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Automatic vehicle and equipment identification — Electronic registration identification (ERI) for vehicles —

Part 2:
Operational requirements

Identification automatique des véhicules et des équipements — Identification d'enregistrement électronique (ERI) pour les véhicules —

Partie 2: Exigences de fonctionnement

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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.

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

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

ISO 24534-2 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Road transport and traffic telematics*, in collaboration with Technical Committee ISO/TC 204, *Intelligent transport systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 24534-2 cancels and replaces ISO/TS 24534-2:2007, which has been technically revised.

ISO 24534 consists of the following parts, under the general title *Automatic vehicle and equipment identification — Electronic registration identification (ERI) for vehicles*:

— *Part 1: Architecture*

— *Part 2: Operational requirements*

— *Part 3: Vehicle data*

— *Part 4: Secure communications using asymmetrical techniques*

— *Part 5: Secure communications using symmetrical techniques*

Introduction

A quickly emerging need has been identified with administrations to improve the unique identification of vehicles for a variety of services. Situations are already occurring where manufacturers intend to fit lifetime tags to vehicles. Various governments are considering the needs and benefits of electronic registration identification (ERI) as a legal proof of vehicle identity with potential mandatory uses. There is commercial and economic justification in respect of both tags and infrastructure that a standard enables an interoperable solution.

ERI is a means of uniquely identifying road vehicles. The application of ERI will offer significant benefits over existing techniques for vehicle identification. It will be a suitable tool for the future management and administration of traffic and transport, including applications in free-flow, multi-lane traffic conditions with the capability to support mobile transactions. ERI addresses the need of authorities and other road users for a trusted electronic identification, including roaming vehicles.

The unique vehicle identifier is held in a secure environment within an electronic registration tag (ERT) fitted to a vehicle. The identifier used to identify a vehicle is called the vehicle identifier or vehicleId. The preferred vehicle identifier is the VIN, assigned to the vehicle by its manufacturer in accordance with ISO 3779, or a variant of this vehicle identifier.

The ERT may contain vehicle data in addition to the unique identifier, as required by authorities or their agents for ERI applications (e.g. vehicle registration details). An ERT is the core component for simple to complex applications of ERI, ranging from a simple read-only device, with more complex applications requiring one or more communications systems.

The ERT may be accessed by an electronic registration reader (ERR), either to read, or read/write data, from or to an ERT.

Optionally, the ERT may communicate with other onboard vehicle equipment. The potential range of ERI applications, simple to complex, will require interoperability to exist between an ERT and an ERR by application.

This part of ISO 24534 illustrates the ERI system concept and the fully featured ERI function enabling simple to complex applications of ERI.

Whilst it is desirable to determine a single set of requirements for operation in all environments and under all operating conditions, this could impose unacceptable costs for an ERI application. This part of ISO 24534 provides classification categories of operational parameters for different aspects of a system specification, enabling appropriate performance parameters to be selected for an ERI application. Annex A provides example ERI user requirements with operational scenarios.

Automatic vehicle and equipment identification — Electronic registration identification (ERI) for vehicles —

Part 2:
Operational requirements

1   Scope

This part of ISO 24534 provides requirements for electronic registration identification (ERI) that are based on an identifier assigned to a vehicle (e.g. for recognition by national authorities) suitable to be used for:

— electronic identification of local and foreign vehicles by national authorities;

— vehicle manufacturing, in-life maintenance and end-of-life identification (vehicle life cycle management);

— adaptation of vehicle data (e.g. for international resales);

— safety-related purposes;

— crime reduction;

— commercial services.

It adheres to privacy and data protection regulations.

This part of ISO 24534 defines the operational requirements for the remaining parts of ISO 24534 and the more limited but relevant provisions of ISO 24535.

Whilst the definition of the organizational framework required to implement, operate and maintain an ERI system is outside the scope of this part of ISO 24534, a list of potential stakeholders in the public and private sector has been included.

