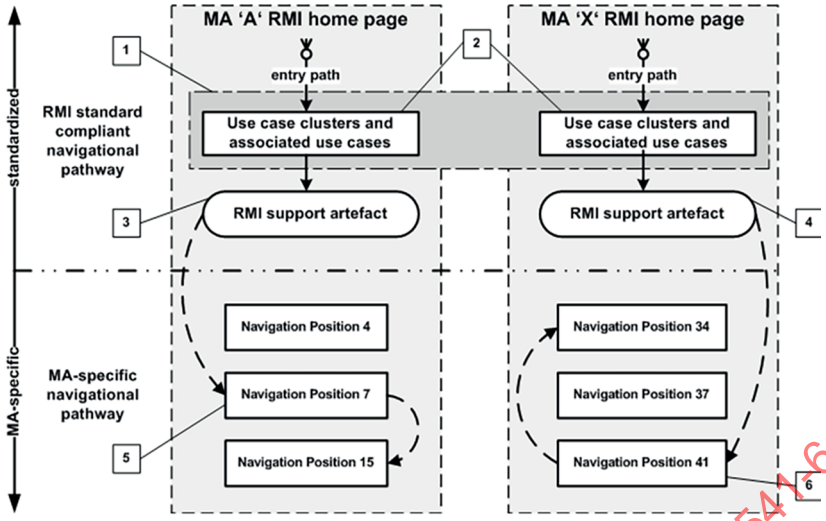
9 Functional user interface requirements

9.1 General description

9.1.1 Navigational pathway from standardized use cases to VM-specific navigation position

Figure 12 illustrates the navigational pathway from use cases to VM-specific navigation position. Each VM RMI system starts with the RMI home page. If the user selects the "standardized navigation" (see Figure 13 key 2), the RMI system navigates to the VM-specific use cases implementation (see Figure 12 key 2) as defined in Clause 7. Figure 12 keys 3 and 4 illustrate the VM-specific RMI support artefact.

The navigational pathway will not only lead the user to a navigated position but help the user to follow the implementation of the use case to obtain the output. The standardised use cases are logical use cases and shall not necessarily be implemented as a one-step transaction from input to output. A sequence of technical transactions may be needed to obtain the output. The complete input may not be required in the first transaction, but could be a step by step transaction sequence.



Key

1 common part for all VM RMI systems

2 VM-specific implementation of use cases as defined in ISO 18541-1

3 VM 'A' specific implementation of RMI support artefact guiding the IO from the standardized use cases map to the VM-specific entry points

4 VM 'X' specific implementation of RMI support artefact guiding the IO from the standardized use cases map to the VM-specific entry points

5 VM 'A' specific implementation to navigation position 7 (see key 5)

6 VM 'X' specific implementation to navigation position 41 (see key 6)

Figure 12 — Navigational pathway from standardized use cases to VM-specific navigation position

9.1.2 VM RMI system standardised navigation

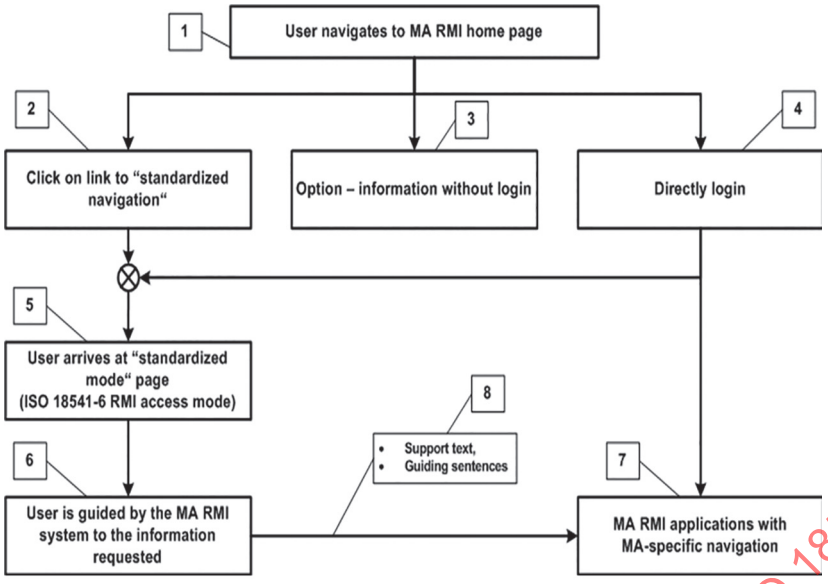
Figure 13 depicts the different entry points for RMI offered to a user in the VM RMI home page (key 1).

In addition to a direct login (key 4) for frequent and experienced users of the specific VM RMI website, an entry point (key 2) for navigation based on Clause 8 shall be provided. Whereas the direct login leads the user directly to the applications, features and components of the specific VM RMI system and to the VM-specific navigation there-in (key 7), the entry point/link for standard base navigation leads the user to a page (key 5) displaying the uses cases of Clause 8, the so called "use cases map" (see 9.2).

Usually, the user will be requested to login before the "use cases map" is displayed. The VM may alternatively not require a login for displaying the use cases map but require the login once a use case in the map is selected. The VM may optionally offer some information parts without login (key 3).

The selection of a use case in the "use cases map" activates the RMI support artefact (key 6) for this specific RMI website, which provides guiding information (key 8) (support text and guiding instructions) to the applications, features and components of the specific VM RMI system and to the VM-specific navigation there-in (key 7).

NOTE Regardless of the entry point chosen by the user, the finally accessed RMI content and applications set is always the same.



Key

1 to 7 see figure description

Figure 13 — VM RMI home page system entry point navigation

Figure 14 illustrates the entry points the VM system shall offer in the VM RMI home page. A select box for login and a select box, link or button for the entry into the standard based navigation.

NOTE Figure 14 is an illustration of the required content. Look-and-feel, position and other design attributes will follow the style guides of the specific VM RMI website.

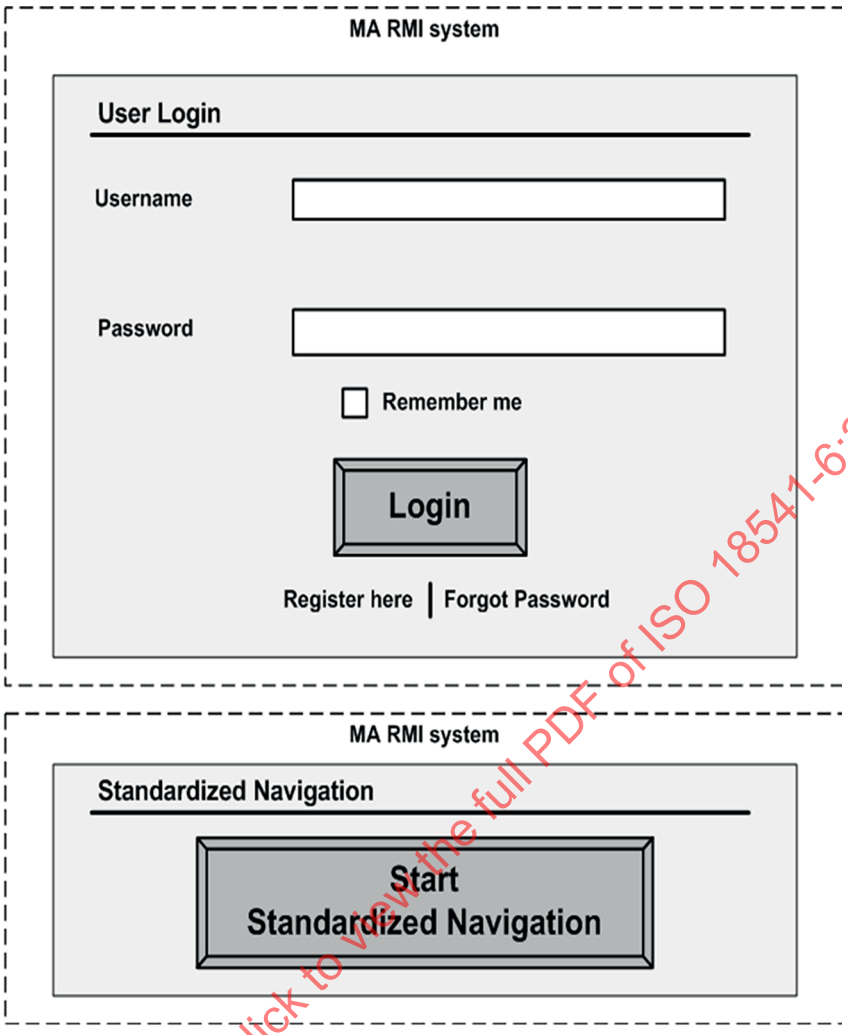


Figure 14 — VM RMI system with login and standardised navigation

9.2 Requirements cluster 8 — Standardized access mode

9.2.1 [FREQ-1] RMI access mode

Table 80 defines the requirements for the chapter 9 RMI access mode.

