IMPLEMENTATION OF DIGITAL TACHOGRAPH SYSTEM IN EUROPEAN UNION

Marcin Rychter

Motor Transport Institute, Poland

Abstract: Tachograph belongs to On Board Recording Devices. It was initially introduced for the railroads in order to companies could better document irregularities. The inventor of the tachograph was Max Maria von Weber, an administrative official, engineer and author. The Hasler Event Recorder was introduced in the 1920s. Regrettably, the construction of analogue tachograph, an original type of tachograph used in road transport, encouraged to numerous frauds and counterfeits of social rules for drivers. For this reason the European Union has developed an inspection system, based on digital tachograph and chip cards, used for recording the data and identification of the system users. The article is the presentation of the main rules of function of the digital tachograph system, used in road transport in European Union. The document describes main legal rules introducing the digital tachograph system, foremost requirements which must be fulfilled by the producers of digital tachographs in order to get the type approval, possibility of future requirements of digital tachograph, main functions, characteristics of participant of digital tachograph system and their tools of the identification, acting and setting of authorize workshops in Poland and European Union and the accessible methods of check and calibration of digital tachographs and their description, based on Commission Regulation (EC) No 1360/2002 of 13 June 2002. Furthermore, the dissertation presents current level of implementation of digital tachograph system in EU Member States.

1. Introduction

The legal basis for the introduction of the digital tachograph system is Council Regulation (EEC) No 2135/98 of 24 September 1998, amending Regulation (EC) No 3821/85 of 20 December 1985 on recording equipment in road transport. Annex 1B of this Regulation contains the technical specification for digital tachographs.

Commission Regulation (EC) No 1360/2002 of 13 June 2002, replacing the Annex 1B, is an actual detailed technical specification for digital tachographs. In accordance with new regulations the inspection system consists of the following elements:

– a digital tachograph VU (*Vehicle Unit*), recording the driver and vehicle operation performance,

– a speed sensor, supplying the vehicle unit with relevant data concerning the vehicle speed and distance travelled,

– chip (data) cards intended for recording the data and identification of the system users.

For the conformity reasons all admitted equipment must fulfil three stages of tests:

– security test – test verifying the fulfilment of all requirements concerning the security, as listed in Annex 10 to the Commission Regulation (EC) No 1360 of 13 June 2002,

– functional test – test verifying the requirements concerning the functionality of the equipment; the tests are specified in Annex 9 to the Commission Regulation (EC) No 1360/2002 of 13 June 2002,

– interoperability test – test for verifying the abilities of a considered equipment to interoperate with other equipment; such tests are performed by only one laboratory under the supervision of the European Commission; only equipment fulfilling these two tests mentioned above can be admitted to this test.
The vehicle unit of the digital tachograph ensures the following functions:

– monitoring the insertions and withdrawals of chip cards,

– displaying and recording the data on the chip cards,

– limiting the data access for various group of users,

– measurement of time,

– measurement of displacement – the equipment records a distance travelled with accuracy of 0.1 km and stores distances travelled by a vehicle of each of last 365 days,

– measurement of speed – ranging from 0 to 220 km/h with accuracy of 0.1 km,

– monitoring and recording the driver's activities,

– monitoring the activities carried out by the workshops,

– loading the data concerning the performance of activities: (information on a place of beginning and ending the work day, information on the driver's activities being performed before inserting a card into the tachograph),

– providing the access to the information data for the transport companies,

– warning,

– monitoring and recording the data concerning the infringement of regulations,

– recording the data by the peripheral equipment.

2. Digital tachograph cards

A characteristic feature of the digital tachograph is an integration of all users of the recording equipment in road transport. The users can be classified in four groups having different rights and obligations, namely:

– driver – while being inspected the driver is requested to present the data card and/or printouts of the current week and the last day of the preceding week if he has driven a vehicle equipped with an analogue tachograph,

– control service – a personnel of the control service is equipped with a controller's data card,

– personnel of service workshops – is equipped with a workshop data card, which allows to install and adjust the settings of a given tachograph; a calibration unit is connected to the tachograph connector provided,

– personnel of transport company - is equipped with a company data card, which allows to display the data intended to be used by the fleet management systems.

