LEVEL OF IMPLEMENTATION OF DIGITAL TACHOGRAPHS SYSTEM IN EUROPEAN UNION

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Abstract

Tachograph is belonging to On Board Recording Devices. Their development has been beginning since before The Second World War. The first on board recording devices is analogue tachograph which obligatory to using to introduce in USA in 1939. This paper includes main rules of function of analogue tachograph and digital tachographs system using in road transport in European Union. According to new Commission Regulation (EC) No 1360/2002 of 13 June 2002 we present elements of an inspection system for recording data and identification of the system users. The tachograph's cards, calibration of digital tachograph, running of authorized workshops and the requirements for authorized workshops, had been specified. Article presents also possibility of future requirements of digital tachograph and authorizes workshops in Poland and Union Europe base on Commission Regulation (EC) No 1360/2002 of 13 June 2002 replacing the Annex 1B. Paper shows diagram of caliration of digital tachograph on road base, diagram of calibration of digital tachograph on work station as well as view of certificated vehicles unit – digital tachograph and view of cards in digital tachographs system in Poland. 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, which are presented in the article.

Keywords: *calibration, card digital tachograpf, system, workshop.*

1. **Introduction**

The analogue tachograph did not satisfy the relevant requirements as owing to its construction certain frauds and counterfeits concerning the drivers' real work were possible. For this reason the European Union has developed an inspection system based on the digital tachograph and chip cards used for recording the data and identification of the system users.

The legal basis for the introduction of such 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 (*approved*) 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 others equipment; such tests are performed by only one laboratory under the supervision of the European Commission (this task is given to the Joint Research Centre at Ispra); only equipment fulfilling these two tests mentioned above can be admitted to this test.

The vehicle unit (Fig. 1) 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 inspection procedures,

Fig. 1. View of certificated vehicles unit – digital tachograph

– 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,
– recording the data by the peripheral (*external*) equipment,
– monitoring and recording the data concerning the infringement of regulations.

2. Tachograph's cards

A characteristic feature of the digital tachograph is an integration of all users of the recording equipment in road transport (Fig. 2). 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 had 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 – are 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 companies– are equipped with a company data card, which allows displaying the data intended to be used by the fleet management systems.

Fig. 2. View of cards in digital tachographs system in Poland

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 a 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 wiring (*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 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. Requirement has to do with authorized workshops

The measuring stand for determining the characteristic coefficient of the vehicle (Fig. 3 – 4):

– the calibration certificate (period between the consecutive calibrations should exceed two year),
– the expert opinion certificate in case the usability of the instruments or measuring methods is not proved in another way.

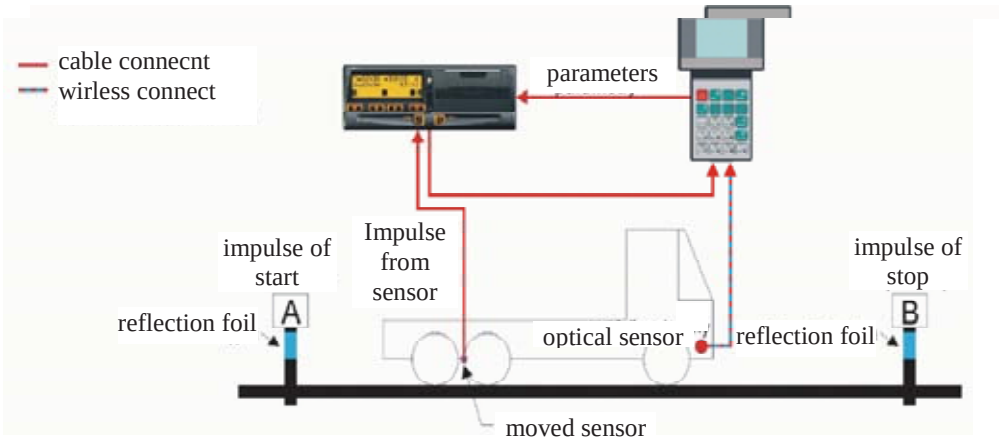

Fig. 3. Diagram of calibration of digital tachograph on road base

Level of introducing the system of the digital tachograph, leading him was divided in the following elements:

– issue digital tachograph's card,
– connected do TACHOnet system,
– approved digital tachograph's workshop,
– trained and equipped control services.

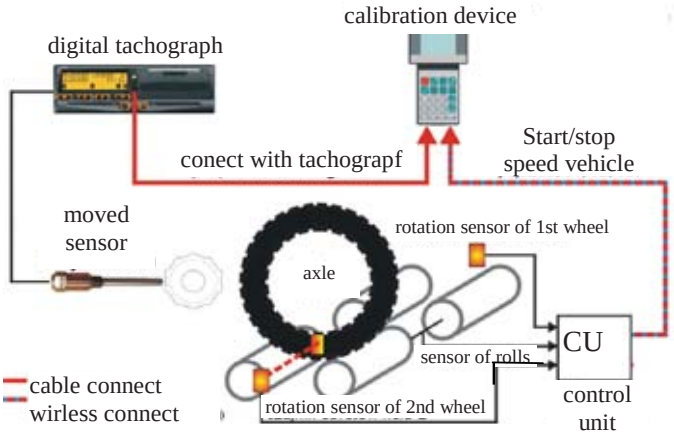

Fig. 4. Diagram of calibration of digital tachograph on work station

States which aren't still issuing cards in the system of digital tachographs:
- Croatia (January 2009 will begin issuing cards),
- Serbia,
- Kosowo (the first half of 2009 will begin issuing cards),
- Cyprus.

Satates don’t connected to the tachonet system:
- Czech Republic,
- Denmark,
- Greece,
- Hungary (are in the test phases),
- Portugal,
- Bulgaria (are in the test phase),
- Kosovo,
- Serbia,
- Croatia,
- Cyprus.

States, which didn't start methods of checking and calibrating digital tachographs:
- Greece (it passed requirements determining functioning of methods of the digital tachograph),
- Malta (he 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:
- 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.

6. 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. That the manufacturer of a vehicle or the workshop is obliged to activate the installed recording equipment before a vehicle leaves a place where installation has taken place. For that reason some procedures for different vehicle groups have been developed as follows:

1. If a vehicle is under obligation of installing the recording equipment and it is equipped with such equipment then the activation and calibration of this equipment must be performed.
2. If a vehicle is under obligation of installing the recording equipment and it is not equipped with such equipment then the installation, activation and calibration of this equipment must be performed.
3. If a vehicle is not under obligation of installing the recording equipment and it is equipped with such equipment then the activation and calibration of this equipment must be performed. Next this equipment can be switched in a mode OUT OF SCOPE.

If a vehicle is not under obligation of installing the recording equipment and it is not equipped with such equipment then the installation of such equipment is not necessary.

References

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