INTERNATIONAL STANDARD

ISO 15031-4

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Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics —

Part 4: External test equipment

Véhicules routiers — Communications entre un véhicule et un équipement externe pour le diagnostic relatif aux émissions —

Partie 4: Équipement d'essai externe

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15031-4 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electric and electronic equipment*.

ISO 15031 consists of the following parts, under the general title *Road vehicles — Communication between vehicle and external test equipment for emissions-related diagnostics*:

— *Part 1: General information*

— *Part 2: Terms, definitions, abbreviations and acronyms*

— *Part 3: Diagnostic connector and related electrical circuits, specification and use*

— *Part 4: External test equipment*

— *Part 5: Emissions-related diagnostic services*

— *Part 6: Diagnostic trouble code definitions*

— *Part 7: Data link security*

Introduction

ISO 15031 consists of a number of parts which, taken together, provide a coherent self-consistent set of specifications to facilitate emissions-related diagnostics. Each part is based on an SAE recommended practice.

This part of ISO 15031 is based on SAE J1978 FEB98, OBD Scan tool (On-board diagnosis).

ISO 15031 specifies a set of standard diagnostic services to be provided by vehicles (OBD services). This International Standard specifies a complementary set of facilities, to be provided by external test equipment, which will include scan tool facilities. These facilities provide complete, efficient and safe access to all of the public OBD (on-board diagnosis) services on any vehicle, which is compliant with ISO 15031.

Only external test equipment passing the conformance tests specified in ISO 15031-4 may claim or advertise that it meets or exceeds the requirements of ISO 15031-4.

Partially conforming external test equipment, which does not accommodate all approved protocols is permitted but shall be so marked.

ISO 15031-4 conformance allows potential purchasers to identify external test equipment which shall work correctly with a variety of vehicle types and provides assurance for external test equipment users that they shall not inadvertently cause damage, obtain incorrect results or be unable to access all available OBD (on-board diagnosis) services. Diagnostic authors who base their test strategies on ISO 15031-4 facilities do not need to concern themselves with the details of specific types of external test equipment. ISO 15031-4 provides vehicle manufacturers with a level of protection against misdiagnosis or damage to their products resulting from external test equipment unavailability or inadequacies.

ISO 15031-4 does not preclude the inclusion of additional capabilities or functions in external test equipment. However, it is the responsibility of the external test equipment designer to ensure that no such capability or function can adversely affect either an OBD-equipped vehicle, which may be connected to the equipment or the equipment itself.

ISO 15031-1 provides an introduction to the International Standard.

Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics —

Part 4: External test equipment

1 Scope

The document specifies:

— a means of establishing communications between an OBD-equipped vehicle and external test equipment,

— a set of diagnostic services to be provided by the external test equipment in order to exercise the services defined in ISO 15031-5,

— conformance criteria for the external test equipment.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7637-2:1990, *Road vehicles — Electrical disturbance by conduction and coupling — Part 2: Commercial vehicles with nominal 24 V supply voltage — Electrical transient conduction along supply lines only*

ISO 9141-2: 1994, *Road vehicles — Diagnostic systems — Part 2: CARB requirements for interchange of digital information*

ISO 9141-2:1994/Amd.1:1996, *Road vehicles — Diagnostic systems — Part 2: CARB requirements for interchange of digital information — Amendment 1*

ISO 11898-1, *Road vehicles — Controller area network (CAN) — Part 1: Data link layer and physical signalling*

ISO 11898-2, *Road vehicles — Controller area network (CAN) — Part 2: High-speed medium access unit*

ISO 14230-4:2000, *Road vehicles — Diagnostic systems — Keyword protocol 2000 — Part 4: Requirements for emission-related systems*

ISO TR 15031-2, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 2: Terms, definitions, abbreviations and acronyms*

ISO 15031-3, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 3: Diagnostic connector and related electrical circuits, specification and use*

ISO 15031-4, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 4: External test equipment*

ISO 15031-5, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 5: Emissions-related diagnostic services*

ISO 15031-6, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 6: Diagnostic trouble code definitions*

ISO 15765-4, *Road vehicles — Diagnostics on Controller Area Networks (CAN) — Part 4: Requirements for emissions-related systems*

ISO 16750-2, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 2: Electrical loads*

SAE J1850:MAY2001, *Class B Data Communications Network Interface*

SAE J1939, *Recommended Practice for Serial Control and Communications Vehicle Network*

SAE J1939-11, *Physical layer, 250 kbps , twisted shielded pair*

SAE J1939-13, *Off-Board diagnostic connector*

SAE J1939-21, *Data link layer*

SAE J1939-71, *Vehicle application layer*

SAE J1939-73, *Application layer — Diagnostics*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TS 15031-2 and SAE J1939 apply.

4 Required functions of the external test equipment

The following are the basic functions that the external test equipment is required to support or provide:

— automatic hands-off determination of the communication interface used to provide OBD services on the vehicle,

— obtaining and displaying the status and results of vehicle on-board diagnostic evaluations,

— obtaining and displaying OBD emissions-related diagnostic trouble codes (DTCs),

— obtaining and displaying OBD emissions-related current data,

— obtaining and displaying OBD emissions-related freeze frame data,

— clearing the storage of OBD emissions-related diagnostic trouble codes, OBD emissions-related freeze frame data storage and OBD emissions-related diagnostic tests status,

— obtaining and displaying OBD emissions-related test parameters and results as described in ISO 15031-5 or SAE J1939-73,

— provide a user manual and/or help facility.