Table 80 — [FREQ-1] RMI access mode

REQ #	FREQ-1
Main title	Requirements for Clause 9 RMI access mode
Requirement definition	VM RMI systems home page shall contain a link or button to Clause 9 RMI access mode called "Standardized Navigation".
Brief description	Since IOs could have less knowledge than ARs about a VM RMI system structure, a link will be provided to help them to navigate in a standardized mode, common to all VMs. This standardized access mode will be in addition to the regular access mode of that specific VM RMI system, if different, so that expert users can use both ways, as they choose their preferred method.
Classification	Mandatory

9.2.2 [FREQ-2] Registration and login support

Table 81 defines the requirements for the registration and login support.

Table 81 — [FREQ-2] Registration and login support

REQ #	FREQ-2
Main title	Requirements for the registration and login support
Requirement definition	The VM RMI system shall support the user to register and to login to the system.
Brief description	After first registration, the VM RMI system allows the user to choose a username and assigns a first password to login to the system according to UC 1.1 (see Clause 7). If the username is already in use, the user needs to select an alternative. The username and password need to meet a minimum of requirements (e.g. minimum number of digits, one capital letter, one number, etc.). The user shall be allowed to change the password(s) to his choice. For security reasons, it is allowed to have an expiry mechanism on the password. If the VM RMI system consists of applications that require a separate registration, the VM RMI system shall inform the user of the subsequent registration(s) for the specific application(s) required in a compact way. The registration requirements are as defined in use case 1.1 to use case input (see Clause 7).
Classification	Mandatory

9.3 Requirements cluster 9 — Use cases map

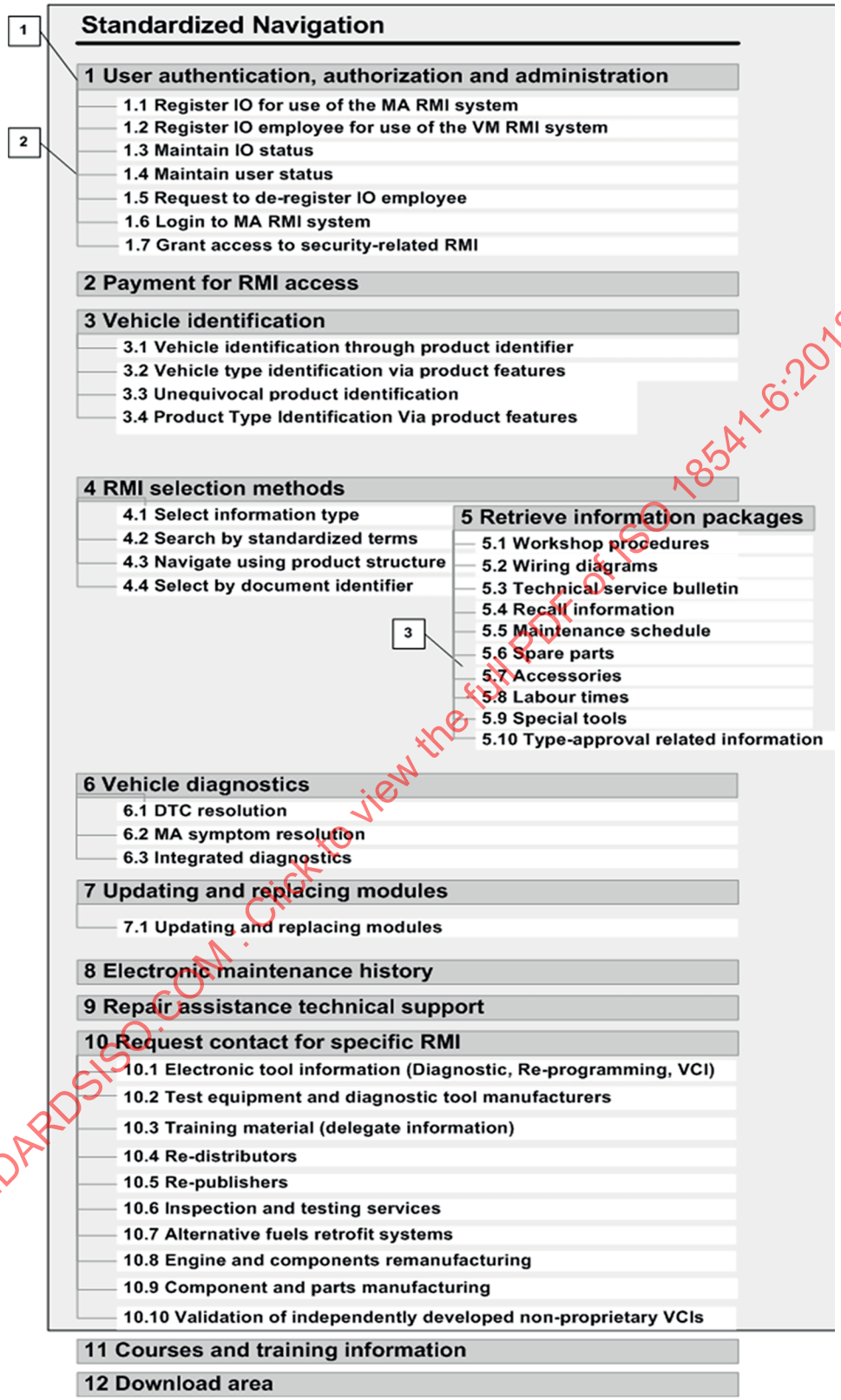
9.3.1 [FREQ-3] VM RMI system implemented use cases map

Figure 15 illustrates the "use cases map". The use cases map displays the use cases defined Clause 8. In case some optional use cases are not supported in the specific VM RMI system, the VM shall indicate this in the map. The map will reflect the structure of the use cases as defined Clause 7. The map can be offered at once containing all use cases in a single page or offered following the use case structure in different pages for ease-of-use purposes.

The use case numbering shall be according to the use case identification in Clause 7 (see key 1 to 2).

The use case titles in cluster 5 are exactly the content and result of use case "4.1 Select information type". This means an entry "5 Retrieve information packages" might not be displayed explicitly in the list. The use cases in cluster 5 might be attached to use case 4.1 (key 3).

NOTE Figure 15 is an illustration of the required content. Look-and-feel, position and other design attributes will follow the style guides of the specific VM RMI website.



Key

1 to 3 see figure description

Figure 15 — VM RMI system implemented use cases map

Table 82 defines the requirements for the VM RMI system implemented use cases.

Table 82 — [FREQ-3] VM RMI system implemented use cases map

REQ #	FREQ-3
Main title	Requirements for the VM RMI system implemented use cases
Requirement definition	The standardized RMI access mode shall access to a page containing all use cases as defined in Clause 7.
Brief description	In order to harmonize the navigational pathway of all VM RMI systems, the standardized RMI access mode will provide a link or context related navigation instructions to a use cases map. All relevant use cases, as defined in Clause 7 shall be shown, with active link or context related navigation instructions to corresponding pages/applications within the VM RMI system. In case some optional use case is not implemented, according to Clause 7, the map will reflect this information and no link will be present.
Classification	Mandatory

9.3.2 [FREQ-4] Download area

Table 83 defines the requirements for the download area.

Table 83 — [FREQ-4] Download area

REQ #	FREQ-4
Main title	Requirements for the download area
Requirement definition	The VM shall facilitate the download of applications to the IO client required for the usage of the RMI system.
Brief description	The VM RMI system shall provide a "download" visual widget as part of the "Standardized Navigation Mode". The visual widget shall enable and support the user to download to the IO client all the applications required for the usage of the system. The visual widget shall be in a visible position in the appropriate pages.
Classification	Mandatory only if manual download and installation of applications to the IO client are required for the particular VM system.

