Workshop B2

Al Bustan Rotana Hotel, Rashidiya Ballroom C


Chaired by Lothar Geilen

Member of CITA Bureau Permanent
WORKSHOP B2

PRESENTATION 1

REPORT OF THE CITA STUDY ON TESTING ELECTRONICALLY CONTROLLED SAFETY SYSTEMS (ECSS)

Christoph Nolte

Deputy Chairperson, CITA Regional Advisory Group Europe (RAG E), CITA
CONTENTS

1. Introduction

2. Inspection methods developed

3. Field tests results

4. Way forward
1. Introduction
OBJECTIVES

• Develop new inspection methods and requirements for tools for electronically controlled safety systems (ECSS) suitable for use in a legislative regime

• Perform cost benefit analysis for introduction of methods into European legislation
DEFINITION FUNCTIONAL TESTING

Performance test of ECSS using measurement with external test equipment:

- Brake tester
- Head light tester
- etc.

>> Testing of functionality / performance of ECSS required
2. **Inspection Methods Developed**
**DEFINITION OF INSPECTION LEVEL**

**Baseline**
- Observation of ECSS Malfunction Indicator Light (MIL)
- Check of correct physical function of the overall ECSS

**Level 1**
- ECSS Fitment test (EOL installation still functional)
- Check of ECSSs (fitting and potentially operational)

**Level 2a**
- ECSS PTI relevant information (electronic system)
- Evaluation of status of electronic system; reading relevant data (e.g. sensor data/threshold values or the safety system pre-defined fault codes)

**Level 2b**
- ECSS triggering with PTI test tool (electro-mechanical system)
- Check of potential functionality of components pertinent to parts of ECSS

**Level 3**
- Physical evaluation of system performance (using external test equipment)
- Check of correct physical function of the overall ECSS

**Note:**
Baseline and level 1 are always included in all other levels.
Level 2a is not included in level 2b or level 3.
Level 2b is sometimes, or partially included in level 3.
OPTIMIZED TEST METHOD FOR FIELD TESTING

Modules

- **note vehicle data**
- **connect plug, ignition on, engine off**
- **select vehicle and module (at diagnostic tool)**

- **module 1**
- **module 2**
- **module 3**

**vehicle data:** VIN, registration date, manufacturer, type, capacity, power, odometer reading

**vehicle fitment:** ABS, ESC, EBS, EBA, EPS, TPMS
active fitted, headlight functions, automatic leveling and bending of headlamps, SRS

- **actual values, controlling, functional test**
Optimized test method for field testing

Modules

module 1
- electronic power steering (EPS)
- anti-lock braking system (ABS),
- electronic stability control (ESC),
- electronic braking system (EBS),
- tyre pressure monitoring system (TPMS) – passive
- tyre pressure monitoring system (TPMS) – active

module 2
- lighting functions
- headlamps – automatic levelling and bending

module 3
- supplementary restraint systems (SRS)
3. Field tests
### DATA SET CHARACTERISTICS

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Number of vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>VW (VW, Audi, Skoda, Seat)</td>
<td>345</td>
</tr>
<tr>
<td>Mercedes/Mercedes Benz</td>
<td>157</td>
</tr>
<tr>
<td>Ford</td>
<td>112</td>
</tr>
<tr>
<td>Toyota</td>
<td>84</td>
</tr>
<tr>
<td>Others</td>
<td>512</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td><strong>1210</strong></td>
</tr>
</tbody>
</table>

#### Valid tests by system

<table>
<thead>
<tr>
<th>System</th>
<th>Number of tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS</td>
<td>273</td>
</tr>
<tr>
<td>ABS/ESC/EBS/(TPMS passive)</td>
<td>842</td>
</tr>
<tr>
<td>TPMS active</td>
<td>185</td>
</tr>
<tr>
<td>Lighting</td>
<td>731</td>
</tr>
<tr>
<td>Headlamps</td>
<td>174</td>
</tr>
<tr>
<td>SRS</td>
<td>449</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td><strong>2654</strong></td>
</tr>
</tbody>
</table>

*FSD- and Bosch-Beissbarth-Tool are specializations, tests are performed specially.*
RESULTS: LEVEL 1 (FITMENT TEST)

• Tool coverage: Variable with range from 4% to 93%
• Data from VM about fitment is required
RESULTS: LEVEL 2

• Tool coverage: Mostly able to read-out sensor values and DTCs provided ECSS communication established

• Failure rate: Not possible to determine because threshold data not available from VMs

• Analysis of Diagnostic Trouble Codes (DTCs) showed that probably not useful for PTI unless standardisation and other measures, such as assessment of the power supply, taken.

• Note: For some SRS systems (e.g. airbag, seat squab sensor) level 2 testing may not be sufficient to detect manipulation
RESULTS: LEVEL 3

ECSS brake system test method includes:

1. Check of brake efficiency on front and rear axle (Comparison of brake force and hydraulic pressure)

2. Check of brake force distribution between front and rear axle

Test method increased failure rate by 4.8 %
SUMMARY

• 2654 tests performed which produced results suitable for analysis
• Level 1: Tool coverage varied widely dependent on type of ECSS
• Level 2: Unable to determine failure rate because vehicle technical data from VMs not available
• Level 3: 4.8% additional failures identified by applying check of brake efficiency on front and rear axle which uses comparison of hydraulic pressure and brake force measured on RBT
• Time taken for tests was often very high with the tools used because most were not designed for PTI.
  • However, after modification of software, these tools together with their associated vehicle communication interfaces (VCIs) will be capable of supporting PTI test requirements with a reduced test time.
4. Way Forward
**NEXT STEPS**

