INTERNATIONAL STANDARD

ISO 18541-1

Second edition
2021-06

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

Part 1: General information and use case definition

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

Partie 1: Informations générales et définitions de cas d'utilisation

Reference number
ISO 18541-1:2021(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword

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

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 of 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 www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO 18541-1:2014), which has been technically revised.

The main changes compared to the previous edition are as follows:

— security-related RMI according to SERMI scheme moved to Annex A;

— correction of errors and improvement of formulations in the entire document.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The ISO 18541 series includes the requirements to be fulfilled by repair and maintenance information (RMI) systems as applied by the European Commission — Enterprise and Industry Directorate-General, Consumer goods — Automotive industry EC mandate M/421,[5] dated Brussels, 21 January 2008.

This mandate relates to the EC type-approval system for vehicles falling into the scopes of Directives 70/156/EEC (replaced by 2007/46/EC [8]), 2002/24/EC [replaced by (EU) 168/2013 [6]] and 2003/37/EC [replaced by (EU) 167/2013 [7]] and, in particular, to requirements for access to vehicle repair and maintenance information by independent operators.

The purpose of the EC Mandate M/421 is to develop a standard or set of standards which specify the requirements to provide standardized access to automotive repair and maintenance information (RMI) for independent operators.

The ISO 18541 series only covers access to automotive repair and maintenance information for light passenger and commercial vehicles [see (EC) No 715/2007 [15], (EC) No 692/2008 [14] and (EU) No 566/2011 [11]] and heavy-duty vehicles [see (EC) No 595/2009 [13], (EU) No 582/2011 [12] and (EU) No 64/2012[9]] based on Directive 2007/46/EC [8] and for two-or three-wheel vehicles and quadricycles based on regulation (EU) 168/2013 [6].

The information included in the ISO 18541 series derives from the legislative requirements on European level in the field of RMI 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 1:
General information and use case definition

1 Scope

This document provides a general overview and structure of each part of the ISO 18541 series. This document also describes the use cases applicable to the standardized access to automotive RMI. The use cases address real world scenarios (e.g. servicing vehicles) regarding the information access necessary to perform vehicle roadside assistance, inspection, diagnosis, repair and maintenance, including the updating and replacement of electronic control units (ECU).

Furthermore, this document defines requirements for granting access to security-related RMI in Annex A following the SERMI scheme.

The RMI systems used by personnel to perform the services consist of:

— a web-based system, which provides access to RMI needed to perform the service(s);

— contact information for specific RMI;

— a security framework to protect access to security-related RMI (vehicle theft protection measures).

This document is applicable to light passenger vehicles and light commercial vehicles.

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/IEC 9594-8, *Information technology — Open systems interconnection — Part 8: The Directory: Public key and attribute certificate frameworks*

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

3 Terms and definitions

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

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

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

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

3.1
access level
level of access to *repair and maintenance information* (3.37) which is either related to security or not related to security

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

3.2
accessory
supplementary feature and component selected by a vehicle owner to enhance safety, performance, comfort, etc. and whose fitting does not impact the vehicle approval

3.3
alternative fuel
type of fuel that is either gaseous at atmospheric temperature and pressure or substantially non-mineral oil derived

Note 1 to entry: Adopted from Regulation (EC) 715/2007 [15].

3.4
alternative fuels retrofit system
engine system mounted on an already registered vehicle for the purpose of operation with *alternative fuels* (3.3)

3.5
alternative fuels system manufacturer
manufacturer of an engine system operating with an *alternative fuel* (3.3)

3.6
appropriate software level
applicable software version for the individual vehicle

3.7
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 Regulation (EC) 461/2010 Article 1 (1)(c) [10].

3.8
certificate
electronic document which uses a digital signature to bind a public key with an identity

3.9
converted vehicle
factory-produced vehicle which has been altered by the addition, deletion, substitution or modification of the body, chassis or essential parts that resembles, but is no longer identical to, the original vehicle for a special purpose

Note 1 to entry: The purpose of the alteration (s) can be, for example to act as rescue vehicle or taxicab.

3.10
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 the *authorized repairer* (3.7)

3.11
diagnostic trouble code
DTC
numeric or alphanumeric identifier which identifies or labels a malfunction

[SOURCE: GTR No 5,[16] definition 3.6]

3.12
electronic maintenance history
digital *information package* (3.18) with virtual stamps that confirms the execution of the prescribed maintenance actions according to the *vehicle manufacturer's* (3.45) schedule

3.13
independent operator
IO
company or legal entity other than authorized dealers and repairers who is directly or indirectly involved in the repair and maintenance of motor vehicles

EXAMPLE Repairers, manufacturers 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* (3.3) vehicles.

