TECHNICAL SPECIFICATION

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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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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 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.

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

This part of ISO/TS 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 ISO/TS 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 ISO/TS 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/TS 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 Parts 4 and 5 of ISO/TS 24534.

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 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
distinguishing identifier
information which unambiguously distinguishes an entity

[ISO/IEC 9798-1, 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/TS 24534

3.4
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.

3.5
electronic registration tag
ERT
onboard ERI device that contains the ERI data including the relevant implemented security provisions and one or more interfaces to access that data

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

NOTE 2 An implementer may choose also to integrate other provisions (e.g. for DSRC communications) into an ERT, as long as this does not compromise the security of the ERT.

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 is an example.

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, 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.

3.8
registration authority (with respect to the ERI data)
organization responsible for writing **ERI data** and security data into an **ERT** according to local legislation

NOTE It is expected that the registration authority with respect to the ERI data may be the same authority that keeps the official register in which the vehicle and its owner or lessee are listed. This part of ISO/TS 24534 does not require this, however.

3.9
registration certificate
vehicle registration document issued by the authority that keeps the official register in which the vehicle and its owner or lessee are listed

4 Abbreviations

4.1
AEI
Automatic Equipment Identification

4.2
ASN.1
Abstract Syntax Notation One [as defined in ISO 8824 (all parts)]

4.3
AVI
Automatic Vehicle Identification

4.4
EEA
European Economic Area

4.5
EN
Europäische Norm (German), English: European Standard

4.6
ENV
Europäische Norm Vorausgabe (German), English: European Pre-Standard

4.7
ERI
Electronic Registration Identification

4.8
ERT
Electronic Registration Tag

4.9
EU
European Union

4.10
IEC
International Electrotechnical Commission

4.11
ISO
International Organization for Standardization

4.12
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 ISO/TS 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 ISO/TS 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 Parts 4 and 5 ISO/TS 24534 for details.

Apart from the vehicle identifier, this part of ISO/TS 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/TS 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/TS 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 ISO/TS 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 that location in new versions of this part of ISO/TS 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                      DriveBySoundLevel 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 the subsections of section 5.5 below.

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/TS 24534.

All components are optional. Whether or not an optional component is present or absent depends on local legislation and/or 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 Technical specification.

NOTE 2 This part of ISO/TS 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/TS 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.

The VehicleIdStatus component shall not be present for a VIN-based vehicle identifier.

The dateOfFirstRegistration component, if present, shall specify the date of the first registration of the vehicle with its current registration authority.

The dateOfRegistration component, if present, shall specify the date of the registration to which this ERI data refers.

The validThru component, if present, shall specify the last day the ERI data is valid. If not present, the validity period may be assumed to be unlimited.

The chassisNumber component, if present, shall specify the chassis number of the vehicle.

The registrationNumber component, if present, shall specify the vehicle's registration number as assigned by the registration authority.

5.5.1.3 Vehicle type components

The vehicleMake component, if present, shall specify the make of the vehicle as assigned by the vehicle manufacturer.

The vehicleType component, if present, shall specify the variant, if applicable, and/or the version, if applicable, of the vehicle as assigned by the vehicle manufacturer.

The vehicleTypeStatus component, if present, shall specify the status of the vehicle type.

The commercialDescription component, if present, shall contain the commercial description(s) of the vehicle.

The typeApprovalNumber component, if present, shall specify the type-approval number.

The vehicleCategory component, if present, shall specify the vehicle category according to local legislation.

The vehicleTaxCategory component, if present, shall specify the vehicle tax category according to local legislation.

The euVehicleCategoryCode component, if present, shall specify the vehicle category according to the EU directives EU 2001/116, EU 2002/24 and UNECE 1999.

The raSpecificVehicleClass1 component, if present, shall contain a registration authority specific vehicle class, category or code.

The raSpecificVehicleClass2 component, if present, shall contain a registration authority specific vehicle class, category or code.

The raSpecificVehicleClass3 component, if present, shall contain a registration authority specific vehicle class, category or code.

The vehicleUse component, if present, shall specify the use of the vehicle.

The privateUse component, if present, shall specify whether the vehicle is for private or for commercial use.

The colour component, if present, shall specify the colour of the vehicle.

5.5.1.4 Vehicle shape components

The length component, if present, shall specify the length of the vehicle.

The width component, if present, shall specify the width of the vehicle.

The height component, if present, shall specify the height of the vehicle.

The wheelbase component, if present, shall specify the wheelbase of the vehicle.

The bodyShape component, if present, shall specify the shape of the body of the vehicle.

The euBodyWorkType component, if present, shall specify the type of body work of the vehicle according to EU 2001/116.

The iso3833VehicleType component, if present, shall specify the type of the vehicle according to ISO 3833.

5.5.1.5 Vehicle number of passengers, axles, and mass components

The numberOfSeats component, if present, shall specify the number of seats, including the driver seat.

The numberOfStandingPlaces component, if present, shall specify the number of standing places.

The maxNumberOfPassenger component, if present, shall specify the maximum permissible number of passengers (including the driver) that may use the vehicle.

The unladenWeight component, if present, shall specify the nominal unladen mass of the vehicle with bodywork.

The maxDesignLadenMass component, if present, shall specify the maximum technically permissible total mass of the vehicle including payload (but excluding the weight of trailers).