- Development of PTI-Scantool
  - Show what’s possible

  - Note vehicle data
  - Connect plug, ignition on, engine off
  - Select vehicle and module (at diagnostic tool)
  - Module 1
  - Module 2
  - Module 3
  - Actual values, controlling, functional test
ISSUES

• Your Aspects and Issues
Thank You
very much for your attention!
ECSS Testing: Concept and Implementation of a Wider Interrogation of the Electronic Controlled Safety System via OBD

Pascal Buekenhoudt

Project Office Manager and Head of the R&D Technical Inspection Service, GOCA, Belgium
CITA Conference 2015

14-16th April 2015, Dubai, UAE

"Enhancing the Value of Vehicle Inspection"
CITA Conference 2015

Priorities for new testing procedures

Testing Electronically Controlled Safety Systems (ECSS)
ECSS testing

Concept and implementation of a wider interrogation of the Electronic Controlled Safety Systems via OBD
A lot of research has been done

• 2002, CITA Research study programme on Electronically controlled systems on vehicles Agreement Number: 99/06;

• TRL Limited – PR/SE/101/00 The reliability of electronically controlled systems on vehicles;
• TRL Limited – PR/SE/439/02 The reliability of ABS and airbag systems with respect to periodic testing: a cost benefit analysis;
• IKA Report 8328 – A test procedure for airbags;
• TÜV Kraftfahrt GmbH, Report 02-946 EL 001 Testing of existing AntiLock Braking Systems (ABS);
• IKA Report 8329 – A test procedure for vehicle dynamic controllers;
A lot of research has been done

• 2002, 2nd CITA Programme on Emission Testing
  With e.g. June 2002, Study 3: Use of OBD at Periodic Inspection;

• 2005, Initiative for Diagnosis of Electronic Systems in Motor Vehicles for PTI (IDELSY);

• 2007, AUTOFORE;

• 2011, TEDDIE;

• 2014, ECSS;
What was the outcome of these researches?

How are we inspecting the Electronic Controlled Safety Systems?

Except for some Member States, we are only looking to the Malfunction Indicator Lamp (MIL).

Should we do more?

If we follow the outcome of all these studies: Yes.
What did PTI organisations set up in the meantime? (non-limitative list)

Germany: FSD Fahrzeugsystemdaten GmbH:
Developed a specific PTI scan tool and test procedures.

FDS was founded in 2004;
+ 100 employees working;
funding: €1 for each PTI.

Their PTI test methods are proven but until today data is not available to check the entire German vehicle fleet.
Belgium: GOCA:
Developed in 2006 (E)OBD inspection based on the IDELSY project

a specific PTI scan tool (hard- and software customised)
information on DTC’s.

The aim for the project was:
• consumer protection;
• learn about ECSS;
• teach the inspector about OBD (location 16 pin socket, etc ...);

in the beginning 18,5% of the tested vehicles did have some trouble codes in their ECSS ECU’s;
What did PTI organisations set up in the meantime? (non-limitative list)

Sweden: Bilprovningen, OPUS Bilprovningen: “E-diagnosis” based on concept of GOCA

Germany, Sweden, France, The Netherlands, ...
Emission tests via OBD (also for diesel cars)

...
Why are we all not testing the ECSS function to its appropriate level?

recommendations of the CITA 2014 ECSS study:

- As a mandatory part of future Type Approvals, the vehicle manufacturers should provide the ability for inspection of all systems with and without usage of vehicle interfaces;
- The data delivery should follow specific rules;
- The communication between the PTI scan tool and the relevant systems should be further standardised.

Furthermore the existing scan tools are developed for diagnoses and repair.
GOCA is convinced that we need a mandatory part in future Type Approval requirements with all necessary data for the inspections of all ECSS systems with and without usage of vehicle interfaces.

Without the data, it will be difficult to develop a complete ECSS test to its appropriate level (Level 3).

It is, however, for GOCA no option to wait until the restrictions for complete ECSS testing are all resolved.

(PTI database would be possible within 5-6 years ?? and then still the inspection methods should be developed. 2-3 years??)

Therefore GOCA wants something already for these years.
To elaborate a complete ECSS test without the database can only be done by a specialised group at a certain cost.

Since equipment manufacturers have also a certain knowledge, a rather budget friendly intermediate solution seems to be possible:

GOCA has searched a new partner to extend their existing (E)OBD test with more possibilities.
GOCA’s idea on how to move forward with ECSS

The system and the VCI’s (Vehicle Communication Interface):

– Will be equal to the existing system (from 2006) and to be able in a more automated way (via VIN) to interrogate the DTC’s from the ECSS systems;

– Will make it possible to evaluate an EOBD emission test;

– Will contain additional information, relevant for Technical Inspection.
PTI will be different in the future with OBD data:

**Anti-fraud measures**

**Automatically reading out the VIN and the mileage**

- Mileages are registered in the CarPass system (complete history) and on each PTI certificate (the mileages actual visit and previous visit)
- Less mistakes instead of the manually input.
- The OBD VIN number will ensure that the right vehicle is at the inspection centre present.
- The VIN numbers are also the key elements to match the OBD data with the vehicle in the inspection centre database.
PTI will be different in the future with OBD data:

**EOBD Emission tests**

The VCI’s will be able to read out ECSS related information, but they will also be able to conduct a complete EOBD emission test.