2   Normative references

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

ISO 24534-3, *Automatic vehicle and equipment identification — Electronic registration identification (ERI) for vehicles — Part 3: Vehicle data*

IEC 60721-3-5:1988, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 5: Ground vehicle installations*

IEC 60215:1987, *Safety requirements for radio transmitting equipment*

EN 301 489-1, *Electromagnetic compatibility and radio spectrum matters (ERM) — Electromagnetic compatibility (EMC) standard for radio equipment and services — Part 1: Common technical requirements*

3   Terms and definitions

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

3.1
access control
prevention of unauthorized use of a resource, including the prevention of use of a resource in an unauthorized manner

[ISO 7498-2:1989, definition 3.3.1]

3.2
access control list
list of entities, together with their access right, which are authorized to have access to a resource

[ISO 7498-2:1989, definition 3.3.2]

3.3
additional vehicle data
ERI data in addition to the vehicle identifier

3.4
authentication
entity authentication which provides each entity with the assurance of the other's identity

3.5
back office
facility for the control and data management of an ERI system by an authority, or for the provision of related services by a service provider

3.6
ERI data
vehicle identifying data which can be obtained from an ERT

NOTE   ERI data consists of the vehicle identifier and possible additional vehicle data.

3.7
electronic registration identification
ERI
action or act of identifying a vehicle by electronic means for the purposes described in the scope of this part of ISO 24534

3.8
electronic registration reader
ERR
device used to read or read/write data from or to an ERT

3.9
electronic registration tag
ERT
onboard ERI device that contains the ERI data, including relevant security provisions and one or more interfaces to access data

NOTE 1   In case of high security, the ERT is a type of SAM (secure application module).

NOTE 2   The ERT may be a separate device or may be integrated into an onboard device that also provides other capabilities (e.g. DSRC communications).

3.10
interoperability
ability of systems to provide services to and accept services from other systems and to use these services to enable the systems to operate effectively together

3.11
lifetime
period of time during which an item of equipment exists and functions

NOTE   Adapted from ISO 14815.

3.12
onboard ERI equipment
equipment fitted within or on the outside of the vehicle and used for ERI purposes

NOTE   The onboard ERI equipment comprises an ERT and may also comprise any additional communication devices.

3.13
operator
entity responsible for the operational management of an ERI system

3.14
privacy
right of individuals to control or influence what information related to them may be collected and stored and by whom and to whom that information may be disclosed

[ISO 7498-2:1989, definition 3.3.43]

3.15
read only
property that data content cannot be changed by a reader/interrogator

3.16
read/write
data mode corresponding to an ERT in which data content can be changed by means of a compatible interrogator via the air interface

3.17
read/write cycle
complete sequence of interaction by the reader/interrogator where the ERT is unambiguously identified and new data, comprising either whole or part of the full data set, is written onto the ERT by means of the air interface

3.18
registration authority
⟨for vehicles⟩ authority responsible for the registration and maintenance of vehicle records

NOTE   The authority can provide vehicle records to accredited organizations.

3.19
registration authority
⟨for ERI data⟩ organization responsible for the ERI data and security data according to local legislation

NOTE   The registration authority for ERI data can be the same as the registration authority for vehicles. This International Standard, however, does not require this.

3.20

registration certificate

vehicle registration document (paper or smart card) issued by the registration authority for vehicles in which the vehicle and its owner or lessee are registered

3.21

roadside equipment

equipment located at a fixed position along the road transport network, for the purpose of communication and data exchanges with the onboard equipment of passing vehicles

3.22

security

protection of information and data so that unauthorized persons or systems cannot read or modify them and authorized persons or systems are not denied access

[ISO/IEC 12207:2008, definition 4.3.9]

3.23

service provider

person or organization providing a service that requires the vehicle identity and/or other information concerning the vehicle

3.24

specific vehicle identification

action or act of establishing the identity of a specific vehicle

NOTE 1   This is in contrast to vehicle vicinity identification, where the vicinity of a vehicle with a specific identity is detected. With specific vehicle identification, it is also known which specific vehicle has been identified.

NOTE 2   Two kinds of specific vehicle identification may be distinguished: first, localized vehicle identification, in which case the location of the identified vehicle is known with such precision that not more than one vehicle can be present at the same time in that location; second, peer communication identification, in which case the identification of the vehicle engaged in some form of communication (e.g. an EFC transaction) is established.