3.14
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* (3.38) activities

3.15
IO authorization
process by which, upon payment of a reasonable and proportionate fee, the CAB assesses that an individual employee of an approved *independent operator* (3.13) complies with the requirements specified in this document and is entitled to be given access to *security-related RMI* (3.38)

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* (3.8) and a PIN that will be supplied by the trust centre.

3.16
IO commercial re-user
entity that is acting as a *redistributor* (3.33) or a *republisher* (3.36)

3.17
IO legal representative
natural person empowered to legally represent the *independent operator* (3.13) in all aspects of the access to the vehicle *repair and maintenance information* (3.35)

3.18
information package
collection of information provided by the *VM's RMI system* (3.46) in response to a specific request

3.19
information type
category, group or set of information

EXAMPLE *Workshop procedures* (3.47) (for body repair, temporary repair, periodic technical inspection), wiring diagrams, *technical service bulletins* (3.41), *recall* (3.32) information and maintenance information.

3.20
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 *VM RMI systems* (3.46) cooperate online, so technical information is provided during the diagnostics process and used for the diagnostic steps.

3.21
IO employee
natural person employed by the *independent operator* (3.13)

3.22
light commercial vehicle
motor vehicle intended for the transport of goods or passengers with a maximum mass not exceeding 3,5 tonnes

3.23
light passenger vehicle
vehicle according to category M1 (≦8 passenger seats except driver seat)

Note 1 to entry: Category M1 is defined in the United Nations Economic and Social Council World Forum for Harmonization of Vehicle Regulations (WP.29) TRANS/WP.29/78/Rev.2.

3.24
maintenance history
history of the performed, prescribed actions for maintaining a vehicle

EXAMPLE Oil changes and other periodic maintenance.

3.25
maintenance schedule
prescribed sequence of maintenance actions for a vehicle following the requirements of the manufacturer

3.26
OBD
on-board diagnostics
system on board a vehicle or engine which can detect malfunctions and, if applicable, indicates their occurrence by means of an alert system, identifying the likely area of the malfunctions by means of information stored in computer memory, and/or communicating that information off-board

Note 1 to entry: Module 'A' of GTR No.°5 [16] concerns the whole vehicle. By referring to that module, the OBD definition is understood as not being restricted to emissions.

3.27
partnered accessory
accessory (3.2) which has been tested, quality assured and certified by the *vehicle manufacturer* (3.45) and for which the VM assumes product liability

3.28
potential repair description
list of potential causes and possible actions recommended to fix a problem

3.29
product feature
feature of a specific vehicle that may be used for navigation through the *VM RMI system* (3.46)

EXAMPLE Engine type (petrol/diesel), transmission type (manual/automatic).

3.30
product structure
inter-related set of units and sub-units in which a vehicle can be divided

Note 1 to entry: The product structure is *vehicle manufacturer* (3.45) specific.

3.31
PTI service
periodic technical inspection service
particular procedure for testing a vehicle during a PTI

EXAMPLE Procedure for testing brake lights.

3.32
recall
process whereby a *vehicle manufacturer* (3.45) notifies all owners of a specific vehicle of a condition or defect that could affect safety, safe operation or environmental issues of that vehicle

3.33
redistributor
independent operator (3.13) offering *repair and maintenance information* (3.35) within their own internal (closed) network

EXAMPLE RAC, ADAC, garage networks.

3.34
remanufacturing
process of overhauling an engine, major assembly or component, to return the engine, major assembly or component to the *vehicle manufacturer's* (3.45) original specification

3.35
RMI
repair and maintenance information
all information required for diagnosis, servicing, inspection, periodic monitoring, repair, re-programming or re-initialising of the vehicle and which the manufacturers provide for their authorized dealers and repairers, including all subsequent amendments and supplements to such information

Note 1 to entry: This information includes all information required for fitting parts or equipment on vehicles.

[SOURCE: (EC) 715/2007[15], article 3.14]

3.36
republisher
independent operator (3.13) who publishes *repair and maintenance information* (3.35) to an external network using the RMI of the *vehicle manufacturer* (3.45)

3.37
security framework
set of processes, roles and technical devices for access to *security-related RMI* (3.38)

Note 1 to entry: The framework is based on the approval and authorization of *independent operators* (3.13) to access security-related RMI at the *VM RMI system* (3.46). The physical access to the VM RMI system for security-related RMI is bound to a digital *certificate* (3.8).

Note 2 to entry: See Annex A for requirements for granting access to security-related information according to the SERMI scheme.

3.38
security-related RMI
RMI (3.35) related to vehicle theft protection measures

3.39
selection method
possible method of selecting *repair and maintenance information* (3.35)

EXAMPLE Searches for a term in the document titles, *information type* (3.19), document ID or other criteria.

3.40
standardized non-proprietary VCI functionality
current standards for communication with a vehicle

EXAMPLE ISO 22900-2, SAE J2534–1, SAE J2534–2.

