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

Part 3:
Vehicle data

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

Partie 3: Données du véhicule

[Revision of first edition (ISO 24534-3:2010)]

ICS 03.220.20; 35.240.60

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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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 24534-3 was prepared by Technical Committee ISO/TC 204, *Intelligent Transport Systems* and by Technical Committee CEN/TC 278, *Road Transport and Traffic Telematics* in collaboration.

This second edition cancels and replaces the first edition (EN ISO 24524 Part 3:2010).

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*

In addition, ISO has published a fifth part as ISO 24534-5:

— *Part 5: Secure communications using symmetrical techniques.*

Introduction

A quickly emerging need has been identified within 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 ERI, such as legal proof of vehicle identity with potential mandatory usages. There is a commercial and economic justification both in respect of tags and infrastructure that a standard enables an interoperable solution.

Electronic Registration Identification (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 an enabling technology 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 users for a trusted electronic identification, including roaming vehicles.

This part of EN ISO 24534 specifies the vehicle-related data that can be exchanged between an onboard Electronic Registration Tag (ERT) and an ERI reader/writer inside or outside the vehicle. The vehicle-related data consist of the vehicle identifier and may also include additional vehicle data as typically included in a vehicle registration certificate.

This part of EN ISO 24534 does not provide any accurate definitions for additional vehicle data items. This is left to the local registration authorities and/or local legislation. This part of EN ISO 24534 only provides the means for an unambiguous exchange of vehicle parameters registered by local registration authorities.

This part of EN ISO 24534 makes use of the basic automatic vehicle identification (AVI) definitions in ISO 14816.

Automatic vehicle and equipment identification — Electronic Registration Identification (ERI) for vehicles — Part 3: Vehicle data

1 Scope

This part of EN ISO 24534 provides the requirements for an Electronic Registration Identification (ERI) that is 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. in case of international re-sales,

— safety-related purposes,

— crime reduction,

— commercial services, and

— adhering to privacy and data protection regulations.

This part of EN ISO 24534 defines the vehicle identification data. This data is called the ERI data and includes:

— the vehicle identifier, and

— possible additional vehicle-related information (as typically included in a vehicle registration certificate).

All additional vehicle data elements are defined as optional. It is left to local legislation and/or the discretion of a registration authority to use or not to use a particular data element. If used, the value is assumed to be the one registered by the registration authority in accordance with local legislation. This part of EN ISO 24534 only provides the syntax for all these data elements.

NOTE The secure application layer interfaces for the exchange of ERI data with an ERI reader or writer are specified in Part 4 of EN ISO 24534 and in ISO 24534-5.

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.

EN ISO 24534-4, *Automatic vehicle and equipment identification — Electronic Registration Identification (ERI) for vehicles — Part 4: Secure communications using asymmetrical techniques*

ISO 24534-5, *Automatic vehicle and equipment identification — Electronic Registration Identification (ERI) for vehicles — Part 5: Secure communications using symmetrical techniques*

ISO 612:1978, *Road vehicles — Dimensions of motor vehicles and towed vehicles — Terms and definitions*

ISO 1176:1990, *Road vehicles — Masses — Vocabulary and codes*

ISO 3779, *Road vehicles — Vehicle identification number (VIN) — Content and structure*

ISO 3780, *Road vehicles — World manufacturer identifier (WMI) code*

ISO 3833, *Road vehicles — Types — Terms and definitions*

ISO/IEC 7498-2, *Information processing systems — Open Systems Interconnection — Basic Reference Model — Part 2: Security Architecture*

ISO/IEC 8824 (all parts), *Information technology — Abstract Syntax Notation One (ASN.1)*

ISO/IEC 8825-2, *Information technology — ASN.1 encoding rules: Specification of Packed Encoding Rules (PER) — Part 2*

ISO/IEC 9798-1, *Information technology — Security techniques — Entity authentication — Part 1: General*

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

3 Terms and definitions

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

3.1
additional vehicle data
ERI data in addition to the vehicle identifier

3.2
attribute
type with an associated identifier

[based on ISO/IEC 8824-1:2008, Annex G.2.15.1]

3.3
distinguishing identifier
information which unambiguously distinguishes an entity

[ISO/IEC 9798-1, definition 3.3.9]

3.4
electronic registration identification
ERI
action or act of identifying a vehicle with electronic means for purposes as mentioned in the scope of this part of EN ISO 24534

3.5
ERI data
vehicle identifying data which can be obtained from an **ERT**

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

3.6
electronic registration tag
ERT
onboard ERI device that contains the ERI data including relevant security provisions and one or more interfaces to access that data

NOTE 1 In case of high security, the ERT is a 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).

