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Development of the Unique Rail Vehicle Identification System:

Best practices in, and national requirements for, rolling stock marking

European Vehicle Register (EVR) and EU vehicle authorisation

Submitted by European Union Agency for Railways (EUAR)

I. Introduction

1. To ensure traceability and history of rail vehicles operated in EU Member states, vehicles previously registered in the national registers, will have to be, as from 16 June 2021, registered under a European vehicle number in the European Vehicle Register (EVR) using a European Vehicle Number (EVN).
2. This briefing note is intended to provide information on the purpose, underlying processes and technical arrangements for the EVR/EVN.

II. European Vehicle Register (EVR)

3. Vehicles are currently registered in national vehicle registers and each EU Member State manages its national vehicle register. In order to improve the usability of national vehicle registers and to avoid redundant registration of one vehicle in several vehicle registers, including vehicle registers of third countries connected to the Virtual Vehicle Register, an EU wide register is to be put in place.

The [European Vehicle Register](#) (EVR) is a centralised register that will provide a harmonised interface to all users for the consultation, registration of vehicle and data management. It is currently being developed by the European Union Agency for Railways (EUAR), which will make it operational by 16 June 2021 in accordance with Article 47(5) of Directive (EU) 2016/797. It will eventually supersede the national registers of EU MSs currently in place, by 16 June 2024 at the latest.

The specification for the EVR has been published as a Commission Implementing Decision ([EU\) 2018/1614](#)¹ (EVR Decision).

Whereas a number of entities with read rights have been defined, a single registration entity independent of any railway undertaking responsible for the processing of the applications and updating of data in the European Vehicle Register in relation to vehicles registered in that Member State has been designated by all individual Member States.

4. A number of general rules applies for the registration in EVR. Among them:

- i) A vehicle, after the authorisation for placing on the market and before being operated, shall be registered in the EVR at the request of the keeper. The keeper shall fill in the e-form and submit the application for registration to one Member State of its choice within the area of use. At the request of the applicant or keeper, the Member State chosen for registering the vehicle shall offer procedures for the pre-reservation of a vehicle number or a range of vehicle numbers.

- ii) For a given vehicle, only one valid registration may exist in the EVR. A vehicle without a valid registration may not be operated.

- iii) Upon registration, the vehicle is assigned a European vehicle number (EVN) by the registration entity in the registering Member State.

- iv) The EVN may be changed in two specific cases: when a vehicle's interoperability capability changes and when the vehicle keeper wishes to register the vehicle in another Member States.

- v) In case of vehicles entering the Union rail system from third countries and registered in a vehicle register not in conformity with Decision (EU) 2018/1614 or not connected to the EVR, the keeper shall submit the

¹ Commission Implementing Decision (EU) 2018/1614 of 25 October 2018 laying down specifications for the vehicle registers referred to in Article 47 of Directive (EU) 2016/797 (EVR Decision).

application for registration to the first Member State where the vehicle is intended to be operated on the Union rail system.

III. European vehicle number (EVN) and linked abbreviations

5. The structure of the EVN is defined in Appendix 6 of the ENV Decision. The EVN is a number consisting of 12 figures, having the following structure:

Rolling stock group	Interoperability capability and vehicle type [2 digits]	Country in which the vehicle is registered	Technical characteristics	Serial number	Check digit
		[2 digits]	[4 digits]	[3 digits]	[1 digit]
Wagons	00 to 09 10 to 19 20 to 29 30 to 39 40 to 49 80 to 89 <i>[details in part 6]</i>	01 to 99 <i>[details in part 4]</i>	0000 to 9999 <i>[details in part 9]</i>	000 to 999	0 to 9 <i>[details in part 3]</i>
Hauled passenger vehicles	50 to 59 60 to 69 70 to 79 <i>[details in part 7]</i>		0000 to 9999 <i>[details in part 10]</i>		
Tractive rolling stock and units in a trainset in fixed or pre-defined formation	90 to 99 <i>[details in part 8]</i>		0000000 to 8999999 <i>[the meaning of these figures is defined by the Member States, eventually by bilateral or multilateral agreement]</i>		

Special vehicles			9000 to 9999 <i>[details in part 11]</i>	000 to 999	
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In a given country, the 7 digits of technical characteristics and serial number are sufficient to identify uniquely a vehicle inside the groups of hauled passenger vehicles and special vehicles.

Alphabetical markings complete the number:

- (a) Abbreviation of the country in which the vehicle is registered (country codes as per the alphabetical coding system described in Appendix 4 to the 1949 convention and Article 45(4) of the [1968 UN convention on road traffic](#));
- (b) Vehicle Keeper Marking (an alphabetic code of 2-5 letters, attributed by EUAR or OTIF);
- (c) Abbreviations of the technical characteristics (interoperability and traffic ability specific codes as per EVR decision)

The check-digit is determined using the Luhn algorithm.

It is notable that the structure of the EVN allows anybody to directly identify the rolling stock group and determine its basic characteristics.

6. The general arrangements for external markings are described in the Appendix H of COMMISSION IMPLEMENTING REGULATION [\(EU\) 2019/773](#)² on the technical specification for interoperability relating to the operation and traffic management subsystem (TSI OPE). Notably, the following general arrangements for external markings apply:

- i) The capital letters and figures making up the marking inscriptions shall be at least 80 mm in height, in a sans serif font type of correspondence quality. A smaller height may only be used where there is no option but to place the marking on the sole bars.
- ii) The marking is put not higher than 2 metres above rail level.
- iii) The keeper may add, in letters of larger size than the European Vehicle Number, an own number marking (consisting generally of digits of the serial number supplemented by alphabetical coding) useful in operations. The place where the own number is marked is left to the choice of the keeper, however it shall be always be possible to distinguish easily the European Vehicle Number from the keeper's own number marking.
- iv) The marking shall be inscribed on the wagon and coach bodywork. In case of coaches with driver's cabin, locomotives, power cars and special vehicles, the European Vehicle Number is also written inside the cabin.

