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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'usage

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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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

ISO 18541-1:2013 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 301, *Road vehicles*, in collaboration with ISO Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 18541 consists of the following parts, under the general title *Road vehicles — Standardized access to automotive repair and maintenance information (RMI)*:

— *Part 1: General information and use case definition*

— *Part 2: Technical requirements*

— *Part 3: Functional user interface requirements*

— *Part 4: Conformance test*

ISO 18542, *Road vehicles — Standardized repair and maintenance information (RMI) terminology*, is a complementary standard that defines standardized RMI terminology and consists of two parts:

— *Part 1: General information and use case definition*

— *Part 2: Standardized process implementation requirements, Registration Authority*

The standardized RMI terminology is contained in a so-called 'Digital Annex' that is maintained and published by the CEN-appointed Registration Authority.

Introduction

This set of standards 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 [6] and 2003/37/EC [7] and, in particular, to requirements for access to vehicle repair and maintenance information by independent operators.

This International Standard only covers access to automotive repair and maintenance information for light passenger and commercial vehicles (see NOTE 1) and heavy duty vehicles (see NOTE 2) based on Directive 70/156/EEC (replaced by 2007/46/EC [8]).

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 information included in this part of ISO 18541 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.

NOTE 1 Regulation (EC) No 715/2007 of the European Parliament and of the Council of 20 June 2007 on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information and Commission Regulation (EC) No 692/2008 of 18 July 2008 implementing and amending Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information and amending Commission Regulation (EU) No 566/2011 of 8 June 2011 amending Regulation (EC) No 715/2007 of the European Parliament and of the Council and Commission Regulation (EC) No 692/2008 as regards access to vehicle repair and maintenance information.

NOTE 2 Regulation (EC) No 595/2009 of the European Pparliament and of the Council of 18 June 2009 on type-approval of motor vehicles with respect to emissions from heavy duty vehicles (Euro VI) and on access to vehicle repair and maintenance information, Commission Regulation (EU) No 582/2011 of 25 May 2011 implementing and amending Regulation (EC) No 595/2009 of the European Parliament and of the Council with respect to emissions from heavy duty vehicles (Euro VI), and Commission Regulation (EU) No 64/2012 of 23 January 2012 amending Regulation (EU) No 582/2011 2011 implementing and amending Regulation (EC) No 595/2009 of the European Parliament and of the Council with respect to emissions from heavy duty vehicles (Euro VI).

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

Part 1:
General information and use case definition

1 Scope

This part of ISO 18541 provides a general overview and structure of each part of ISO 18541. It also specifies use cases related to repair and maintenance information (RMI) systems in order to standardize the access to RMI for independent operators.

This part of ISO 18541 also describes the use cases applicable to the standardized access to automotive RMI. The use cases address real world scenarios (e.g. servicing vehicles) in regard to the information access necessary to perform vehicle roadside assistance, inspection, diagnosis, repair and maintenance, including the updating and replacement of Electronic Control Units (ECU).

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.

This part of ISO 18541 provides an overview of the entire standard and how it applies to the automotive industry.

This part of ISO 18541 is applicable to light passenger and commercial vehicles as defined in regulation (EC) 715/2007 Article 2.[15]

2 Normative references

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

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

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

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

3.1.1
access level
level of access to RMI which is either relevant to security or not relevant to security

EXAMPLE One might 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 on 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

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

3.1.4
alternate fuels retrofit systems
engine systems mounted on an already registered vehicle for the purpose of operation with alternative fuels

3.1.5
alternative fuels system manufacturer
manufacturer of an engine system operating with an alternative fuel

3.1.6
appropriate software level
applicable software version for the individual vehicle

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

3.1.8
certificate
electronic document which uses a digital signature to bind a public key with an identity

3.1.9
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 e.g. to act as rescue vehicle or taxicab

3.1.10
detailed diagnosis
diagnostic process that identifies, with precision, potential malfunction causes

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

3.1.11
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 AR

3.1.12
diagnostic trouble code
DTC
numeric or alphanumeric identifier which identifies or labels a malfunction

Note 1 to entry: Adopted from United Nations Global Technical Regulation No.°5.[16]

3.1.13
electronic maintenance history
digital information package with virtual stamps that confirms the execution of the prescribed maintenance actions according to the VM's schedule

3.1.14
global technical regulation
GTR
World-Wide Harmonized On-Board Diagnostics Global Technical Regulation No.°5

Note 1 to entry: See Reference.[16]

3.1.15
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 vehicles.