3. Calibration of digital tachograph

The tachograph can be installed by the manufacturers of vehicles (it applies to the newly produced vehicles) or by the authorised workshops (if it had not been installed yet in a given vehicle or if its replacement could be required).

According to the Annex 1B provision no 243 the installed tachograph has to be activated before the vehicle, on which it is mounted, leaves the installation place.

Before commissioning the vehicle it is necessary to perform the calibration of the installed tachograph.

The calibration process includes:

– displaying the data (in case if it is not the initial calibration),

– determining the diameter of the vehicle tyre (based on the measurement),

– determining the characteristic coefficient of the vehicle,

– determining the constant of a tachograph [imp/km],

– loading the recording equipment with data,

– preparing the identification plate and placing it on a recording equipment,

– sealing with leads.

After leaving the authorised workshop the vehicle equipped with a calibrated tachograph can be used. Every two years the vehicle-tachograph set must be subjected to an inspection in the authorised workshop and to the re-calibration procedure afterwards.

The tachograph can be also sold and reused in another vehicle. Such operation requires dismounting the tachograph from the vehicle by a recognised workshop. Next the tachograph is installed in another vehicle and after a new calibration performed the vehicle can be put in operation.

After a time specified by the manufacturer the tachograph is dismounted from the vehicle by the recognised workshop and withdrawn from the exploitation.

4. Running of authorized workshops

Since the installation of the recording equipment in the vehicle up to a moment of its commissioning some actions must be done which result in the introduction of a new vehicle-tachograph set to an European digital system. According to the provisions of the European regulations (Council Regulations (EEC) Nos. 3820/85, 3821/85, 2135/85, and Commission Regulation (EC) No 1360 with Annexes) every digital tachograph before entering the system is subjected to the activation and calibration procedures. Moreover, the installed and activated vehicle-tachograph set must be periodically checked regarding its conformity with the metrological needs specified in the relevant regulations (Annex 1B to the Commission Regulation (EC) No 1360/2002). It can happen that during the operation of the recording equipment a necessity of repair or replacement, and, in an extreme case, even withdrawal of its damaged elements occurs. For these reasons a network of the professional workshops is needed, which will provide a satisfactory basis for the digital tachograph servicing.

The authorised tachograph workshop is an organizational unit approved and certified by the Member State authorised for performing the procedures and functions as follows:

– installation of the recording equipment and its activation;

– tests of the recording equipment;

– inspection of the recording equipment;

– displaying the information data (stored data of the vehicle unit);
– withdrawal of the recording equipment elements.

A basic duty of the authorised workshop is to guarantee that every vehicle-tachograph set leaving such workshop could meet the requirements specified in the Regulation (EC) No 3821/85 of 1985.

According to the Annex 1B of the Commission Regulation (EC) No 1360/2002) of 2002 an installation process is defined as an assembling the recording equipment (a vehicle unit and speed sensor with a necessary cables in the vehicle.

In reality the installation procedure consists of five stages:

– a preliminary inspection of the recording equipment;

– assembling the recording equipment;

– loading the vehicle unit memory with given values of the calibration information parameters;

– sealing with leads the places of the speed sensor installation;

– assembling the installation plate (plaque).

The preliminary inspection of the recording equipment includes:

– avisual inspection – aims at a detection of any possible mechanical defects and checks a completeness of the delivered equipment according to the manufacturer's specification;

– verifying the indication errors: concerning the distance travelled, speed value and time measurement.