9.4 Requirements cluster 10 – Navigational pathway

9.4.1 [FREQ-5] Navigational pathway

Table 84 defines the requirements for the VM RMI navigational pathway.

Table 84 — [FREQ-5] Navigational pathway

REQ #	FREQ-5
Main title	Requirements for the standardized VM RMI navigation support
Requirement definition	The user selects a use case he would like to access and the VM RMI system guides him through the navigation pathway that will fulfil the request.
Brief description	This requirement can be fulfilled in a number of ways. At a minimum, the VM RMI system shall provide a use case sensitive help. A use case sensitive help will provide the order in which pre-requisite use cases shall be chosen in order to reach the target use case. An example of a more sophisticated solution would be an interactive use cases map (see FREQ-2). An interactive use cases map will guide a user through the pre-requisite use cases that shall be chosen in order to reach the target use case. In both instances, solutions may vary from VM RMI system to VM RMI system but will nonetheless facilitate the IO's navigation.
Classification	Mandatory

10 Conformance test cases

10.1 Conformance test case — General structure

10.1.1 Overview

Each test case is structured by six titles. In the following, details and examples for each of these titles (ordered list) are given.

10.1.2 Test case reference number and title [RMI-CT_...] [title]

A reference to the corresponding test case requirement is specified via a unique abbreviation, number and title as follows:

— [RMI-CT_UCx.y] of Clause 7;

— [RMI-CT_TREQ-m] of Clause 8;

— [RMI-CT_FREQ-n] of Clause 9;

where

‘x’, ‘y’ are numeric numbers as assigned in Clause 7;

‘m’, ‘n’ are numeric numbers which are used in ascending numeric order.

10.1.3 Test purpose

The test purpose gives a short description of the according test case and a reference to the corresponding use case or requirement.

NOTE The test case approach depends on the definition of the referenced use case or requirement.

10.1.4 Configuration

The configuration subclause addresses the configuration of the VM RMI system.

10.1.5 Preamble (setup state)

The preamble defines preconditions which are used for preparation and initialization of the VM RMI system with a view to performing the specific test. For example, a precondition could be the successful establishment of an Internet connection.

10.1.6 Test execution

Test execution of a single test case is organized in steps. These steps are described in Table 85 as shown in the example below.

Table 85 — Test execution example

Step #	Description
1	Description of first test step.
2	Description of second test step.
N	Description of Nth test step.

10.1.7 Postamble

The "Postamble" defines post conditions which are used to return the VM RMI system back to a definite state. For example, a post condition could be "go back to standardized navigation".

10.1.8 Result criteria

The test result criteria are composed of three different results as listed in Table 86.

Table 86 — Test result criteria

Result	Definition
Pass	The test purpose was achieved by passing all steps in the test execution as expected.
Deficiency	The test purpose was achieved with opportunities for improvement identified and documented in detail.
Fail	The test purpose was not achieved. Reason(s) shall be documented in detail.
Not applicable	The test case is not applicable because the use case or requirement is not supported by the VM RMI system.

All test cases comply with the test result criteria specified in Table 86 except those test cases which require specific test results.

10.2 CT cluster 1 – Access-related data administration

10.2.1 [RMI-CT_TREQ-13, 14, 15, 16, 18, Annex B] Test client configuration

10.2.1.1 Overview

This is a conformance test for checking the client configuration requirements specified in Clause 8.

10.2.1.2 Test purpose

The purpose of the conformance test is to verify that the used client and the installed software is according to requirements as specified in Clause 8.

10.2.1.3 Configuration

No additional configuration required.

10.2.1.4 Preamble (setup state)

Setup conditions: None.

10.2.1.5 Test execution

Table 87 defines the test execution.

Table 87 — [RMI-CT_TREQ-13, 14, 15, 16, 18, Annex B] Test client configuration test execution

Step #	Description
1	Check the client PC and the installed software is according to the technical requirements TREQ-13 Type of device in Clause 8.
2	Check the client PC and the installed software is according to the technical requirements TREQ-14 Hardware features in Clause 8.
3	Check the client PC and the installed software is according to the technical requirements TREQ-15 Operating systems in Clause 8.

Table 87 *(continued)*

Step #	Description
4	Check the client PC and the installed software is according to the technical requirements TREQ-16 Web browser in Clause 8.
5	Check the client PC and the installed software is according to the technical requirements TREQ-18 Internet connection (VM recommendations i.e. bandwidth, type of network) in Clause 8.
6	Check the client PC and the installed software is according to the actual version of Annex B.

10.2.1.6 Postamble

No post conditions.

10.2.2 [RMI-CT_TREQ-17] Test presentation formats for information packages

10.2.2.1 Overview

This is a conformance test for checking the presentation formats for information packages specified in Clause 8.

10.2.2.2 Test purpose

The purpose of the conformance test is to verify that information packages are presented using the open text and open graphic formats or can be printed using standard software plug-ins as specified in Clause 8 and available via the download area as specified in Clause 9.

10.2.2.3 Configuration

No additional configuration required.

10.2.2.4 Preamble (setup state)

Existence of download area as defined in FREQ-4 of Clause 9.

10.2.2.5 Test execution

Table 88 defines the test execution.

Table 88 — [RMI-CT_TREQ-17] Test presentation formats for information packages test execution

Step #	Description
1	Check the existence of download area as stated in FREQ-4.
2	In case no download area is present, go to step #4.
3	Download and install, if needed, all applications/plug-ins available via download area.
4	Perform all tests present in cluster 8 to verify that all information packages are properly displayed without any additional applications/plug-ins.

10.2.2.6 Postamble

No post conditions.

10.3 CT cluster 2 — Test client's external interfaces

10.3.1 [RMI-CT_TREQ-9] Test vehicle communication interface (VCI)

10.3.1.1 Overview

This is a conformance test for checking the VCI requirements specified in Clause 8.

10.3.1.2 Test purpose

This conformance test is used to verify that the VM RMI system client communicates to the vehicle via a VCI compliant to TREQ-9 VCI in Clause 8.

10.3.1.3 Configuration

The communication device for testing is validated by VM according to VM RMI website statement.

Any necessary driver for communication device as required by the VM RMI technical requirements according to both, VM and VCI manufacturer installation instructions is installed [e.g. TREQ-9 Vehicle communication interface (VCI)].

10.3.1.4 Preamble (setup state)

Setup conditions are as follows:

— all test cases passed of CT cluster 1 – Access-related data administration;

— if required by the VM, a battery charger with minimum requirements according to VM specification is connected to the vehicle;

— VCI is connected to PC and OBD plug of the vehicle;

— navigate to VM RMI home page;

— according to VM RMI system registration, login and payment might be required.

10.3.1.5 Test execution

Table 89 defines the test execution.

Table 89 — [RMI-CT_TREQ-9] Test vehicle communication interface (VCI) test execution

Step #	Description
1	Start one conformance test among RMI_CT_UC 6.3, RMI_CT_UC 7.1, RMI_CT_UC 7.2.
2	Check if VM RMI application indicates VCI detection.
3	Proceed with the same conformance test up to the first step where confirmation of communication between vehicle and VM RMI system is possible (e.g. reading of data from ECU, activation of actuators via ECU).
4	Abort conformance test under execution before writing on ECU has started.
5	In case the VCI is not detected, verify and check if all necessary configuration and preamble steps are properly fulfilled (this may require technical support). Repeat steps #1 to #4.

10.3.1.6 Postamble

No post conditions.

10.3.2 [RMI-CT_TREQ-11] Test parts ordering for security-related features

10.3.2.1 Overview

This is a conformance test for checking the interface to a parts ordering system for security-related parts if and only if such an interface is supported by the VM RMI system as specified in Clause 8.

10.3.2.2 Test purpose

This conformance test is used to verify the proper functioning of the interface to the online ordering system. The test case is only applicable if the online ordering of security-related parts is supported by the VM RMI system.

10.3.2.3 Configuration

VM RMI system supports an online ordering feature for security-related parts.

10.3.2.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid digital certificate and authorization for access to security-related RMI according to Clause 8;

— VM RMI system is not under Maintenance;

— VM RMI home page visible;

— according to VM RMI system registration, login and payment might be required.

