



INTERNATIONAL MOTOR VEHICLE INSPECTION COMMITTEE

Position paper

Standardisation - Electronic periodic technical inspection (ePTI) of electronically controlled safety systems (ISO/WD 20730)

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Brief summary.

This position paper concerns the planned ISO standard 20730, “Road vehicles — Vehicle roadworthiness interface for electronic Periodic Technical Inspection (ePTI)”. It underlines the requirements of the users to ensure a practical use of the standard during periodic technical inspections.

1 Introduction

The purpose of the periodic technical inspection is to check the roadworthiness, environmental compatibility and regulatory compliance of the vehicle.

In order to check the environmental compatibility of vehicles with petrol or diesel engines, it has been required by law in Europe since 2001 and 2004, respectively, that the engine electronics can be checked via the electronic vehicle interface. The “ISO 15031” OBD standard is one of the standards developed for this purpose. It includes the communication requirements as well as a list of standardised diagnostic trouble codes (DTC’s), measurement values and routines, which are continuously updated. The diagnostic information content can be used for both, vehicle repair and for the periodic technical inspection.

To date, there has been **no** comparable standard for safety-relevant systems. Given the rapid increase in the number of electronic safety systems installed in vehicles in recent years and with a view to semi- and fully automated vehicles in the future, checking these systems via the electronic vehicle interface has become vital. This is the only way that the efficiency and effectiveness of checking such systems can eventually be ensured in Europe and around the world, with the aim of ultimately minimising the number of road fatalities and serious injuries.

In May 2014, several vehicle manufacturers took the initiative in coordination with inspection organisations to advance the ISO/NP 20730 joint project in ISO/TC 22 SC31, “Data Communication”. The common goal is the successful completion of the project and to reference the ISO standard 20730 in applicable type-approval regulations, so that the minimum requirements for vehicle diagnostic communication of safety-relevant systems will be taken into account early in the vehicle development process.

2 Content of the standard and positions of the users

2.1 General information

The ISO standard 20730, “Road vehicles — Vehicle roadworthiness interface for electronic Periodic Technical Inspection (ePTI)” should describe the necessary communication requirements and data definitions. However, the methods of the periodic technical inspection and its presentation of results depend on country-specific legislation. This means that the results evaluation, e.g. comparison of measurements with a threshold value or the interpretation of a DTC, is not part of this standard.

The standardised OBD interface should be used for ISO 20730-related access to the vehicle. In order to ensure robust PTI inspections and broad coverage in many countries, it must also be possible to conduct the inspection via the vehicle interface even without an active Internet connection.

The goal is a comprehensive standardisation of relevant diagnostic data; however, the provision of data for developing generic scan tools will be necessary in the future. This applies in particular to installation information and proprietary diagnostic information, which cannot be standardised due to the varying equipment and diagnostic concepts of vehicle manufacturers. The content and scope of diagnostic information are governed in the relevant country-specific regulations (e.g. in 715/2007/EC and in the corresponding ECE regulations in the EU).

2.2 Authorisation to access the vehicle interface (certificates)

Free and unlimited access shall also continue to be possible for electronic periodic technical inspections. Full access to all diagnostic functions must therefore be guaranteed for the PTI.

The position of ACEA that “vehicle manufacturers will continue to grant access to vehicle data required for diagnosis, repair and maintenance by means of the OBD (on-board diagnosis) interface when the vehicle is stationary, in accordance with EU law” [1] is supported by the inspection organisations.

Vehicle manufacturers reserve the right to limit access via the vehicle interface by using certificates in order to minimise the risk of cyber-attacks or attacks on vehicle safety by means of “dongles”. “Considering the risks of cyber-attacks and the increasing threat to vehicle safety and security caused by connected plugs (so-called ‘dongles’) developed by third-party service providers, vehicle manufacturers reserve themselves the right to limit the data accessible via the OBD interface to those required for diagnosis, repair and maintenance.” [1] Therefore, in accordance with the *security by design* principle, it must be required of future vehicle construction that electronic interfaces of



the vehicle be designed securely and protected against attacks and that they enable full data access by authorised third parties.

A specific PTI certificate must not be subject to any access limitations as opposed to a repair and maintenance certificate. The PTI inspectors are acting by legal mandate and must have full access to the vehicle diagnosis.