² COMMISSION IMPLEMENTING REGULATION (EU) 2019/773 on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union

7. Currently, there is around 1M vehicles registered in the EU Member States, using the EVN.

IV. Authorisation of vehicles operated in the EU

8. Any rail vehicle intended for operation in EU member states must be authorized according to the commonly defined procedure. Authorisation applies to vehicles and to vehicle types. A vehicle authorisation for placing on the market will always result in a vehicle type authorisation granted at the same time (when vehicle type authorisation was not previously available). A vehicle type authorisation (i.e. the design) does not necessarily require that a vehicle conforming to that type is authorised, the decision lies with the applicant.

A new vehicle type and/or vehicle must always be authorised. Where changes are made to the vehicle type and/or the vehicle, be it a change to the applicable rules sufficient to require a renewed type authorisation, a change to the design (dependent on the scale of the change) or a change to the area of use, there is a need to apply for an authorisation.

9. The application is made through the One-Stop Shop (OSS), operated by the EUAR. When the area of use is limited to one Member State the applicant chooses the authorising entity responsible for issuing the authorisation, to be either the Agency or the national safety authority for the Member State. In all cases where the authorisation is for a vehicle having an area of use covering more than one Member State the authorising entity is the Agency.

In the case of an authorisation in conformity to type, it is beneficial if the authorising entity is the same entity that issued the vehicle type authorisation.

10. There are various types of authorisations with their own specific requirements:

i) 'First authorisation' applies to a new vehicle type – including variants and versions – and where applicable, to the first vehicle of a new vehicle type.

ii) 'Renewed vehicle type authorisation' is used when the design of a vehicle type has not changed but there is a change to the applicable rules that includes a requirement for renewal of the authorisation. The scope of the authorisation is limited to the changed rules.

iii) 'Extended area of use' is required where the design of the vehicle has not changed but the area of use is extended.

iv) 'New authorisation' applies when a change has been made to an already authorised vehicle and/or vehicle type that requires authorisation. The scope of the assessment is limited to the changes.

v) 'Authorisation in conformity to type' is used for a vehicle or a series of vehicles that conform to an already authorised and valid vehicle type. The authorisation is given on the basis of a declaration of conformity to that type.

11. Whereas each authorization has its own internal identifier, the vehicle is assigned a number (EVN) by the registration entity at the moment of registration in a given EU member state.

In practice, in some cases, a pre-reserved number (e.g. future EVN) is used to identify the vehicle in the authorisation process.

V. Further considerations

12. The requirements and vehicle related legal processes established in the EU legislation use specific terminology and taxonomies for rolling stock. The Annex to this note provides a basic overview relevant in the context of the Luxembourg protocol application.

Annex: Vehicle types as defined in the EU legislation

A common glossary for vehicle types may be needed to support the identification of rail vehicles under the Luxembourg protocol. In this context, the Glossary for Transport statistics ³jointly developed by UNECE, Eurostat and ITF offers a good starting point.

The categories of vehicles and their definitions, established thereby, are broadly compatible with those established in the EU railway legislations and applied in various processes in the Member States of the European Union.

locomotive	a traction vehicle which is not designed for carrying payload and has the ability to be uncoupled from a train in normal operation
coach	a vehicle without traction designed for carrying passengers
wagon	a vehicle without traction designed for carrying freight
On Track Machine (OTM)	a vehicle designed for construction, maintenance or condition measuring of the infrastructure
shunter	traction unit designed for use only on shunting yards, stations and depots
multiple unit	a fixed formation of vehicles that can operate as a train designed for passenger traffic
tram	a vehicle designed for passenger operation on tramways (a passenger road vehicle designed to seat more than nine persons (including the driver), which is connected to electric conductors or powered by diesel engine and which is rail-borne)
tram-train	a vehicle designed for combined use on both a light-rail infrastructure and a heavy-rail infrastructure
metro vehicle	a vehicle designed for passenger operation on the metro lines, where ‘metro’ (also known as ‘subway’, ‘metropolitan railway’ or ‘underground’) lines means an electric railway for the transport of passengers with the capacity for a heavy volume of traffic and characterised by exclusive rights-of-way, multi-car trains, high speed and rapid acceleration, sophisticated signalling as well as the absence of level crossings to allow a high frequency of trains and high platform load. Metros are also characterised by closely spaced stations, normally meaning a distance of 700 to 1 200 m between the stations. ‘High speed’ refers to the comparison with trams and light rail, and means here approximately 30 to 40 km/h on shorter distances, 40 to 70 km/h on longer distances

Besides, the [EVR Decision](#), contains, in Appendix 6, Part 8, a basic taxonomy for tractive vehicles, coded as 0-9. It reflects the two main energy sources used nowadays in railway (diesel, electricity) and the operational use of vehicles. Given the innovative practices in rail transport, the share of vehicles falling under the type “0 - miscellaneous” may increase in the future.

³ UNECE, ITF, Eurostat (2019) Glossary for Transport Statistics, 5th edition