10.3.2.5 Test execution

Table 90 defines the test execution.

Table 90 — [RMI-CT_TREQ-11] Test parts ordering for security-related features test execution

Step #	Description
1	Check if VM RMI system supports the online interface for ordering security-related parts. If not, the conformance test [RMI-CT_TREQ-11] is not applicable.
2	Follow the instruction given by the VM RMI system to order security-related parts online.
3	Check if the interface is functioning.

NOTE [RMI-CT_TREQ-11] is applicable only if the VM RMI system supports the online ordering of security-related parts.

10.3.2.6 Postamble

No post conditions.

10.3.3 [RMI-CT_TREQ-12] Test partnered accessory provider systems

10.3.3.1 Overview

This is a conformance test for checking the interface to a partnered accessory provider system if and only if such an interface is supported by the VM RMI system as specified in Clause 8.

10.3.3.2 Test purpose

This conformance test is used to verify the proper functioning of the interface or link to the partnered accessory provider system. The test case is only applicable if an interface or a link to a partnered accessory provider system is supported by the VM RMI system.

10.3.3.3 Configuration

VM RMI system supports an interface or a link to a partnered accessory provider system.

10.3.3.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— according to VM RMI system registration, login and payment might be required.

10.3.3.5 Test execution

Table 91 defines the test execution.

Table 91 — [RMI-CT_TREQ-12] Test partnered accessory provider systems test execution

Step #	Description
1	Access UC 5.7.2 Accessory information partnered with a VM part number following instructions according to FREQ-5.
2	Check if VM RMI system supports an interface or a link to a partnered accessory provider system. If not, the conformance test [RMI-CT_TREQ-12] is not applicable.
3	Check if the interface or link is functioning.

NOTE [RMI-CT_TREQ-12] is applicable only if the VM RMI system supports the interface or link to a partnered accessory provider system.

10.3.3.6 Postamble

No post conditions.

10.4 CT cluster 3 — Test user authentication, authorization and administration

10.4.1 [RMI-CT_UC1.1] Test to register IO for use of the VM RMI system

10.4.1.1 Overview

This is a conformance test for use case 1.1 specified in Clause 7.

10.4.1.2 Test purpose

This conformance test is used to verify that the VM RMI system allows registration of new IOs as specified in the test steps.

10.4.1.3 Configuration

No additional configuration required.

10.4.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid registration data;

— optional: access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.4.1.5 Test execution

Table 92 defines the test execution.

Table 92 — [RMI-CT_UC1.1] Test to register IO for use of the VM RMI system test execution

Step #	Description
1	Tester (in the role of the IO legal representative) selects UC 1.1 and follows instructions provided, according to FREQ-5, verifying that all following steps are possible.
2	Tester (in the role of the IO legal representative) accepts Terms and Conditions.
3	Tester (in the role of the IO legal representative) accepts agreement on registration fee, if applicable.
4	Optional: Further input may be requested in recognition of local legislation.
5	The registration application will be processed.
6	The tester is notified about further steps in the registration process.
7	The tester is notified about the following: — contract agreement between IO and VM; — success of registration of tester (in the role of the IO legal representative); — acceptance or rejection of the IO approval to access security-related RMI; — access level of the tester (in the role of the IO legal representative), granted if the presented digital certificate and the authorization are valid; — reason for rejection if applicable.
8	In case registration is accepted, agreement on User ID and Password.

10.4.1.6 Postamble

No post conditions.

10.4.2 [RMI-CT_UC1.2_A] Test to register IO employee for use of the VM RMI system — Scenario A

10.4.2.1 Overview

This is a conformance test for use case 1.2 specified in Clause 7.

10.4.2.2 Test purpose

This conformance test is used to verify that the VM RMI system allows registration of new IO employees for use of the VM RMI system as defined by the IO legal representative and specified in the test steps.

10.4.2.3 Configuration

No additional configuration required.

10.4.2.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid registration data;

— optional: access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.4.2.5 Test execution

Table 93 defines the test execution for scenario A: Tester's role is an IO legal representative.

Table 93 — [RMI-CT_UC1.2_A] Test to register IO employee for use of the VM RMI system — Scenario A test execution

Step #	Description
1	Tester (in the role of the IO legal representative) selects UC 1.2_A and follows instructions provided, according to FREQ-5, verifying that all following steps are possible.
2	The system requests the tester (in the role of the IO legal representative) to confirm the validity of the IO data.
3	The VM RMI system asks the tester to choose a User ID and either assigns an initial password to the user or allows them to enter one that satisfies the VM's password security requirements.
4	Agreement on User ID and password (the User ID shall be unique in the VM system).
5	The tester is notified about the successful registration of the IO employee.

10.4.3 [RMI-CT_UC1.2_B] Test to register IO employee for use of the VM RMI system — Scenario B

10.4.3.1 Overview

This is a conformance test for use case 1.2 specified in Clause 7.

10.4.3.2 Test purpose

This conformance test is used to verify that the VM RMI system allows registration of new IO employees for use of the VM RMI system on his request as specified in the test steps.

10.4.3.3 Configuration

No additional configuration required.

10.4.3.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid registered user data of the IO legal representative;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.4.3.5 Test execution

Table 94 defines the test execution for scenario B.

Table 94 — [RMI-CT_UC1.2_B] Test to register IO employee for use of the VM RMI system — Scenario B test execution

Step #	Description
1	Tester (in the role of the IO employee) selects UC 1.2_B and follows instructions provided, according to FREQ-5, verifying that all following steps are possible.
2	The tester enters the requested identification data for the IO: company name, etc.
3	The VM RMI system either assigns an initial password to the tester or allows the user to enter one that satisfies the VM´s password security requirements.
4	Agreement on User ID and Password (the User ID shall be unique in the VM system).
5	The VM RMI system sends a request to the tester (in the role of the IO legal representative) asking to agree on the registration of the IO employee.
6	The VM RMI system processes the decision from the tester (in the role of the IO legal representative). NOTE This may need some time due to the response time by the IO legal representative.
7	The tester is notified about the successful or rejected registration.

10.4.3.6 Postamble

No post conditions.

10.4.4 [RMI-CT_UC1.3] Test to maintain IO status

10.4.4.1 Overview

This is a conformance test for use case 1.3 specified in Clause 7.

10.4.4.2 Test purpose

This conformance test is used to verify that the VM RMI system allows modifications of modifiable user data and keeps user data up to date of already registered users performed by the IO legal representative as specified in the test steps.

10.4.4.3 Configuration

No additional configuration required.

10.4.4.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.4.4.5 Test execution

Table 95 defines the test execution.

Table 95 — [RMI-CT_UC1.3] Test to maintain IO status test execution

Step #	Description
1	Tester (in the role of the IO legal representative) selects UC 1.3 and follows instructions provided, according to FREQ-5, verifying that all following steps are possible.
2	Tester (in the role of the IO legal representative) changes (updates) IO data and confirms. The data will be processed.
3	— Case #1: The tester is notified if the change of data was successful. — Case #2: The tester is notified that a new validation of the IO company is required and further steps are necessary. — Case #3: The tester is notified that a new registration according to use case 1.1 is required.

10.4.4.6 Postamble

No post conditions.

10.4.5 [RMI-CT_UC1.4] Test to maintain user status

10.4.5.1 Overview

This is a conformance test for use case 1.4 specified in Clause 7.

10.4.5.2 Test purpose

This conformance test is used to verify that the VM RMI system allows modification of modifiable user data of already registered users performed by the IO employee as specified in the test steps.

10.4.5.3 Configuration

No additional configuration required.

10.4.5.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.4.5.5 Test execution

Table 96 defines the test execution.

Table 96 — [RMI-CT_UC1.4] Test to maintain user status test execution

Step #	Description
1	Tester (in the role of the IO employee) selects UC 1.4 and follows instructions provided, according to FREQ-5, verifying that all following steps are possible.
2	Tester (in the role of the IO employee) changes (updates) password, preferred language and e-mail address.
3	Notify the tester if change of data was successful.

10.4.5.6 Postamble

No post conditions.

10.4.6 [RMI-CT_UC1.5] Test to de-register an IO employee

10.4.6.1 Overview

This is a conformance test for use case 1.5 specified in Clause 7.

