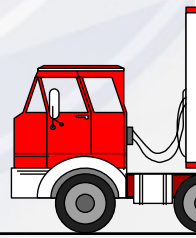



MIDT Project

Seminar in Moscow
2 and 3 March 2006






The issues to be covered:

- Type approval of the digital tachograph

- Its life cycle

- Its use

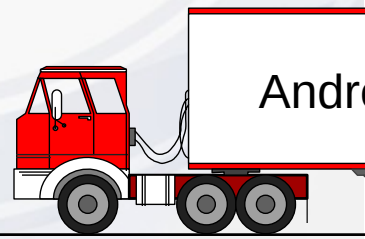
- The access to the recorded data

- The ways to check driver activities

- Card issuing

- Approval of workshops

- The presentation of the MIDT project






MAIN CHARACTERISTICS OF THE DIGITAL TACHOGRAPH SYSTEM

Andrew KELLY - UK




TYPE APPROVAL




- Digital tachographs and tachograph cards will not be type approved if they cannot work with all types of tachograph and with all makes of tachograph cards already type approved

- With analogue tachographs, the situation is different.

They are type approved with a particular type of paper disc.




Therefore, an applicant for the type approval of his product cannot be granted with one certificate, as it is the case with the analogue tachograph, but with four different certificates :

- a functionality certificate ;
- a security certificate ;
- an interoperability certificate ;
- a type approval certificate.




TYPE APPROVAL

Legal basis at EU level:

Council Regulation (EC) n° 2135/98

Art. 5:

A Member State shall grant EC component type-approval to any type of recording equipment (…), to any model memory card which conforms to the requirements of (…) Annex 1B




TYPE APPROVAL

Commission Regulation 1360/2002 (Annex 1B):

Chapter VIII
Type-approval of recording equipment and tachograph cards

General points
Security certificate
Functionality certificate
Interoperability certificate
Type approval certificate
Exceptional procedure: first interoperability tests

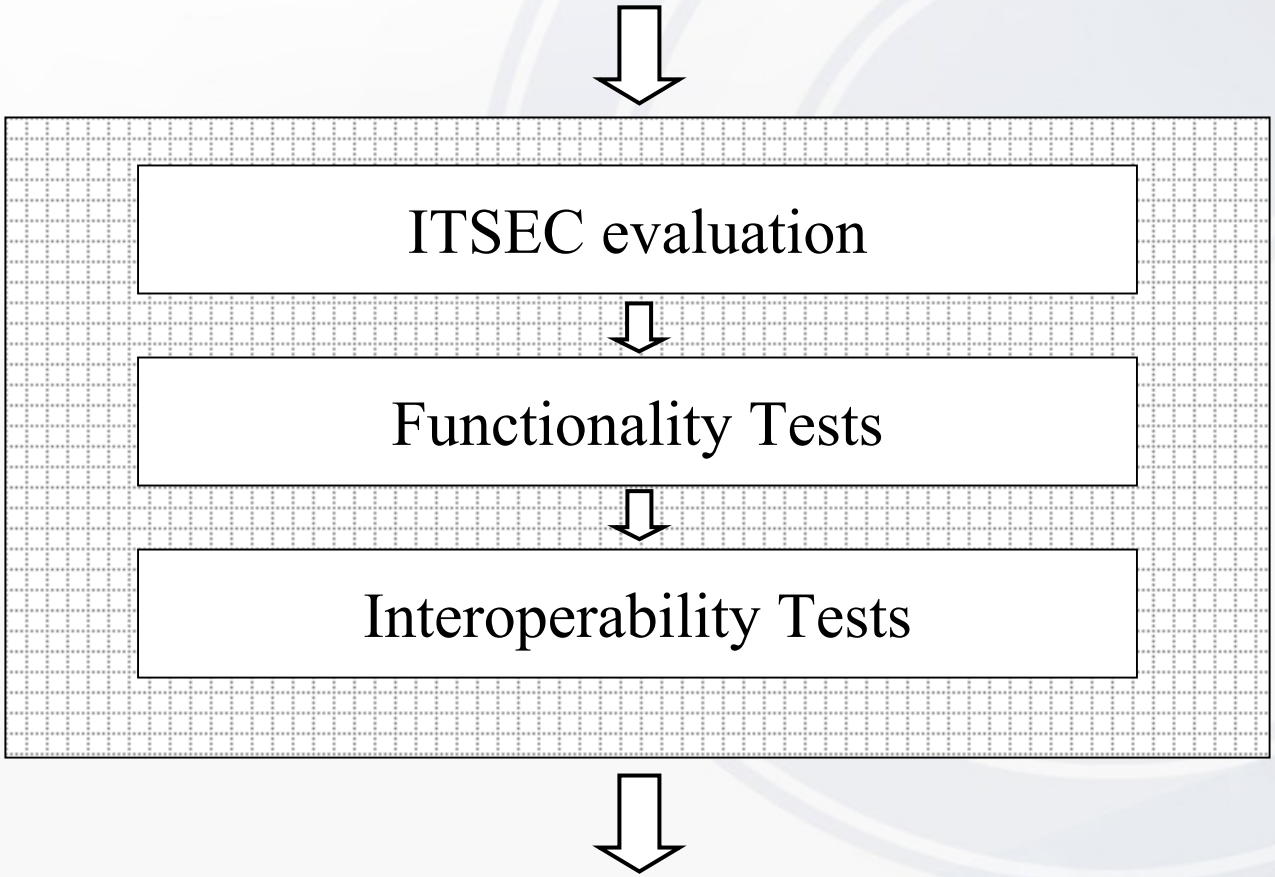


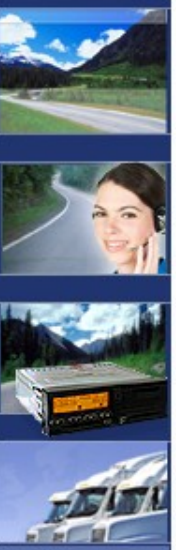

TYPE APPROVAL

Type approval tests will be same at AETR level !!!