Furthermore the OBD will give additional information on the tailpipe testing with Engine temperature and Engine speed.
GOCA’s idea on how to move forward with ECSS

PTI will be different in the future with OBD data:

**Additional information (not only DTC’s and EOBD)**

<table>
<thead>
<tr>
<th>Battery voltage</th>
<th>Trigger values tyre pressure for all 4 wheels (tpms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake fluid level</td>
<td>Status igniters (SRS)</td>
</tr>
<tr>
<td>Wheel speed for each wheel</td>
<td>Value igniters (SRS)</td>
</tr>
<tr>
<td>Steering wheel angle</td>
<td>Switch passenger airbag (SRS)</td>
</tr>
<tr>
<td>Brake pressure (ABS)</td>
<td>Status seat occupancy (SRS)</td>
</tr>
<tr>
<td>Lateral acceleration (ABS)</td>
<td>Status seat belt (SRS)</td>
</tr>
<tr>
<td>Yaw rate (ABS)</td>
<td></td>
</tr>
</tbody>
</table>
PTI will be different in the future with OBD data:

The extra information shows a lot of possibilities to be further explored and to enhance the existing Technical Inspection.

– Brake fluid level could be added next to the visual inspection;
– Since a low battery voltage generate a lot of DTC’s this information is also important;
– Brake Efficiency testing of M1 category vehicles. We hope to find a similar system as the RD method by evaluating brake forces against hydraulic brake pressure captured by the OBD system;
– Research on the ECSS systems of ABS and SRS.
GOCA’s idea on how to move forward with ECSS

GOCA:

All PTI test centres will have this new VCI’s by the end of 2015.

GOCA aims with this initiative

– to learn about these ECSS systems and how to test them;
– to get information about the usefulness of testing ECSS;
– to get a scan tool adapted to our needs with a limited budget;
– Gather the experience and know-how to develop the test procedures once the vehicle manufacturer database is available.
GOCA is convinced that already today limited ECSS testing is possible and give several advantages for later on testing the ECSS systems to its appropriate level.

As always, as for each of our projects, GOCA would be glad to exchange their experience with other PTI organisations

- to learn from each other about ECSS;
- to start up an similar project;
- to develop together ECSS methods;
- to look together to the future of PTI.
ECSS testing

Concept and implementation of a wider interrogation of the Electronic Controlled Safety Systems via OBD

Thank you for your attention

buekenhoudt.p@goca.be
Workshop B2
Presentation 3

CAPABILITY ANALYSIS OF DIFFERENT SCANNING TOOLS TO CHECK ECSS

Enrique Taracido
Technical Director, Supervision & Control, SA Representing the Spanish Association AECA, Spain
Electronic PTI
Spain 2014

Capability analysis of different scanning tools to check ECSS

April 2015
1. Project description

2. Main figures

3. Conclusions & results
1. Project description

Main objectives:

Verify that equipments and vehicles are not only ready to be tested in workshops, but also for PTI diagnosis offering fast, easy and comprehensive information for PTI inspectors and vehicle owners.

Analyse the feasibility and the convenience of implementing the electronic diagnosis of particular electronic safety systems (ECSS) related to the safety and environment of vehicles category M1 in PTI centres.
1. Project description

Why:

Governments must take steps to develop the Electronic PTI:

- **ECSS affects** and controls vehicles, also have defects & cause accidents.
- **ECSS implementation is more & more common** everyday.
- It is our **responsibility to keep technology updated** and offer complete services to customers: we must support and promote the PTI activity.

So, we must wonder:

- Is the equipment ready to fulfil requirements?
- Is their a demand from the fleet of vehicles for this?
AECA- ITV

PTI-Spanish Association of Entities Collaborating with the Government

www.aeca-itv.com

ESC

BAS

AEBS

TPMS

LDWS

International Motor Vehicle Inspection Committee aisbl
Consultative Status Category II to the Economic and Social Council of the United Nations
<table>
<thead>
<tr>
<th>SAFETY SYSTEM</th>
<th>CODE NAME</th>
<th>CATEGORY</th>
<th>DATES N Types / N Mat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1/11/2014 - 11/7/2016</td>
</tr>
<tr>
<td>Braking assist</td>
<td>BAS</td>
<td>M1, N1</td>
<td>24/2/2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24/8/2015</td>
</tr>
<tr>
<td>Advance Emergency Braking</td>
<td>AEBS</td>
<td>M2, M3, N2, N3</td>
<td>1/11/2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1/11/2015</td>
</tr>
<tr>
<td>Line departing Warning</td>
<td>LDWS</td>
<td>M2, M3, N2, N3</td>
<td>1/11/2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1/11/2015</td>
</tr>
<tr>
<td>Tyre Pressure Monitoring</td>
<td>TPMS</td>
<td>M1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1/11/2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1/11/2014</td>
</tr>
</tbody>
</table>
1. Project description

Who:

AECA ITV:

Spanish governmental & private companies non-profitmaking association since 1982, helping the Administration to develop standards, inspection guides & manuals, legal requirements, etc.:

66 entities, 400 centers, 1062 lines.

It represents the interest of the association & aims to improve the quality of the offered service.

