

CITA WG1 Safety Systems & SubWG1 on Brake Testing  
webmeeting, 6th – 7th April 2020



# **OBd trouble code reading as part of PTI in Slovakia**

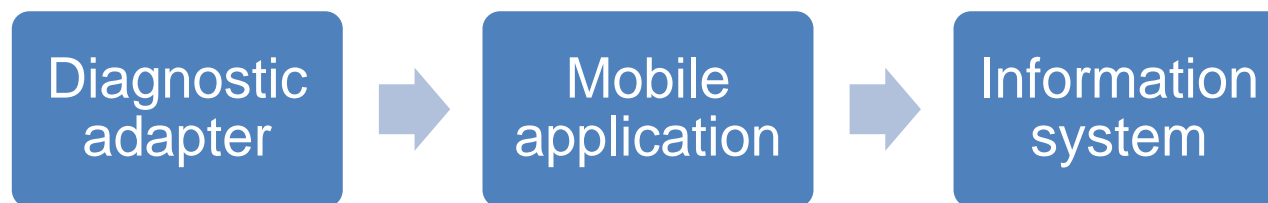
Ing. Juraj Matej, PhD.

# Diagnostic trouble codes (DTC) reading

## Principle

### Diagnostic adapter – Mobile application – Information system

- OBD reading in Slovakia since 1st. January 2020
- DTC reading from electronic vehicle interface according to Directive 2014/45/EU via ELM 327 and mobile application
- Mobile application transfers data to the PTI information system
- PTI information system selects transferred DTC according to the Directive 2014/45/EU and automatically assigns in:
  - Items (Braking equipment, Steering, ...) and
  - Assessment of deficiencies (Minor, Major, Dangerous)



# Diagnostic trouble codes (DTC) reading ELM 327

## Commercial diagnostic adapter – ELM 327

- Supports all OBD II protocols
- Compact, but bad to pull out from OBD connector
- Easy to forget in the OBD connector
- Recommended with OBD extension cable



# Diagnostic trouble codes (DTC) reading Application



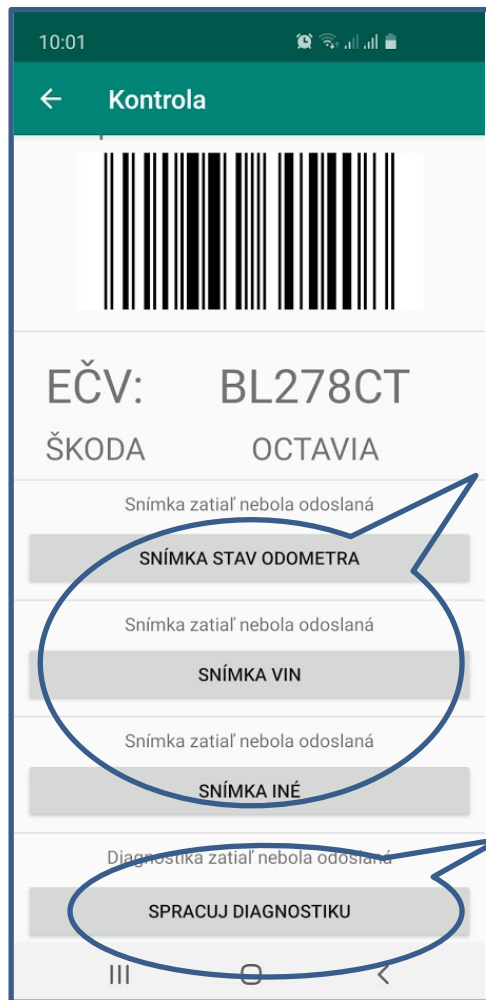
## Mobile application

- Developed by TESTEK with the Institute of Automotive Mechatronics
- Free application for Android and iOS (for iOS with company Pixwell cooperation)
- Application reads DTC and also VIN and Odometer, if the vehicle electronic interface allows it
- For PTI OBD reading is obligatory on vehicles registered after 1st. January 2012
- Application is easy to use with simple GUI
  - Application shows vehicles recorded in the information system
  - Inspector starts OBD reading by touching the button
  - Application transfers data to the information system step by step
  - Inspector can see the transferred data (DTC) in the information system
  - All without inspector's intervention (except for touching the button to start reading)