The maxAuthorizedLadenMass component, if present, shall specify the maximum permissible total mass of the vehicle including payload (but excluding the mass of trailers) when in service in the jurisdiction of the registration authority.

The maxAuthorizedTrainMass component, if present, shall specify the maximum permissible total mass in kilograms of the whole vehicle, including payload (and including trailers and the payload of trailers) when in service in the jurisdiction of the registration authority.

The maxAuthorizedPayload component, if present, shall specify the maximum permissible payload of the vehicle (but excluding the payload of trailers).

The numberOfAxles component, if present, shall specify the number of axles of the vehicle (including lifted axles).

The authorizedAxleLadenMass component, if present, shall specify the maximum laden mass on each axle in kilograms.

The maxTowebleMassBrakedTrailer component, if present, shall specify the technically permissible maximum braked towable mass of the trailer.

The maxTowebleMassUnbrakedTrailer component, if present, shall specify the technically permissible maximum unbraked towable mass of the trailer.

5.5.1.6 Vehicle engine and power source components

The engineId component, if present, shall specify the engine identification number.

The primeEngineType component, if present, shall specify type of the prime engine of the vehicle as assigned by the manufacturer.

The enginePowerSource component, if present, shall specify the power source(s) of the vehicle.

The primePowerSource component, if present, shall specify the power source of the prime engine.

The engineMaxNetPower component, if present, shall specify the nominal (maximum net) power of the engine.

The engineDisplacement component, if present, shall specify the displacement of the engine.

The ratedEngineSpeed component, if present, shall specify the rated speed.

The powerWeightRatio component, if present, shall specify the power/weight ratio of the vehicle.

The maxSpeed component, if present, shall specify the maximum speed of the vehicle.

The fuelTankCapacity component, if present, shall specify the capacity of the fuel tank(s).

5.5.1.7 Environmental characteristics components

The stationarySoundLevel component, if present, shall specify the stationary sound level of the vehicle.

The engineSpeed component, if present, shall specify the engine speed.

The driveBySoundLevel component, if present, shall specify the drive-by sound level of the vehicle.

The emissionCO component, if present, shall specify the CO exhaust emission.

The emissionHC component, if present, shall specify the HC exhaust emission.

The emissionNOx component, if present, shall specify the NO_x exhaust emission.

The emissionHCandNOx component, if present, shall specify the HC plus CO_x exhaust emission.

The particulatesForDiesel component, if present, shall specify the exhaust emission of particulates for diesel.

The correctedAbsorptionCoefficient component, if present, shall specify the corrected absorption coefficient for diesel.

The emissionCO2 component, if present, shall specify the CO_2 exhaust emission.

The combinedFuelConsumption component, if present, shall specify the combined fuel consumption of the vehicle.

The environmentalCategory component, if present, shall be of type EnvironmentalCategory and shall specify the environmental category of the vehicle.

The euroType component, if present, shall specify the environmental category of the vehicle conform to directive EU 1988/77 as amended by EU 2003/522.

5.5.1.8 Other components

The lastOfficialTestData component, if present, shall specify the data observed during the last official vehicle test, e.g. a periodic motor vehicle test or an intermediate motor vehicle test.

The lastOfficialTestData component shall only be present if at least one of its components is present.

NOTE The value of the EriRegistrationData has to be signed and therefore needs a canonical representation.

The raSpecificVehicleData component, if present, may contain any additional registration authority-specific data.

5.5.2 Administrative types

RegistrationAuthority	::= EntityId
VehicleIdStatus	::= Text60
DateOfFirstRegistration	::= DATE
DateOfRegistration	::= DATE
ValidThru	::= DATE
ChassisNumber	::= PrintableString (SIZE (1..23)) -- incl. 3 WMI characters
RegistrationNumber	::= CS4

Unless specified otherwise, the definition and assignment of the values for the types defined in this subclause are at the discretion of the registration authority and/or local legislation (see 5.5.1).

The RegistrationAuthority type shall be used to identify a registration authority and shall be of type EntityId.

The VehicleIdStatus type shall be used to specify the status of a vehicle identifier.

The VehicleIdStatus type shall not be used for a VIN-based vehicle identifier.

EXAMPLE Possible values are e.g. ordinary, authority assigned, the identifier of the authority that assigned the vehicleId, etc.

The DateOfFirstRegistration type shall be used to specify the date of the first registration of a vehicle with its current registration authority.

The value of a DateOfFirstRegistration component shall at least contain the year and optionally the month and/or day.

The DateOfRegistration type shall be used to specify the date of the registration to which this ERI data refers.

The ValidThru type shall be used to specify the last day the ERI data is valid. If not present, the validity period may be assumed to be unlimited.

The ChassisNumber type shall be used to specify the chassis number of a vehicle.

The RegistrationNumber type shall be used to specify the vehicle's registration number as assigned by the registration authority.