3.25

vehicle vicinity identification

action or act of establishing the identity of a specific vehicle near an external ERI reader (ERR) without pinpointing the exact position of the vehicle

NOTE   If there is more than one vehicle present in the vicinity of a reader, no specific vehicle, or its exact location, is identified. However, it will establish that a specific vehicle identity has passed in the vicinity of a reader.

4   Abbreviated terms

AIB   accredited, independent testing body
ELV   end-of-life vehicles
EMC   electromagnetic compatibility
ERI   electronic registration identification
ERM   electromagnetic compatibility and radio spectrum matters
ERR   electronic registration reader
ERT   electronic registration tag
SAM   secure application module

5 System requirements

5.1 ERI system context

Figure 1 provides a context diagram (informative) of the environment within which the ERT functions, with the wider relationships which may exist with other components of an ERI system.
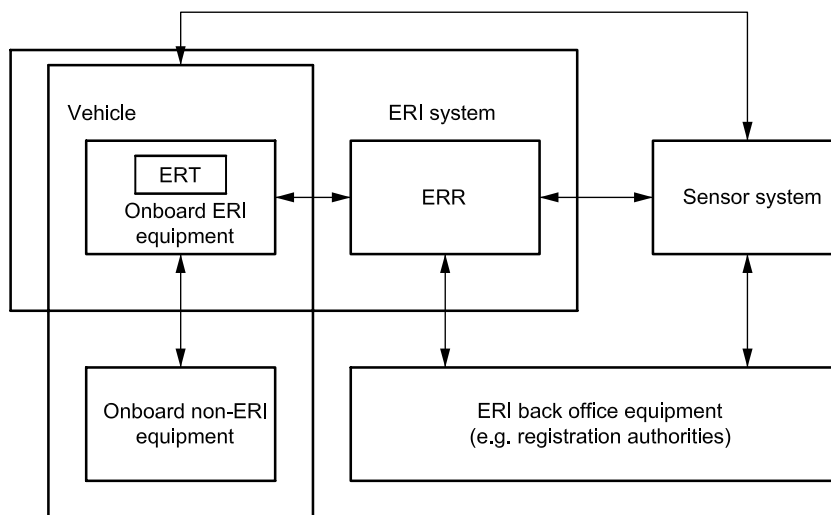

Figure 1 — Fully featured ERI system, with onboard ERT component

5.2 ERT

The ERT shall contain the vehicle identifier and may include additional vehicle data.

The ERT shall communicate directly or indirectly with an ERR.

NOTE   The ERT may also communicate with other onboard ERI equipment, or onboard non-ERI equipment, when ERI data is required to support other transport applications.

5.3 Operational parameters

5.3.1 General

In the classes defined herein, the ERT shall have the capability to communicate ERI data over a wireless link to an ERR.

An ERI system may be required to operate from stationary or low vehicle speeds; also, with traffic travelling in congested traffic conditions or at free flow, motorway speeds.

5.3.2 ERT read range

ERI data shall be capable of being read from the ERT by an external ERR which may, according to application, operate as a close proximity reader (i.e. handheld), mobile (i.e. vehicle mounted), or a fixed location [i.e. roadside equipment (RSE)].

NOTE   Reading parameters are defined within this subclause; writing parameters are subject to many factors and are outside the scope of this part of ISO 24534.

5.3.3   ERI system interoperability

The ERI system shall provide interoperability with other ERI systems developed in conformance to this part of ISO 24534.

NOTE   Contractual arrangements between registration authorities or their agents are outside the scope of this part of ISO 24534.

5.4   ERT memory allocation

5.4.1   ERT memory

The ERI system shall have the requirement that the ERT has secure memory dedicated to the storage of the vehicle identification data. Such requirements are determined in this part of ISO 24534 and associated standards (ISO 24534 Parts 3, 4 and 5 and ISO 24535).

For applications of ERI, where additional information is required to support vehicle identification (e.g. vehicle classification), a minimum data set is determined in ISO 24534-3.

