Organisational and Software Anti-Tampering Mechanisms throughout the Testing Process

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ANTI-TAMPERING

Organisational and software anti-tampering mechanisms throughout PTI process

2014 vs 1
WHY A TECHNICAL INSPECTION?

Security

Antipollution

Transfer

Moralisation

Braking / Suspension

Direction

Park remediation

Administrative Control

Anti-Fraud

No vehicle transformation
WHICH VEHICLES FOR PTI?

- TRUCKS
  - Trucks & articulated lorries
  - Tractors

- LIGHT VEHICLES
  - Buses & Coaches
  - Trains

- 2-WHEELER
  - Motorized 2-wheelers
  - Tricycle

- PASSENGER VEHICLES
  - Taxi

- OTHER VEHICLES
  - Passenger vehicles
WHAT PTI APPLIES TO?

- Vehicle Identification
- Braking
- Direction
- Safety
- Pollution
- Lighting, Signalling
- Equipment
- Structure, Body
- Mechanical parts
- Visibility
- Taxi
- Public Transport
- Light Vehicles
- Transportation of dangerous goods
- Trucks
PTI SUPERVISION

Vehicle regulation (registration)

PTI regulation
(What: control point
How: method)

Obligation &
Periodicity, (tariff)

Authority
(State or
delegation: network)

Place: agreements,
Equipment:
Homologation

Training:
Organisation,
Base & method

Supervision
Audits
Internal/external

Archiving
recording

Report &
Follow-up
(Reparation
Second
examination)

Anti-fraud mechanisms
PTI RANGE
TEST PROCEDURE TO GET GAS ANALYSER APPROVED

- Calibration slope
- Exactitude
- Repeatability
- Stability in the time
- Influence of gas components
- Atmospheric pressure
- Procedure
- Water trap
- Hexane/Propane equivalence ratio
- HC
- Warm-up time
- Response time
- Low flow
- Leak
- Data transmission
- Test results printing
- Electromagnetic field at main supply frequency
- Electrostatic discharges
- Radiant Electromagnetic field
- Short reduction of the electric power supply
- Design file
- Protection
- Low tension security
- Discharge on the electric main supply
- Shocks and Vibrations
- Damp heat
- Dry heat
- Cold
Commissioning / service / calibration

- Metrological booklet
- Specific Equipment Procedure (calibration)
- Commissioning info:
  - Civil works
  - Infrastructure
  - Machine security...
- Conformity certificate
- Regular tools:
- Approved technical people & company
- Specific tool & equipment for calibration and test
BRAKING TESTS: VISUAL CHECK AND ROLLER BRAKE TESTER CONTROL

Efficiency test
Unbalance test

Roadworthy and degradation

Result transmission
SAFETY TESTS:
Visual inspection and test on play detectors

Push /Stretching Movement
Roadworthy and degradation

Result transmission
Pollution Tests:

Gas analysis (Petrol)

Opacity measurement (Diesel)

Result transmission
VISIBILITY AND LIGHTING:

**LIGHTING**
Test with headlight tester

**VISIBILITY**
Visual test

Result transmission
COMMUNICATION

• Transmission mode:
  – RS232
  – Wifi
  – Bluetooth

• Concentrator module:
  – GIEGnet / GIEGlan
  – OTClan

• Telemaintenance/remote upgrading
• Remote backup
• (CCD camera, sound, speaker, Skype)

Anti-fraud devices
Vehicle Inspection Management

Solution for 2/3 wheelers, HGV & LGV

Management software: Mono and multi centres

Phase Test
Global architecture, various layers

- Vehicle Management National Agency
- PTI National Agency
- Report
- Process Management
- Data collection
- Communication
- Equipements

- Process
- Process
- Process
- Process
Vehicle Inspection Process Software

Archiving/ Centralisation
Activity report
Statistics

Report print-out
Official documents

Braking
Suspension
Side-slip
Gas analysis and opacity
Lighting

Automatic test

Visual Inspection

Vehicle identification
Vehicle insertion into the test flow

Internet reservation (opt)
Cash processing (opt)
(Type of visit/vehicle function)

Load/ Appointment
Cash

Back up statistics

Activity report

Statistics

Vehicle document checking
Under-Car visual inspection
Vehicle identification double check

AB-123-CD

Active Zone

7m

2m

5m

1.5m
Vehicle identification double check

OTCLan

- CI
- RES
- SYNC

Demande par fichier
Certificat d’Immatriculation

Réponse par fichier résultats

Synchronisation (trigger)

CAP1830 Camera

AB-123-CD

or

AB-344-CA

AB-344-CA
Annex II: Article 12.2.5: Make impossible all changes of the information sent by control equipment
OTCLAN: TRACEABILITY AND SECURITY

**HW**
- Equipment traceability
- Homologation traceability
- Calibration traceability

**SW**
- Software traceability (version, homologation)
- Protocol traceability (version, homologation)

**TEST**
- Test traceability (date, duration)

**Traceability**

**Data**

**Vehicle Identification**

**Security when data exchange**

**Integrity**
- Footprint
- Data

**Encryption**
- RC4 encryption

**Control**
- Storage OTC
- Controls OTC
OTCLAN: TRACEABILITY AND SECURITY

Homologation:
- Security
- Exhaustiveness
- Compliance
- Interoperability

G  Gas Analyser
O  Opacimeter
F  Brake tester
S  Suspension tester
R  Side-slip tester
P  Headlight tester
A  Play detector
E  EOBD reader
D  Decelerometer
DATA TRANSMISSION: OPERATING

File sharing & data exchange

Shared disk area between PTI PC master and equipment

PTI station
PC master

Request by Vehicle ID file dropped in this file directory

Set of files for test results from various equipment

OTCLan
CI
RES
SYNC
TEST RESULTS DATA EXCHANGE SCENARIO

OTC central database

Off line Test result check

PTI SATION SOFTWARE MGT

Files flushing

TEST EQUIPMENT

DATA

OTCLAN

CI

RES

SYNC
EXAMPLE:

AJ540FM.CI vehicle file which starts the mechanism

[CI]
C001=AJ-540-FM
C002=01021990
C003=ES
C004=A
C005=N
C006=RENAULT
C007=LAGUNA
C008=M13333333333
C009=1500
C010=5
C011=VP
C012=01012012101009

[CRC]
EMPREINTE=9C00C202322D62A11766DC173A341B3ECFDADCA5
EXAMPLE:

**Encryption** is done on the yellow part

- Data footprint (computed on the yellow part)
- **CONDENSAT** tag
- Random data (from the equipment)

So on the global purple area

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**Vehicle Identification**

**Data**

**Security for Data and exchange**

**Traceability**

- Equipment traceability
- Approval traceability
- Calibration traceability
- SW traceability (version, approval)
- Protocol traceability (version, approval)
- Test traceability (date, duration)
OTC Data collection Protocol

Report
- Who, date, time, test token
- Who, test token
- Vehicle Data, owner, test token
- Defaults, remarks, Comments, test token
- Data from test equipment, Data stream, test token
- Data about equipment, Brand/type Serial N°, HW/SW...

Trace Errors
Retry management Log/History

XML Stream (socket to socket)

OTC Data Base

Process
Data Validity check

PTI National Agency
Off-line Test result check

Tracks
Errors
Retry management
Log/History

Log file of exceptions (human modification)

Statistics
European Commission
ROADWORTHINESS PACKAGE expectation

Types approval
Registrations
Results of inspections

Road side Checks base
Electronic Certificate

Process
Possible data gateway

OTC Data Base

PTI National Agency
CITA 2014 Session xxx

Workshop x:

Anti-tampering mechanisms

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