5.5.3 The EU vehicle category code type

The EuVehicleCategoryCode type is defined as follows:

```
EuVehicleCategoryCode ::= CHOICE {
        euVehicleCategoryL      EuVehicleCategoryL,   -- conforms to EU 2002/24 and UNECE 1999
        euVehicleCategoryM      EuVehicleCategoryM,   -- conforms to EU 2001/116 and UNECE 1999
        euVehicleCategoryN      EuVehicleCategoryN,   -- conforms to EU 2001/116 and UNECE 1999
        euVehicleCategoryO      EuVehicleCategoryO,   -- conforms to EU 2001/116 and UNECE 1999
        euVehilcleCategoryT     NULL,    -- conforms to UNECE 1999
        euVehilcleCategoryG     NULL     -- conforms to EU 2001/116 and UNECE 1999
        }

EuVehicleCategoryL ::= ENUMERATED {l1, l2, l3, l4, l5, l6, l7}

EuVehicleCategoryM ::= ENUMERATED {m1, m2, m3}

EuVehicleCategoryN ::= ENUMERATED {n1, n2, n3}

EuVehicleCategoryO ::= ENUMERATED {o1, o2, o3, o4}
```

An EuVehicleCategoryCode value may be a vehicleCategoryL value, a vehicleCategoryM value, a vehicleCategoryN value, a vehicleCategoryO value, a vehicleCategoryT value or a vehicleCategoryG value.

The euVehicleCategoryL alternative shall be chosen for a vehicle in the L category according to directive EU2002/24 or UNECE 1999.

The euVehicleCategoryL alternative, if chosen, shall have one of the values l1, l2, l3, l4, l5, l6, or l7 for, respectively, the vehicle categories L1, L2, L3, L4, L5, L6, or L7 defined in directive EU2002/24 or UNECE 1999.

NOTE 1 EU Vehicle category L is used for vehicles with less than three wheels.

The euVehicleCategoryM alternative shall be chosen for a vehicle in the M category according to directive EU2001/116 or UNECE 1999.

The euVehicleCategoryM alternative, if chosen, shall have one of the values m1, m2, or m3 for, respectively, the vehicle categories M1, M2 or M3 defined in directive EU2001/116 or UNECE 1999.

NOTE 2 EU Vehicle category M is used for passenger vehicles with M1 for vehicles with no more than eight seats in addition to the driver seat, M2 for vehicles with more than eight seats but less than five tons and M3 for vehicles with more than eight seats and more than five tons.

NOTE 3 The category M1 special purpose vehicles from UNECE 1999 can be described as EU2001/116 body types (see the euBodyWorkType).

The euVehicleCategoryN alternative shall be chosen for a vehicle in the N category according to directive EU2001/116 or UNECE 1999.

The euVehicleCategoryN alternative, if chosen, shall have one of the values n1, n2, or n3 for, respectively, the vehicle categories N1, N2 or N3 defined in directive EU 2001/116 or UNECE 1999.

NOTE 4 EU Vehicle category N is used for vehicles carrying goods with N1 for vehicles not exceeding 3,5 tons maximum mass; N2 for vehicles exceeding 3,5 tons maximum mass but not exceeding 12 tons; and N3 for vehicles exceeding 12 tons maximum mass.

The euVehicleCategoryO alternative shall be chosen for a vehicle in the O category according to directive EU2001/116 or UNECE 1999.

The euVehicleCategoryO alternative, if chosen, shall have one of the values o1, o2, o3, or o4 for, respectively, the vehicle categories O1, O2, O3 or O4 defined in directive EU 2001/116 or UNECE 1999.

NOTE 5 EU Vehicle category O is used for (semi-) trailers with O1 for trailers not exceeding 0,75 tons maximum mass, O2 for trailers exceeding 0,75 tons maximum mass but not exceeding 3,5 tons, O3 for trailers exceeding 3,5 tons maximum mass but not exceeding 10 tons, and O4 for trailers exceeding 10 tons maximum mass.

The euVehicleCategoryT alternative shall be chosen for a vehicle in the T category according to UNECE 1999.

NOTE 6 EU Vehicle category T is used for agricultural and forestry tractors.

The euVehicleCategoryG alternative shall be chosen for a vehicle in the G category according to directive EU2001/116 or UNECE 1999.

NOTE 7 EU Vehicle category G is used for off-road vehicles.

5.5.4 Other Vehicle type types

VehicleMake	::= Text60	
VehicleType	::= Text60	
VehicleTypeStatus	::= Text60	
CommercialDescription	::= Text60	
TypeApprovalNumber	::= PrintableString (SIZE (1..60))	
VehicleCategory	::= Text60	
VehicleTaxCategory	::= Text60	
RaSpecificVehicleClass1	::= Text60	
RaSpecificVehicleClass2	::= Text60	
RaSpecificVehicleClass3	::= Text60	
VehicleUse	::= Text60	
PrivateUse	::= BOOLEAN	-- False = commercial use
VehicleColour	::= Text60	

Unless specified otherwise, the definition and assignment of the values for the types defined in this subclause are at the discretion of the registration authority and/or local legislation (see 5.5.1).

The VehicleMake type shall be used to specify the make of a vehicle as assigned by the vehicle manufacturer.

The VehicleType type shall be used to specify the variant, if applicable, and/or the version, if applicable, of a vehicle as assigned by the vehicle manufacturer.

The VehicleTypeStatus type shall be used to specify the status of the vehicle type.

EXAMPLE 1 Possible values are e.g. prototype, prefabricated type, modified type, etc.

The CommercialDescription type shall be used for the commercial description(s) of a vehicle.

The TypeApprovalNumber type shall be used to specify the type-approval number, if available.