5.4.2   ERT read/write cycles

The memory of an ERT having read/write capabilities shall, with the exception of the unique vehicle identifier or any other permanently locked data, be capable of being accessed for the purpose of reading or changing data a minimum of 100 000 times.

5.5   Security of ERI data

Access to ERI data memory, for read or write functions, shall be controlled through an authorized user access control list.

The data security elements of the ERT concerning confidentiality, integrity, authenticity and non-repudiation are given in ISO 24534-4 and ISO 24534-5.

5.6   ERT location

The ERT shall be fixed permanently to the vehicle and should be located to minimize exposure to the road environment (e.g. stone damage).

The ERT location shall not interfere with physical access for vehicle maintenance.

NOTE   The identification of locations on a vehicle, suitable for ERT installation, is outside the scope of this part of ISO 24534.

5.7   Onboard ERI equipment safety

5.7.1   Mechanical

The onboard ERI equipment shall be securely mounted to the vehicle and present no hazard to vehicle occupants or the safe operation of the vehicle.

5.7.2   Electrical

An ERT requiring an electrical power supply may operate from its own internal battery, or through connection to the vehicle electrical system.

An ERT, or onboard ERI equipment powered by the vehicle electrical supply, shall use a fused connection and operate at electrical power levels commensurate with the vehicle and ERI equipment specifications.

The electric or magnetic fields produced shall not exceed the levels as specified in IEC 60215 and/or EN 301 489-1.

5.7.3 Visual

The onboard ERI equipment shall not obscure or interfere with the driver's view of the road, or be a distraction to the driving task.

5.7.4 Controls

An ERI transaction shall not require driver intervention.

5.8 Environmental requirements

The ERT and any other onboard ERI equipment shall comply with the environmental parameters for onboard equipment specified (class: H1, H2, and H3) in accordance with IEC 721-3-5 and also specified in 5.10.2 of ISO 14815:2005.

NOTE   Basic environmental testing procedures are provided by IEC 68-1:1987 and IEC 68-4:1987.

5.9 ERT security

5.9.1 Electronic data security

Data regarded as confidential shall be accessed or modified only by authorized parties. ISO 24534-4 references confidentiality, authentication and access control provisions.

If an ERT remains operable following physical tampering, the ERT shall be capable of reporting to the ERR any potential tampering with the normal operation of the ERT and that security may have been compromised.

5.9.2 Physical security

An ERT shall resist removal from the fixed location on the vehicle.

An ERT shall indicate deliberate attempts to physically remove or tamper with the placement on a vehicle of permanently displaying visual evidence.

In the event of an ERT being physically removed from the vehicle, it shall be rendered permanently inoperable and require replacement by an authorized supplier.

5.10 ERT life cycle

The ERT life cycle can be dependent on the functionality of the ERT and the physical placement of the ERT on a vehicle, e.g. ERT windscreen placement can be expected to have a much shorter life cycle compared to less exposed placements on a vehicle.

NOTE   A typical life cycle for an ERT installed on a vehicle, for the full life of the vehicle, is given in Annex B.

6 System classification requirements

6.1 General

In order to claim compliance with this part of ISO 24534, equipment shall achieve the performance of the declared classification parameter, or combination of parameters, specified in the tables defined in this clause.

6.2 ERT lifetime classification

The ERT shall be capable of operating without maintenance according to one of the class definitions given in Table 1.

Table 1 — ERT lifetime classification

Lifetime classification	ERT lifetime years
ERT-A0	> 30
ERT-A1	30
ERT-A2	25
ERT-A3	15
ERT-A4	10
ERT-A5	3
ERT-A6	< 3

6.3 ERT power sources

An ERT may function without a battery electrical supply, or require a battery supply source. For an exchangeable battery within the ERT, the battery lifetime shall be according to the class definitions in Table 2. These requirements are independent of technology.

Table 2 — ERT power source lifetime classification

Lifetime classification	Lifetime years (based on 500 ERT transactions per month)
ERT-B0	> 15
ERT-B1	15
ERT-B2	10
ERT-B3	5
ERT-B4	3
ERT-B5	1
ERT-B6	—[a]
a Not applicable since no battery required.	