3.7
periodic motor vehicle test
compulsory periodic (e.g. annual) test of the roadworthiness of a motor vehicle of above a specified age, or a certificate of passing such a test

EXAMPLE The MOT test in the United Kingdom is an example.

3.8
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, definition 3.3.43]

NOTE Because this term relates to the right of individuals, it cannot be very precise and its use should be avoided except as a motivation for requiring security.

3.9
registration authority
<for vehicles> authority responsible for the registration and maintenance of vehicle records

NOTE The authority may provide vehicle records to accredited organizations.

3.10
registration authority
<for ERI data> organization responsible for writing **ERI data** and security data according to local legislation

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

3.11
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

3.12
type
named set of values

[ISO/IEC 8824-1]

4 Abbreviations

AEI Automatic Equipment Identification

ASN.1 Abstract Syntax Notation One [as defined in ISO 8824 (all parts)]

AVI Automatic Vehicle Identification

EEA European Economic Area

EFC Electronic Fee Collection

EN Europäische Norm (German), English: European Standard

ENV Europäische Norm Vorausgabe (German), English: European Pre-Standard

ERI Electronic Registration Identification

ERT Electronic Registration Tag

EU European Union

IEC International Electrotechnical Commission

ISO International Organization for Standardization

VIN Vehicle Identification Number

5 Requirements

5.1 Vehicle identification data

5.1 is informative only.

The secure onboard environment in which the vehicle identification data is stored is called the Electronic Registration Tag (ERT).

This Clause 5 provides an abstract definition of the ERI data to be exchanged between the ERT and an ERI reader or writer. The abstract definitions are defined using Abstract Syntax Notation One (ASN.1) as defined in ISO 8824 (all parts).

The identifier used to identify a vehicle is called the vehicle identifier or vehicleId. The preferred vehicle identifier is the VIN that is assigned to the vehicle by its manufacturer in accordance with ISO 3779.

However, in order to make this part of EN ISO 24534 also applicable in countries where the VIN is not used, an alternative is also supported (see 5.2). The fundamental requirement is that the combination of a registration authority and a vehicle identifier should be globally distinguishing.

NOTE 1 As two vehicles built 30 years after each other may have the same VIN, the VIN is not 100 % unique.

NOTE 2 Empirical data has shown that a database of a registration authority may contain duplicate VIN numbers.

NOTE 3 In this part of EN ISO 24534, the combination of the almost unique vehicleId and a unique ERT number may be used as the unambiguous distinguishing identifier. The ERT number is a unique read-only identifier that is written into the ERT during ERT manufacturing time. See Part 4 of EN ISO 24534, and ISO 24534-5for details.

Apart from the vehicle identifier, this part of EN ISO 24534 also supports the use of additional vehicle data as typically included in a vehicle registration certificate. This additional vehicle data may, e.g., be used as:

— additional identification information to improve the trust in a vehicle identifier, and

— certified vehicle information for other applications (e.g. for tolling to determine a tariff).

5.2 The vehicle identifier

The VehicleId type shall be used for the vehicle identifier according to local legislation and is defined as follows:

```
VehicleId ::= CHOICE {
        vin                     VIN,                    -- preferred choice
```



```
        raSpecificVehicleId              RaSpecificVehicleId,
        …
        }

VIN ::= CS5
```

NOTE 1 The '…' at the end of the definition designates that the type VehicleId may be extended with additional components at the end of the type definition in new versions of this part of EN ISO 24534, e.g. to cope with a new VIN standard.

The VehicleId should be a globally distinguishing identifier.

NOTE 2 When identifying a vehicle, the ERT always delivers the vehicleId in combination with the identifier of the registration authority and the ERT number. The identifier of the registration authority may be used to obtain additional information about the vehicle. The ERT number is an extra unique identifier from another source that may be used to resolve potential disputes about the VIN of a vehicle.