The VehicleCategory type shall be used to specify the vehicle category according to local legislation.

The VehicleTaxCategory type shall be used to specify the vehicle tax category according to local legislation.

The RaSpecificVehicleClass1 type shall be used for a registration authority specific vehicle class, category or code.

The RaSpecificVehicleClass2 type shall be used for a registration authority specific vehicle class, category or code.

The RaSpecificVehicleClass3 type shall be used for a registration authority specific vehicle class, category or code.

The VehicleUse type shall be used to specify the use of a vehicle.

EXAMPLE 2 A registration authority may want to use the vehicleUse component to specify the usage of a particular category of a vehicle with values such as e.g. private or commercial, or “school bus” for a vehicle in the bus category, or “rental car” for a private car.

The PrivateUse type shall be used to specify whether a vehicle is for private or for commercial use. If for private use the value shall be TRUE, if for commercial use the value shall be FALSE.

The VehicleColour type shall be used to specify the colour of a vehicle.

5.5.5 The ISO 3833 vehicle type

The Iso3833VehicleType type is defined as follows:

```
Iso3833VehicleType ::= ENUMERATED {
        passengerCar,                   -- term No 3.1.1
        saloon,                         -- term No 3.1.1.1 (sedan)
        convertibleSaloon,              -- term No 3.1.1.2
        pullmanSaloon,                  -- term No 3.1.1.3
        stationWagon,                   -- term No 3.1.1.4
        truckStationWagon,              -- term No 3.1.1.4.1
        coupe,                          -- term No 3.1.1.5 (coupé)
        convertible,                    -- term No 3.1.1.6 (open tourer, roadstar, spider)
        multipurposePassengerCar,       -- term No 3.1.1.7
        forwardControlPassengerCar,     -- term No 3.1.1.8
        specialPassengerCar,            -- term No 3.1.1.9
        bus,                            -- term No 3.1.2
        minibus,                        -- term No 3.1.2.1
        urbanBus,                       -- term No 3.1.2.2
        interurbanCoach,                -- term No 3.1.2.3
        longDistanceCoach,              -- term No 3.1.2.4
        articulatedBus,                 -- term No 3.1.2.5
        trolleyBus,                     -- term No 3.1.2.6
        specialBus,                     -- term No 3.1.2.7
        commercialVehicle,              -- term No 3.1.3
        specialCommercialVehicle,       -- term No 3.1.3.1
        specialVehicle,                 -- term No 3.1.4
        trailingTowingVehicle,          -- term No 3.1.5 (draw-bar tractor)
        semiTrailerTowingVehicle,       -- term No 3.1.6 (fifth wheel tractor)
        trailer,                        -- term No 3.2.1
        busTrailer,                     -- term No 3.2.1.1
        generalPurposeTrailer,          -- term No 3.2.1.2
        caravan,                        -- term No 3.2.1.3
        specialTrailer,                 -- term No 3.2.1.4
        semiTrailer,                    -- term No 3.2.2
        busSemiTrailer,                 -- term No 3.2.2.1
        generalPurposeSemiTrailer,      -- term No 3.2.2.2
        specialSemiTrailer,             -- term No 3.2.2.3
        roadTrain,                      -- term No 3.3.1
        passengerRoadTrain,             -- term No 3.3.2
        articulatedRoadTrain,           -- term No 3.3.3
        doubleRoadTrain,                -- term No 3.3.4
        compositeRoadTrain,             -- term No 3.3.5
        specialRoadTrain,               -- term No 3.3.6
        moped,                          -- term No 3.4
        motorCycle                      -- term No 3.5
        }
```

A “term No”. in a comment parts refers to the number of the corresponding term and its definition in ISO 3833.

A value of Iso3833VehicleType type shall conform the corresponding definition in ISO 3833.

5.5.6 Other vehicle shape types

VehicleLength	::= Millimetre
VehicleWidth	::= Millimetre
VehicleHeight	::= Millimetre
Wheelbase	::= Millimetre
VehicleBodyShape	::= Text60
EuBodyWorkType	::= PrintableString (SIZE (2)) -- conforms to EU 2001/116

Unless specified otherwise, the definition and assignment of the values for the types defined in this subclause are at the discretion of the registration authority and/or local legislation (see 5.5.1).

The Vehiclelength type shall be used to specify the length of a vehicle in millimetres.

Unless local legislation specifies otherwise, ISO 612 term 6.1 applies and the length includes draw gear.

The vehicleWidth type shall be used to specify the width of a vehicle in millimetres.

Unless local legislation specifies otherwise, ISO 612 term 6.2 applies.

The VehicleHeight type shall be used to specify the height of a vehicle in millimetres.

Unless local legislation specifies otherwise, ISO 612 term 6.3 applies.

The Wheelbase type shall be used to specify the wheelbase of a vehicle in millimetres.

Unless local legislation specifies otherwise, ISO 612 term 6.4 (wheel space) applies and for vehicles with three or more axles (or semi-trailers with two or more axles) the distance is taken from the foremost wheel (the fifth wheel kingpin for semi-trailers) to the rearmost wheel.

The BodyShape type shall be used to specify the shape of the body of a vehicle.

The EuBodyWorkType type shall be used to specify the type of body work of a vehicle according to EU 2001/116.

NOTE 1 The EU bodywork type (two printable characters) is a refinement of ISO 3833.