In case of the digital tachograph, as distinct from the analogue one, the recording errors for: a length of distance travelled, speed and duration of driving time are not subject to verification. The brand new recording equipment is delivered to the manufacturers of vehicles authorised for servicing the inactive digital tachographs. It means that all parameters have default values. For that reason a person installing the recording equipment is obliged to perform a preliminary calibration of the tachograph – i.e. to enter the setting values and the vehicle identification data. In case these parameter values are not determined (*available*), the chain type parameters will be marked with "?", and the numerical ones with „0".

The installation is the only action when the setting the calibration data without the necessity of using the workshop data card is possible.

After completing the operations necessary for assembling the recording equipment, all connections, breaking of which can cause an undetectable interruptions in recording or data loss, should be sealed with leads.

The last stage of the tachograph installation is documenting the results, i.e. printing and assembling the so called descriptive plaque. The installation plaque must be also sealed with leads unless it is placed in a way making its removal without visible traces impossible.

The tachograph installed in the vehicle should be subject to the activation procedure before leaving the place of installation. The activation of the digital tachograph is a set of actions (operations) resulting in:

– readiness of the recording equipment for operation (i.e. recording the driver's work time performance);the functions for recording and storing the data are being activated;

– activating the tachograph safety functions.

The tachograph activation is automatically performed by the first insertion of the valid workshop data card into the card reader and entering the correct PIN code. During the activation process the matching the speed sensor and vehicle unit occurs. All actions relating to the activation procedure should be carefully performed as repeated use of an incorrect PIN can result in a permanent interlock of the workshop data card.

5. Level of implementation of digital tachograph system

Level of introducing the system of the digital tachograph, leading it, was divided into the following elements:

– issue of digital tachograph's card,

– connect to TACHOnet system,

– approved of digital tachograph workshop,

– trained and equipped control services.

States which do not issue cards in the system of digital tachographs:

– Croatia (January 2009 start to issue cards),

– Serbia,

– Kosovo,

– Cyprus.

States which do not connected to the tachonet system

– The Czech Republic,

– Denmark,

– Greece,

– Hungary (is in the test phases),

– Portugal,

– Kosovo,

– Serbia,

– Croatia,

– Cyprus.

States, which have not started methods of checking and calibrating digital tachographs:

– Greece,

– Malta (it adopted the Italian system, drivers are going to Italy to carry checking and calibrating digital tachographs),

– Kosovo,
– Serbia,

– Croatia,

– Cyprus.

Almost all states accomplished training and equipping of control officers, with the exception of:

– Greece,

– Portugal,

– Romania,

– Serbia,

– Croatia,

– Kosovo,

– Cyprus.

At present they are being led widely snitch works above introducing the system of digital tachograph in such states as Russia, Ukraine or Moldova.

Level of implementation of digital tachograophs system is presented in table 1 and in figure 1–5. They present situation of each country and connected do TACHOnet system, number of issued cars (driver, company, workshop, control), number of approval workshop in country of Europe and situation with malfunction, stolen or lost cards.

Table 1: Countries connected to TACHOnet system

Countries connected to TACHOnet system				
Austria Belgium Bulgaria Czech Republic Cyprus Greece	Estonia Finland France Germany Iceland Ireland	Italy Latvia Lithuania Lichtenstein Luxembourg Malta	Norway Poland Romania Slovak Republic	Slovenia Spain Sweden Switzerland The Nederlands UK
Countries not yet connected to TACHOnet system				
EU countries			Hungary is in test phase. Denmark is not yet involved. Portugal is in test phase.	
Non EU-AETR countries:			Andora is in test phase. Monaco is in test phase	