# Diagnostic trouble codes (DTC) reading Application

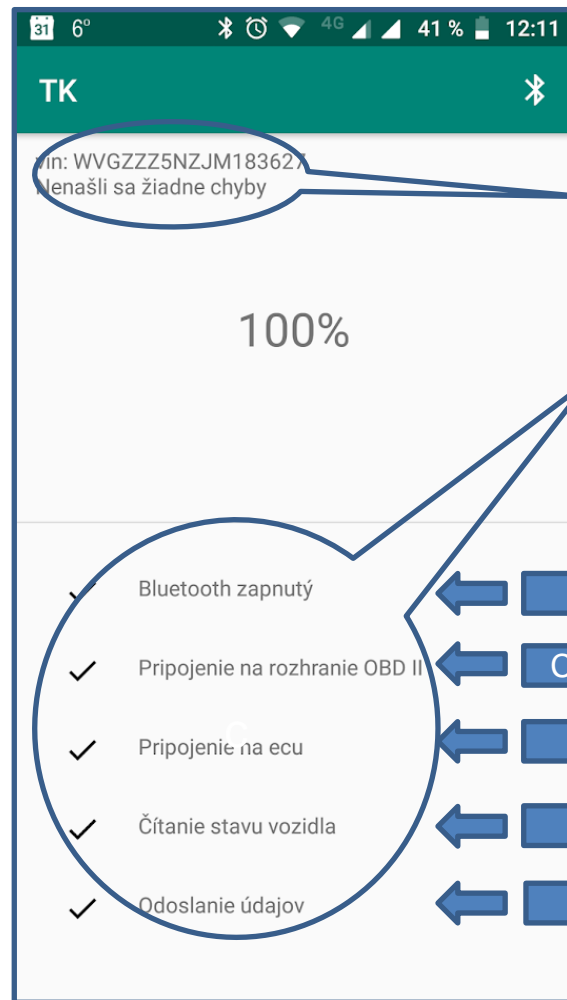


## Mobile application GUI



Buttons for take pictures of VIN, ODOMeter or other

Button to start OBD reading



VIN and information about transferred DTC

Automatic process without inspector intervention

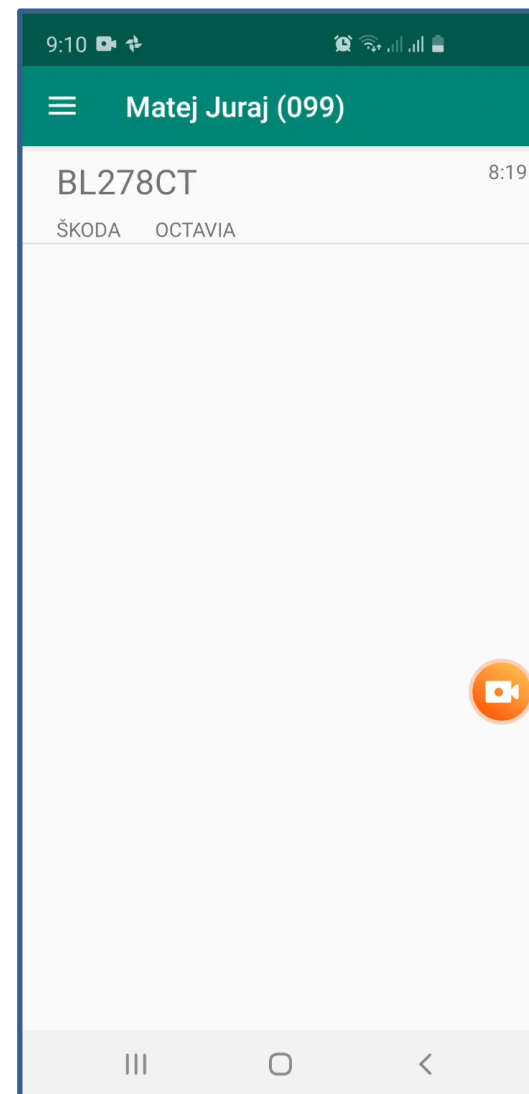
- Bluetooth ON
- Connection to OBD interface
- Connection to ECU
- Data reading
- Data transferred

OBD trouble code reading as part of PTI in Slovakia

# Diagnostic trouble codes (DTC) reading Application

## Mobile application – video

- Selecting registration plate of tested vehicle
- Selecting of OBD reading option
- Pairing application with ELM 327
- Automated OBD reading process:
  - Connection to Bluetooth
  - Connection to OBD interface
    - Transferring data to the information system
  - Connection to ECU
    - Transferring data to the information system
  - Reading process
    - Transferring data to the information system