NOTE 2 The EU bodywork type is also used for the designation of the special purpose vehicles as defined in UNECE 1999 (see EU2001/116).

5.5.7 Number of passenger, axles and mass types

```
NumberOfSeats                    ::= INTEGER                    -- including the driver seat
NumberOfStandingPlaces           ::= INTEGER
MaxNumberOfPassengers            ::= INTEGER                    -- including the driver
UnladenWeight                    ::= Kilogram
MaxDesignLadenMass               ::= Kilogram
MaxAuthorizedLadenMass           ::= Kilogram
MaxAuthorizedTrainMass           ::= Kilogram
MaxAuthorizedPayload             ::= Kilogram

NumberOfAxles                    ::= INTEGER
AuthorizedAxleLadenMass          ::= SEQUENCE OF Kilogram  -- from front to rear axle
MaxTowableMassBrakedTrailer      ::= Kilogram
MaxTowableMassUnbrakedTrailer ::= Kilogram
```

Unless specified otherwise, the definition and assignment of the values for the types defined in this subclause are at the discretion of the registration authority and/or local legislation (see 5.5.1).

The NumberOfSeats type shall be used to specify the number of seats, including the driver seat.

The NumberOfStandingPlaces type shall be used to specify the number of standing places.

The MaxNumberOfPassenger type shall be used to specify the maximum permissible number of passengers (including the driver) that may use a vehicle.

The UnladenWeight type shall be used to specify the nominal unladen mass of a vehicle with bodywork in kilograms.

Unless local legislation specifies otherwise, ISO 1176 term 4.6 (complete vehicle kerb mass) applies.

The MaxDesignLadenMass type shall be used to specify the maximum technically permissible total mass of a vehicle including payload (but excluding the weight of trailers) in kilograms.

Unless local legislation specifies otherwise, ISO 1176 term 4.7 (maximum design total mass) applies.

The MaxAuthorizedLadenMass type shall be used to specify the maximum permissible total mass of a vehicle including payload (but excluding the mass of trailers) in kilograms when in service in the jurisdiction of the registration authority.

Unless local legislation specifies otherwise, ISO 1176 term 4.8 (maximum authorized total mass) applies.

The MaxAuthorizedTrainMass type shall be used to specify the maximum permissible total mass in kilograms of a whole vehicle, including payload (and including trailers and the payload of trailers) when in service in the jurisdiction of the registration authority.

Unless local legislation specifies otherwise, ISO 1176 term 4.19 (maximum authorized mass of vehicle combination) applies.

The MaxAuthorizedPayload type shall be used to specify the maximum permissible payload of a vehicle (but excluding the payload of trailers) in kilograms.

Unless local legislation specifies otherwise, ISO 1176 term 4.10 (maximum authorized pay mass) applies.

The NumberOfAxles type shall be used to specify the number of axles of a vehicle (including lifted axles).

The AuthorizedAxleLadenMass type shall be used to specify the maximum laden mass on each axle in kilograms.

The first value in the list shall specify the maximum laden mass on the front axle, the second on the axle next to the front axle (including lifted axles) and so on.

Unless local legislation specifies otherwise, ISO 1176 term 4.11 (maximum design axle load) applies.

The MaxTowebleMassBrakedTrailer type shall be used to specify the technically permissible maximum braked towable mass of a trailer in kilograms.

Unless local legislation specifies otherwise, ISO 1176 term 4.18 (maximum design towed mass) applies.

The MaxTowebleMassUnbrakedTrailer type shall be used to specify the technically permissible maximum unbraked towable mass of a trailer in kilograms.

Unless local legislation specifies otherwise, ISO 1176 term 4.18 (maximum design towed mass) applies.

5.5.8 Engine and power source types

```
EngineId  ::= PrintableString (SIZE (1..60))
PrimeEngineType                 ::= Text60
EnginePowerSources              ::= SEQUENCE OF PowerSource   -- primary source first
PrimePowerSource                ::= PowerSource
EngineMaxNetPower               ::= Kilowatt
EngineDisplacement              ::= Millilitre
RatedEngineSpeed                ::= PerMinute
PowerWeightRatio                ::= KilowattPerKilogram
MaxSpeed                        ::= KilometrePerHour
FuelTanksCapacity               ::= Litre

PowerSource ::= ENUMERATED {
        notPowered,             humanPowered,
        animalPowered,          unleadedPetrol,
        leadedPatrol,           diesel,
        bioDiesel,              alcohol,
        otherFuel,              lpg,
        hydrogen,               externalElectricPower,
        battery,                sun,
        …,                      other
        }
```

Unless specified otherwise, the definition and assignment of the values for the types defined in this subclause are at the discretion of the registration authority and/or local legislation (see 5.5.1).

The EngineId type shall be used to specify the engine identification number.

The PrimeEngineType type shall be used to specify type of the prime engine of a vehicle as assigned by the manufacturer.

The EnginePowerSources type shall be used to specify the power source(s) of a vehicle (see below). In case of a hybrid vehicle, the primary power source is mentioned first.

The PrimePowerSource type shall be used to specify the power source of the prime engine.

The EngineMaxNetPower type shall be used to specify the nominal (maximum net) power of the engine in kW.

The EngineDisplacement type shall be used to specify the displacement of the engine in millilitres (cm^{-3}).