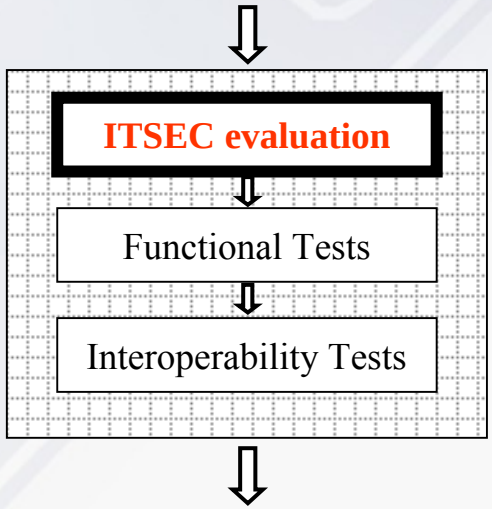

Type Approval Tests

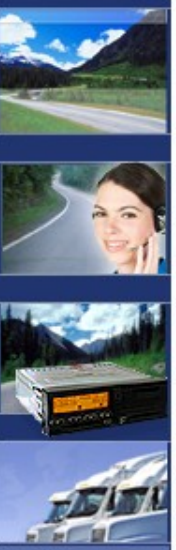




Card ITSEC evaluation: Requirements Annex I B

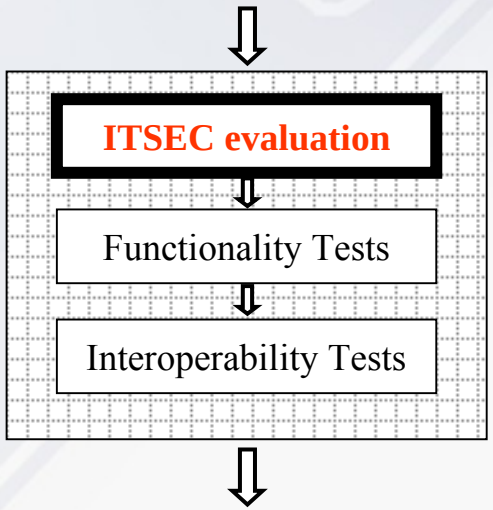
- Claimed Minimum Strength of Mechanisms
  - The minimum strength of mechanisms for the Tachograph Card is **High** as defined in ITSEC
- Level of Assurance
  - The target level of assurance for the Tachograph Card is ITSEC level **E3**





Card ITSEC evaluation: Result

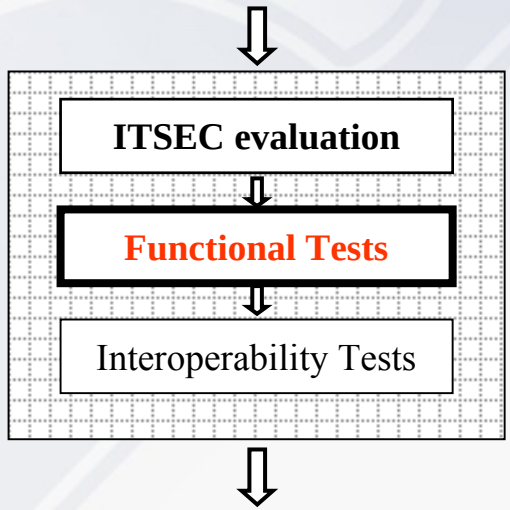
- ITSEC assure that the card manufacturers implement the cards with the specified *target levels*
- The *static characteristics* of the cards and the corresponding manufacturing process are following the requirements

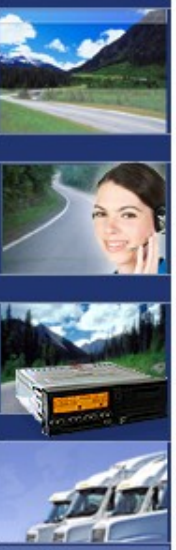





Card Functionality Tests: Overview

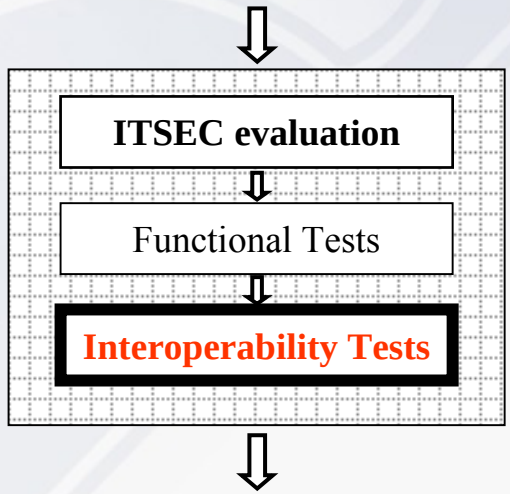
1. Administrative examination
2. Visual inspection
3. Physical tests
4. Protocol tests
5. Card structure
6. Functional tests
7. Environmental Tests





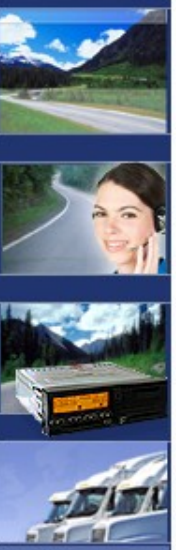
Interoperability Tests

- Appendix 9 (of Annex 1B) defines the interoperability tests :
- Mutual Authentication between VU and cards
- Read/Write Tests
  - ✓ activity scenarios
  - ✓ card downloading
  - ✓ card printout