If PTI certificates are used, they shall have a minimum validity period of 6 months. Limitation to a shorter validity period would result in high costs during the construction of a stable infrastructure and interfere with the efficient implementation of the inspection.

PTI certificates shall be administered by an independent authority. This means that the vehicle manufacturer transfers an allotment of certificates to a neutral institution, which bears the responsibility for administering the PTI certificates.

2.3 Definition of safety-relevant systems

Electronically controlled systems and functions must be evaluated with respect to their safety and environmental relevance. The inclusion and updating of systems in a system list must be based on clearly defined criteria. On principle, the criteria must cover all systems that have an impact on roadworthiness and environmental compatibility. Consequently, these requirements also include all electronically controlled systems that are relevant to type approval. The following list, which are to be continuously updated according to the state of the art in science and technology, would be suitable as a current criteria catalogue:

- Deceleration of vehicle,
- Longitudinal, lateral and yaw stabilisation of vehicle movements,
- Hold the vehicle stationary,
- Change of heading direction,
- Adjustment of the intensity and/or direction of the road illumination,
- Adjustment of the signal image of the vehicle lighting devices,
- Protecting the survival space of road users,
- Prevention of the accidental deployment of protective devices for road users,
- Adjustment of the behaviour of the suspension and shock absorbers,
- Monitoring and control of tyre air pressure,
- Adjustment of the aerodynamic devices,
- Electric drivetrain concept for vehicle drive,
- Changes in visibility,



- Accident- and emergency-related communication,
- V2V and V2I communication;

2.4 Fitment inspection and software inspection

Vehicles are equipped with various safety systems and safety-relevant functions. In order to inspect the original installation of a safety-relevant system or function, all relevant VIN-specific vehicle information must be provided so that the integrity of the systems can be inspected.

Even today, control-unit software is often subsequently modified. The applications are diverse. Illegal software modifications might be used to increase engine performance or to have the control unit ignore a defective system. It should be assumed that safety-relevant updates will be implemented at increasingly short intervals over the total vehicle life cycle potentially via the vehicle's wireless communication.

Therefore, it is necessary to inspect the software versions and software integrity as part of the periodic technical inspection in order to ensure regulatory compliance. The authorities responsible for type approval and vehicle inspection and/or the agencies responsible under state law, the technical services and the institutions responsible for the periodic technical inspection should be informed of each safety- and environmentally relevant modification. Accordingly, all valid VIN-specific software versions and check sums must be stored in a database and updated regularly.

2.5 Readout of DTC's

A central purpose of the periodic technical inspection is to evaluate the condition of the vehicle. So ideally, a list of standardised DTC's should be prepared for each safety-relevant system as part of ISO 20730. This list must be continually expanded in accordance with the state of the art in science and technology. Unlimited access to all manufacturer-specific DTC's must continue to be possible.

2.6 Readout of measured values

A readout of measured values can help to indicate, for example, a defective sensor or a limitation of system functionality. As part of ISO 20730, a list of standardised measured values should be prepared, including their resolution and physical value. This list must be continually expanded in accordance with the state of the art in science and technology. Unlimited access to manufacturer-specific measurements must remain possible.



2.7 Triggering of routines

The triggering of actuators allows conclusions to be drawn regarding the proper functioning of various safety systems. Here, too, a standardised list of routines is needed as a part of ISO 20730 and must be continuously expanded in accordance with the state of the art in science and technology. Unlimited access to manufacturer-specific routines must be possible.

3 Summary

The development of a standard to simplify the electronic periodic technical inspection is welcome. The standard has the goal of incorporating PTI-specific diagnostic functions already during vehicle development. This includes readouts of the software version and check sum, measured values, error codes and the control of actuators/routines. Unlimited access to the vehicle interface must be provided for the electronic PTI. Once completed, the standard should be referenced in the type-approval regulations. It must be continuously revised in accordance with the state of the art in science and technology. An effort is being made to develop an independent standard that defines the necessary data provision with applicable rules of interpretation for manufacturer-specific diagnostic information.

References

[1] 12/2016 ACEA Position Paper, "Access to vehicle data for third-party services".