3.41
technical service bulletin
TSB
bulletin issued by the manufacturer detailing a fix for a known concern

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

3.42
temporary repair procedure
temporary solution to a problem that is usually available at roadside services

EXAMPLE Closing the roof of a convertible.

3.43
VCI functionality
vehicle communication interface functionality
set of functions to provide communication between vehicle systems and a software application for diagnostics or reprogramming according to the requirements specified in ISO 18541-2

3.44
VIN
vehicle identification number
unique 17-character serial number given by the *vehicle manufacturer* (3.45) to identify individual motor vehicles

3.45
VM
vehicle manufacturer
person or body who is responsible to the approval authority for all aspects of the type approval or authorization process and for ensuring conformity of production of a vehicle

Note 1 to entry: It is not essential that the person or body be directly involved in all stages of the construction of the vehicle, system, component or separate technical unit which is the subject of the approval process.

[SOURCE: 2007/46/EC,[8] article 3.27]

3.46
vehicle manufacturer repair and maintenance information system
VM RMI system
information system by which the *vehicle manufacturer* (3.45) provides access to *repair and maintenance information* (3.35) through a website

3.47
workshop procedure
information provided by a *vehicle manufacturer* (3.45) describing specific repair and maintenance

EXAMPLE Repair procedures, working advice or other instructions.

4 Abbreviated terms

AR	authorized repairer
BP	basic principle
CAB	conformity assessment body
DTC	diagnostic trouble code
ECU	electronic control unit
GTR	global technical regulations
GUI	graphical user interface
IO	independent operator
IR	independent repairer
OBD	on-board diagnostic
PIN	personal identification number
PTI	periodic technical inspection
RMI	repair and maintenance information
SERMI	forum for access to security-related vehicle repair and maintenance information
TSB	technical service bulletin
VCI	vehicle communication interface
VIN	vehicle identification number
VM	vehicle manufacturer

NOTE In this document GTR is used to reference specifically GTR No. 5: Technical requirements for on-board diagnostic systems (OBD) for road vehicles. See Reference [16].

5 Document overview and structure

The ISO 18541 series provides an implementer with all documents and references required to support the implementation of the requirements related to standardized access to automotive RMI in accordance with the requirements set forth in EC mandate M/421 [5].

— ISO 18541-1: General information and use case definition

This document provides an overview of the document set and structure along with the use case definitions for light passenger and commercial vehicles and a common set of resources (definitions, references) for use by all subsequent parts. The standardized access to automotive RMI shall be implemented by the VMs in their RMI systems.

— ISO 18541-2: Technical requirements

It provides all technical requirements related to a VM RMI system for light passenger and commercial vehicles. These requirements will reflect the deriving needs from the use cases as specified in ISO 18541-1 (this document).

EXAMPLE (not a complete list):

- access-related data administration;
- information technology architecture;
- external interfaces;
- technical infrastructure recommendations;
- operations.

— ISO 18541-3: Functional user interface requirements

It specifies all functional user interface requirements related to a VM RMI system for light passenger and commercial vehicles, e.g. navigational pathway and user guidance. These requirements will reflect the deriving needs from the use cases as specified in ISO 18541-1 (this document).

— ISO 18541-4: Conformance test

It specifies conformance test cases for a self-conformance test by the provider of the VM RMI system for light passenger and commercial vehicles. The conformance test cases will follow the use case definition of ISO 18541-1 (this document) as well as the requirements stated in ISO 18541-2 and ISO 18541-3.

The purpose of ISO 18541-4 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.

— ISO 18541-5: Heavy duty specific provisions

It specifies the applicability of the use cases, requirements and test cases of ISO 18541-1 through ISO 18541-4 to heavy duty vehicles. A majority of use cases, requirements and test cases are applicable without any modification. Otherwise the required modification is specified in detail.

— ISO 18541-6: L-category vehicle specific RMI use cases and requirements

It provides implementers with all specifications and references required to support the implementation of the requirements related to standardized access to for two- and three-wheeled vehicles and quadricycles (L-category) repair and maintenance information in their RMI systems.

Figure 1 illustrates the document structure of the ISO 18541 series with reference to the ISO 18542 series.