In other words…



TYPE APPROVAL

Security evaluation

Test request

Tachograph recording equipment or smart card **manufacturer**

Accredited ITSEC Laboratory

Security tests in accordance with Appendix 10

Test result

ITSEC body

Successfully passed tests

Yes

Certificate

ITSEC certificate

TYPE APPROVAL

Functionality tests

Test request

Tachograph recording equipment or smart card **manufacturer**

(Accredited) Laboratory

Functional tests in accordance with Appendix 9

Test result

Type approval authority

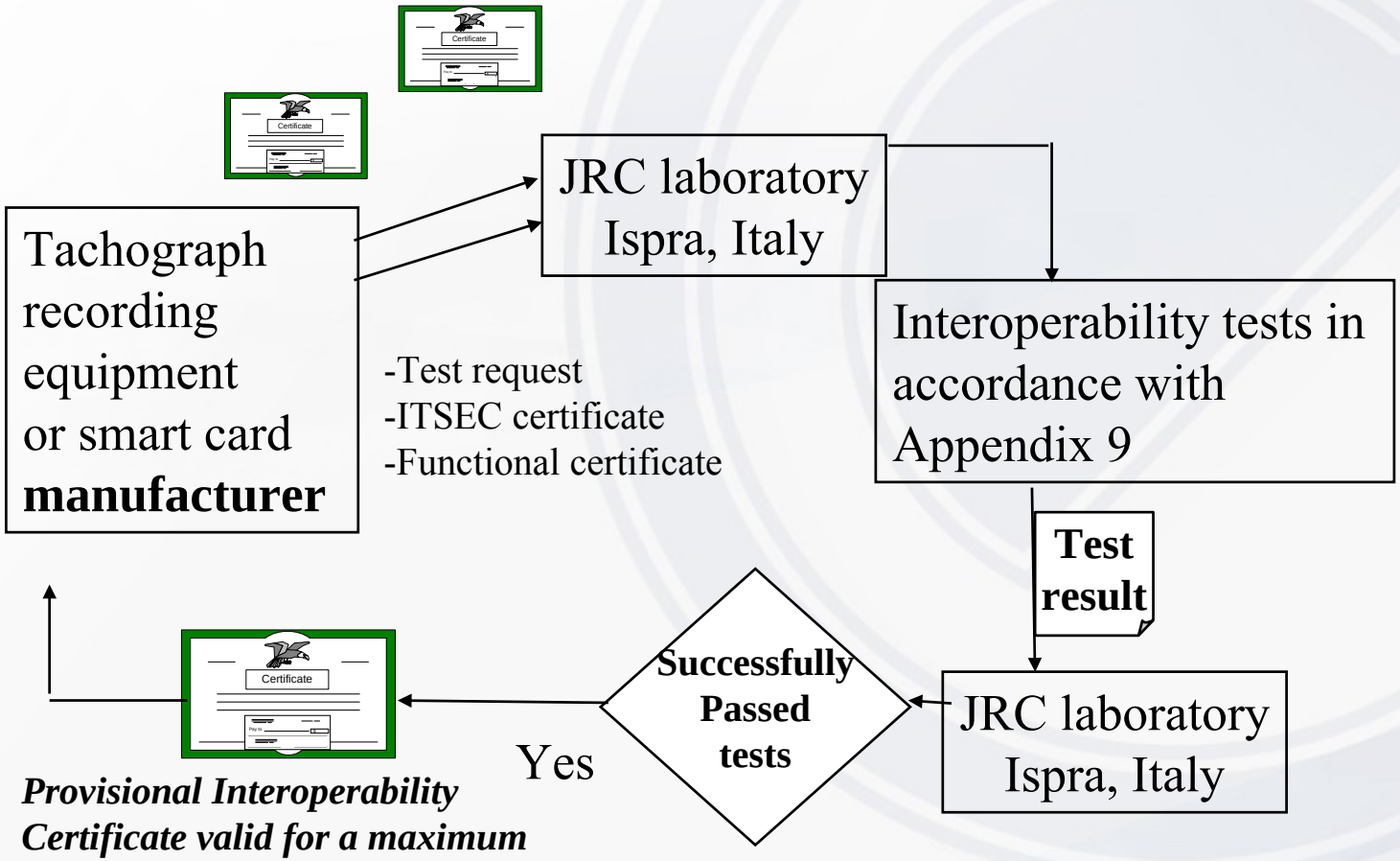
Successfully Passed tests

Yes

Functional certificate

TYPE APPROVAL

Interoperability tests






TYPE APPROVAL

EC Type Approval

MS type approval authority

- ITSEC certificate
- Functional certificate
- Definitive Interoperability certificate

Certificate of Type Approval

TYPE APPROVAL

Type Approved Tachograph equipment/cards

MS
type approval authority

Copy of Certificate
of Type Approval

JRC

Public web site
with list of type approved
recording equipment
and tachograph cards
models

http://dtc.jrc.it/pages/Root%20Certification.htm




Key points:

Digital tachographs are very secure =

Security

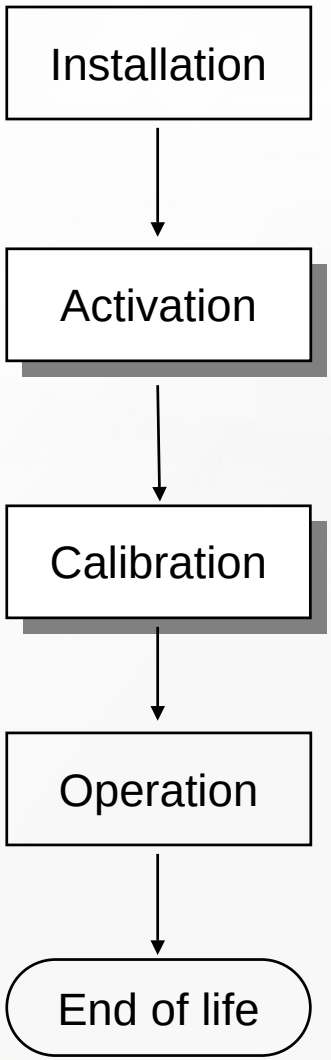
All Vehicles Units (VUs) have to work with all tachographs cards =

Interoperability




HOW TO PUT A DIGITAL TACHOGRAPH INTO SERVICE ?

New equipment*



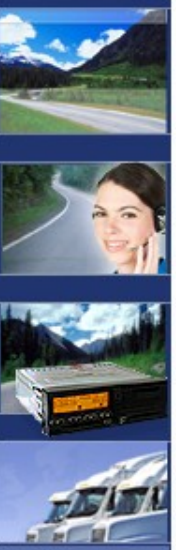
Before a new recording equipment comes into full operation, it must be installed in a vehicle, activated and calibrated.

When new equipment is installed in a new vehicle, these three operations may take place at different times and/or In different places

When new equipment is installed in an existing vehicle, these three operations are combined in one.

* meaning a new 1B tachograph as opposed to a second hand 1B tachograph

New equipment / Installation



Installation

Activation

Calibration

Operation

End of life

Mounting of the recording equipment in a vehicle.

Installation is performed by vehicle manufacturers, approved fitters or approved workshops

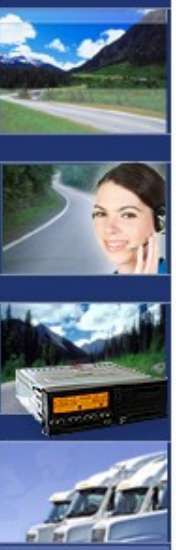
Vehicle manufacturer should pre-set, in the data memory, the vehicle parameters he knows (theoretical calibration)

Note: This does **not** require a workshop card

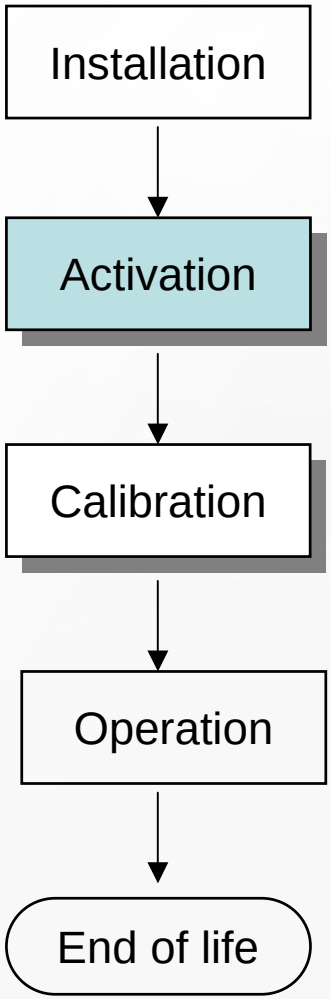
Unknown parameters (such as VRN) will default and appear as "?"

Security of signals is achieved by encryption, no mechanical seals are required **other than** securing the mechanical fitting of the sensor on the gearbox

At this stage the recording equipment accepts any vehicle parameters entered, and does not record activities, events or faults.



New equipment / Activation

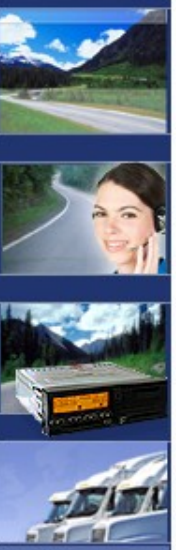


Operation of activating the security enforcing functions and the recording functions.

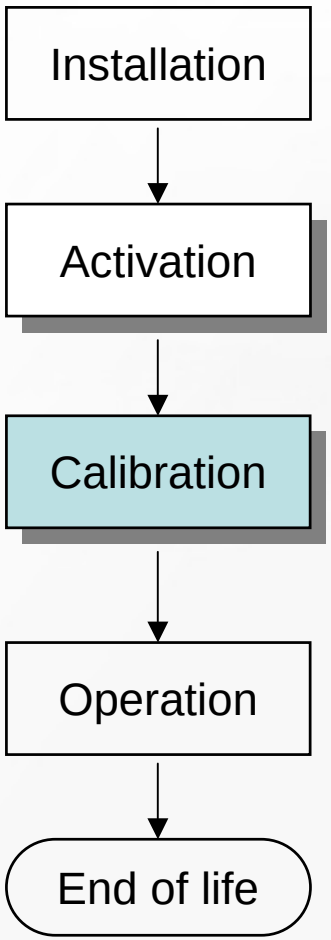
Installation of new equipment **must** be followed by activation

Activation is triggered by the first insertion of a workshop card into the Vehicle Unit

A vehicle manufacturer having installed new recording equipment must activate the same before the vehicle leaves the factory (Vehicle manufacturers therefore need workshop cards)



New equipment / Calibration



Updating / Confirming vehicle parameters held in data memory
Vehicle parameters include identification:- VIN, VRN,
Characteristics:- w, k, l, speed limiter value, odometer value, time)