6.4 ERT read classification

6.4.1 ERT read range

ERI data shall be capable of being read from the ERT by an external ERR which may, according to application, operate as a close proximity reader (i.e. handheld), mobile (i.e. vehicle mounted), or a fixed location (i.e. roadside equipment).

The ERR shall be capable of reading the unique vehicle identifier from the ERT according to the class definitions in Table 3.

Table 3 — ERT read range classification

ERT read range	Minimum read range metres
ERT-C1	1 000
ERT-C2	500
ERT-C3	250
ERT-C4	100
ERT-C5	50
ERT-C6	10
ERT-C7	3
ERT-C8	1
ERT-C9	0,004

6.4.2 ERT passing vehicle speed range

An ERR shall be capable of reading ERI data from the ERT at vehicle passing speeds according to the class definitions in Table 4.

Table 4 — ERT vehicle speed classification

ERT read capability	Passing vehicle speed km/h
ERT-D1	0 to 500
ERT-D2	0 to 250
ERT-D3	0 to 150
ERT-D4	0 to 50
ERT-D5	0 to 25
ERT-D6	< 5

6.5 Onboard ERI equipment categories

Onboard ERI equipment shall be classified as five separate categories. Environmental operating conditions are classified according to ISO 14815.

The ERI equipment categories are defined as follows:

— **Category 1: ruggedized interoperable**
ERI equipment capable of being mounted and operating externally on vehicle. Capable of functioning in extreme (class 1) environmental and system operational conditions.

— **Category 2: standard interoperable**
ERI equipment mounted within vehicle, with the possible exception of the antennae. Capable of functioning within standard (maximum class 2) environmental and system operational conditions.

— **Category 3: interoperable within selected environmental classes**
ERI equipment mounted within vehicle, with the possible exception of the antennae. Capable of operating within standard (maximum class 2) system operational conditions and conforming to selected environmental classes.

— **Category 4: interoperable within selected operational classes**
ERI equipment mounted within vehicle, with the possible exception of the antennae. Capable of operating within normal (maximum class 2) environmental conditions and conforming to selected operational classes.

— **Category 5: interoperable within selected operational and environmental classes**
ERI equipment mounted within vehicle, with the possible exception of the antennae. Capable of operating within selected operational and environmental classes.

7 ERI system organizational framework

A list of potential stakeholders in the public and private sector, required to implement, operate and maintain ERI based systems, is provided in Annex C.

The definition of an organizational framework required for the operation of ERI systems is outside the scope of this part of ISO 24534.

Annex A
(informative)

Example user requirements and operational scenarios

A.1 User requirements

A.1.1 Categories of users

This annex distinguishes the following categories of users:

— vehicle owners/drivers/fleet operators;

— public sector authorities (including enforcement authorities);

— automotive industry; and

— other private service providers.

A.1.2 Vehicle owners/drivers/fleet operators

The vehicle owner, vehicle driver or vehicle fleet operator requirements for ERI systems and onboard ERI equipment may include the following:

— onboard equipment should not distract the driver from the driving task, or obstruct the driver from the safe control and operation of the vehicle;

— onboard equipment should be low cost, with ease of installation, and require minimal maintenance;

— onboard equipment should be reliable in operation and may include the capability to flag a malfunction to the vehicle driver or the system operator;

— onboard equipment should be tamperproof and rendered permanently inoperable if removed;

— ERI vehicle data should be secure (authenticity) with the vehicle identifier maintained as unique to a vehicle;

— ERI vehicle data should be secure (confidentiality) with the privacy of user data maintained according to national regulations;

— onboard equipment may be required for other services available from different service providers;

— ERI vehicle data should be verifiable with the vehicle owner able to read the ERI data stored in the onboard ERI equipment.

NOTE   This requirement may impact on the security provisions for ERI vehicle data.