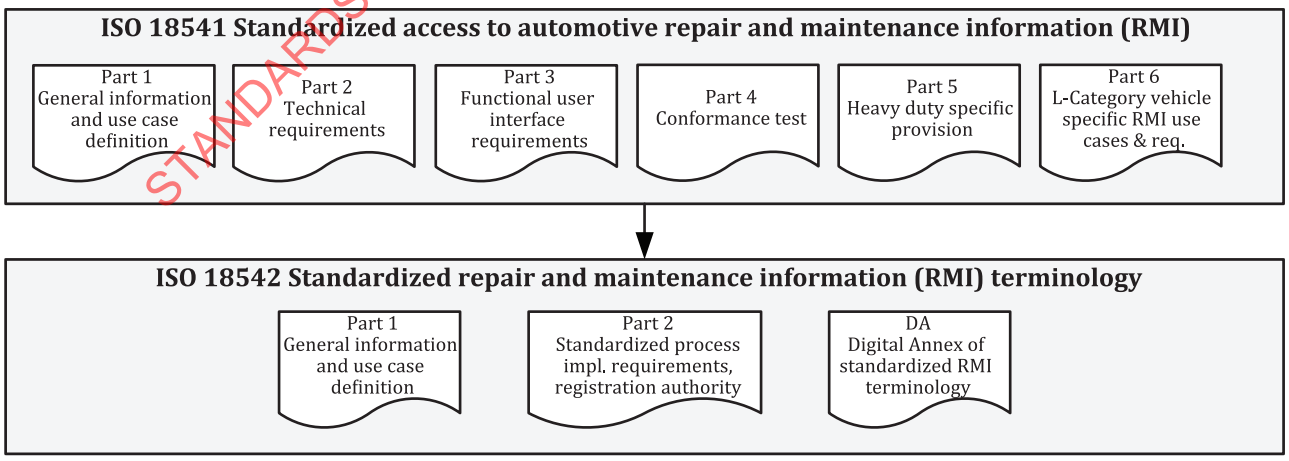


Figure 1 — Document structure

6 General information

6.1 Access to vehicle RMI

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

Figure 2 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 (meeting the specification in ISO 18541-2:2021, 9.2) 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 objectives of standardized access to automotive RMI from a user's point of view.

VM RMI system configuration scenarios are described in ISO 18541-2. The following VM RMI system configuration scenarios are examples and should not be considered as 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;

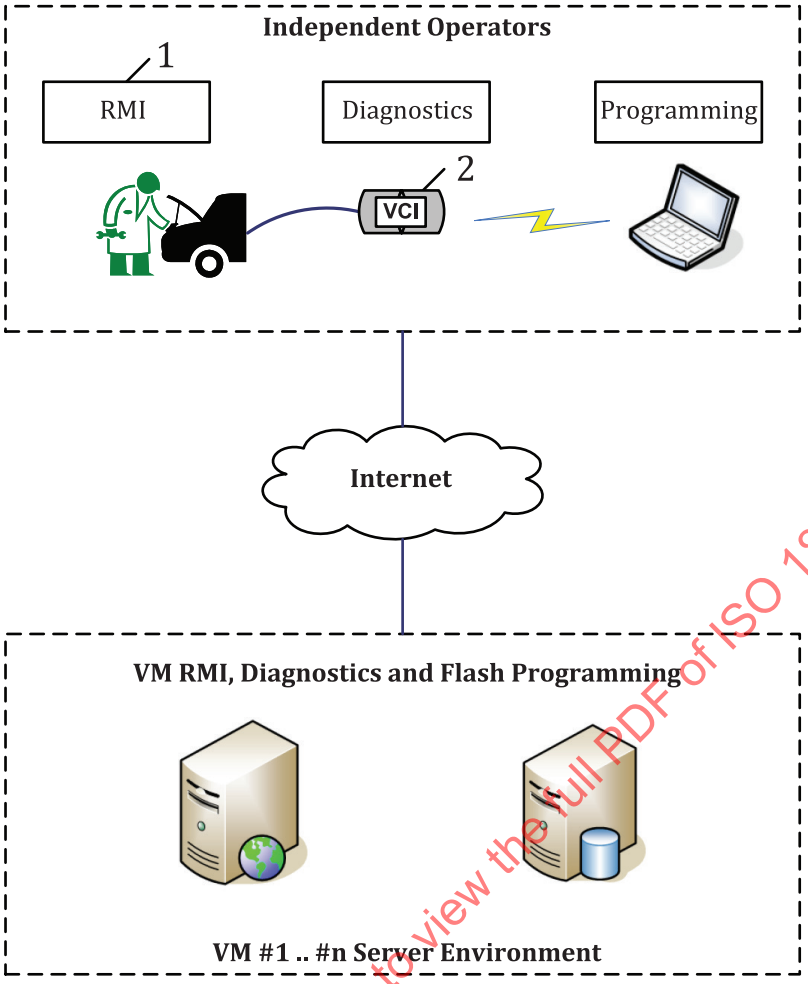
  — client(s): browser-capable computing hardware platform, diagnostic software installation downloaded from the server, Flash programming software installation downloaded from the server, VCI connected to vehicle and computing hardware platform with vehicle communication protocol support to retrieve data 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 2 depicts a typical example of the access to vehicle RMI.