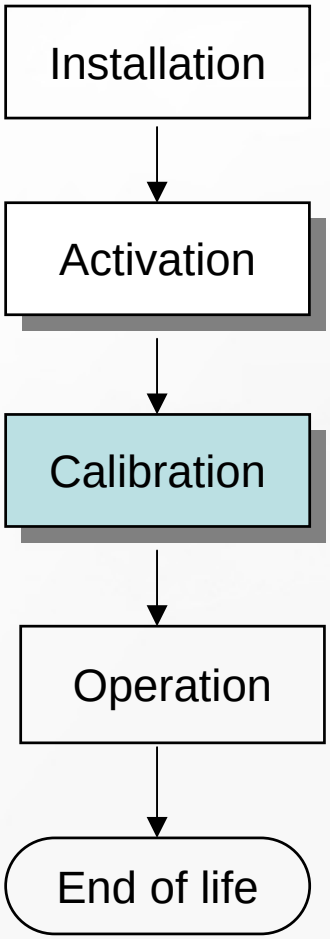
This operation is performed by approved fitters or approved workshops and requires the use of a workshop card,

This operation is mandatory for new vehicles (confirmation of pre-set parameters and entry of parameters previously unknown such as VRN) as well as for second hand vehicles,

The recording equipment is then ready for full operation.




Recording calibration data and activity



Within the memory of the recording equipment:

- Data relating to first calibration
- Data relating to last 5 calibrations*

* Only the last one of a particular calendar day if several have been performed within that day.

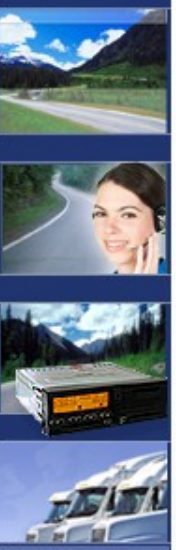
Within the memory of the workshop card:

- Data relating to last 88 calibrations
- Sequential counter of all calibrations carried performed with that card



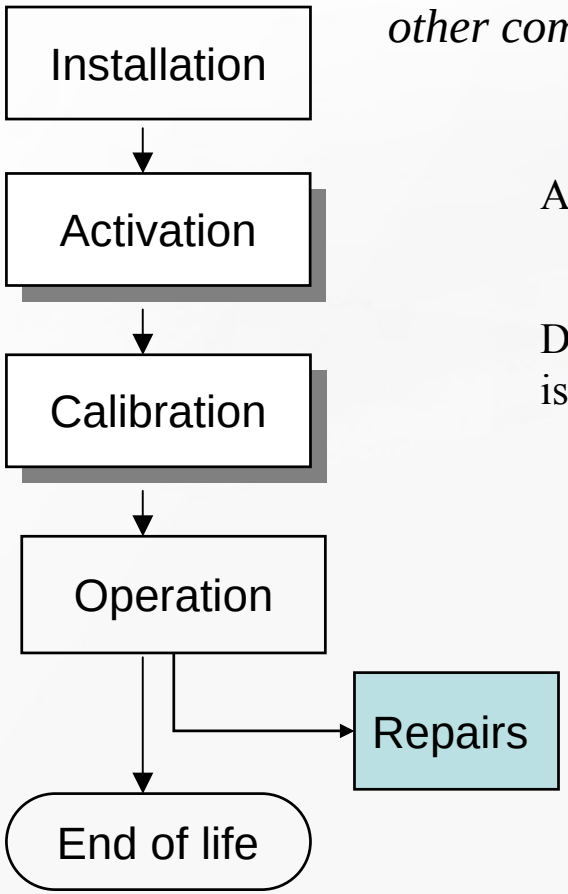

Maintenance of the digital tachograph

INSPECTIONS & DECOMMISSIONING



Repairs

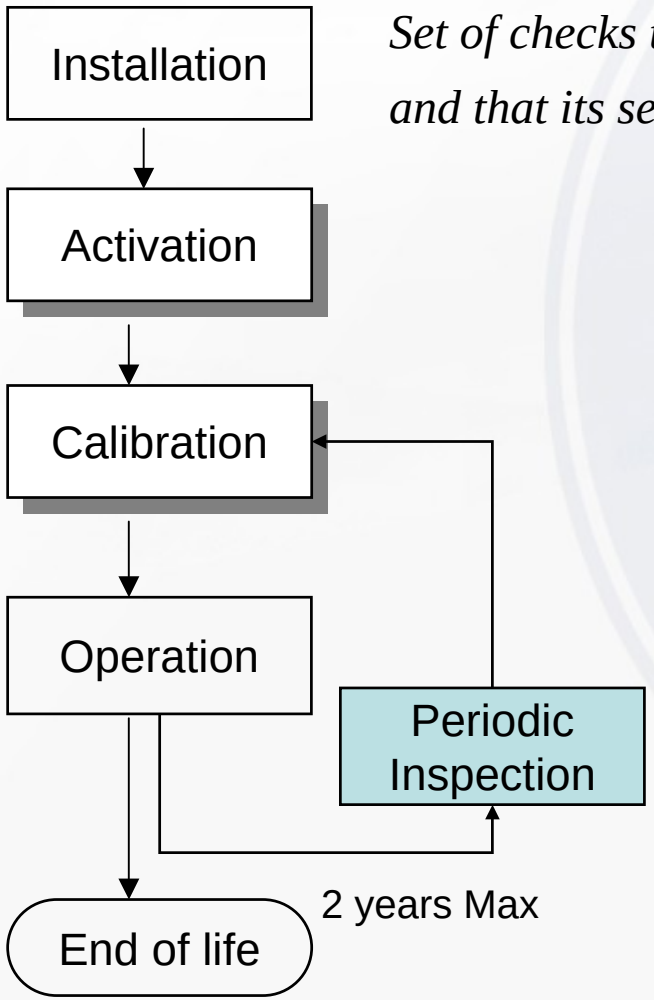
Any operation on a component of the recording equipment that requires to disconnect its power supply or to disconnect it from other components, or to open it.