NOTE 3 The choice of which alternative is used is outside the scope of this part of EN ISO 24534. It may e.g. depend on local legislation.

The vin alternative, if used, shall be of type VIN and is the preferred vehicle identifier. The type VIN is identical to the type CS5 as defined in ISO 14816. The value of the vin alternative shall be the value of the VIN as assigned conforming to ISO 3779 by a manufacturer or a registration authority.

The raSpecificVehicleId alternative, if used, shall contain a globally distinguishing identifier for the vehicle and shall be of type RaSpecificVehicleId as defined below:

```
RaSpecificVehicleId ::= SEQUENCE {
        wmi                              PrintableString (SIZE(3)),
        nonIsoStandardId                 PrintableString (SIZE (1..20))
        }
```

The wmi component shall contain the World Manufacturer Identifier (WMI) code of the organization that assigned the nonIsoStandardId value, and the WMI code shall be assigned to this organization according to ISO 3780.

The nonIsoStandardId component shall be of type PrintableString with a maximum length of 20 characters.

NOTE Any additional meaning conveyed in the value of a nonIsoStandardId component is outside the scope of this part of EN ISO 24534.

5.3 The ERI data type

The EriData type shall be used for the ERI data and is defined as follows:

```
EriData ::= SEQUENCE {
        vehicleId                        VehicleId,
        additionalEriData                AdditionalEriData OPTIONAL
        }
```

The vehicleId component shall contain the vehicle's identifier as defined in 5.2.

The AdditionalEriData component, if present, shall contain the additional ERI data.

5.4 The additional ERI data type

The type AdditionalEriData is used for the additional ERI data and is defined as follows:


```
AdditionalEriData ::= CHOICE {
        additionalEriRegistrationData     AdditionalEriRegistrationData,   -- preferred choice
        …,
        raSpecificAdditionalEriData       OCTET STRING (SIZE (0..1024))
                                          -- only to be used if AdditionalEriRegistrationData is not supported
        }
```

The additionalEriRegistrationData alternative is the preferred alternative and shall be chosen whenever a value of the type AdditionalEriRegistrationData can be used.

The raSpecificAdditionalEriData alternative is of type OCTET STRING with a maximum length of 1024 octets and shall only be used if a value of the type additionalEriRegistrationData cannot be used.

NOTE The '…' in the definition designates that the type AdditionalEriData may be extended with additional alternatives at the end of the type definition in new versions of this part of EN ISO 24534, e.g. to cope with a new version of the alternative eriRegistrationData.