Since 1992:

- Vehicles passed > 213 millions.
- Vehicles rejected: 46 millions vehicles (21,57%).
- Serious/Minor defects: 81/201 millions
1. Project description

Who:

By AECA-ITV, companies which performed the test:

- Tüv Rheinland
- Veiasa
- Intectra
- Certio ITV
- Grupo Itevelesa
- SGS
- Atisae
- Itvasa
- Entidad IDV Madrid
- Applus Iteve Technology
- Supervisión y Control
- Prevencontrol
1. Project description

Who:

AFIBA & Equipment Manufacturers:
Association of manufacturers, dealers and importers of equipment & devices for automotion, companies such as:

- Bosch / Capatest
- AVL
- Texas
- Autocom / Vteq
- Hella
- Lambda Automotive
- Equipa Taller
- Actia Müller
- Maha
- Ryme/Continental Automotive VDO
- Launch
- Teknika Bereziak
1. Project description

How:

1. AECA decides to develop the project.
2. It establishes a plan.
3. The equipment manufacturers and AFIBA were asked to participate.
4. The main characteristics and goals were explained.
5. The equipment is lent and field testing starts.
6. Results are gathered and conclusions extracted.
7. Summary and results are presented to AFIBA for continuous development and offered to the CITA Work Group I.
8. Results are sent with recommendations to the Ministry of Industry for further legislation considerations.
1. **Project description**

Vehicle population target:

<table>
<thead>
<tr>
<th>Most sold vehicles 2009 (Spain)</th>
<th>Units</th>
<th>Market %</th>
<th>Units to be inspected per company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-RENAULT MEGANE</td>
<td>52.156</td>
<td>16.03 %</td>
<td>12.02</td>
</tr>
<tr>
<td>2-CITROEN C4</td>
<td>42.369</td>
<td>13.02 %</td>
<td>9.77</td>
</tr>
<tr>
<td>3-SEAT IBIZA</td>
<td>40.859</td>
<td>12.56 %</td>
<td>9.42</td>
</tr>
<tr>
<td>4-PEUGEOT 207</td>
<td>31.039</td>
<td>9.54 %</td>
<td>7.15</td>
</tr>
<tr>
<td>5-FORD FOCUS</td>
<td>30.311</td>
<td>9.32 %</td>
<td>6.99</td>
</tr>
<tr>
<td>6-PEUGEOT 308</td>
<td>28.986</td>
<td>8.91 %</td>
<td>6.68</td>
</tr>
<tr>
<td>7 - VOLKSW. GOLF</td>
<td>25.927</td>
<td>7.97 %</td>
<td>5.98</td>
</tr>
<tr>
<td>8-OPEL ASTRA</td>
<td>25.166</td>
<td>7.73 %</td>
<td>5.80</td>
</tr>
<tr>
<td>9-NISSAN QASHQAI</td>
<td>24.601</td>
<td>7.56 %</td>
<td>5.67</td>
</tr>
<tr>
<td>10-SEAT LEON</td>
<td>23.966</td>
<td>7.37 %</td>
<td>5.52</td>
</tr>
</tbody>
</table>
1. **Project description**

   **Required scanning tools characteristics:**

1. Easy to identify the connection port.
2. Comfortable routine, language protocols & interface use.
3. Success rate in vehicle communication $\geq 90\%$.
4. Offers VIN & mileage.
5. Identifies and verifies the state of the main ECSS.
6. Reads, understands & classifies all the vehicle DTC.
7. Information transference and ease of storage, adapted data format.
8. Fast use and response (complete test $< 5´$).
1. Project description

Required scanning tools characteristics:

8. Wi-fi connection & multiuser platform.
9. Easy integration with inspection software (standard protocols).
10. Self identification scanning tool.
11. Possibility to configure the inspected items (ECSS).
12. Distance warning.
13. Permanently updated DDBB.
1. Project description

Items to be inspected:

1. Vehicle identification (VIN) & mileage.
2. ESC.
3. ABS.
4. EBS.
5. EPS.
6. Restraint systems (airbags, pretensors y charge limiters) ASR.
7. OBD.
8. Others.
2. Main figures:

<table>
<thead>
<tr>
<th>Carrocería</th>
<th>Motor</th>
<th>Frenos</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### RESULTADOS GENERALES 2013

<table>
<thead>
<tr>
<th>Datos Generales</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DATOS GENERALES

<table>
<thead>
<tr>
<th>Marca Vehículo</th>
<th>Modelo</th>
<th>Matrícula</th>
<th>Fecha 1ª Maniobrabilidad</th>
<th>Tipo de Maniobra</th>
<th>Vehículo</th>
<th>Contraseña Horolog.</th>
<th>Posición OBD</th>
<th>¿He tenido algún paso?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autel</td>
<td>Ford</td>
<td>2006XGR</td>
<td>01/06/09</td>
<td>12345</td>
<td>Ejemplo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Focus</td>
<td>2004SR</td>
<td>01/04/04</td>
<td>67890</td>
<td>Ejemplo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ejemplo</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

*Note: The table contains data for different vehicle models and parameters, including dates of first maneuverability, vehicle type, and other details.*
<table>
<thead>
<tr>
<th></th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>APPLUS</td>
</tr>
<tr>
<td>TOTAL Nº OF ESSAYED VEHICLES</td>
<td>134</td>
</tr>
<tr>
<td>TOTAL Nº OF ESSAYS</td>
<td>317</td>
</tr>
<tr>
<td>Expected number %</td>
<td>179</td>
</tr>
</tbody>
</table>

**PTI Centers**

<table>
<thead>
<tr>
<th></th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>APPLUS</td>
</tr>
<tr>
<td>MEGANE</td>
<td>14</td>
</tr>
<tr>
<td>CITROEN C4</td>
<td>12</td>
</tr>
<tr>
<td>SEAT IBIZA</td>
<td>19</td>
</tr>
<tr>
<td>PEUGEOT 207</td>
<td>13</td>
</tr>
<tr>
<td>PEUGEOT 308</td>
<td>12</td>
</tr>
<tr>
<td>OPEL ASTRA</td>
<td>8</td>
</tr>
<tr>
<td>SEAT LEON</td>
<td>13</td>
</tr>
<tr>
<td>VW GOLF</td>
<td>12</td>
</tr>
<tr>
<td>NISSAN QASHQAI</td>
<td>7</td>
</tr>
<tr>
<td>FORD FOCUS</td>
<td>9</td>
</tr>
<tr>
<td>OTROS</td>
<td>14</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>133</td>
</tr>
</tbody>
</table>