10.4.6.2 Test purpose

This conformance test is used to verify that the VM RMI system allows withdrawing access rights of a registered user by the IO legal representative as specified in the test steps.

10.4.6.3 Configuration

No additional configuration required.

10.4.6.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid registered user data of the IO legal representative and the IO employee;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.4.6.5 Test execution

Table 97 defines the test execution.

Table 97 — [RMI-CT_UC1.5] Test to de-register an IO employee test execution

Step #	Description
1	Tester (in the role of the IO legal representative) selects UC 1.5 and follows instructions provided, according to FREQ-5, verifying that all following steps are possible.
2	Tester (in the role of the IO legal representative) selects User ID for whom access rights have to be withdrawn.
3	Tester (in the role of the IO legal representative) selects access rights to be withdrawn, then confirms. Withdrawal of user rights will be processed.
4	VM RMI system confirms successful action.
5	Tester (in the role of the IO legal representative) is notified of the result of the de-activation of the IO employee account(s).

10.4.6.6 Postamble

No post conditions.

10.4.7 [RMI-CT_UC1.6] Test login to VM RMI system

10.4.7.1 Overview

This is a conformance test for use case 1.6 specified in Clause 7.

10.4.7.2 Test purpose

This conformance test is used to verify that the VM RMI system allows login of registered users as specified in the test steps.

10.4.7.3 Configuration

No additional configuration required.

10.4.7.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid registered user data;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.4.7.5 Test execution

Table 98 defines the test execution.

Table 98 — [RMI-CT_UC1.6] Test login to VM RMI system test execution

Step #	Description
1	Tester selects UC 1.6 and follows instructions provided, according to FREQ-5, verifying that all following steps are possible.
2	Tester is given access to the VM RMI system.

10.4.7.6 Postamble

No post conditions.

10.4.8 [RMI-CT_UC1.7] Test for granting access to security-related RMI

10.4.8.1 Overview

This is a conformance test for use case 1.7 specified in Clause 7.

10.4.8.2 Test purpose

This conformance test is used to verify that the VM RMI system allows the access to security-related RMI.

10.4.8.3 Configuration

No additional configuration required.

10.4.8.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid registered user data;

— valid digital certificate according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.4.8.5 Test execution

Table 99 defines the test execution granting access to security-related RMI for an IO legal representative.

Table 99 — [RMI-CT_UC1.7] Test for granting access to security-related RMI for an IO legal representative test execution

Step #	Description
1	Tester (in the role of a IO legal representative/IO employee) selects UC 1.7 and follows instructions provided, according to FREQ5, verifying that all following steps are possible.
2	Tester presents the digital certificate according to the SERMI scheme. NOTE Hardware certificate shall be the one associated with the User ID and Passwords used in step #1.
3	The VM RMI system checks the approval of the IO for which the IO legal representative/IO employee is registered.
4	The VM RMI system checks the validity of the certificate and authorization via request to the trust centre that issued the certificate.
5	Access level for security-related RMI is granted according to the presented digital certificate.
6	The VM RMI system communicates the granted access level to the tester (both at IO employee and IO legal representative level if different).

10.4.8.6 Postamble

No post conditions.

10.5 CT cluster 4 — Test functional user interface implementation

10.5.1 [RMI-CT_FREQ-1] Test for RMI access mode

10.5.1.1 Overview

This is a conformance test for functional user interface requirement FREQ-1 specified in Clause 9.

10.5.1.2 Test purpose

This conformance test is used to verify that the VM RMI system implements the requirements for the Clause 9 RMI access mode.

10.5.1.3 Configuration

No additional configuration required.

10.5.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible.

10.5.1.5 Test execution

Table 100 defines the test execution.

Table 100 — [RMI-CT_FREQ-1] Test for RMI access mode test execution

Step #	Description
1	A button or link called “Standardized Navigation” shall be present.

10.5.1.6 Postamble

No post conditions.

10.5.2 [RMI-CT_FREQ-2] Test for registration and login support

10.5.2.1 Overview

This is a conformance test for functional user interface requirement FREQ-2 specified in Clause 9.

10.5.2.2 Test purpose

This conformance test is used to verify that the VM RMI system implements the requirements for the registration and login support.

10.5.2.3 Configuration

No additional configuration required.

10.5.2.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid registration data for login support;

— VM RMI system is not under maintenance;

— VM RMI home page visible.

10.5.2.5 Test execution

Table 101 defines the test execution.

Table 101 — [RMI-CT_FREQ-2] Test for registration and login support test execution

Step #	Description
1	The VM RMI system provides support for registrations and login issues. EXAMPLE Contact area, Frequently Asked Questions, support area or online help.

10.5.2.6 Postamble

No post conditions.

10.5.2.7 Result criteria

In case one of three expected functions (e.g. registration, login, password recovery) is not possible, FREQ-4 has failed.

In case all functions are possible, but the correct process is not provided in the use cases map, FREQ-5 has failed.

10.5.3 [RMI-CT_FREQ-3] Test for implemented use cases map

10.5.3.1 Overview

This is a conformance test for functional user interface requirement FREQ-3 specified in Clause 9.

10.5.3.2 Test purpose

This conformance test is used to verify that the VM RMI system implements the requirements for the implemented use cases.

10.5.3.3 Configuration

No additional configuration required.

10.5.3.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible.

10.5.3.5 Test execution

Table 102 defines the test execution.

Table 102 — [RMI-CT_FREQ-3] Test for implemented use cases map test execution

Step #	Description
1	Access to “standardised navigation”.
2	The implemented “use cases map” with all relevant use cases shall be displayed.
3	All implemented use cases shall have active links or context related navigation instructions.

10.5.3.6 Postamble

No post conditions.

10.5.4 [RMI-CT_FREQ-4] Test for download area

10.5.4.1 Overview

This is a conformance test for functional user interface requirement FREQ-4 specified in Clause 9.

10.5.4.2 Test purpose

This conformance test is used to verify that the VM RMI system implements the requirements for the download area.

10.5.4.3 Configuration

No additional configuration required.

10.5.4.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.5.4.5 Test execution

Table 103 defines the test execution.

Table 103 — [RMI-CT_FREQ-4] Test for download area test execution

Step #	Description
1	In case a specific use case requires the download of applications to the IO client for the usage of the RMI system, a visual widget shall be in a visible position in the use cases map.
2	By selecting the widget, user shall be guided through the different steps required for downloading and installing the application.

NOTE FREQ-4 is mandatory only if manual download and installation of applications to the IO client are required for the particular VM system, thus [RMI-CT_FREQ-4] Test for download area could be not applicable for a specific VM RMI system.

10.5.4.6 Postamble

No post conditions.

10.5.5 [RMI-CT_FREQ-5] Test for navigational pathway

10.5.5.1 Overview

This is a conformance test for functional user interface requirement FREQ-5 specified in Clause 9.

10.5.5.2 Test purpose

This conformance test is used to verify that the VM RMI system implements the requirements for the standardized VM RMI navigation support.

10.5.5.3 Configuration

No additional configuration required.

10.5.5.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.5.5.5 Test execution

Table 104 defines the test execution.

Table 104 — [RMI-CT_FREQ-5] Test for navigational pathway test execution

Step #	Description
1	At a minimum, the VM RMI system shall provide a use case sensitive help. A use case sensitive help will provide the order in which pre-requisite use cases shall be chosen in order to reach the target use case.
2	An example of a more sophisticated solution would be an interactive use cases map that will guide a user through the pre-requisite use cases that shall be chosen in order to reach the target use case.
3	By following the provided navigational path, user shall be able to access selected use case.

10.5.5.6 Postamble

No post conditions.

10.6 CT cluster 5 — Test payment for RMI

10.6.1 [RMI-CT_UC2] Test payment for RMI

10.6.1.1 Overview

This is a conformance test for use case 2 specified in Clause 7.

10.6.1.2 Test purpose

This conformance test is used to verify proper handling of payments and that the VM RMI system provides the possibility to select subscription, to select payment arrangements and payment-relevant data (card data, account id, etc.), activates (enables) the selected subscription, and produces a receipt.

10.6.1.3 Configuration

No additional configuration required.

10.6.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data;

— subscriptions for security-related RMI may require a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible;

10.6.1.5 Test execution

Table 105 defines the test execution.