Any repair of the equipment must be followed by a calibration

Downloading of the VU data may be required before any repair is commenced

Periodic Inspections



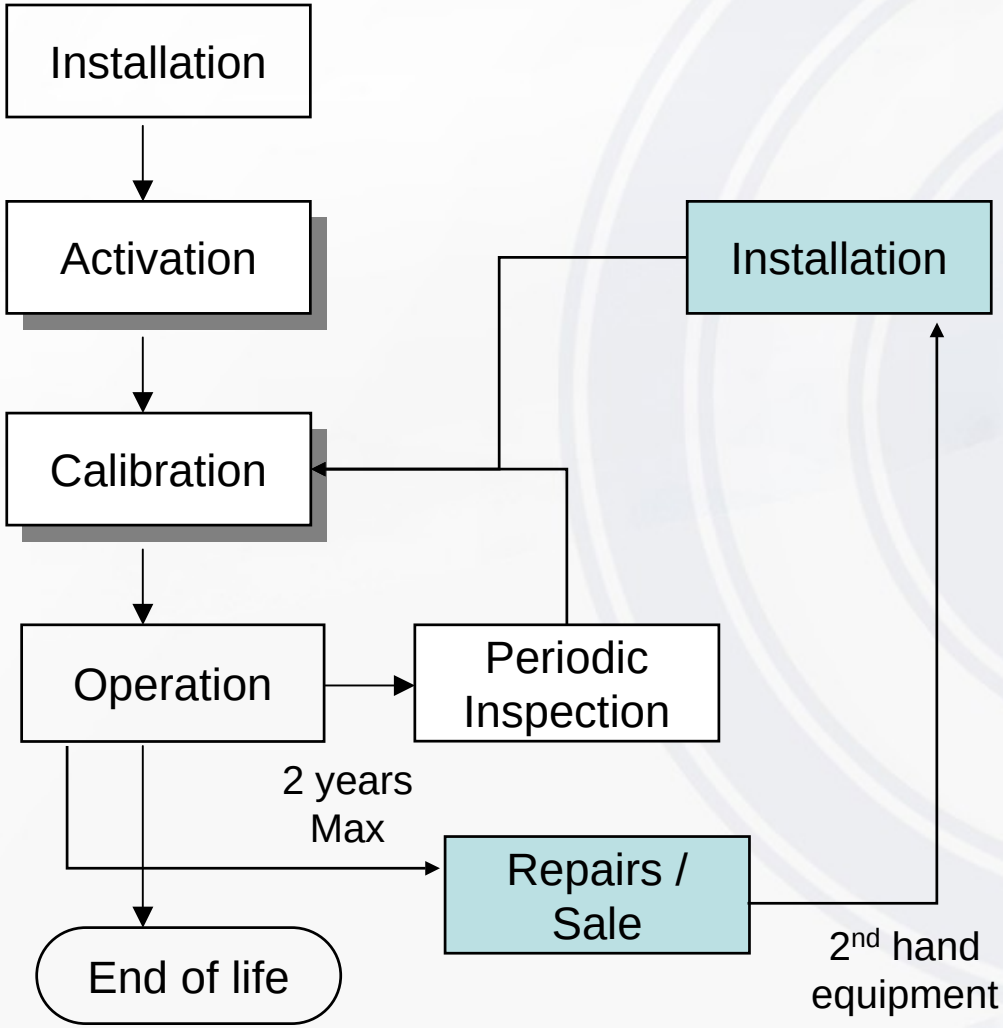
Set of checks to ensure the recording equipment works properly and that its settings correspond to the vehicle characteristics

Must be performed at least once within two years of the last inspection

Finalised by updating or confirmation of current parameters in data memory (= calibration)

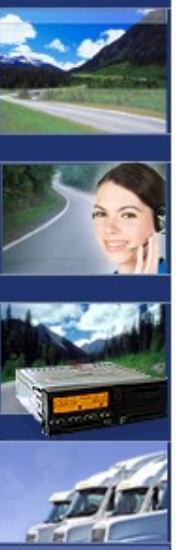
Also performed after any alteration to the vehicle parameters