**Car shop / Workshop / Rental**

<table>
<thead>
<tr>
<th></th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>APPLUS</td>
</tr>
<tr>
<td>MEGANE</td>
<td>1</td>
</tr>
<tr>
<td>CITROEN C4</td>
<td>-</td>
</tr>
<tr>
<td>SEAT IBIZA</td>
<td>-</td>
</tr>
<tr>
<td>PEUGEOT 207</td>
<td>-</td>
</tr>
<tr>
<td>PEUGEOT 308</td>
<td>-</td>
</tr>
<tr>
<td>OPEL ASTRA</td>
<td>-</td>
</tr>
<tr>
<td>SEAT LEON</td>
<td>-</td>
</tr>
<tr>
<td>VW GOLF</td>
<td>-</td>
</tr>
<tr>
<td>NISSAN QASHQAI</td>
<td>-</td>
</tr>
<tr>
<td>FORD FOCUS</td>
<td>-</td>
</tr>
<tr>
<td>OTROS</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1</td>
</tr>
</tbody>
</table>
2. Main figures:

Test numbers by equipment:

<table>
<thead>
<tr>
<th>Test Numbers by Equipment</th>
<th>SCANTOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AECA ITV</td>
<td></td>
</tr>
<tr>
<td>HELLA, S.A.</td>
<td>168</td>
</tr>
<tr>
<td>EQUIPATALLER, S.L</td>
<td>136</td>
</tr>
<tr>
<td>VTEQ</td>
<td>96</td>
</tr>
<tr>
<td>AVL</td>
<td>261</td>
</tr>
<tr>
<td>ROBERT BOSCH</td>
<td>180</td>
</tr>
<tr>
<td>TEXA IBÉRICA</td>
<td>221</td>
</tr>
<tr>
<td><strong>ESSAYS TOTAL NUMBER</strong></td>
<td><strong>235</strong></td>
</tr>
<tr>
<td>SCANTOOLS</td>
<td></td>
</tr>
<tr>
<td>TEKNIKA BEREZIAK</td>
<td>246</td>
</tr>
<tr>
<td>LAUNCH IBÉRICA</td>
<td>221</td>
</tr>
<tr>
<td>LAMBDA AUTOMOTIVE</td>
<td>210</td>
</tr>
<tr>
<td>MAHA</td>
<td>242</td>
</tr>
<tr>
<td>ACTIA MULLER</td>
<td>161</td>
</tr>
<tr>
<td>CONTINENTAL VDO</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2378</strong></td>
</tr>
</tbody>
</table>
# 2. Main figures:

<table>
<thead>
<tr>
<th>GENERAL</th>
<th>IDENTIFIED</th>
<th>BODY CAR</th>
<th>MOTOR</th>
<th>BRAKES</th>
<th>STEERING</th>
<th>OTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connects</td>
<td>Km</td>
<td>VIN</td>
<td>Detects airbag, pretensor &amp; charge limiters</td>
<td>Detects motor electronics/injection/Modifications (OBD)</td>
<td>Detects ABS, ESP, braking system</td>
<td>Detects Power Steering</td>
</tr>
<tr>
<td>2378</td>
<td>2378</td>
<td>2378</td>
<td>2378</td>
<td>2378</td>
<td>2378</td>
<td>2378</td>
</tr>
<tr>
<td>95,84</td>
<td>13,96</td>
<td>31,79</td>
<td>82,30</td>
<td>9,17</td>
<td>4,75</td>
<td>85,83</td>
</tr>
<tr>
<td>3,99</td>
<td>68,33</td>
<td>63,12</td>
<td>11,56</td>
<td>72,62</td>
<td>1,18</td>
<td>7,95</td>
</tr>
<tr>
<td>0,17</td>
<td>17,70</td>
<td>5,09</td>
<td>6,14</td>
<td>18,21</td>
<td>3,24</td>
<td>6,22</td>
</tr>
</tbody>
</table>

### DETECTED ELECTRONIC SYSTEMS

- OTHERS: 79,98%
- STEERING: 72,75%
- BRAKES: 84,40%
- MOTOR: 85,83%
- BODY CAR: 82,30%
- VIN: 31,79%
- KM: 13,96%
- CONNECTS: 95,84%

### SYSTEMS WITH DETECTED FAILURES

- OTHERS: 26,87%
- STEERING: 4,71%
- BRAKES: 7,86%
- MOTOR: 25,40%
- BODY CAR: 9,17%
2. Main figures:

**CONNECTS**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>99,61%</td>
<td>96,11%</td>
<td>96,83%</td>
<td>98,37%</td>
<td>96,19%</td>
<td>99,54%</td>
<td>92,14%</td>
<td>96,17%</td>
<td>97,05%</td>
<td>80,12%</td>
<td>98,21%</td>
<td>96,87%</td>
<td>95,60%</td>
</tr>
</tbody>
</table>

**DETECTS KM**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>31,41%</td>
<td>8,33%</td>
<td>18,55%</td>
<td>5,69%</td>
<td>39,04%</td>
<td>33,93%</td>
<td>15,28%</td>
<td>1,27%</td>
<td>8,07%</td>
<td>2,97%</td>
<td>14,58%</td>
<td>16,52%</td>
<td></td>
</tr>
</tbody>
</table>

**DETECTS VIN**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40,22%</td>
<td>9,44%</td>
<td>16,74%</td>
<td>14,63%</td>
<td>39,52%</td>
<td>39,52%</td>
<td>16,17%</td>
<td>16,17%</td>
<td>19,85%</td>
<td>11,80%</td>
<td>38,09%</td>
<td>22,91%</td>
<td>19,60%</td>
</tr>
</tbody>
</table>
2. Main figures:

DETECTS AIRBAG, INERTIA-REEL SEATBELTS & LOAD LIMITERS

DETECTS ENGINES’ ELECTRONIC/INJECTION/OBD ALTERATION

DETECTS ABS/ESP/BRAKES SYSTEM
2. Main figures:

**DETECTS STEERING ELEMENTS**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>76,24%</td>
<td>87,22%</td>
<td>84,62%</td>
<td>89,84%</td>
<td>65,24%</td>
<td>71,04%</td>
<td>64,05%</td>
<td>67,23%</td>
<td>64,71%</td>
<td>47,83%</td>
<td>88,69%</td>
<td>44,79%</td>
<td>70,96%</td>
</tr>
</tbody>
</table>

**DETECTS OTHER SYSTEMS**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>88,51%</td>
<td>82,77%</td>
<td>93,67%</td>
<td>95,53%</td>
<td>82,86%</td>
<td>9,05%</td>
<td>78,51%</td>
<td>80,85%</td>
<td>78,68%</td>
<td>68,32%</td>
<td>95,24%</td>
<td>71,88%</td>
<td>77,16%</td>
</tr>
</tbody>
</table>
2. Main figures:

Average testing time:
2. Main figures:

### SCANTOOL X

- **Connects**: 99.61%
- **Mileage**: 82.75%
- **Reads VIN**: 88.50%
- **Detects Airbags, Pretensioners & Load charge limiters**: 83.14%
- **Detects Motor Electronics, Injection & OBD**: 76.24%
- **Detects ABS, ESP & Braking System**: 88.51%
- **Detects other systems**: 1:31
- **Scanning average time**:
3. Conclusions & results
### 3. Conclusions & results

<table>
<thead>
<tr>
<th>DEVICE</th>
<th>CONNECTS</th>
<th>KM</th>
<th>VIN</th>
<th>AIRBAG....</th>
<th>MOTOR</th>
<th>BRAKING</th>
<th>P STEERING</th>
<th>OTHERS</th>
<th>SCANNING</th>
<th>FINAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>VERY GOOD</td>
</tr>
<tr>
<td>B</td>
<td>OK</td>
<td>N. I.</td>
<td>N. I.</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>N. I.</td>
<td>GOOD</td>
</tr>
<tr>
<td>C</td>
<td>OK</td>
<td>OK</td>
<td>N. I.</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>GOOD</td>
</tr>
<tr>
<td>D</td>
<td>OK</td>
<td>N. I.</td>
<td>N. I.</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>GOOD</td>
</tr>
<tr>
<td>E</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>N. I.</td>
<td>N. I.</td>
<td>N. I.</td>
<td>OK</td>
<td>OK</td>
<td>GOOD</td>
</tr>
<tr>
<td>F</td>
<td>OK</td>
<td>OK</td>
<td>N. I.</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>N. I.</td>
<td>GOOD</td>
</tr>
<tr>
<td>I</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>N. I.</td>
<td>N. I.</td>
<td>N. I.</td>
<td>N. I.</td>
<td>OK</td>
<td>OK</td>
<td>N. I.</td>
</tr>
<tr>
<td>K</td>
<td>OK</td>
<td>N. I.</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>GOOD</td>
</tr>
</tbody>
</table>

N.I.: Needs improvement
3. Conclusions & results

Recommendations shared with equipment manufacturers:

1. **Connection** to the systems through OBD port must be **fast and automatic** identifying VIN.

2. Manual configuration of the scanned systems must be implemented, so it is **possible to select particular ECSS to be checked**.

3. It is necessary to **downsize** some equipment.

4. **DTC** should be **standardised, periodic & remotely updated**, categorised and give useful information about the car state, data should be easily exported to PTI official reports.

5. Tests should not interrupt the normal inspection process, **reduce consequences** and dedicated time.
3. Conclusions & results

Government Conclusions :

1. Devices in the market could give us the required information.

2. Equipment software can be integrated easily at the PTI centres.

3. PTI testing can be done during the normal inspection time without problems.

4. Additional information can be provided to customers based on DTC.

5. Vehicles have given a good response to the connection of different scanning tools and they quickly facilitate the required information.

6. Electronic PTI is optional nowadays in Spain, it is expected new legislation obliging implementation for 2018.
1. Project description

2. Main figures

3. Conclusions & results
Project description

Main objectives:

Verify that devices/equipments and vehicles are not only ready to be tested in workshops, but also for PTI diagnosis offering fast, easy and comprehensive information for PTI inspectors and vehicle owners.

It seems clear that the equipments on the market is prepared, although some brands need to improve and it is very important to work hard on DTC data, main conclusion is to “start implementing Electronic PTI”.

Analyse the feasibility and the convenience of implementing the electronic diagnosis of particular electronic safety systems (ECSS) related to the safety and environment of vehicles category M1 in PTI centers.

The Fleet of vehicles demands Electronic PTI, DTCs are an important tool and are already affecting safety and environment issues.
Thank you very much!