The RatedEngineSpeed type shall be used to specify the rated speed in min^{-1}.

The RowerWeightRatio type shall be used to specify the power/weight ratio of a vehicle in kW/kg.

The MaxSpeed type shall be used to specify the maximum speed of a vehicle in km/h.

The FuelTankCapacity type shall be used to specify the capacity of the fuel tank(s) in litres.

The PowerSource type shall be used to specify a power source and shall have one of the valaues: notPowered, humanPowered, animalPowered, unleadedPetrol, leadedPatrol, diesel, bioDiesel, alcohol, otherFuel, lpg, hydrogen, externalElectricPower, battery, sun, or other.

NOTE The '…' designates that the type may be still extended with other power sources at that location in new versions of this part of ISO/TS 24534.

5.5.9 Environmental components

```
StationarySoundLevel              ::= DB
EngineSpeed                       ::= PerMinute
DriveBySoundLevel                 ::= DB
EmissionCO                        ::= GpkmOrGpkw
EmissionHC                        ::= GpkmOrGpkw
EmissionNOx                       ::= GpkmOrGpkw
EmissionHCandNOx                  ::= GramPerKilometre
ParticulatesForDiesel             ::= GpkmOrGpkw
CorrectedAbsorptionCoefficient    ::= PerMinute
EmissionCO2                       ::= GramPerKilometre
CombinedFuelConsumption           ::= LitrePer100Kilometre
EnvironmentalCategory             ::= Text60

EuroType ::= ENUMERATED {non-euro, euro-1, euro-2, euro-3, euro-4, euro-5, euro-6, … }
```

Unless specified otherwise, the definition and assignment of the values for the types defined in this subclause are at the discretion of the registration authority and/or local legislation (see 5.5.1).

The StationarySoundLevel type shall be used to specify the stationary sound level of the vehicle in dB(A).

The EngineSpeed type shall be used to specify the engine speed in min^{-1}.

The DriveBySoundLevel type shall be used to specify the drive-by sound level of the vehicle in dB(A).

The EmissionCO type shall be used to specify the CO exhaust emission in g/km or g/kWh.

The EmissionHC type shall be used to specify the HC exhaust emission in g/km or g/kWh.

The EmissionNOx type shall be used to specify the NO_x exhaust emission in g/km or g/kWh.

The EmissionHCandNOx type shall be used to specify the HC plus CO_x exhaust emission in g/km.

The ParticulatesForDiesel type shall be used to specify the exhaust emission of particulates for diesel in g/km or g/kWh.

The CorrectedAbsorptionCoefficient type shall be used to specify the corrected absorption coefficient for diesel in min^{-1}.

The EmissionCO2 type shall be used to specify the CO_2 exhaust emission in g/km.

The CombinedFuelConsumption type shall be used to specify the combined fuel consumption of a vehicle in litre/100km.

The EnvironmentalCategory type shall be used to be of type EnvironmentalCategory and shall specify the environmental category of a vehicle.

The EuroType type shall be used to specify the environmental category of a vehicle conforming to directive EU 1988/77 as amended by EU 2003/522.

5.5.10 The official test data type

The type OfficalVehicleTestData shall be used for the results of an official roadworthiness test of the vehicle, e.g. a periodic motor vehicle test or an intermediate test and is defined as follows:

```
OfficialVehicleTestData ::= SEQUENCE {
        date                DATE OPTIONAL,
        location            NameAndAddress OPTIONAL,
        odometerValue       Kilometre OPTIONAL,
        emissionCO          GpkmOrGpkw OPTIONAL,
        emissionHC          GpkmOrGpkw OPTIONAL,
        remarks             Text60 OPTIONAL,
        …
        }
```

The date component, if present, shall specify the date of a vehicle test.

The location component, if present, shall be of type NameAndAddress and shall specify the name and address of the vehicle test facility.

The odometerValue component, if present, shall specify the reading of the odometer in kilometres.

The emissionCOx component, if present, shall specify the CO_x exhaust emission in g/km or g/kWh.

The emissionHC component, if present, shall specify the HC exhaust emission in g/km or g/kWh.

The remarks component, if present, shall specify any additional remarks.

5.5.11 Other types

5.5.11.1 Registration authority specific data

```
RaSpecificData ::= Text60
```

The raSpecificVehicleData component, if present, may contain any additional registration authority-specific data.

5.5.11.2 Measurement units

Measurement unit types to describe a vehicle are defined as follows:

```
GpkmOrGpkw ::= CHOICE {
        gramPerKilometre    GramPerKilometre,
        gramPerKilowatt     GramPerKilowatt
        }

Kilometre ::=               INTEGER (0..MAX)
DB        ::=               INTEGER (0..MAX)
GramPerKilometre ::=        INTEGER (0..MAX)
GramPerKilowatt ::=         INTEGER (0..MAX)
Kilogram  ::=               INTEGER (0..MAX)
KilometrePerHour ::=        INTEGER (0..MAX)
Kilowatt   ::=              INTEGER (0..MAX)
KilowattPerKilogram ::=     INTEGER (0..MAX)
Litre      ::=              INTEGER (0..MAX)
LitrePer100Kilometre ::=    INTEGER (0..MAX)
Millilitre    ::=           INTEGER (0..MAX)
Millimetre ::=              INTEGER (0..MAX)
PerMinute ::=               INTEGER (0..MAX)
```

The GpkmOrGpkw type shall be used to specify a value in grams per kilometre or in grams per kilowatt. The type shall only be used when a user may choose between either of these values.