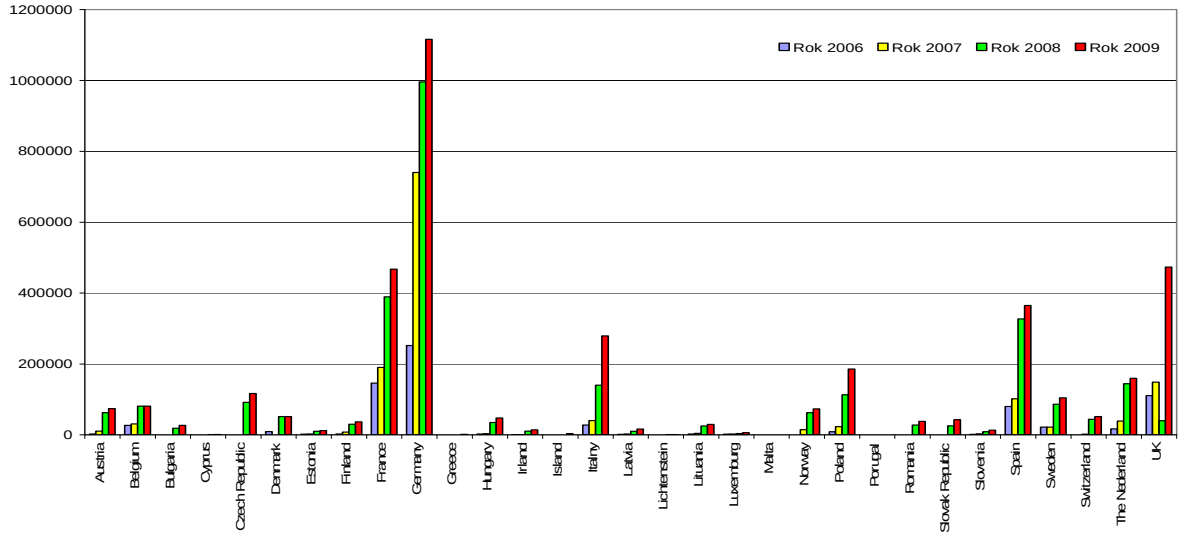

Figure 1: Number of issued driver cards in Europe in 2006–2009

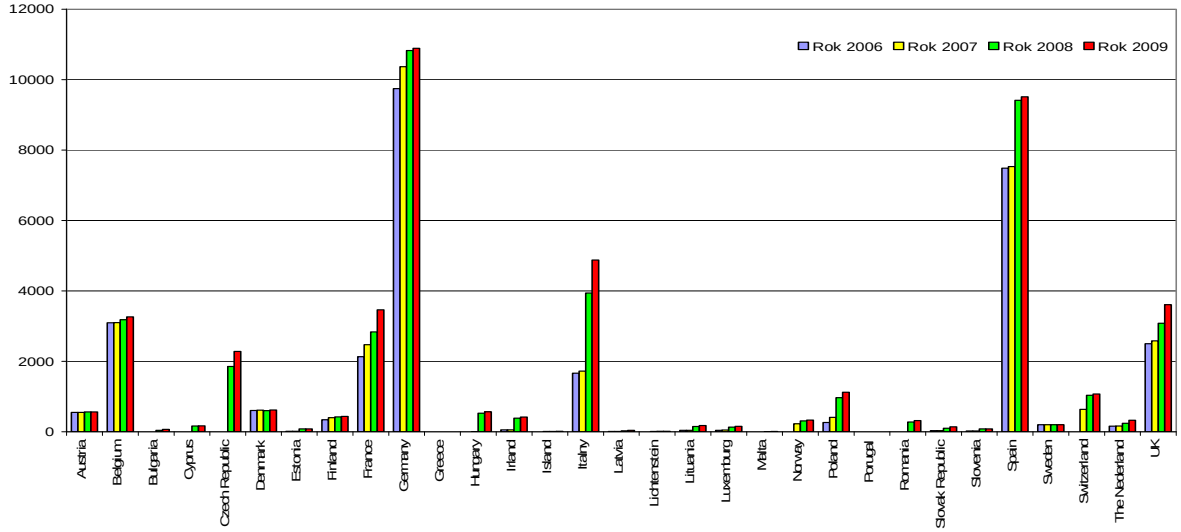

Figure 2: Number of issued control cards in Europe in 2006–2009

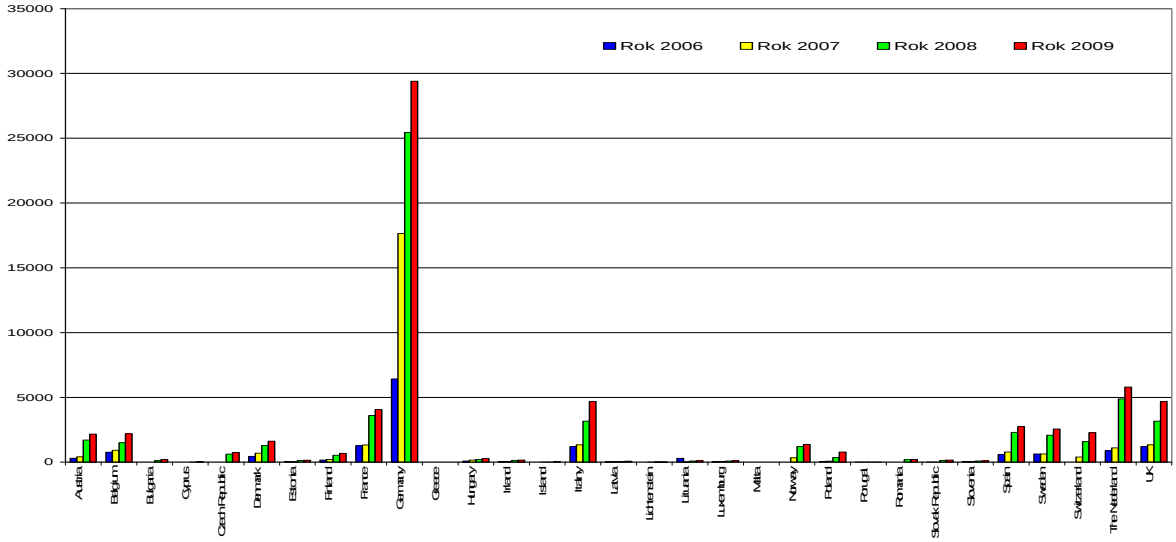

Figure 3: Number of issued workshop cards in Europe in 2006–2009

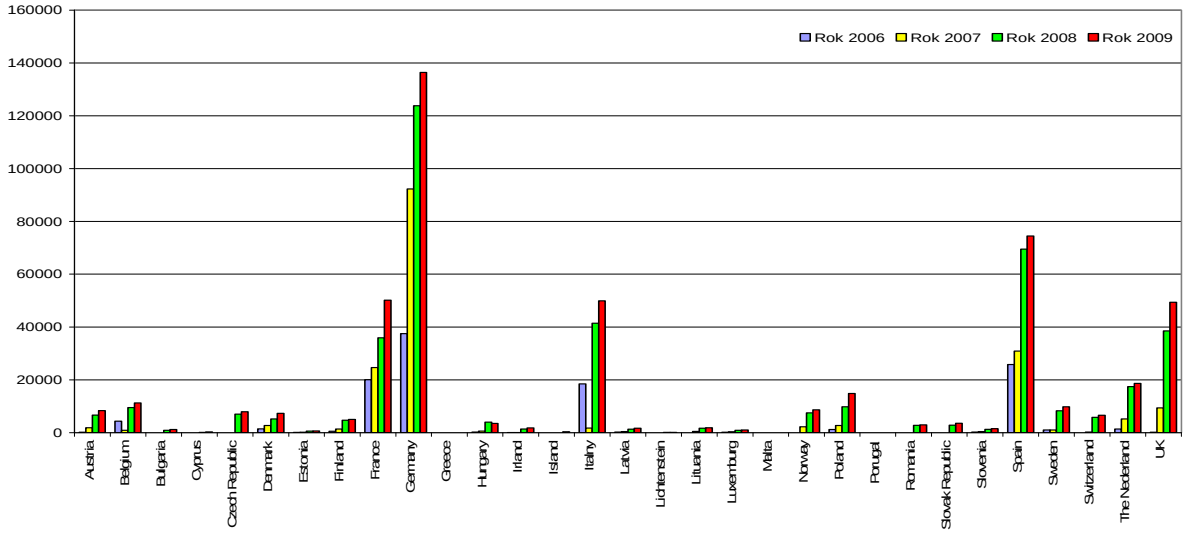

Figure 4: Number of issued company cards in Europe in 2006–2009

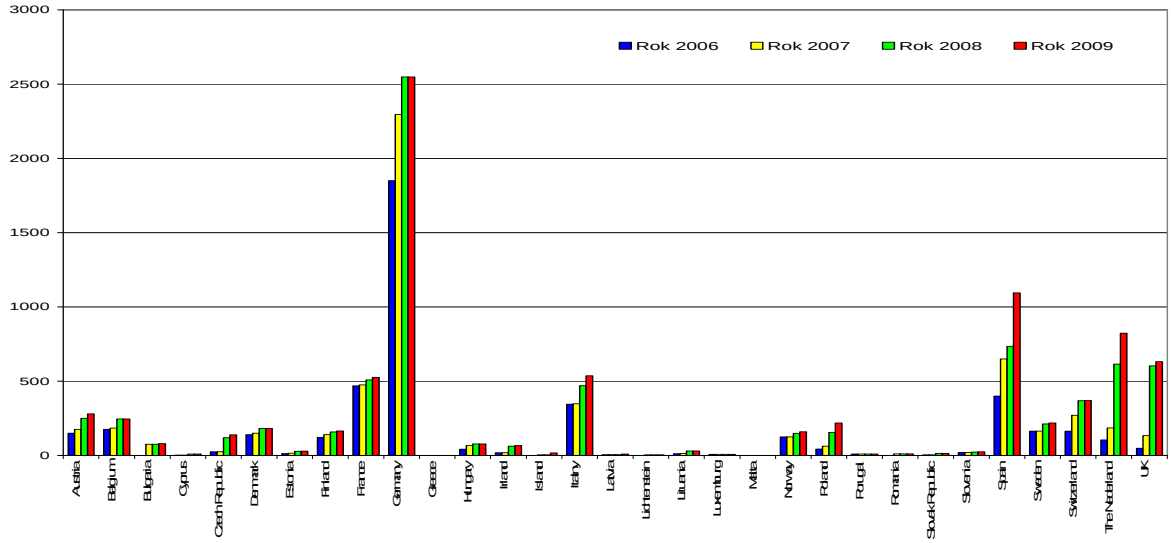

Figure 5: Number of approved workshops in Europe in 2006–2009

In Europe digital tachograph cards are issued by 32 card issuing authorities. In consecutive years of functiong of digital tachograph system the following number of cards were issued:

– in 2005 – 233087,

– in 2006 – 1278954,

— in 2007 – 1666613,

– in 2008 – 1443636,

– in 2009 are 4474211.

In all issuing digital tachograph cards were 2,1% of malfunction. In consecutive years, percentage participation of malfunctioned cards were:

– in 2005 - 0,32%,

– in 2006 - 0,42%,

– in 2007 - 0,55%,

– in 2008 are 0,85%.

Conclusion

A certain group of vehicles is excluded from this obligation (these exclusions are stated in the Regulation (EC) No 3821/85 of 20 December 1985, Article 4). Such exclusion can be considered as a certain departure of the Annex 1B provision no 243 which states. The vehicle manufacturer and the workshop are obliged to activate the installed recording equipment before a vehicle leaves a manufactury of the vehicles, where the installation took place, the most frequently.

References

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2. Act of digital tachograph system of 29 July 2005. Dz. U. 180 position 1494.

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5. Documents of EU-MIDT.