Supervisión y Control SA - Syc ITV
Enrique Taracido Vázquez
etaracido@sycitv.com
Workshop B2

Presentation 4

TEST METHODS AND DATA FOR THE PTI OF ECSS AND THEIR INTERNATIONAL PROVISION

Christian Theis

Federal Ministry of Transport and Digital Infrastructure (BMVI), Germany
TEST METHODS AND DATA FOR THE PTI OF ECSS AND THEIR INTERNATIONAL PROVISION

Christian Theis
Federal Ministry of Transport and Digital Infrastructure

Chairman of the Controlling Board
Central Agency for PTI
TEST METHODS AND DATA FOR THE PTI OF ECSS

AGENDA

History of PTI

PTI of ECSS in the EU and in Germany
- PTI-relevant systems
- ECSS testing tools
- Data and information from vehicle manufacturers
- Process: Provision of PTI information, development of test methods from OEM to the inspectors
- Next steps

International provision of German test methods

Future of PTI
VEHICLE CHECK 1936
THE PTI OF ECSS IN THE EU AND IN GERMANY
LEGAL BASIS
LEGAL BASIS

Directive 2014/45/EU
LEGAL BASIS

Directive 2014/45/EU

Road Traffic Licensing Regulation included PTI

StVZO
LEGAL BASIS

Directive 2014/45/EU

Road Traffic Licensing Regulation
particularly §29 and annexes VIII, VIIIa, …, VIIIe

DEDICATED ECSS TESTING

VISUAL/MANUAL:
SINCE 2011-12-31

VIA THE ELECTRONIC VEHICLE INTERFACE:
FROM 2018 - 2023

StVZO

(1) Die Halter von zulassungspflichtigen Fahrzeugen im Sinne des § 3 Absatz 1 der Fahrzeug-Zulassungsverordnung und kennzeichenpflichtigen Fahrzeugen nach § 4 Absatz 2 und 3 Satz 2 der Fahrzeug-Zulassungsverordnung haben ihre Fahrzeuge auf ihre Kosten nach Maßgabe der Anlage VIII in Verbindung mit Anlage VIIIa in regelmäßigen Zeitabständen untersuchen zu lassen. Ausgenommen sind

1. Fahrzeuge mit rotem Kennzeichen oder Kurzzeitkennzeichen,
2. Fahrzeuge der Bundeswehr und der Bundespolizei

über die Untersuchung der Fahrzeuge der Feuerwehren und des Katastrophschutzes entscheiden die zuständigen obersten Landesbehörden im Einzelfall oder allgemein.

(2) Der Halter hat den Monat, in dem das Fahrzeug spätestens zur
1. Hauptuntersuchung vorzuführen, durch eine Prüfplakette nach Anlage IXa auf dem amtlichen Kennzeichen nachzuweisen,
2. Sicherheitsprüfung vorgeführt, muss durch eine Prüfmarke in Verbindung mit einem SP-Schild nach Anlage IXb nachzuweisen.


(3) Eine Prüfplakette darf nur dann zugestellt und angebracht werden, wenn die Vorschriften der Anlage VIII eingehalten sind. Durch die nach durchgeführt die Hauptuntersuchung zugestellte und angebrachte Prüfplakette wird bescheinigt, dass das Fahrzeug zum Zeitpunkt dieser Untersuchung vorschriftsmäßig nach Nummer 1.2 der Anlage VIII ist. Weist das Fahrzeug lediglich geringe Mängel auf, so kann abweichend von Satz 1 die Prüfplakette zugestellt und angebracht werden, wenn die un-
LEGAL BASIS

StVZO

Road Traffic Licensing Regulation included PTI

particularly §29 and annexes VIII, VIIIa, …, VIIIe

LEGAL BASIS

Directive 2014/45/EU

StVZO

Road Traffic Licensing Regulation included PTI

particularly §29 and annexes VIII, VIIIa, …, VIIIe
PTI-RELEVANT SYSTEMS
CRITERIA FOR PTI-RELEVANT SYSTEMS

13 relevant criteria, incl.:

- Braking
- Change of direction
- Longitudinal, transverse and yaw dynamic stabilization of vehicle movement
- Improvement of the visibility conditions
- Change in suspension and damping behavior
- ...

Systems are PTI-relevant, which are able to execute one or more of the 13 safety- or environmentally relevant criteria
PTI-RELEVANT SYSTEMS

11 Systems, including:

- Electronic brake system (EBS)
- Electronic Power Steering (EPS)
- Electronic Stability Control (ESC)

...
# PTI-RELEVANT SYSTEMS

<table>
<thead>
<tr>
<th>11 Systems, including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic brake system (EBS)</td>
</tr>
<tr>
<td>Electronic Power Steering (EPS)</td>
</tr>
<tr>
<td>Electronic Stability Control (ESC)</td>
</tr>
<tr>
<td>...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock absorbers / Electronic damping</td>
</tr>
<tr>
<td>Electronic parking brake</td>
</tr>
</tbody>
</table>
# PTI-RELEVANT SYSTEMS

## 11 Systems, including:
- Electronic brake system (EBS)
- Electronic Power Steering (EPS)
- Electronic Stability Control (ESC)
- ...  

## 2 Systems
- Shock absorbers / Electronic damping
- Electronic parking brake

## 50 Systems, including:
- Test method (video)
- Shock absorbers / Electronic damping
- Electronic parking brake
- Adaptive Cruise Control
- Automatic emergency brake
- Lane keeping assist
- ...
ECSS TESTING TOOLS
### Tool description

**Directive 2014/45/EU**

**ANNEX III**

[...]