5.5.11.3 Entity identifier

The type EntityId is used for a global identification of entities and is defined as follows:

```
EntityId ::= OBJECT IDENTIFIER
```

5.5.11.4 Name and address

The NameAndAddress type shall be used to specify a name and address and is defined as follows:

```
NameAndAddress ::= SEQUENCE {
        name                    Text60,
        otherNamesOrInitials    Text60 OPTIONAL,
        address                 Text60
        }
```

The name component shall specify the surname or business name of a natural or artificial person.

The otherNamesOrInitials component, if present, shall specify other name(s) or initial(s). The otherNamesOrInitials component shall be present where appropriate and absent if not.

The address component shall specify the address of the natural or artificial person.

NOTE The NameAndAddress type is compliant with EU 2003/127 which also specifies a maximum length of 60 characters.

5.5.11.5 Text

The Text60 type is used for textual ERI data and defined as follows:

```
Text60 ::= UTF8String (SIZE (1..60))
```

The value is a UTF8 string according to ISO 8824 not exceeding 60 characters.

5.6 Encoding

When exchanged between an ERT and an ERI reader or writer, ERI data shall be encoded according to the canonical packed encoding rules (CANONICAL-PER) ALIGNED variant as defined in ISO 8825-2.

Annex A
(normative)

ASN.1 Module

NOTE This clause can as a whole be converted to simple text and then be compiled. It therefore contains no additional clause headers and titles.

-- VEHICLE DATA MODULE --

```
ElectronicRegistrationIdentificationVehicleDataModule
{iso(1) standard(0) iso24534 (24534) vehicleData (1) version (0)}
DEFINITIONS AUTOMATIC TAGS ::= BEGIN

-- Electronic Registration Identification (ERI)- Vehicle Data

-- EXPORTS  everything;

IMPORTS
        CS4, CS5                        FROM AVIAEINumberingAndDataStructures;

-- Vehicle Identifier

VehicleId ::= CHOICE {
        vin                             VIN,                        -- preferred choice
        raSpecificVehicleId             RaSpecificVehicleId,
        …
        }

VIN ::= CS5

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

-- ERI data

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


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

-- Additional ERI registration data

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                       DriveBySoundLevel 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
        }
```

-- *Administrative data*

```
RegistrationAuthority           ::= EntityId
VehicleIdStatus                 ::= Text60
DateOfFirstRegistration         ::= DATE
DateOfRegistration              ::= DATE
ValidThru                       ::= DATE
ChassisNumber                   ::= PrintableString (SIZE (1..23)) -- incl. 3 WMI characters
RegistrationNumber              ::= CS4
```

-- *Vehicle type*

```
VehicleMake                     ::= Text60
VehicleType                     ::= Text60
VehicleTypeStatus               ::= Text60
CommercialDescription           ::= Text60
TypeApprovalNumber              ::= PrintableString (SIZE (1..60))
VehicleCategory                 ::= Text60
VehicleTaxCategory              ::= Text60
RaSpecificVehicleClass1         ::= Text60
RaSpecificVehicleClass2         ::= Text60
RaSpecificVehicleClass3         ::= Text60
VehicleUse                      ::= Text60
PrivateUse                      ::= BOOLEAN             -- False = commercial use
VehicleColour                   ::= Text60

EuVehicleCategoryCode ::= CHOICE {
        euVehicleCategoryL      EuVehicleCategoryL,   -- conforms to EU 2002/24 and UNECE 1999
        euVehicleCategoryM      EuVehicleCategoryM,   -- conforms to EU 2001/116 and UNECE 1999
        euVehicleCategoryN      EuVehicleCategoryN,   -- conforms to EU 2001/116 and UNECE 1999
        euVehicleCategoryO      EuVehicleCategoryO,   -- conforms to EU 2001/116 and UNECE 1999
        euVehilcleCategoryT     NULL,    -- conforms to UNECE 1999
        euVehilcleCategoryG     NULL     -- conforms to EU 2001/116 and UNECE 1999
        }

EuVehicleCategoryL ::= ENUMERATED {l1, l2, l3, l4, l5, l6, l7}

EuVehicleCategoryM ::= ENUMERATED {m1, m2, m3}

EuVehicleCategoryN ::= ENUMERATED {n1, n2, n3}

EuVehicleCategoryO ::= ENUMERATED {o1, o2, o3, o4}
```