# Diagnostic trouble codes (DTC) reading Information System

## Transferred „raw data“

OBD správy	
Kód	Popis
	version=1.4,ATD OK >ATZ ELM327 v1.5 >ATR V 14.2V >
	"
	version=1.4,ATD OK >ATZ ELM327 v1.5 >ATR V 14.2V > >SEARCHING... 41 00 BE 3D A8 13 >AUTO, ISO 15765-4 49 02 01 00 00 00 1: 00 00 00 00 00 00 00 2: 00 00
	version=1.4,ATD OK >ATZ ELM327 v1.5 >ATR V 14.2V >ATE0 01 >SEARCHING... 41 00 BE 3D A8 13 >AUTO, ISO 15765-4 49 02 01 00 00 00 1: 00 00 00 00 00 00 00 2: 00 00 >43 00 >

1. Data transferring:  
- Adapter identification,  
- Voltage in OBD connector

2. Data transferring:  
- OBD protocol  
- VIN number, ODO

3. Data transferring:  
- DTC scan

OBD trouble code reading as part of PTI in Slovakia

# Diagnostic trouble codes (DTC) reading Information System

## Assigning transferred data

- For example:

If the information system recognizes DTC for ABS, it automatically assigns this to major failure according to the Directive 2014/45/EU

1.6.f - Anti-lock braking system (ABS) - System indicates failure via the electronic vehicle interface – Major failure.

OBD správy ↻			
Kód	Popis	VIN	Km
C0081	ABS Malfunction Indicator (Subfault)	VF37J9HP0CJ629844	0
iOS, v1.2, Adapter identification: ELM327 v1.5, Voltage: 13.8V, Vehicle Protocol: ISO 15765-4 (CAN 11/500), Adapter States: [OBD2AdapterStateInitializing, OBD2AdapterStateInitializing, OBD2AdapterStateInitializing, OBD2AdapterStateReady, OBD2AdapterStateConnected]			

DTC for ABS

Yellow colour indicates  
Major failure – visual  
information for inspector



# Diagnostic trouble codes (DTC) reading Information System

## Assigning transferred data

- Directive 2014/45/EU
- The information system uses a conversion table for assigning of DTC to PTI failures according to the Directive 2014/45/EU

<p>1.6. Anti-lock braking system (ABS)</p> <p>Item</p>	<p>Visual inspection and inspection of warning device and/or using electronic vehicle interface.</p>	<p>(a) Warning device malfunctioning.</p> <p>(b) Warning device shows system malfunction.</p> <p>(c) Wheel speed sensors missing or damaged.</p> <p>(d) Wirings damaged.</p> <p>(e) Other components missing or damaged.</p> <p>(f) System indicates failure via the electronic vehicle interface.</p>	<p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p>	<p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p>	
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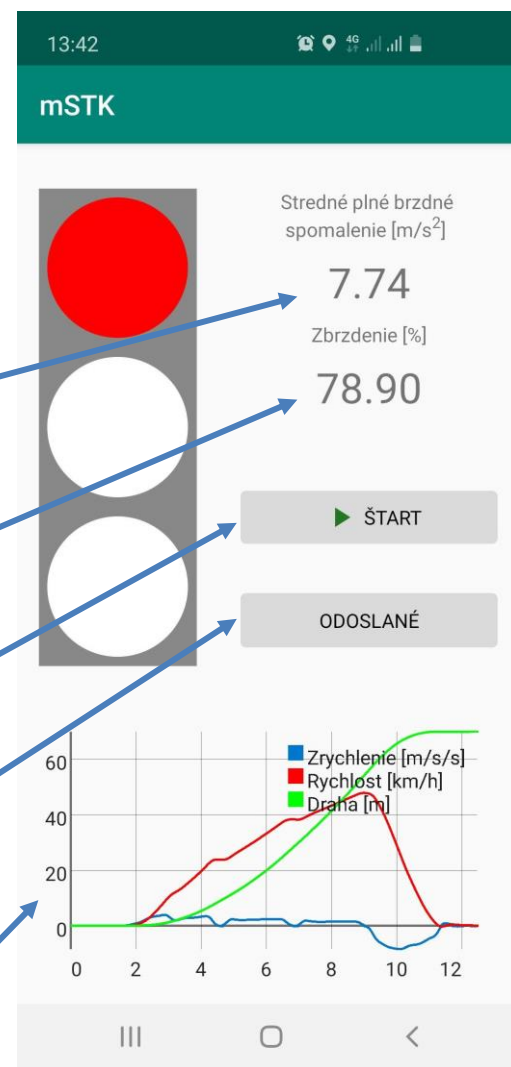
Reason for failure

Assessment of deficiencies

# Mobile application – other options

## Application options

- Take and transfer pictures of VIN
- Take and transfer pictures of Odometer
- Take and transfer pictures of other required data
- OBD reading and transfer data
- Driving brake test



Next button in main GUI: Driving test

Button to Start driving test

Button to data transfer

Graph of distance, speed and acceleration

The mean fully developed deceleration

Brake efficiency



Thank you for your attention