Key

1 repair and maintenance information
2 vehicle communication interface

Figure 2 — Typical example of access to vehicle RMI

6.2 Standardized access to RMI benefit examples

6.2.1 Independent operators

The following benefits are applicable to 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.

6.2.2 Vehicle manufacturers

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

— improved sales of RMI to independent operators,

— streamlining of access to RMI to a single method,

— simplification of future RMI system development,

— provision of a consistent interface between RMI, diagnostics and other information.

7 RMI use case overview and principles

7.1 Overview of basic principles

The basic principles have been established as a guideline to define the RMI use cases.

— 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: 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.

— BP5: the VM is required to provide for the purposes of repair and maintenance the same information that it provides to its ARs in a non-discriminatory manner.

— BP6: the VM is only expected to provide the VM RMI system and information in the languages as provided to its ARs.

7.2 Overview of 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 delete the registration of an 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

Table 1 *(continued)*

#	Main title of use case cluster	Brief description	Use case reference
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 use of the VIN UC 3.2 Vehicle type identification via product features
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 (see 7.3). 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
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 (for body repair, temporary repair, periodic technical inspection), — wiring diagrams, — technical service bulletins, — recall information, — maintenance information, — 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 Converted vehicles UC 5.10 Special tools
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

Table 1 *(continued)*

#	Main title of use case cluster	Brief description	Use case reference
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 7.1 Updating and replacing modules UC 7.2 Tuning kit
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
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, — 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 3 illustrates all use case clusters and associated use cases.

The detailed definition of each use case is defined in Clause 7.