2nd hand equipment



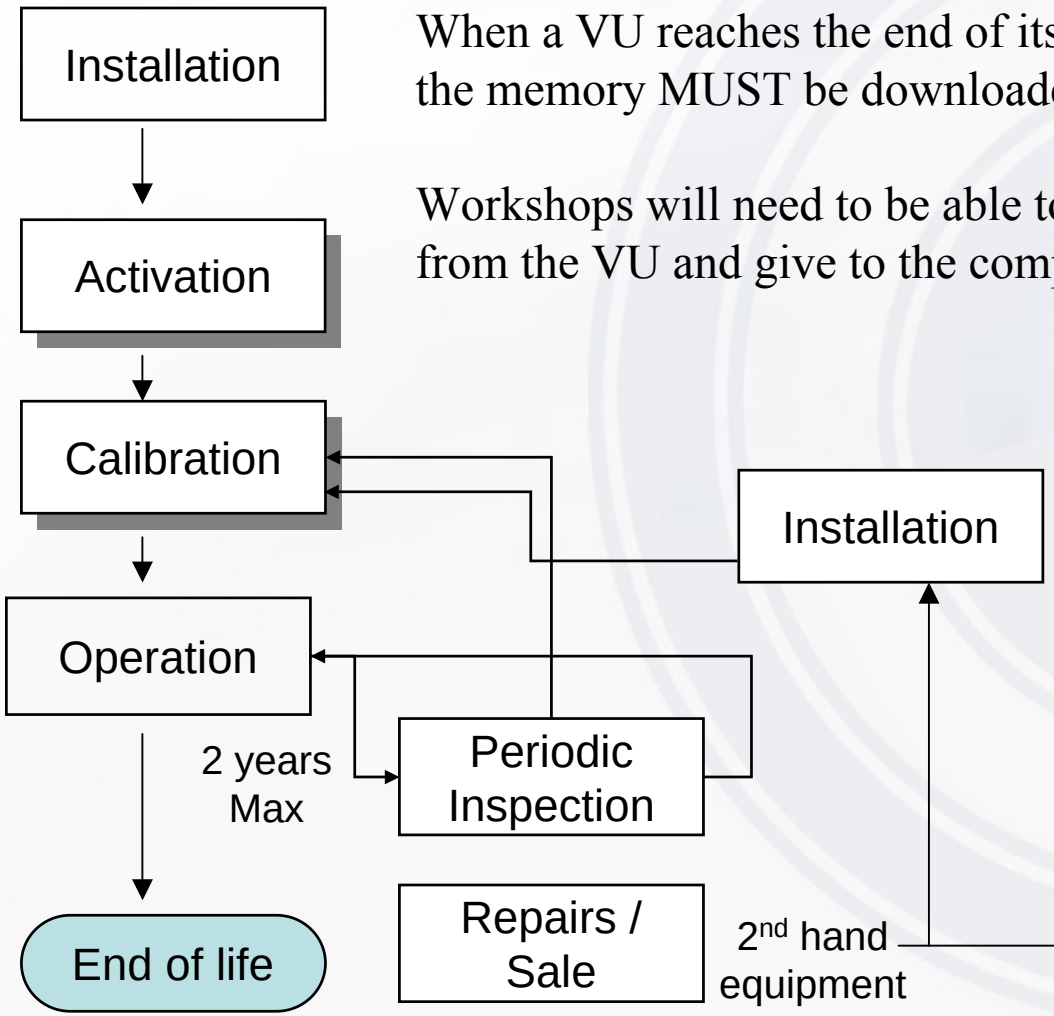
2nd hand equipment (removed from another vehicle) may be installed in any other vehicle
The equipment is still activated, and therefore needs only to be calibrated after installation.

Data download



When a VU reaches the end of its life the data contained within the memory MUST be downloaded and kept for 12 months

Workshops will need to be able to supply downloaded data from the VU and give to the company that owns the data



In event of not being able to download data, a certificate of un-downloadability will be issued [copy will be kept for 1 year minimum]




THE DIGITAL TACHOGRAPH




What are the main characteristics of the digital tachograph?

- It is totally digital
- It is tamper-proof
- It works with smart cards
- It outputs data through a printer, a downloading connector and a display
- It allows drivers to enter manually some data
- It has an average of 365 days capacity memory




It has been designed in such a way that the digital tachograph itself is considered as the memory of the vehicle whilst the driver card is considered as the memory of the activities performed by its holder.




DATA RECORDED




BY THE TACHOGRAPH




By the tachograph:

- concerning the vehicle: parameters, VRN and VIN

- concerning the tachograph: part number, manufacturer's name, faults

- concerning the driver: name, first names and his/her diver card number




By the tachograph :

- concerning the driving time: every driving time (if the driver does not insert his driver card in the tachograph and starts driving, driving without a driver card will be recorded)

- concerning the other drivers' activities: rest, availability and work will be recorded through manual entries in real time (mode switch)




ON THE DRIVER CARD




On the driver card:

- same information as the tachograph concerning the vehicle and the tachograph characteristics

- concerning the driving time: every driving time but nothing when the driver card is not inserted

- concerning the other drivers' activities: rest, availability and work are recorded; manual entries "*a posteriori*" in the driver card but without erasing anything already recorded




Driver activities are also recorded with other data identifying others things such as:

- their location at the start and at the end of their daily working day (entered manually by the driver)
- distances travelled through the odometer values
- speed (detailed speed and over speeding)
- events and faults (malfunctioning of the tachograph, the sensor, the card, etc…)

Data organisation V.U.




Equipment Identification
VU:
- Manufacturer Name, Address,
- Part number,
- Serial number,
- Software version,
- Date of manufacture,
- Approval number,
- Speed measurement range,
- First installation date

Sensor:
- Serial number,
- Approval number.
- First installation date

Installation/Periodic inspection
- Date and time,
- Test station identification:
  - Name, Address,
  - Card number and expiry date,
- k,
- Vehicle identification:
  - VIN, VRN & Registration country,
- Vehicle characteristics:
  - w, l, speed limit.
- Time adjustment. Old and new values

Repair

Company data locks
Date & time, In Out
Company Card number, Name, Address

Drivers identification
Per insertion/withdrawal cycle:
- Driver name, first name,
- Card number, nation, expiry date,
- Insertion date & time, slot, odometer,
- Previously used vehicle:
  - VRN & Nation
  - Withdrawal date & time,
- Withdrawal date & time, odometer.

Activity data
Per activity:
- Card inserted (Yes/No),
- Slot (Driver/Co-Driver),
- Crew (Yes/No),
- Activity code Dr/Wk/Av/Re,
- Date & time start or duration.

Location
Driver card number, date & time,
- Country, region,
- Odometer

Midnight Odometer
Date, Odometer

Speed (24 hours)
- per second

Control activity
Date & time, Control card number, Type

Events
Per event:
- Dr. and Co-Dr. Card numbers at start and end,
- Date & time start and end,
- Nb of similar events this day.