3.1.16
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

3.1.17
IO authorization
process by which, upon payment of a reasonable and proportionate fee, the CAB assesses that an individual employee of an approved IO complies with the requirements specified in this part of ISO 18541 and is entitled to be given access to security-related RMI

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 and a PIN that will be supplied by the Trust Centre

3.1.18
IO legal representative
natural person empowered to legally represent the IO in all aspects of the access to vehicle RMI

3.1.19
information package
collection of information provided by the VM's RMI system in response to a specific request

3.1.20
information type
category, group or set of information

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

3.1.21
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 cooperate online, so technical information is provided during the diagnostics process and used for the diagnostic steps.

3.1.22
IO employee
natural person employed by the IO

3.1.23
maintenance history
history of the performed, prescribed actions for maintaining a vehicle

EXAMPLE Oil changes and other periodic maintenance.

3.1.24
maintenance schedule
prescribed sequence of maintenance actions for a vehicle following the requirements of the manufacturer

3.1.25
on-board diagnostics
OBD
system on board a vehicle or engine which is capable of detecting malfunctions and, if applicable, of indicating 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.

3.1.26
p-code
standardized DTC for powertrain errors according to ISO 15031-6

3.1.27
partnered accessories
accessories which have been tested, quality assured and certified by the VM and for which the VM assumes product liability

3.1.28
potential repair descriptions
list of potential causes and possible actions recommended to fix a problem

3.1.29
product features
features of a specific vehicle that may be used for navigation through the VM RMI system

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

3.1.30
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 VM specific.

3.1.31
periodic technical inspection service
PTI service
particular procedure for testing a vehicle during a PTI

EXAMPLE Procedure for testing brake lights.

3.1.32
recall
process whereby a VM notifies all owners of a specific vehicle of a condition or defect that could affect safety, safe operation or environmental issues of that vehicle

3.1.33
redistributor
IO offering RMI within their own internal (closed) network

EXAMPLE RAC, ADAC, garage networks.

3.1.34
remanufacturing
process of overhauling an engine, major assembly or component, to return the engine, major assembly or component to the VM's original specification

3.1.35
repair and maintenance information
RMI
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.

Note 2 to entry: Adapted from Regulation (EC) 715/2007.[9]

3.1.36
republisher
IO who publishes RMI to an external network using the RMI of the VM

3.1.37
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

Note 1 to entry: As mandated in the Regulations (EC) 715/2007[15] and (EC) 692/2008.[14]

Note 2 to entry: The framework is based on the approval and authorization of IOs by certified entities to access security related RMI at the VM RMI system. The physical access to the VM RMI system for security related RMI is bound to a digital certificate.

3.1.38
security-related RMI
RMI subject to protection measures in the security framework

3.1.39
security repair and maintenance information
SERMI
de-facto association founded by IO and VM organizations 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*

3.1.40
selection methods
possible methods of selecting RMI

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

3.1.41
standardized non-proprietary VCI functionality
current standards for communication with a vehicle

EXAMPLE ISO 22900-2, SAE J2534–1/2.

3.1.42
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.

3.1.43
temporary repair procedure
temporary solution to a problem that is usually available at roadside services

EXAMPLE Closing the roof of a convertible.

3.1.44
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 requirements specified in ISO 18541-2

3.1.45
vehicle identification number
VIN
unique 17-character serial number given by the VM to identify individual motor vehicles

3.1.46
vehicle manufacturer
VM
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.

Note 2 to entry: Adapted from Directive 2007/46/EC.[8]

3.1.47
vehicle manufacturer repair and maintenance information system
VM RMI system
information system by which the VM provides access to RMI through a website

3.1.48
workshop procedure
information provided by a VM describing specific repair and maintenance

EXAMPLE Repair procedures, working advice or other instructions.

3.2 Abbreviated terms

AR	authorized repairer
BP	basic principle
CAB	conformity assessment body
DRP	direct re-publisher
DTC	diagnostic trouble code
ECU	electronic control unit
GTR	global technical regulations
GUI	graphical user interface
HMI	human machine interface
IO	independent operator
IR	independent repairer
MI	malfunction indicator
OBD	on-board diagnostic
PIN	personal identification number
PTI	periodic technical inspection
PTT	pass-thru tool
RMI	repair and maintenance information
SERMI	security repair and maintenance information
TSB	technical service bulletin
VCI	vehicle communication interface
VIN	vehicle identification number
VM	vehicle manufacturer

4 Document overview and structure

The ISO 18541 document set 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.