5.5 Additional ERI registration data

5.5.1 The Additional ERI registration data type

5.5.1.1 The definition of the Additional ERI registration data type

The AdditionalEriRegistrationData type contains the vehicle related data typically found in a vehicle registration certificate and is defined as follows:

```
AdditionalEriRegistrationData ::=  SEQUENCE {
        -- Administrative data
        registrationAuthority           RegistrationAuthority OPTIONAL,
        vehicleIdStatus                 VehicleIdStatus OPTIONAL,
        dateOfFirstRegistration         DateOfFirstRegistration OPTIONAL,
        dateOfRegistration              DateOfRegistration OPTIONAL,
        validThru                       ValidThru OPTIONAL,
        chassisNumber                   ChassisNumber (SIZE (1..23)) OPTIONAL,
        registrationNumber              RegistrationNumber OPTIONAL,

        -- Vehicle type
        vehicleMake                     VehicleMake OPTIONAL,
        vehicleType                     VehicleType OPTIONAL,
        vehicleTypeStatus               VehicleTypeStatus OPTIONAL,
        commercialDescription           CommercialDescription OPTIONAL,
        typeApprovalNumber              TypeApprovalNumber OPTIONAL,
        vehicleCategory                 VehicleCategory OPTIONAL,
        vehicleTaxCategory              VehicleTaxCategory OPTIONAL,
        euVehicleCategoryCode           EuVehicleCategoryCode OPTIONAL,
        raSpecificVehicleClass1         RaSpecificVehicleClass1 OPTIONAL,
        raSpecificVehicleClass2         RaSpecificVehicleClass2 OPTIONAL,
        raSpecificVehicleClass3         RaSpecificVehicleClass3 OPTIONAL,
        vehicleUse                      VehicleUse OPTIONAL,
        privateUse                      PrivateUse OPTIONAL,
        colour                          VehicleColour OPTIONAL,

        -- Vehicle shape
        length                          VehicleLength OPTIONAL,
        width                           VehicleWidth OPTIONAL,
        height                          VehicleHeight OPTIONAL,
        wheelbase                       Wheelbase OPTIONAL,
        bodyShape                       VehicleBodyShape OPTIONAL,
        euBodyWorkType                  EuBodyWorkType OPTIONAL,
        iso3833VehicleType              Iso3833VehicleType OPTIONAL,
```

```
-- Vehicle number of passengers, axles, and mass
numberOfSeats                 NumberOfSeats OPTIONAL,  -- including the driver seat
numberOfStandingPlaces        NumberOfStandingPlaces OPTIONAL,
maxNumberOfPassengers         MaxNumberOfPassengers OPTIONAL,    -- including the driver
unladenWeight                 UnladenWeight OPTIONAL,
maxDesignLadenMass            MaxDesignLadenMass OPTIONAL,
maxAuthorizedLadenMass        MaxAuthorizedLadenMass OPTIONAL,
maxAuthorizedTrainMass        MaxAuthorizedTrainMass OPTIONAL,
maxAuthorizedPayload          MaxAuthorizedPayload OPTIONAL,

numberOfAxles                 NumberOfAxles OPTIONAL,
authorizedAxleLadenMass       AuthorizedAxleLadenMass OPTIONAL, -- from front to rear axle
maxTowableMassBrakedTrailer   MaxTowableMassBrakedTrailer OPTIONAL,
maxTowableMassUnbrakedTrailer  MaxTowableMassUnbrakedTrailer OPTIONAL,

-- Vehicle engine and power source
engineId                      EngineId (SIZE (1..60)) OPTIONAL,
primeEngineType               PrimeEngineType OPTIONAL,
enginePowerSources            EnginePowerSources OPTIONAL,
primePowerSource              PrimePowerSource OPTIONAL,
engineMaxNetPower             EngineMaxNetPower OPTIONAL,
engineDisplacement            EngineDisplacement OPTIONAL,
ratedEngineSpeed              RatedEngineSpeed OPTIONAL,
powerWeightRatio              PowerWeightRatio OPTIONAL,
maxSpeed                      MaxSpeed OPTIONAL,
fuelTanksCapacity             FuelTanksCapacity OPTIONAL,

-- Environmental characteristics
stationarySoundLevel          StationarySoundLevel OPTIONAL,
engineSpeed                   EngineSpeed OPTIONAL,
driveBySoundLevel             DriveBySoundLevel OPTIONAL,
emissionCO                    EmissionCO OPTIONAL,
emissionHC                    EmissionHC OPTIONAL,
emissionNOx                   EmissionNOx OPTIONAL,
emissionHCandNOx              EmissionHCandNOx OPTIONAL,
particulatesForDiesel         ParticulatesForDiesel OPTIONAL,
correctedAbsorptionCoefficient CorrectedAbsorptionCoefficient OPTIONAL,
emissionCO2                   EmissionCO2 OPTIONAL,
combinedFuelConsumption       CombinedFuelConsumption OPTIONAL,
environmentalCategory         EnvironmentalCategory OPTIONAL,
euroType                      EuroType OPTIONAL,

-- Others
lastOfficialTestData          OfficialVehicleTestData OPTIONAL,
…,
raSpecificData                RaSpecificData OPTIONAL
axlesPerAxleGroup             AxlesPerAxleGroup OPTIONAL,
                              -- from front to rear axle group
authorizedAxleGroupLadenMass  AuthorizedAxleGroupsLadenMass OPTIONAL,
                              -- from front to rear axle group

-- ERI data used for EFC (types imported from ElectronicRegistrationIdentificationEfcVehicleData
efcVehicleDimensions          VehicleDimensions,
efcPassengerCapacity          PassengerCapacity,
efcVehicleWeightLimits        VehicleWeightLimits,
efcAxleWeightLimits           AxleWeightLimits,
efcVehicleSpecificCharacteristics VehicleSpecificCharacteristics,
efcTrailerCharacteristics     TrailerCharacteristics,
efcEngine                     Engine,
efcSoundLevel                 SoundLevel,
efcCO2EmissionValue           CO2EmissionValue,
```