A.1.3 Public sector authorities

Public sector authority requirements for ERI systems and onboard ERI equipment may include the following:

— onboard ERI equipment with an expected operational lifetime as long as the expected lifetime of a vehicle, with the option of retrofitting to vehicles currently in use on the roads;

— enforcement capability for identification of vehicles (e.g. stolen or abandoned), including stationary/parked vehicles, through comparison of ERI vehicle data with the vehicle construction plate (VIN);

— prevention of vehicle registration plate fraud by comparison of a vehicle registration plate with the corresponding ERI vehicle identifier for both stationary and moving vehicles;

— detection of malfunctioning (or unequipped) onboard ERI equipment;

— vehicle vicinity identification of moving local and foreign vehicles, the vehicle vicinity identification suitable as legal evidence, for foreign vehicles, both in the jurisdiction in which it is identified and in the jurisdiction where it is registered;

— specific vehicle identification of moving local and foreign vehicles, the specific vehicle identification suitable as legal evidence for foreign vehicles, both in the jurisdiction in which it is identified and in the jurisdiction where it is registered;

— support after-theft vehicle recovery measures (using standards currently under development by CEN/TC 278 relating to after-theft recovery of stolen vehicles);

— usable as an electronic car ID (ECI) as requested in the eEurope action plan of the Feira European Council, 19 to 20 June, 2000;

— usable for an end-of-life administration to support measures as required by directive 2000/53/EC;

— readable with fixed, mobile and handheld equipment;

— provision of additional vehicle information as required by local legislation;

— provision for the addition of a group identifier to cater for a subset of vehicles.

NOTE 1   This list does not contain any localization services such as relate to after-theft recovery.

NOTE 2   It is assumed that vehicle identification data (and additional vehicle-related data) is registered and maintained centrally by registration authorities and other authorities for access.

Table A.1 identifies technical applications that may be based on the requirements above. The table indicates whether vicinity identification will suffice, or whether specific vehicle identification is required.

Table A.1 — Technical applications and public sector authority requirements

Application category	Vicinity identification only	Specific vehicle identification
Fulfilment of (legal) vehicle documentation e.g. tax paid, insurance, periodic motor vehicle test	X	
Speed monitoring a defined distance at the point of detection	X	X
Infringement of closed or restricted lanes (e.g. bus lanes or HGV lanes) based on: registered vehicle category/parameters (e.g. public service vehicle) measured vehicle parameters at the point of detection	X	X
Traffic monitoring (collecting floating car data) for: congestion management route guidance advice traffic flow measurement	X	
Access control		X
Road user charging enforcement for system with onboard fee calculation fee determination for system with fee calculation external to the vehicle		X X
NOTE 1 If a vehicle is required to be stopped by an authority at the time of detection, specific vehicle identification is required.		
NOTE 2 ISO 612 provides terms and definitions for the parameters/dimensions of motor vehicles and towed vehicles.		

A.1.4 Automotive industry

The automotive industry may have the following requirements for onboard ERI equipment:

— low cost (e.g. component, internal and external logistic chain, maintenance);

— clearly defined process for obtaining and commissioning an ERI device;

— unobtrusiveness to the vehicle design;

— not distracting the driver from the driving task, or obstructing the control and safe operation of the vehicle;

— deployment of onboard ERI equipment should not hinder the performance of other vehicle components, particularly a vehicle electronic management system;

— easily fitted into new and existing vehicles and easily replaced in case of defects;

— adherence to end-of-life regulatory requirements (ELV directive);

— ERI onboard equipment optionally used with other service providers;

— usable during the manufacturing process.

Table A.2 identifies technically feasible applications that may be based on the requirements above which will require specific vehicle identification.

Table A.2 — Technical applications and automotive industry requirements

Application category	Vicinity identification only	Specific vehicle Identification

Development, build and fleet management by car manufacturers to include:
    new cars (e.g. production, transport, commercial network)
    second-hand cars (e.g. vehicle dealerships)
    vehicle fleet
	—	X

Original equipment manufacturer (OEM) support:
    vehicle location (e.g. within vehicle storage car park)
    vehicle fuelling station
    access control
	—	X

Service, maintenance and repair support
    vehicle identification at reception
    access to onboard vehicle maintenance
    end user support and value added services
	—	X

On-trip maintenance	—	X
Distributed auditing of unsold vehicles	—	X
End-of-life (ELV) management	—	X

A.1.5 Additional service providers

Additional service providers may provide ERI services for other vehicle identification applications:

— access control (e.g. public and private car parks, freight vehicle depots) where access is enabled according to an access control list;

— use as a vehicle identifier in the event of non-payment of a charge levied;

— use as a vehicle subscription identifier for services (e.g. car parking charge, travel information, road charging).