— This part of ISO 18541: *General information and use case definition*
This part provides an overview of the document set and structure along with the use case definitions 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*
Part 2 specifies all technical requirements related to a VM RMI system. These requirements will reflect the deriving needs from the use cases as specified in Part 1.

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*
Part 3 specifies all functional user interface requirements related to a VM RMI system e.g. navigational pathway and user guidance. These requirements will reflect the deriving needs from the use cases as specified in Part 1.

— ISO 18541-4: *Conformance test*
Part 4 specifies 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 of Part 1 as well as the requirements stated in Parts 2 and 3.
The purpose of Part 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.

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

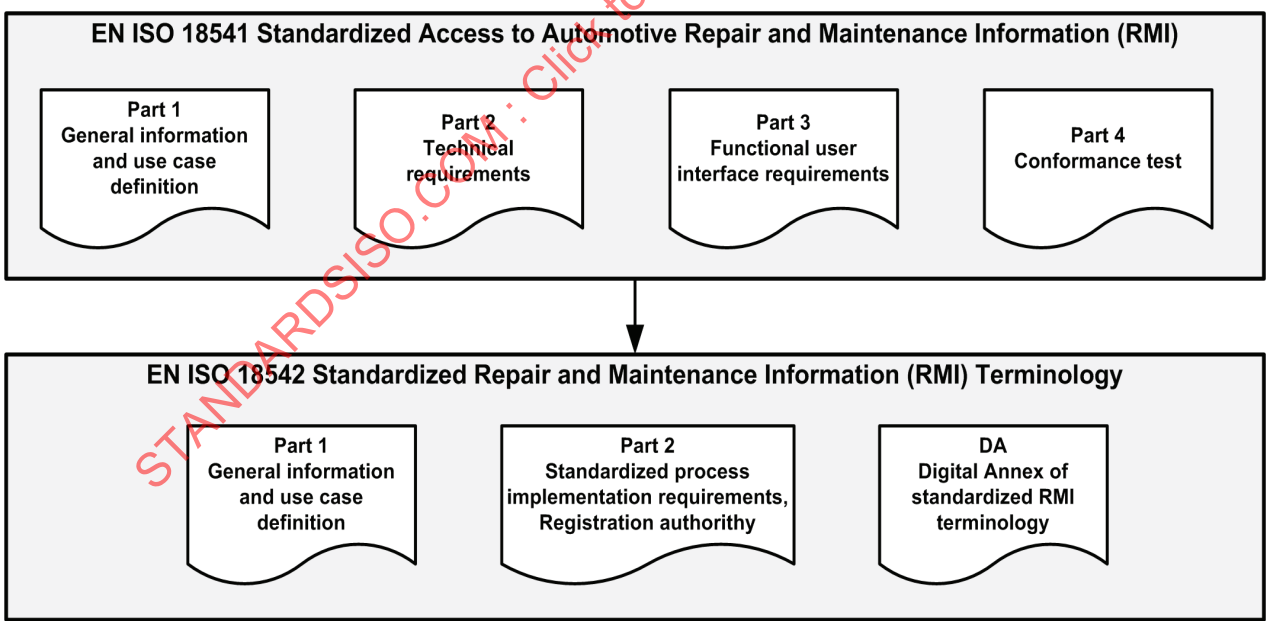


Figure 1 — Document structure

5 General information

5.1 Access to vehicle RMI

This part of ISO 18541 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 18541-2:2014, Annex A) 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 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;

