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

Part 3:
Vehicle data

Identification automatique des véhicules et des équipements — Identification d'enregistrement électronique (ERI) pour les véhicules — Partie 3: Données du véhicule

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Contents

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 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 24534-3 cancels and replaces ISO/TS 24534-3:2008, 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.

This part of 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 consists of the vehicle identifier and might also include additional vehicle data as typically included in a vehicle registration certificate.

This part of 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 ISO 24534 only provides the means for an unambiguous exchange of vehicle parameters registered by local registration authorities.

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

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

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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 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 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 ISO 24534-4 and 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.

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 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)*

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
distinguishing identifier
information which unambiguously distinguishes an entity

[ISO/IEC 9798-1:1997, definition 3.3.9]

3.3
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 ISO 24534

3.4
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.

3.5
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).

3.6
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.

3.7
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]

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

3.8
registration authority
⟨for vehicles⟩ authority responsible for the registration and maintenance of vehicle records

NOTE   The authority can provide vehicle records to accredited organizations.

3.9
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.

3.10
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

4 Abbreviations

AEI	automatic equipment identification
ASN.1	Abstract Syntax Notation One [as defined in ISO/IEC 8824 (all parts)]
AVI	automatic vehicle identification
EEA	European Economic Area
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
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/IEC 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 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 apart 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 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 ISO 24534-4 and ISO 24534-5 for details.

Apart from the vehicle identifier, this part of 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 that location in new versions of this part of 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 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 4   Any additional meaning conveyed in the value of a nonIsoStandardId component is outside the scope of this part of 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 1 024 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 can be extended with additional alternatives at that location in new versions of this part of 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
        axleGroupConfiguration             NumberOfAxlesForEachAxleGroup OPTIONAL, -- from front to
                                           rear axle group
        authorizedAxleGroupLadenMass       AuthorizedAxleGroupLadenMass OPTIONAL, -- from front to
                                           rear axle group
        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
        }
```

The type of the components of the AdditionalEriRegistrationData type is defined in 5.5.1.2 to 5.5.1.8.

NOTE 1   The "…" at the end of the AdditionalEriRegistrationData definition designates that the AdditionalEriRegistrationData type may be still extended with additional components at that location in new versions of this part of ISO 24534.

All components are optional. Whether or not an optional component is present or absent depends on local legislation and the discretion of the vehicle's registration authority.

The precise meaning of a value of a component, if present, shall be determined by local legislation and/or the vehicle's registration authority and shall always take precedence over a definition in this International Standard.

NOTE 2   This part of ISO 24534 only facilitates the exchange of ERI registration data values for the purpose of vehicle identification. Both the precise definition of terms and the assignment of values in a particular state or country are outside the scope of this part of ISO 24534.

NOTE 3   In order to maintain consistency with the vehicle's registration certificate, the value of a component, if present and applicable, should be equal to or at least as precise as the value of the corresponding data item on the vehicle's registration certificate.

5.5.1.2   Administrative data components

The registrationAuthority component, if present, shall identify the registration authority that registered the vehicle.

The VehicleIdStatus component, if present, shall specify the status of the vehicle identifier.