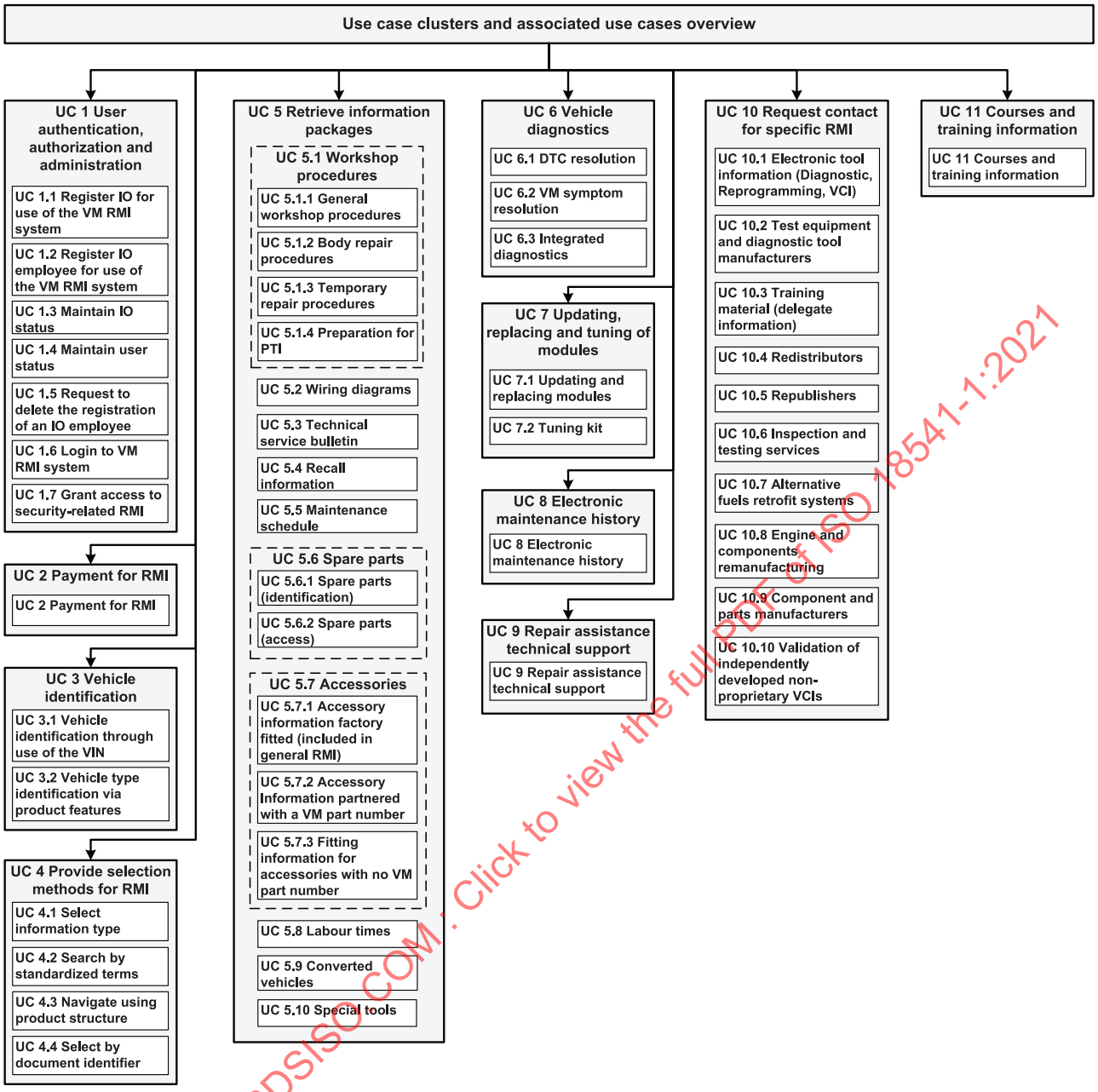


Figure 3 — Use case clusters and associated use cases overview

7.3 Access to security-related RMI

If access to security-related RMI is provided following the SERMI scheme, the requirements in Annex A shall apply.

8 RMI use cases

8.1 UC 1 User authentication, authorization and administration

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

Table 2 specifies the applicable use case to meet the requirements.

Table 2 — UC 1.1 Register IO for use of the VM RMI system

Actor	IO legal representative
Goal	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, — user ID and password of the IO legal representative (the user ID must be unique in the VM system), — 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, — registration fee if applicable.
Use case output	Notification of: — contract agreement between IO and VM established or rejected, — IO legal representative registered or rejected. Justification in case of rejection.
Brief description	The VM validates the identity and the legitimacy of the requester. The implemented validation mechanism is VM-specific. NOTE There can be local legal requirements regarding validation mechanisms. 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.
	— 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 use of the VIN) 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. The VM may charge a reasonable registration fee to the IO.

Table 2 *(continued)*

Classification	Mandatory

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

Table 3 specifies the applicable use case to meet the requirements.

Table 3 — UC 1.2 Register IO employee for use of the VM RMI system

Actor	IO legal representative or IO employee
Goal	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, — 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, — choice of a 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
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. The VM may charge a reasonable registration fee to the IO.
Classification	Mandatory

8.1.3 UC 1.3 Maintain IO status

Table 4 specifies the applicable use case to meet the requirements.

Table 4 — 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

8.1.4 UC 1.4 Maintain user status

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

Table 5 — 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

8.1.5 UC 1.5 Request to delete the registration of an IO employee

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

Table 6 — UC 1.5 Request to delete the registration of an IO employee

Actor	IO legal representative
Goal	Request to delete the registration of an IO employee.
Use case input	IO legal representative requests to delete the registration of an IO employee.
Use case output	IO employee account(s) is deleted.
Brief description	The IO legal representative requests to delete the registration of an IO employee account(s). The VM RMI system processes the request. The IO legal representative is notified of the result of the deletion of the IO employee account(s).
Classification	Mandatory

8.1.6 UC 1.6 Login to VM RMI system

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

Table 7 — UC 1.6 Login to VM RMI system

Actor	Independent operator (IO legal representative and/or IO employee)
Goal	Obtain access to the VM RMI system.
Use case input	— User ID, — password.
Use case output	Successful login into the VM RMI system.

Table 7 *(continued)*

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 RMI and operations requires an appropriate access level, which needs to be granted by the VM.
Classification	Mandatory

8.1.7 UC 1.7 Grant access to security-related RMI

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

Table 8 — UC 1.7 Grant access to security-related RMI

Actor	IO employee, IO legal representative
Goal	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, — credentials requested by the VM for this purpose.
Use case output	Access level for security-related RMI is granted according to the presented credentials. 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.
Brief description	The VM checks the presented credentials. 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.
Classification	Mandatory

8.2 UC 2 Payment for RMI

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

Table 9 — UC 2 Payment for RMI

Actor	Independent operator
Goal	Handle payments.
Use case input	— Select subscription, — select payment arrangement, NOTE The user can contact the VM for possible multiple access purchase. — payment-relevant data (card data, account id, etc.).
Use case output	— Subscription activated, — receipt, — user can start accessing the VM RMI system based on the subscription.

Table 9 *(continued)*

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. NOTE It is possible that some areas of the VM RMI system do not require a subscription.
Classification	Mandatory for VMs who charge for RMI.

