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Motorcycles and Mopeds — Communication between vehicle and external equipment for diagnostics — Diagnostic connector and related electrical circuits, specification and use

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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.

ISO 19689 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 38, *Motorcycles and mopeds*.

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Introduction

This International Standard specifies On Board Diagnostic Connector for motorcycles and mopeds.

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Motorcycles and Mopeds — Communication between vehicle and external equipment for diagnostics — Diagnostic connector and related electrical circuits, specification and use

1 Scope

This standard specifies a minimum set of requirements for a diagnostic connector used in communication between motorcycles and mopeds, and external equipment for diagnostics. Its aim is to promote the use of a common diagnostic connector throughout the motorcycle industry. The diagnostic connection consists of two mating connectors, the vehicle connector and the external test equipment connector. Applicable to all types of motorcycles and mopeds, the connector specified is sealed with positive locking feature and is intended for short-term diagnostic connection only.

This standard specifies functional requirements for:

- a) the vehicle connector, separated into the four principal areas of
 - connector location,
 - connector design,
 - connector contact allocation, and
 - electrical requirements for connector and related electrical circuits, and
- b) the external test equipment connector, separated into the three principal areas of
 - connector design,
 - connector contact allocation, and
 - electrical requirements for connector and related electrical circuits.

The dimensional requirements of the vehicle connector are given as a minimum specification, to allow design freedom.

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 6722-1, *Road vehicles -- 60 V and 600 V single-core cables -- Part 1: Dimensions, test methods and requirements for copper conductor cables*

ISO 8092-2:2005, *Road vehicles -- Connections for on-board electrical wiring harnesses -- Part 2: Definitions, test methods and general performance requirements*

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

ISO 15031-3:2004, *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 test equipment for emissions-related diagnostics — Part 4: External test equipment*

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*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

3.1 connection

two mated connectors or contacts.

[SOURCE: ISO 15031-3:2004, definition 3.1]

3.2 connector

assembly of contact and housing which terminates conductors for the purpose of providing connection and disconnection to a suitable mating connector.

[SOURCE: ISO 15031-3:2004, definition 3.2]

3.3 contact

conductive element in a connector (including means for cable attachment) which mates with a corresponding element to provide an electrical path.

[SOURCE: ISO 15031-3:2004, definition 3.3]

3.4 female contact

electrical contact (including means for cable attachment) intended to make electrical engagement on its inner surface and to accept entry of a male contact, thus forming an electrical connection.

EXAMPLE Receptacle, sleeve.

[SOURCE: ISO 15031-3:2004, definition 3.4]

3.5 male contact

electrical contact (including means for cable attachment) intended to make electrical engagement on its outer surface and to enter a female contact, thus forming an electrical connection.

EXAMPLE Tab, pin, blade.

[SOURCE: ISO 15031-3:2004, definition 3.5]

4 Vehicle connector location

4.1 General

It should be recognized that country or regional governments could mandate a connector location which supersedes these provisions.

4.2 Recommended location

The vehicle connector shall be located in easily access. The preferred location is under the seating position.

4.3 Vehicle operation

Attachment of any external test equipment to the vehicle connector shall not preclude normal physical and electrical operation of the vehicle.

[SOURCE: ISO 15031-3:2004, clause 4.5]

5 Vehicle and external test equipment connector design

5.1 Dimensions

For the dimensions of the external test equipment connector, see Annex A.

The external test equipment connector shall be mateable with the vehicle connector: compliance of the electrical, mechanical and climatic performances of the connection shall be guaranteed.

5.2 Number of contacts

The vehicle connector and the external test equipment connector shall be capable of accommodating 6 contacts.

5.3 Contact requirements

The vehicle connector shall consist of female contacts that will mate with the male blade contacts of the external test equipment connector.

[SOURCE: ISO 15031-3:2004, clause 5.3.1]

5.4 Connector color/features

The vehicle connector shall be red colored.

The vehicle connector and the external test equipment connector shall have latching features to ensure that the external test equipment connector will remain mated when properly connected. The latching feature shall be designed to provide a positive feel when the external test equipment connector is fully seated.

The vehicle connector shall have the latch mechanism that can be released when disconnect latched connectors.

5.5 Temperature class

The minimum temperature range for the selected material shall be Class 2, in accordance with the environmental temperature range specified in ISO 8092-2:2000, Table 3, i.e. $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$.

[SOURCE: ISO 15031-3:2004, clause 5.7]