Table 105 — [RMI-CT_UC2] Test payment for RMI test execution

Step #	Description
1	Select UC 2 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select subscription (content and period).
3	Select payment arrangement.
4	Fill in requested payment relevant data (card data, account id, etc.).
5	Confirm. Data will be processed.
6	VM notifies user about further steps (e.g. invoicing).
7	VM grants access to VM RMI system according to subscription process.

10.6.1.6 Postamble

No post conditions.

10.7 CT cluster 6 — Test for vehicle identification

10.7.1 [RMI-CT_UC3.1] Test vehicle identification through product identifier

10.7.1.1 Overview

This is a conformance test for use case 3.1 specified in Clause 7.

10.7.1.2 Test purpose

This conformance test is used to verify that the VM RMI system provides vehicle identification via VIN input.

10.7.1.3 Configuration

No additional configuration required.

10.7.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.7.1.5 Test execution

Table 106 defines the test execution.

Table 106 — UC 3.1 Vehicle identification through product identifier test execution

Step #	Description
1	Select UC 3.1 and follow instruction provided according to FREQ-5.
2	Provide a valid VIN as required by the VM RMI system.
3	The VM RMI system will provide vehicle summary information for this specific VIN as defined in UC 3.1 - Use case output.

10.7.1.6 Postamble

The retention of the vehicle identification can only be verified in the subsequent use cases where that specific vehicle identification is required.

10.7.2 [RMI-CT_UC3.2] Test vehicle identification via product features

10.7.2.1 Overview

This is a conformance test for use case 3.2 specified in Clause 7. Conformance testing for classification C2 is outside the scope of this conformance test as conformance will be VM-specific.

10.7.2.2 Test purpose

This conformance test is used to verify that the VM RMI system provides vehicle identification via product features in cases where this functionality is provided to ARs.

10.7.2.3 Configuration

No additional configuration required.

10.7.2.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.7.2.5 Test execution

Table 107 defines the test execution.

Table 107 — [RMI-CT_UC3.2] Test vehicle identification via product features test execution

Step #	Description
1	Select UC 3.2 and follow instruction provided according to FREQ-5.
2	Input or select allowed product feature option where offered by the VM RMI system.
3	Make information request using product feature(s) such as model, vehicle year, etc.
4	The VM RMI system will provide available vehicle information relevant to the submitted product features.

10.7.2.6 Postamble

The retention of the vehicle identification can only be verified in the subsequent use cases where that specific vehicle identification is required.

10.8 CT cluster 7 — Test selection methods for RMI

10.8.1 [RMI-CT_UC4.1] Test selection of information type

10.8.1.1 Overview

This is a conformance test for use case 4.1 specified in Clause 7.

10.8.1.2 Test purpose

This conformance test is used to verify that the VM RMI system provides the relevant information types.

10.8.1.3 Configuration

No additional configuration required.

10.8.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible;

— either VIN according to UC 3.1 or product features according to UC 3.2 selected.

10.8.1.5 Test execution

Table 108 defines the test execution.

Table 108 — [RMI-CT_UC4.1] Test selection of information type test execution

Step #	Description
1	Select UC 4.1 and follow instruction provided according to FREQ-5.
2	VM RMI system displays a list of information types.
3	Select at least one of the listed information types.

10.8.1.6 Postamble

The retention of the information type(s) selected can only be verified in the subsequent use case(s) where that specific information type(s) is required.

10.8.2 [RMI-CT_UC4.2] Test search by standardized terms

10.8.2.1 Overview

This is a conformance test for use case 4.2 specified in Clause 7.

10.8.2.2 Test purpose

This conformance test is used to verify that the VM RMI system provides searching by terms from the Digital Annex according to ISO 18542.

10.8.2.3 Configuration

Latest implemented version of the RMI Terminology Digital Annex.

10.8.2.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible;

— either VIN according to UC 3.1 or product features according to UC 3.2 selected.

10.8.2.5 Test execution

Table 109 defines the test execution.

Table 109 — [RMI-CT_UC4.2] Test search by standardized terms test execution

Step #	Description
1	Select UC 4.2 and follow instruction provided according to FREQ-5.
2	Input a term from the digital annex.
3	Submit the search request.
4	The VM RMI system returns a list of document titles containing either the standardized term or the mapped term in the title or in the metadata of the document.

10.8.2.6 Postamble

No post conditions.

10.8.3 [RMI-CT_UC4.3] Test navigation using product structure

10.8.3.1 Overview

This is a conformance test for use case 4.3 specified in Clause 7.

10.8.3.2 Test purpose

This conformance test is used to verify that the VM RMI system provides navigation capability via the product structure to enable the user to browse the information.

10.8.3.3 Configuration

No additional configuration required.

10.8.3.4 Preamble (setup state)

Setup conditions are:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible;

— either VIN according to UC 3.1 or product features according to UC 3.2 selected.

10.8.3.5 Test execution

Table 110 defines the test execution.

Table 110 — [RMI-CT_UC4.3] Test navigation using product structure test execution

Step #	Description
1	Select UC 4.3 and follow instruction provided according to FREQ-5.
2	Navigate within the product structure to the required level.
3	The VM RMI system provides a list of available information packages for the selected item.

10.8.3.6 Postamble

No post conditions.

10.8.4 [RMI-CT_UC4.4] Test selection by document identifier

10.8.4.1 Overview

This is a conformance test for use case 4.4 specified in Clause 7.

10.8.4.2 Test purpose

This conformance test is used to verify that the VM RMI system provides searching by document identifier if offered to VMs ARs.

10.8.4.3 Configuration

No additional configuration required.

10.8.4.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.8.4.5 Test execution

Table 111 defines the test execution.

Table 111 — [RMI-CT_UC4.4] Test selection by document identifier test execution

Step #	Description
1	Select UC 4.4 and follow instruction provided according to FREQ-5.
2	Enter a valid document identifier.
3	The VM RMI system displays the document title relevant to the identifier.

10.8.4.6 Postamble

No post conditions.

10.9 CT cluster 8 — Test retrieval of information packages

10.9.1 [RMI-CT_UC5.1.1] Test retrieval of general workshop procedures

10.9.1.1 Overview

This is a conformance test for use case 5.1.1 specified in Clause 7.

10.9.1.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to selected general workshop procedure.

10.9.1.3 Configuration

No additional configuration required.

10.9.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.1.5 Test execution

Table 112 defines the test execution.

Table 112 — [RMI-CT_UC5.1.1] Test retrieval of general workshop procedures test execution

Step #	Description
1	Select UC 5.1.1 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select one document in the search result list.
3	The document corresponding to the pre-selected options shall open to be read.

10.9.1.6 Postamble

No post conditions.

10.9.2 [RMI-CT_UC5.1.2] Test retrieval of body repair procedures

10.9.2.1 Overview

This is a conformance test for use case 5.1.2 specified in Clause 7.

10.9.2.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to the selected body repair procedure.

10.9.2.3 Configuration

No additional configuration required.

10.9.2.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.2.5 Test execution

Table 113 defines the test execution.

Table 113 — [RMI-CT_UC5.1.2] Test retrieval of body repair procedures test execution

Step #	Description
1	Select UC 5.1.2 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select one document in the search result list.
3	The corresponding document shall open to be read.

NOTE UC 5.1.2 is optional but mandatory if the repair information exists, thus RMI-CT_UC5.1.2 could be not applicable for a specific VM RMI system.

10.9.2.6 Postamble

No post conditions.

10.9.3 [RMI-CT_UC5.1.3] Test retrieval of temporary repair procedures

10.9.3.1 Overview

This is a conformance test for use case 5.1.3 specified in Clause 7.

10.9.3.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to selected temporary repair procedure.

10.9.3.3 Configuration

No additional configuration required.

10.9.3.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.3.5 Test execution

Table 114 defines the test execution.

Table 114 — [RMI-CT_UC5.1.3] Test retrieval of temporary repair procedures test execution

Step #	Description
1	Select UC 5.1.3 and follow instruction provided, according to FREQ5, verifying that all following steps are possible.
2	Select one document in the search result list.
3	The corresponding document shall open to be read.

NOTE UC 5.1.3 is optional but mandatory if provided by VM to VM AR, thus RMI-CT_UC5.1.3 could be not applicable for a specific VM RMI system.