8.3 UC 3 Vehicle identification

8.3.1 UC 3.1 Vehicle identification through use of the VIN

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

Table 10 — UC 3.1 Vehicle identification through use of the VIN

Actor	Independent operator
Goal	Identify a specific vehicle and vehicle summary.
Use case input	VIN
Use case output	— Vehicle type, — product features, — factory fitted options e.g. power steering, brakes, SRS, EPS, EBS, ABS, headlight type, — type approval number of the vehicle model, — identified vehicle for subsequent VM RMI system use purposes.
Brief description	The VM RMI system presents a vehicle summary (factory fitted) major and minor features and available information related to that VIN as provided to the VM´s AR and the type approval number of the vehicle model. The identified vehicle is noted by the VM RMI system, so that in subsequent use cases the requested information can be provided.
Classification	Mandatory

8.3.2 UC 3.2 Vehicle type identification via product features

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

Table 11 — UC 3.2 Vehicle type identification via product features

Actor	Independent operator
Goal	Identify a vehicle type or vehicle types.
Use case input	Product features selection filter, for example: — model, — production period, — body type, — drive type, — engine type, — transmission type.
Use case output	Identified vehicle type or vehicle types according to selected product features for subsequent VM RMI system use purposes.
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 a list of supported product features. The IO selects a set of product features (selection filter). The VM RMI system presents the information types available according to the selection filter. 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 in subsequent use cases the requested information can be provided for this vehicle type or these vehicle types. — 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 in subsequent use cases the requested information can be provided for this vehicle type or these vehicle types.
Classification	Mandatory

Table 11 *(continued)*

[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 5.9 Converted vehicles, UC 6.2 VM symptom resolution (only if provided to the AR).
[b] Information types that explicitly require VIN input are:	
UC 5.4 Recall information, UC 6.1 DTC resolution, UC 6.3 Integrated diagnostics,	UC 7.1 Updating and replacing modules, UC 8 Electronic maintenance history.

8.4 UC 4 Provide selection methods for RMI

8.4.1 UC 4.1 Select information type

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

Table 12 — 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, for example: — general workshop procedures, — body repair 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).
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

8.4.2 UC 4.2 Search by standardized terms

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

Table 13 — 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 VM mapped 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 the ISO 18542 series.
Classification	Mandatory

8.4.3 UC 4.3 Navigate using product structure

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

Table 14 — 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

8.4.4 UC 4.4 Select by document identifier

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

Table 15 — 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.
Brief description	The VM RMI system displays the requested document.
Classification	Optional but mandatory if provided by VM to VM AR.

8.5 UC 5 Retrieve information packages

8.5.1 UC 5.1 Workshop procedures

8.5.1.1 UC 5.1.1 General workshop procedures

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

Table 16 — UC 5.1.1 General workshop procedures

Actor	Independent operator
Goal	Access the workshop procedures.
Use case input	Select the title of one of the workshop procedures.
Use case output	Display the selected workshop procedure.
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

8.5.1.2 UC 5.1.2 Body repair procedures

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

Table 17 — UC 5.1.2 Body repair procedures

Actor	Independent operator
Goal	Access the 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 where in the VM RMI system 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.

8.5.1.3 UC 5.1.3 Temporary repair procedures

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

Table 18 — UC 5.1.3 Temporary repair procedures

Actor	Independent operator
Goal	Perform 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 perform a temporary fix or remote activation
Brief description	The VM is free to choose where in the VM RMI system 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.

8.5.1.4 UC 5.1.4 Preparation for PTI

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

Table 19 — UC 5.1.4 Preparation for PTI

Actor	Independent operator
Goal	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.

8.5.2 UC 5.2 Wiring diagrams

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

Table 20 — UC 5.2 Wiring diagrams

Actor	Independent operator
Goal	Access the wiring diagrams.
Use case input	Select the desired wiring diagram or view.
Use case output	Display the selected wiring diagram.
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

8.5.3 UC 5.3 Technical service bulletin

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

Table 21 — UC 5.3 Technical service bulletin

Actor	Independent operator
Goal	Access 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.

8.5.4 UC 5.4 Recall information

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

Table 22 — UC 5.4 Recall information

Actor	Independent operator
Goal	Identify if a recall is required on a vehicle.

Table 22 *(continued)*

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

8.5.5 UC 5.5 Maintenance schedule

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

Table 23 — UC 5.5 Maintenance schedule

Actor	Independent operator
Goal	Access a 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.

8.5.6 UC 5.6 Spare parts

8.5.6.1 UC 5.6.1 Spare parts (identification)

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

Table 24 — 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.

Table 24 *(continued)*

Classification	Mandatory

8.5.6.2 UC 5.6.2 Spare parts (access)

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

Table 25 — UC 5.6.2 Spare parts (access)

Actor	Independent operator
Goal	Access spare part information.
Use case input	Access spare parts catalogue.
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

8.5.7 UC 5.7 Accessories

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

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

Table 26 — UC 5.7.1 Accessory information factory fitted (included in general RMI)

Actor	Independent operator
Goal	Access factory fitted accessory repair information.
Use case input	Select the information package.
Use case output	Display repair information.
Brief description	The VM RMI system provides accessory information for VM built-in accessories.
Classification	Mandatory

8.5.7.2 UC 5.7.2 Accessory information partnered with a VM part number

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

Table 27 — UC 5.7.2 Accessory information partnered with a VM part number

Actor	Independent operator
Goal	Access accessory 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

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

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

Table 28 — UC 5.7.3 Fitting information for accessories with no VM part number

Actor	Independent operator
Goal	Access 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.