Time adjustments
Per event:
- Workshop card number,
- Date & time old and new settings;

Overspeed
- Date of last speed control,
- Date of first event and Nb of events since,

Per longest event on a day:
- Card numbers,
- Date & time start and end,
- Maximum and average speeds,
- Nb of similar events this day.

Faults
Per fault:
- Dr. and Co-Dr. card numbers at start and end,
- Date & time start, end

Download control
Last download date and time,
Company identification:Name, Card number,
Download software version.

Security elements

Data organisation - Card




Card Information
ID
Chip:
- IC serial number
- IC manufacturing reference

Manufacturer:
- Card serial number
- Card manufacturer number
- Card personaliser ID
- IC identifier

Version:
- Application (=Driver card)
- Structure_Version (= 8K)

Driver card info
- Issuing Nation
- Card Number, Repl, Index
- Issue Date
- Issuing Authority Name
- Driver Name, First names
- Driver Birth date
- Beginning of validity date
- Expiry date

Driving License
- Lic Authority Nation
- Lic Issue Number
- Lic Authority Name

Vehicles used
Per calendar day and vehicle chang
- First use date & time, odometer,
- Last use date & time, odometer,
- VRN, Nation.

Activity Data
Per calendar day:
- Date,
- Distance travelled,
- Per Activities:
  - Card inserted (Yes/No),
  - Slot (Driver/Co-Driver),
  - Crew (Yes/No),
  - Activity Code (Dr/Wk/Av/R),
  - Start time.

Location
Per daily work period begin and end:
- Date & time, Odometer,
- Country, (region).

Security elements

Events
Event code,
- Date &time begin and end,
- VRN, Nation.

Faults
Fault code,
- Date &time begin and end,
- VRN, Nation.

Control
Date & time,
- Control Card number,
- Control Type,
- VRN, Nation.



What data is available – and where?

VU

Vehicle's related data

- the tachograph
- the calibration data
- the vehicle
- the drivers
- the activities of all the drivers who drove the vehicle
- locations
- odometers
- detailed speed and over speeding
- events and faults of both the VU and the DC
- the enforcement officers/bodies and the type of control

DC

Card holder's related data

- identity of the driver
- driving license number
- the activities performed by the diver in all the vehicles he drove
- locations
- odometers
- events and faults of both the VU and the DC
- the enforcement officers/bodies and the type of control



What data is available - and where?

VU

- Equipment identification data
- Security elements
- Driver card insertion and withdrawal data
- ***Driver activity data***
- ***Places where daily work periods start and/or end***
- ***Odometer data***
- Detailed speed data
- ***Events and faults data***
- Calibration data
- Time adjustment data
- ***Control activity data***
- Company locks data
- Download activity data
- ***Specific conditions data***

DC

- Card identification data
- Card holder identification
- Driving license information
- ***Driver card holder activity data***
- ***Places where daily work periods start and/or end***
- ***Odometer data***

- ***Events and faults data***
- Vehicles used data
- Card session data
- ***Control activity data***

- ***Specific conditions data***



What data is available – and where?

VU

Examples of important data missing in the VU as far as enforcement is concerned :

- the activities performed by the driver, subject of the control, in other vehicles → see his/her driver card

- the activities performed by the driver when away from a vehicle → see eventually his/her driver card

DC

Examples of important data missing in the DC as far as enforcement is concerned :

- driving without driver card → see eventually the VU

- detailed speed




Data protection

- The digital tachograph falls under the scope of data protection rules for different reasons :

- The digital tachograph **records and stores digital data** concerning individuals (mainly drivers) as well as legal persons (transport companies and approved workshops)

See requirements 73 to 105 b of AETR Appendix 1B




Data protection

- **<u>These data are accessible</u>** in different ways, depending on whether or not tachograph cards are used, and where tachograph cards are used, and depending on the type of cards that is used (driver, company, control or workshop cards), and the mode of operation of the tachograph

See requirements 007 to 11 of the AETR Appendix 1B




Data protection

- These data are also **downloaded** and can also be **transferred** for freight and fleet management, but also for enforcement purposes

See requirements 149 to 151 of AETR Appendix 1B




Data protection

- Finally, the digital tachograph **records and stores data on tachograph cards**, to be issued to the different persons submitted to the provisions of the AETR

See requirements 108 to 112 of the AETR Appendix 1B




- Each tachograph card contains data, that are accessible in different ways regulated notably and mainly by the AETR as far as enforcement is concerned

  See requirements 194 to 212 b of the AETR Appendix 1B for the driver card

  See requirements 213 to 230 a of the AETR Appendix 1B for the workshop card

  See requirements 231 to 234 of the AETR Appendix 1B for the control card

  See requirements 235 to 238 of the AETR Appendix 1B for the company card




Data protection

- These data, their recording, their storage, the way they can be accessed, their transfer and their use come into the scope of the data protection rules (if any in the non EU-AETR Contracting Parties)

- Therefore, Contracting Parties which will have to implement the amendments to the AETR shall make sure that their implementation scheme does not contradict their data protection rules




Operational Modes
Data Read Access Rights

With his/her driver card, a driver can display, print all data related to him/herself, the other ones being “anonymous”

With his/her control card, a control officer can display, print, download ALL data,

With its company card, a company can display and print all data not locked by another company,

Without card, all data can be displayed or printed except personal identification (Names and Card numbers) which is blinded. Access limited to 8 days.




Operational Modes
Data Read Access Rights

	No Card	Driver Card	Control Card	Company Card
Print Display	All data with personal identifiers blinded	All own data + Idem No Card	All data	All data except for periods locked by other companies + Idem No Card
Download	Forbidden	Forbidden	All data	All data except for periods locked by other companies