(14) A device to connect to the electronic vehicle interface, such as an OBD scan tool;
## ECSS TESTING TOOLS

<table>
<thead>
<tr>
<th>Tool description</th>
<th>Tool description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive 2014/45/EU ANNEX III</td>
<td>StVZO ANNEX Vllld</td>
</tr>
<tr>
<td>[...]</td>
<td>[...]</td>
</tr>
<tr>
<td>(14) A device to connect to the electronic vehicle interface, such as an OBD scan tool;</td>
<td>Nr.25 Devices for [...] testing using the electronic vehicle interface</td>
</tr>
</tbody>
</table>

The PTI Adapter is a **PTI-specific** scantool with integrated **acceleration and yaw rate sensors** enabling hybrid test methods as e.g. an efficient **shock absorber test**
DATA AND INFORMATION FROM VEHICLE MANUFACTURERS
DATA AND INFORMATION FROM VEHICLE MANUFACTURERS

Legal basis

Directive 2014/45/EU

Article 4, No. 3

Implementing act before 2018-05-20 for

(a) a set of technical information [...] necessary for roadworthiness testing [...], and

(b) the detailed rules concerning the data format and the procedures for accessing the relevant technical information.

The technical information [...] shall be made available, free of charge or at a reasonable price, by the manufacturers
## DATA AND INFORMATION FROM VEHICLE MANUFACTURERS

<table>
<thead>
<tr>
<th>Legal basis</th>
<th>Legal basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive 2014/45/EU</td>
<td>StVZO</td>
</tr>
<tr>
<td>Article 4, No. 3</td>
<td>Annexe VIIIa and VIIIe, since 2006-04-01</td>
</tr>
</tbody>
</table>

Implementing act before 2018-05-20 for

(a) a set of technical information […] necessary for roadworthiness testing […], and

(b) the detailed rules concerning the data format and the procedures for accessing the relevant technical information.

The technical information […] shall be made available, free of charge or at a reasonable price, by the manufacturers

Vehicle manufacturers deliver for their vehicles PTI requirements regarding
- Fitment
- Condition
- Function and Performance

for all PTI-relevant Systems

and test methods to test the compliance with these requirements.

The information for a vehicle is delivered at latest 6 months after the market start of the vehicles model.
DATA AND INFORMATION FROM VEHICLE MANUFACTURERS

Content

In discussion in EC working groups (preparing the implementing act)

Status: Draft of the table of necessary information

Format & Process

Discussion in EC working groups (preparing the implementing act) starts 2015
# DATA AND INFORMATION FROM VEHICLE MANUFACTURERS

## Content

In discussion in EC working groups (preparing the implementing act)

Status: Draft of the table of necessary information

## Content (examples)

- Vehicle-specific information about the originally installed systems
- Diagnostic data and information for a fitment test
- Reference values for the brake performance test
- …

## Format & Process

Discussion in EC working groups (preparing the implementing act) starts 2015

## Format & Process

- Diagnostic data: mainly ODX, partly PDF, Excel and other formats
- Other data and information: wide diversity of formats
- Data delivery mainly via SFTP upload
PROCESS: PROVISION OF PTI INFORMATION, DEVELOPMENT OF TEST METHODS FROM OEM TO THE INSPECTORS

Manufacturers

Testing centres and relevant competent authorities

Inspectors
PROCESS: PROVISION OF PTI INFORMATION, DEVELOPMENT OF TEST METHODS FROM OEM TO THE INSPECTORS

Manufacturers

Testing centres and relevant competent authorities

Inspectors

Manufacturers

Relevant competent authority
Central agency for PTI

Testing centres
Inspection organizations

Inspectors
TEST METHODS
TEST METHODS

European Union

for 11 Systems

Test methods not specified in detail

In preparation: Delegated act to introduce test methods for ECSS using the electronic vehicle interface.

1st step: ECSS project

for 2 Systems

Test methods not specified in detail
Test methods not specified in detail

In preparation: Delegated act to introduce test methods for ECSS using the electronic vehicle interface

1st step: ECSS project

for 11 Systems

for 50 Systems (examples)

for 2 Systems
TEST METHODS

for 11 Systems

Test methods not specified in detail

In preparation: Delegated act to introduce test methods for ECSS using the electronic vehicle interface

1st step: ECSS project

for 50 Systems (examples)

Fitment test

Function test

Performance test

for 2 Systems

Test methods not specified in detail
NEXT STEPS
NEXT STEPS

2015 (?)
Delegated act: Inclusion of ECSS test methods using the electronic vehicle interface

Before 2018-05-20
Implementing act: Definition of information to be provided by manufacturers and data formats and access procedures to be used

2018-05-20
2014/45/EU comes into force
i.a. requirements regarding test methods (ANNEX I) obligatory

At latest 2023-05-20
Start of the obligatory use of the electronic vehicle interface for PTI
NEXT STEPS

2015 (?)
Delegated act: Inclusion of ECSS test methods using the electronic vehicle interface

Before 2018-05-20
Implementing act: Definition of information to be provided by manufacturers and data formats and access procedures to be used

2018-05-20
2014/45/EU comes into force
i.a. requirements regarding test methods (ANNEX I) obligatory

2015-07-01
Start of the obligatory use of the electronic vehicle interface for PTI

At latest 2023-05-20
Start of the obligatory use of the electronic vehicle interface for PTI
INTERNATIONAL PROVISION
OF GERMAN TEST METHODS
[International] Organizations authorized for performing PTI according to Directive 2010/48/EU receive the PTI test methods by request for a non-discriminatory fee.

Source: No. 3.3, Annex VIIIe StVZO
TECHNICAL ACCESS
SAMPLE UNIT (FOR TRIAL)

- Notebook with preinstalled PTI Software & Data (incl. test methods)
- PTI-specific test tool

Central agency for PTI (FSD)
TECHNICAL ACCESS
PRODUCTIVE USAGE (WITH CONTRACT)

PTI Organization
Notebook, Tablet, Smartphone with PTI Software
PTI-specific or generic test tool

Online-Access to PTI Data via webservice

Central agency for PTI (FSD)
FUTURE PTI: STARDATE 5928.5
THANK YOU FOR YOUR ATTENTION!

ANY QUESTIONS?