-- *Vehicle shape*

```
VehicleLength                   ::= Millimetre
VehicleWidth                    ::= Millimetre
VehicleHeight                   ::= Millimetre
Wheelbase                       ::= Millimetre
```

```
VehicleBodyShape                    ::= Text60
EuBodyWorkType                      ::= PrintableString (SIZE (2))   -- conforms to EU 2001/116

Iso3833VehicleType ::= ENUMERATED {
        passengerCar,               -- term No 3.1.1
        saloon,                     -- term No 3.1.1.1 (sedan)
        convertibleSaloon,          -- term No 3.1.1.2
        pullmanSaloon,              -- term No 3.1.1.3
        stationWagon,               -- term No 3.1.1.4
        truckStationWagon,          -- term No 3.1.1.4.1
        coupe,                      -- term No 3.1.1.5 (coupé)
        convertible,                -- term No 3.1.1.6 (open tourer, roadstar, spider)
        multipurposePassengerCar,   -- term No 3.1.1.7
        forwardControlPassengerCar, -- term No 3.1.1.8
        specialPassengerCar,        -- term No 3.1.1.9
        bus,                        -- term No 3.1.2
        minibus,                    -- term No 3.1.2.1
        urbanBus,                   -- term No 3.1.2.2
        interurbanCoach,            -- term No 3.1.2.3
        longDistanceCoach,          -- term No 3.1.2.4
        articulatedBus,             -- term No 3.1.2.5
        trolleyBus,                 -- term No 3.1.2.6
        specialBus,                 -- term No 3.1.2.7
        commercialVehicle,          -- term No 3.1.3
        specialCommercialVehicle,   -- term No 3.1.3.1
        specialVehicle,             -- term No 3.1.4
        trailingTowingVehicle,      -- term No 3.1.5 (draw-bar tractor)
        semiTrailerTowingVehicle,   -- term No 3.1.6 (fifth wheel tractor)
        trailer,                    -- term No 3.2.1
        busTrailer,                 -- term No 3.2.1.1
        generalPurposeTrailer,      -- term No 3.2.1.2
        caravan,                    -- term No 3.2.1.3
        specialTrailer,             -- term No 3.2.1.4
        semiTrailer,                -- term No 3.2.2
        busSemiTrailer,             -- term No 3.2.2.1
        generalPurposeSemiTrailer,  -- term No 3.2.2.2
        specialSemiTrailer,         -- term No 3.2.2.3
        roadTrain,                  -- term No 3.3.1
        passengerRoadTrain,         -- term No 3.3.2
        articulatedRoadTrain,       -- term No 3.3.3
        doubleRoadTrain,            -- term No 3.3.4
        compositeRoadTrain,         -- term No 3.3.5
        specialRoadTrain,           -- term No 3.3.6
        moped,                      -- term No 3.4
        motorCycle                  -- term No 3.5
        }

-- Vehicle number of passengers, axles, and mass
NumberOfSeats                       ::= INTEGER                  -- including the driver seat
NumberOfStandingPlaces              ::= INTEGER
MaxNumberOfPassengers               ::= INTEGER                  -- including the driver
UnladenWeight                       ::= Kilogram
MaxDesignLadenMass                  ::= Kilogram
MaxAuthorizedLadenMass              ::= Kilogram
MaxAuthorizedTrainMass              ::= Kilogram
MaxAuthorizedPayload                ::= Kilogram

NumberOfAxles                       ::= INTEGER
AuthorizedAxleLadenMass             ::= SEQUENCE OF Kilogram  -- from front to rear axle
MaxTowableMassBrakedTrailer         ::= Kilogram
MaxTowableMassUnbrakedTrailer       ::= Kilogram
```

```
-- Vehicle engine and power source
EngineId  ::= PrintableString (SIZE (1..60))
PrimeEngineType                 ::= Text60
EnginePowerSources              ::= SEQUENCE OF PowerSource     -- primary source first
PrimePowerSource                ::= PowerSource
EngineMaxNetPower               ::= Kilowatt
EngineDisplacement              ::= Millilitre
RatedEngineSpeed                ::= PerMinute
PowerWeightRatio                ::= KilowattPerKilogram
MaxSpeed                        ::= KilometrePerHour
FuelTanksCapacity               ::= Litre

PowerSource ::= ENUMERATED {
        notPowered,             humanPowered,
        animalPowered,          unleadedPetrol,
        leadedPatrol,           diesel,
        bioDiesel,              alcohol,
        otherFuel,              lpg,
        hydrogen,               externalElectricPower,
        battery,                sun,
        …,                      other
        }

-- Environmental characteristics
StationarySoundLevel            ::= DB
EngineSpeed                     ::= PerMinute
DriveBySoundLevel               ::= DB
EmissionCO                      ::= GpkmOrGpkw
EmissionHC                      ::= GpkmOrGpkw
EmissionNOx                     ::= GpkmOrGpkw
EmissionHCandNOx                ::= GramPerKilometre
ParticulatesForDiesel           ::= GpkmOrGpkw
CorrectedAbsorptionCoefficient  ::= PerMinute
EmissionCO2                     ::= GramPerKilometre
CombinedFuelConsumption         ::= LitrePer100Kilometre
EnvironmentalCategory           ::= Text60

EuroType ::= ENUMERATED {non-euro, euro-1, euro-2, euro-3, euro-4, euro-5, euro-6, … }

-- Others

OfficialVehicleTestData ::= SEQUENCE {
        date                    DATE OPTIONAL,
        location                NameAndAddress OPTIONAL,
        odometerValue           Kilometre OPTIONAL,
        emissionCO              GpkmOrGpkw OPTIONAL,
        emissionHC              GpkmOrGpkw OPTIONAL,
        remarks                 Text60 OPTIONAL,
        …
        }

RaSpecificData ::= Text60

--Measurement units

GpkmOrGpkw ::= CHOICE {
        gramPerKilometre        GramPerKilometre,
        gramPerKilowatt         GramPerKilowatt
        }
```