Annex B
(informative)

Typical operational usage of onboard ERI equipment

B.1 Life cycle of onboard ERI equipment

The life cycle depends on the required ERT functionality. ERI data may be installed either prior or following installation of the ERT to a vehicle. The ERI (additional) data may also require modification during the operational lifetime.

B.2 Typical operational usage

The following are examples of typical operational usage for an ERT during the lifetime of a vehicle:

— ERT type specification (security an integral part of the specification);

— design for specific application, including interfaces and location on vehicle;

— manufactured in a secure environment certified by the authority;

— ERI data written to the ERT by an authority or their authorized agent;

— installation on vehicle by an agent accredited by the registration authority;

— vehicle specific data (additional to unique vehicle identifier) written to ERT;

— operational use with vehicle;

— criminal acts (e.g. vehicle theft) recorded by the authority register;

— modification of vehicle specific data as required by authorized access to read/write facility;

— modification of application (non-regulated) data;

— faulty ERT (ERT failure due to fault within ERT, accidental/deliberate physical damage, or tamper detection), nature of fault diagnosed, recorded, with ERT replaced by accredited agent of the registration authority;

— end-of-life period:

  — ERI unique identifier electronically deleted from ERT;

  — any other data, subject to national data protection requirements, deleted from ERT;

  — taking the ERT out of life cycle, which should be undertaken in a secure environment certified by the authority;

  — certification of completion of life cycle.

Annex C
(informative)

Example of ERI system stakeholders

The following entities (stakeholders) are expected to be required for the operation of an ERI system:

— vehicle manufacturer: responsible for assigning a unique identifier to each vehicle built;

— tag manufacturer: the organization or organizations responsible for assembling the components required for the ERT of an ERI system;

— vehicle dealer: commercial outlet for vehicles;

— registration authority: the authority responsible for registration of vehicle and keeper details;

— ERI registration authority: the authority responsible for administering all aspects of the ERI scheme not covered by the registration authority;

— owner: person or entity who owns the vehicle;

— keeper: person or entity responsible for the vehicle;

— driver: person driving the vehicle;

— certification authority: entity responsible for the creation of public key certificates;

— access authority: persons or organizations entitled (by virtue of public legislation) to read ERI data from a vehicle (this may include registration authority, police, inspection authorities, etc.);

— security evaluator: organization licensed to perform system security evaluations;

— service provider: person or organization providing a service that requires the vehicle identity and/or other information concerning the vehicle;

— ERT holder: the person or organization responsible for the ERT (e.g. the vehicle manufacturer, owner, keeper or driver);

— inspection authority: authority responsible for periodic vehicle inspection.

NOTE   A complete description of an ERI system, interoperable between countries, would require a specific definition of roles, responsibilities and interactions between these entities by national authorities and is outside the scope of this part of ISO 24534.

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[10]   ISO 24535, *Intelligent transport systems — Automatic vehicle identification — Basic electronic registration identification (Basic ERI)*

[11]   ELV directive, 2000, Directive 2000/53/EC of the European Parliament and of the Council, 18 September 2000 on end-of-life vehicles

[12]   EU 1970/156 EU directive 1970/156 on the approximation of the laws of Member States relating to the type-approval of motor vehicles and their trailers

[13]   EU 19888/77 EU directive 1988/77 on the approximation of the laws of Member States relating to the measures to be taken against the emission of gaseous pollutants from diesel engines for use in vehicles

[14]   EU 19992/61 and EU directive 1933/61 relating to the type approval of two or three-wheel motor vehicles

[15]   EU directive 2003/127/EC amending Council Directive 1999/37/EC on the registration documents for vehicles

[16]   ARIB-T75 Dedicated Short-Range Communication System, Version 1.0, Sept.6.2001

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