10.9.3.6 Postamble

No post conditions.

10.9.4 [RMI-CT_UC5.1.4] Test retrieval of preparation for PTI

10.9.4.1 Overview

This is a conformance test for use case 5.1.4 specified in Clause 7.

10.9.4.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to selected information for preparation for PTI.

10.9.4.3 Configuration

No additional configuration required.

10.9.4.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.4.5 Test execution

Table 115 defines the test execution.

Table 115 — [RMI-CT_UC5.1.4] Test retrieval of preparation for PTI test execution

Step #	Description
1	Select UC 5.1.4 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	The VM RMI system displays the requested PTI information or offers access to PTI services.
3	The corresponding document shall open to be read.

NOTE UC 5.1.4 is optional but mandatory if provided by VM to VM AR, thus RMI-CT_UC5.1.4 could be not applicable for a specific VM RMI system.

10.9.4.6 Postamble

No post conditions.

10.9.5 [RMI-CT_UC5.2] Test retrieval of wiring diagrams

10.9.5.1 Overview

This is a conformance test for use case 5.2 specified in Clause 7.

10.9.5.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to selected wiring diagram.

10.9.5.3 Configuration

No additional configuration required.

10.9.5.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.5.5 Test execution

Table 116 defines the test execution.

Table 116 — [RMI-CT_UC5.2] Test retrieval of wiring diagrams test execution

Step #	Description
1	Select UC 5.2 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select one document in the search result list.
3	The corresponding document shall open to be read.

10.9.5.6 Postamble

No post conditions.

10.9.6 [RMI-CT_UC5.3] Test retrieval of technical service bulletin

10.9.6.1 Overview

This is a conformance test for use case 5.3 specified in Clause 7.

10.9.6.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to selected technical service bulletin.

10.9.6.3 Configuration

No additional configuration required.

10.9.6.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.6.5 Test execution

Table 117 defines the test execution.

Table 117 — [RMI-CT_UC5.3] Test retrieval of technical service bulletin test execution

Step #	Description
1	Select UC 5.3 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select one document in the search result list.
3	The corresponding document shall open to be read.

NOTE UC 5.3 is optional but mandatory if provided by VM to VM AR, thus RMI-CT_UC5.3 could be not applicable for a specific VM RMI system.

10.9.6.6 Postamble

No post conditions.

10.9.7 [RMI-CT_UC5.4] Test retrieval of recall information

10.9.7.1 Overview

This is a conformance test for use case 5.4 specified in Clause 7.

10.9.7.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to selected recall information.

10.9.7.3 Configuration

No additional configuration required.

10.9.7.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.7.5 Test execution

Table 118 defines the test execution.

Table 118 — [RMI-CT_UC5.4] Test retrieval of recall information test execution

Step #	Description
1	Select UC 5.4 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Information package will show the recall title and a message including a brief information about the issue that is to be solved and the indication that the VM would provide a free of charge repair through their authorized network.

10.9.7.6 Postamble

No post conditions.

10.9.8 [RMI-CT_UC5.5] Test retrieval of maintenance schedule

10.9.8.1 Overview

This is a conformance test for use case 5.5 specified in Clause 7.

10.9.8.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to maintenance schedule.

10.9.8.3 Configuration

No additional configuration required.

10.9.8.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.8.5 Test execution

Table 119 defines the test execution.

Table 119 — [RMI-CT_UC5.5] Test retrieval of maintenance schedule test execution

Step #	Description
1	Select UC 5.5 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	The corresponding document shall open to be read.
3	If implemented, links to relevant procedures will lead to the maintenance procedures.

10.9.8.6 Postamble

No post conditions.

10.9.9 [RMI-CT_UC5.6.1] Test retrieval of spare parts (identification)

10.9.9.1 Overview

This is a conformance test for use case 5.6.1 specified in Clause 7.

10.9.9.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to spare parts (identification).

10.9.9.3 Configuration

No additional configuration required.

10.9.9.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.9.5 Test execution

Table 120 defines the test execution.

Table 120 — [RMI-CT_UC5.6.1] Test retrieval of spare parts (identification) test execution

Step #	Description
1	Select UC 5.6.1 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select one document in the search result list.
3	The corresponding document shall open to be read.
4	In case spare parts catalogue is not part of standard RMI in a specific VM RMI system, result shall be a link to spare parts catalogue.

10.9.9.6 Postamble

No post conditions.

10.9.10 [RMI-CT_UC5.6.2] Test retrieval of spare parts (access)

10.9.10.1 Overview

This is a conformance test for use case 5.6.2 specified in Clause 7.

10.9.10.2 Test purpose

This conformance test is used to verify that the VM RMI system provides direct access to spare parts catalogue.

10.9.10.3 Configuration

No additional configuration required.

10.9.10.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.10.5 Test execution

Table 121 defines the test execution.

Table 121 — [RMI-CT_UC5.6.2] Test retrieval of spare parts (access) test execution

Step #	Description
1	Select UC 5.6.2 and follow instruction provided, according to FREQ-5.
2	Spare parts catalogue homepage appears.

10.9.10.6 Postamble

No post conditions.

10.9.11 [RMI-CT_UC5.7.1] Test retrieval of accessory information factory fitted (included in general RMI)

10.9.11.1 Overview

This is a conformance test for use case 5.7.1 specified in Clause 7.

10.9.11.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to accessory information factory fitted.

10.9.11.3 Configuration

No additional configuration required.

10.9.11.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.11.5 Test execution

Table 122 defines the test execution.

Table 122 — [RMI-CT_UC5.7.1] Test retrieval of accessory information factory fitted (included in general RMI) test execution

Step #	Description
1	Select UC 5.7.1 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select one document in the search result list.
3	The corresponding document shall open to be read.

10.9.11.6 Postamble

No post conditions.

10.9.12 [RMI-CT_UC5.7.2] Test retrieval of accessory information partnered with a VM part number

10.9.12.1 Overview

This is a conformance test for use case 5.7.2 specified in Clause 7.

10.9.12.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to accessory information partnered with a VM part number.

10.9.12.3 Configuration

No additional configuration required.

10.9.12.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.12.5 Test execution

Table 123 defines the test execution.

Table 123 — [RMI-CT_UC5.7.2] Test retrieval of accessory information partnered with a VM part number test execution

Step #	Description
1	Select UC 5.7.2 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select one document in the search result list.
3	The corresponding document shall open to be read.
4	In case a specific partnered accessory information is not part of standard RMI in a specific VM RMI system, result shall be a link to the third party responsible for the accessory.

10.9.12.6 Postamble

No post conditions.

10.9.13 [RMI-CT_UC5.7.3] Test retrieval of fitting information for accessories with no VM part number

10.9.13.1 Overview

This is a conformance test for use case 5.7.3 specified in Clause 7.

10.9.13.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to fitting information for accessories with no VM part number.

10.9.13.3 Configuration

No additional configuration required.

10.9.13.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.13.5 Test execution

Table 124 defines the test execution.

Table 124 — [RMI-CT_UC5.7.3] Test retrieval of fitting information for accessories with no VM part number test execution

Step #	Description
1	Select UC 5.7.3 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select one document in the search result list.
3	The corresponding document shall open to be read.
4	A single document shall generally be accessible with each and any of the implemented search criteria.

NOTE UC 5.7.3 is optional but mandatory if provided by VM to VM AR, thus RMI-CT_UC5.7.3 could be not applicable for a specific VM RMI system.

10.9.13.6 Postamble

No post conditions.

10.9.14 [RMI-CT_UC5.8] Test retrieval of labour times

10.9.14.1 Overview

This is a conformance test for use case 5.8 specified in Clause 7.

10.9.14.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to labour times.

10.9.14.3 Configuration

No additional configuration required.

10.9.14.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.14.5 Test execution

Table 125 defines the test execution.

Table 125 — [RMI-CT_UC5.8] Test retrieval of labour times test execution

Step #	Description
1	Select UC 5.8 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Select specific labour times.
3	Selected labour times are displayed.

10.9.14.6 Postamble

No post conditions.

10.9.15 [RMI-CT_UC5.9] Test retrieval of special tool information

10.9.15.1 Overview

This is a conformance test for use case 5.9 specified in Clause 7.

10.9.15.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to the special tool information.