8.5.8 UC 5.8 Labour times

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

Table 29 — 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

8.5.9 UC 5.9 Converted vehicles

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

Table 30 — UC 5.9 Converted vehicles

Actor	Independent operator
Goal	Obtain repair and maintenance information for converted vehicles.
Use case input	VIN or product feature.
Use case output	RMI information on VM components and information on interfaces.
Brief description	The VM RMI system provides RMI on VM components of the converted vehicle and RMI on published or AR available interfaces.
Classification	Optional but mandatory if provided by VM to VM AR.

8.5.10 UC 5.10 Special tools

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

Table 31 — UC 5.10 Special tools

Actor	Independent operator
Goal	Access the special tool information.
Use case input	Select the title of one of the information packages, e.g. identification of tool, picture and instructions.

Table 31 *(continued)*

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

8.6 UC 6 Vehicle diagnostics

8.6.1 UC 6.1 DTC resolution

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

Table 32 — UC 6.1 DTC resolution

Actor	Independent operator
Goal	Access DTC information.
Use case input	— DTC, — vehicle identification by VIN (mandatory), and — 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 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

8.6.2 UC 6.2 VM symptom resolution

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

Table 33 — UC 6.2 VM symptom resolution

Actor	Independent operator
Goal	Access diagnosis and repair requirements.
Use case input	— Symptoms, — vehicle identification: by VIN (mandatory); 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

8.6.3 UC 6.3 Integrated diagnostics

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

Table 34 — UC 6.3 Integrated diagnostics

Actor	Independent operator
Goal	Access 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.
Brief description	This use case is optional; however, if provided to AR then it shall be provided at the same level to IO as defined in ISO 18541-2. 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 ISO 18541-2. 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.

8.7 UC 7 Updating, replacing and tuning of modules (ECUs)

8.7.1 UC 7.1 Updating and replacing modules

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

Table 35 — UC 7.1 Updating and replacing modules

Actor	Independent operator
Goal	To be able to perform the legitimate update and/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, — 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

Table 35 *(continued)*

Brief description	The user links the vehicle to the VM RMI system via standardized non-proprietary VCI functionality (as defined in ISO 18541-2). 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. 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 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

8.7.2 UC 7.2 Tuning kit

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

Table 36 — UC 7.2 Tuning kit

Actor	Independent operator
Goal	Enable the IO to install the VM's tuning kit (e.g. hardware and/or software).
Use case input	Request for VM tuning kit
Use case output	Vehicle updated to the appropriate software and/or hardware level and functional or service parts correctly programmed/installed and configured
Brief description	IO requests purchase of official VM tuning kit according to VM-specific process: — IO purchases official VM tuning kit, — IO installs official VM tuning kit into customer vehicle in accordance with VM installation instruction, — IO performs programming/coding according to use case 7.1 if software update of the module is required.
Classification	Mandatory if the tuning kit is provided by the VM.

8.8 UC 8 Electronic maintenance history

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

Table 37 — UC 8 Electronic maintenance history

Actor	Independent operator
Goal	Access and update the history of VM prescribed maintenance actions.

Table 37 *(continued)*

Use case input	— VIN, — electronic maintenance history selection, — digital signature using a certificate that shall be in accordance with ISO/IEC 9594-8 (X509 V3).
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/IEC 9594-8 (X509 V3). A printout 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.

8.9 UC 9 Repair assistance technical support

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

Table 38 — 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

8.10 UC 10 Request contact for specific RMI

8.10.1 UC 10.1 Electronic tool information (diagnostic, reprogramming, VCI)

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

Table 39 — 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 and VCI.
Use case input	Request VM's contact information and information about manufacturer's diagnostic tool, reprogramming tool and VCI.

Table 39 *(continued)*

Use case output	VM's contact information for: — description of manufacturer's diagnostic tool and VCI, — available list of contacts (country by country) where diagnostic tools and VCI can be purchased.
Brief description	The independent operator requests information about the VM's diagnostic tool and VCI. The VM RMI system either displays information about the VM's diagnostic tool and VCI and relevant ordering information or links the user to the VM tool supplier website containing the information about the VM's diagnostic tool and VCI and relevant ordering information. This can be contact information to a supplier.
Classification	Mandatory

8.10.2 UC 10.2 Test equipment and diagnostic tool manufacturers

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

Table 40 — 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.
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.
Classification	Mandatory

8.10.3 UC 10.3 Training material (delegate information)

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

Table 41 — UC 10.3 Training material (delegate information)

Actor	Independent training provider
Goal	Obtain 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

8.10.4 UC 10.4 Redistributors

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