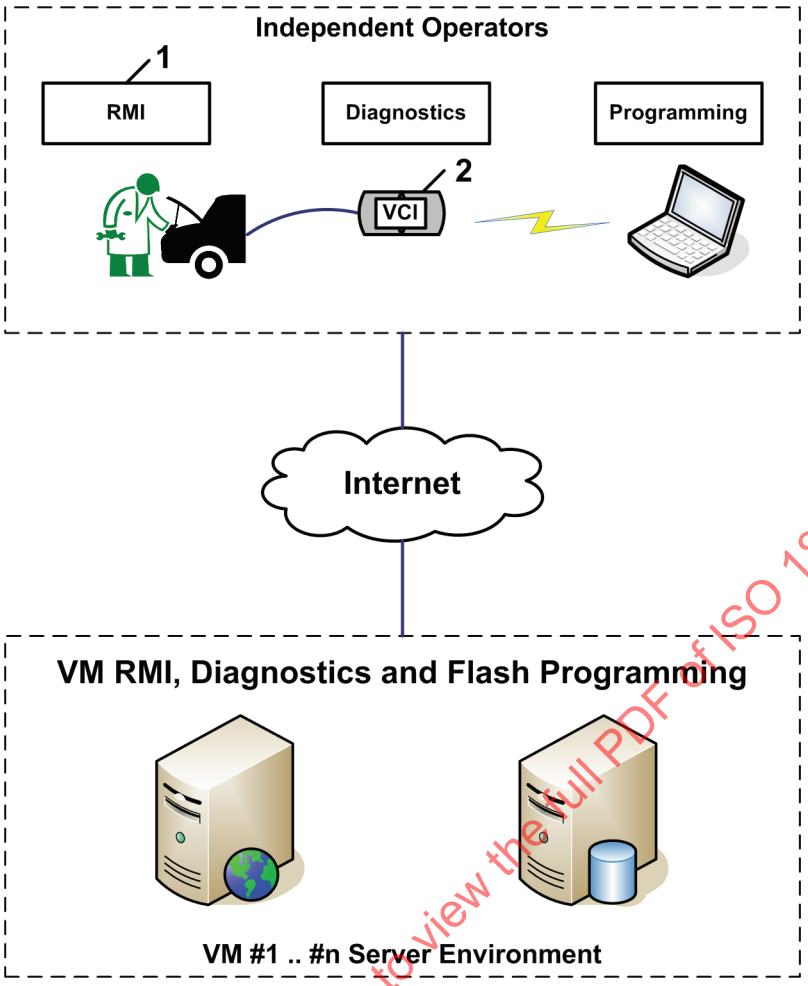
  — Client(s): Browser capable computing hardware platform, diagnostic software installation downloaded from the server, Flash programming software installation downloaded from the server, VCI connected to vehicle and computing hardware platform with vehicle communication protocol support to retrieve data 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

5.2 Standardized access to RMI benefit examples

5.2.1 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.

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,

— 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.

6 RMI use case overview and principles

6.1 Overview of basic principles

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: Actors for the use cases are independent operators as defined in regulation EC 715/2007,[9] VM RMI system and VM. Special roles for specific use cases may be defined and explained in 3.1.

— 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 ARs in a non-discriminatory manner.

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

6.2 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 de-register IO employee UC 1.6 Login to VM RMI system UC 1.7 Grant access to security-related RMI

Table 1 *(continued)*

#	Main title of use case cluster	Brief description	Use case reference
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 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.