10.9.15.3 Configuration

No additional configuration required.

10.9.15.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.15.5 Test execution

Table 126 defines the test execution.

Table 126 — [RMI-CT_UC5.9] Test retrieval of special tool information test execution

Step #	Description
1	Select UC 5.10 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	The VM RMI system shall give access to special tool information.

10.9.15.6 Postamble

No post conditions.

10.9.16 [RMI-CT_UC5.10] Test retrieval of type approval information

10.9.16.1 Overview

This is a conformance test for use case 5.10 specified in Clause 7.

10.9.16.2 Test purpose

This conformance test is used to verify that the VM RMI system provides access to type-approval information.

10.9.16.3 Configuration

No additional configuration required.

10.9.16.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.9.16.5 Test execution

Table 127 defines the test execution.

Table 127 — [RMI-CT_UC5.10] Test retrieval of type approval information test execution

Step #	Description
1	Select UC 5.10 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	The VM RMI system shall give access to type approval information.

10.9.16.6 Postamble

No post conditions.

10.10 CT cluster 9 — Test vehicle diagnostics

10.10.1 [RMI-CT_UC6.1] Test DTC resolution

10.10.1.1 Overview

This is a conformance test for use case 6.1 specified in Clause 7.

10.10.1.2 Test purpose

This conformance test is used to verify that the VM RMI system provides a description of the DTC if it is relevant to the vehicle and module and, if available, a list of potential causes or hints for further investigation.

10.10.1.3 Configuration

No additional configuration required.

10.10.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.10.1.5 Test execution

Table 128 defines the test execution.

Table 128 — [RMI-CT_UC6.1] Test DTC resolution test execution

Step #	Description
1	Select UC 6.1 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Enter or select the relevant DTC.
3	The VM RMI system returns a description of the DTC and, if available, a list of potential causes or hints for further investigation, to the same level and content as provided to AR.

10.10.1.6 Postamble

No post conditions.

10.10.2 [RMI-CT_UC6.2] Test VM symptom resolution

10.10.2.1 Overview

This is a conformance test for use case 6.2 specified in Clause 7.

Depending on the diagnostic strategy chosen by the VM, isolated symptom resolution may not be supported. In such cases, symptom resolution is part of the integrated diagnostics.

10.10.2.2 Test purpose

This conformance test is used to verify that the VM RMI system delivers a list of potential causes or hints for further investigation when provided with a VM symptom as found by reading the published technical documentation.

10.10.2.3 Configuration

No additional configuration required.

10.10.2.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.10.2.5 Test execution

Table 129 defines the test execution.

Table 129 — [RMI-CT_UC6.2] Test VM symptom resolution test execution

Step #	Description
1	Select UC 6.2 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Input or select valid VM symptom as found by reading the published technical documentation.
3	The system returns a list of potential causes or hints for further investigation, to the same level and content as provided to AR.

10.10.2.6 Postamble

No post conditions.

10.10.3 [RMI-CT_UC6.3] Test integrated diagnostics

10.10.3.1 Overview

This is a conformance test for use case 6.3 specified in Clause 7.

10.10.3.2 Test purpose

This conformance test is used to verify that the VM RMI system provides integrated diagnostics via standardized non-proprietary VCI functionality using a non-proprietary front end.

10.10.3.3 Configuration

Test if communication device for testing is validated by VM according to VM RMI website statement.

Any necessary driver for communication device as required by the VM RMI technical requirements according to both, VM and VCI manufacturer installation instructions is installed (e.g. TREQ-8 VCI manufacturer-specific device driver and VM-specific device driver).

10.10.3.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.10.3.5 Test execution

Table 130 defines the test execution.

Table 130 — [RMI-CT_UC6.3] Test integrated diagnostics test execution

Step #	Description
1	Select UC 6.2 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	When requested, link the vehicle to the VM RMI system via VM validated non-proprietary VCI functionality.
3	The VM RMI system checks the vehicle ECUs and displays diagnostic information. The VM RMI system checks the vehicle ECUs and displays precise diagnostics results and repair recommendation.

NOTE UC 6.3 is optional but mandatory if provided by VM to VM AR, thus the RMI-CT_UC6.3 could be not applicable for a specific VM RMI system.

10.10.3.6 Postamble

No post conditions.

10.11 CT cluster 10 — Test updating and replacing of modules (ECUs)

10.11.1 [RMI-CT_UC7] Test updating and replacing modules information

10.11.1.1 Overview

This is a conformance test for use case 7 specified in Clause 7.

10.11.1.2 Test purpose

This conformance test is used to verify that the VM RMI system provides information about updating and replacing modules.

10.11.1.3 Configuration

Test if communication device for testing is validated by VM according to VM RMI website statement.

Any necessary driver for communication device as required by the VM RMI technical requirements according to both, VM and VCI manufacturer installation instructions is installed (e.g. TREQ-8 VCI manufacturer-specific device driver and VM-specific device driver).

10.11.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.11.1.5 Test execution

Table 131 defines the test execution.

Table 131 — [RMI-CT_UC7] Test updating and replacing modules information test execution

Step #	Description
1	Select UC 7 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	The user requests the necessary action for updating or replacing modules. Security measures, i.e. approval/authorization to protect against vehicle theft or emission control and engine calibration tampering may be required.
3	The VM RMI system identifies the required software versions for the individual vehicle. Update the ECU software according to the valid configuration if the prerequisites for software update are fulfilled.

NOTE By performing this conformance test, a valid repair operation is executed on the actual vehicle.

10.11.1.6 Postamble

No post conditions.

10.12 CT cluster 11 — Test electronic maintenance history

10.12.1 [RMI-CT_UC8] Test electronic maintenance history

10.12.1.1 Overview

This is a conformance test for use case 8 specified in Clause 7.

10.12.1.2 Test purpose

This conformance test is used to verify that the VM RMI system allows the user with a digital certificate to view and update and digitally sign an electronic maintenance history schedule in cases where it is the only record of maintenance available to the customer and to make a printout for the customer.

10.12.1.3 Configuration

No additional configuration required.

10.12.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— valid digital certificate for electronic signature;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.12.1.5 Test execution

Table 132 defines the test execution.

Table 132 — [RMI-CT_UC8] Test electronic maintenance history test execution

Step #	Description
1	Select UC 8 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Indicate customer consent where necessary.
3	View maintenance history.
4	Input maintenance data as required.
5	Submit the digitally signed maintenance history update according to ISO 20828 (X509.V3).
6	Print customer copy of maintenance history.

10.12.1.6 Postamble

No post conditions.

10.13 CT cluster 12 — Test repair assistance, technical support

10.13.1 [RMI-CT_UC9] Test repair assistance technical support

10.13.1.1 Overview

This is a conformance test for use case 9 specified in Clause 7.

10.13.1.2 Test purpose

This conformance test is used to verify that the VM RMI system provides repair assistance and repair technical support for the purposes of repairing the vehicle.

10.13.1.3 Configuration

No additional configuration required.

10.13.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;

— valid login data and subscription, if required by the VM RMI system;

— access to security-related RMI requires a valid digital certificate and authorization according to Clause 8;

— VM RMI system is not under maintenance;

— VM RMI home page visible;

— standardized navigation map visible.

10.13.1.5 Test execution

Table 133 defines the test execution.

Table 133 — [RMI-CT_UC9] Test repair assistance technical support test execution

Step #	Description
1	Select UC 9 and follow instruction provided, according to FREQ-5, verifying that all following steps are possible.
2	Follow instructions and input data if required by the VM RMI system.
3	Verify that assistance and support is provided in accordance with the VM-specific support mechanism and timescales.

10.13.1.6 Postamble

No post conditions.

10.14 CT cluster 13 — Test request for contact information

10.14.1 [RMI-CT_UC10.1] Test for retrieval of electronic tool information (Diagnostic, Reprogramming, VCI)

10.14.1.1 Overview

This is a conformity test for use case 10.1 specified in Clause 7.

10.14.1.2 Test purpose

This conformance test is used to verify that the VM RMI system provides contact information about on how to obtain manufacturer's diagnostic tool, reprogramming tool and VCI.

10.14.1.3 Configuration

No additional configuration required.

10.14.1.4 Preamble (setup state)

Setup conditions are as follows:

— valid and operational technical infrastructure according to Clause 8;