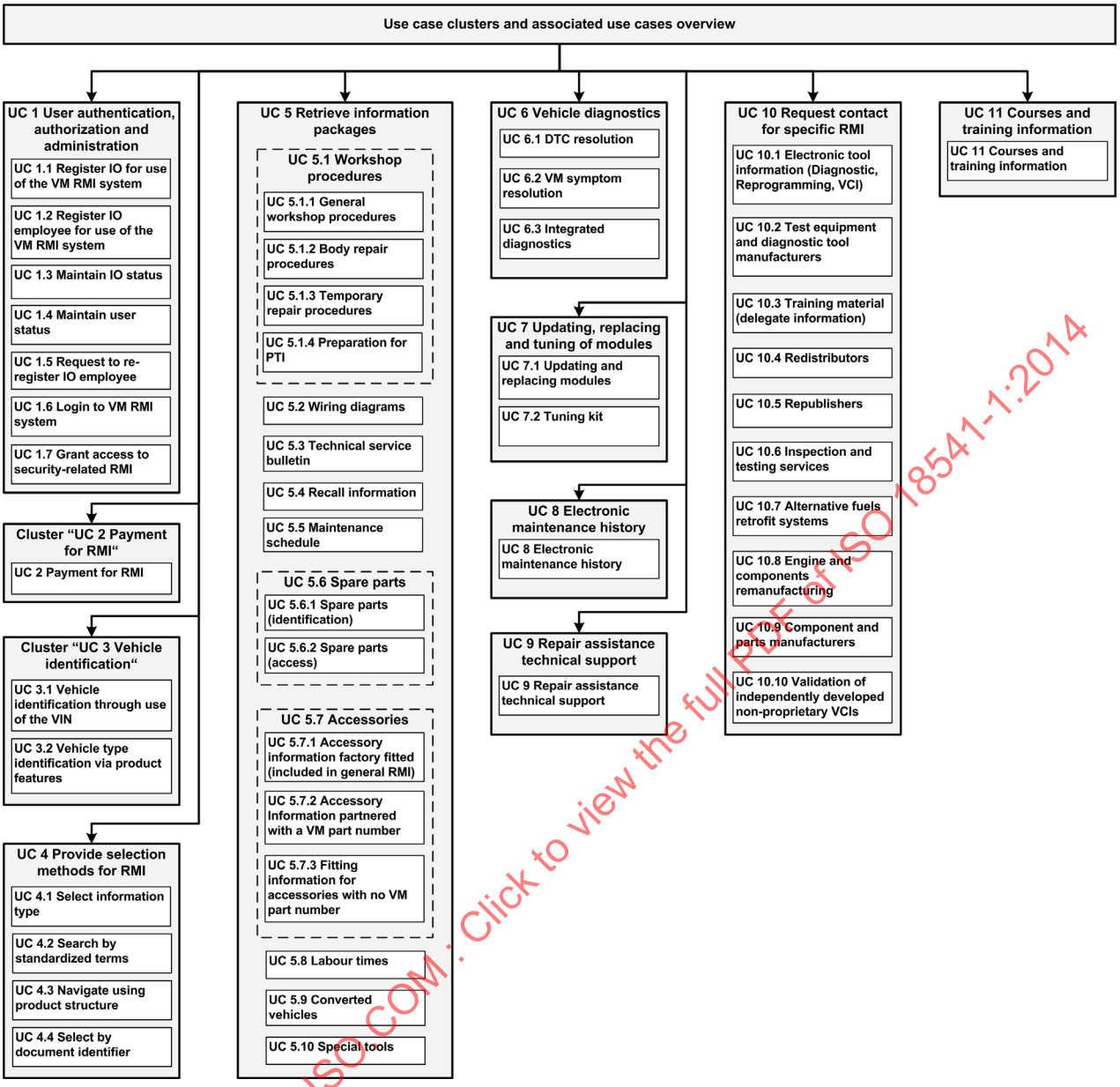


Figure 3 — Use case clusters and associated use cases overview

7 RMI 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 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	To register the IO for use of the VM RMI system.

Table 2 *(continued)*

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 must 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, — registration fee if applicable.
Use case output	Notification of: — Contract agreement between IO and VM established or rejected. — IO legal representative registered or rejected. — Acceptance or rejection of the IO approval to access security-related RMI. Justification in case of rejection.

Table 2 *(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 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. VM may charge a reasonable registration fee to the IO.
Classification	Mandatory.

7.1.2 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	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, — 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 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.
Brief description	The VM requests the IO legal representative to confirm the validity of the IO data. The VM accepts IO´s employee as an 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.

7.1.3 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.

7.1.4 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.

7.1.5 UC 1.5 Request to de-register IO employee

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

Table 6 — 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.

7.1.6 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	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.

7.1.7 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	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.
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.

7.2 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	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 accessing the VM RMI system based on the subscription.
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 Some areas of the VM RMI system may not require a subscription.
Classification	Mandatory for VMs who charge for RMI.

7.3 UC 3 Vehicle identification

7.3.1 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	Identification of 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.

7.3.2 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	Identification of a vehicle type or vehicle types.
Use case input	Product features selection filter e.g. — 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.

Table 11 *(continued)*

Classification	Mandatory
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

7.4 UC 4 Provide selection methods for RMI

7.4.1 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 e.g.: — 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.

7.4.2 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 package 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 ISO 18542.
Classification	Mandatory.

7.4.3 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.

7.4.4 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.

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 16 specifies the applicable use case to meet the requirements.

Table 16 — 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 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.

7.5.1.2 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 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 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.

7.5.1.3 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	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 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.

7.5.1.4 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	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.

7.5.2 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 to 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.

7.5.3 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 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.

7.5.4 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.
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.

7.5.5 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 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.

7.5.6 UC 5.6 Spare parts

7.5.6.1 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.
Classification	Mandatory.

7.5.6.2 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	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.

7.5.7 UC 5.7 Accessories

7.5.7.1 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	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.

7.5.7.2 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	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.

7.5.7.3 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	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.

7.5.8 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.

7.5.9 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	To 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.

7.5.9.1 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 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.

7.6 UC 6 Vehicle diagnostics

7.6.1 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	Provide 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 (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.

7.6.2 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	Provide 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.

7.6.3 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	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.
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 Part 2 of ISO 18541). 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 Part 2 of ISO 18541. 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.

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

7.7.1 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	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; — 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 Part 2 of ISO 18541). 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.

7.7.2 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 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 tuning kit is provided by the VM.