

ICS 43.040.10



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 43258.4-2023

**Road vehicles - Diagnostic communication over Internet
Protocol (DoIP) - Part 4: Ethernet-based high-speed data link
connector**

(English Translation)

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Table of Contents

Foreword...	3
Introduction...	5
1 Scope...	8
2 Normative references...	9
3 Terms, definitions and abbreviated terms...	9
3.1 Terms and definitions...	9
3.2 Abbreviated terms...	10
4 Conventions...	11
5 Connector requirements...	11
Annex A (Normative) Ethernet pin assignment option 1...	12
Annex B (Normative) Ethernet pin assignment option 2...	15
Bibliography...	18

Foreword

This document is drafted in accordance with the rules provided in GB/T 1.1-2020

Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents.

This document is part 4 of GB/T 43258 Road vehicles - Diagnostic communication over Internet Protocol (DoIP). The following parts have been issued for GB/T 43258:

- Part 2: Transport protocol and network layer services;
- Part 3: Wired vehicle interface based on IEEE 802.3;
- Part 4: Ethernet-based high-speed data link connector.

This document adopts ISO 13400-4:2016 Road vehicles - Diagnostic communication over Internet Protocol (DoIP) - Part 4: Ethernet-based high-speed data link connector by modification.

The technical differences between this document and ISO 13400-4:2016, and the causes for these differences are as follows:

- REMOVE the reference and description of ISO 13400-1 which has been abolished.

1 Scope

This document specifies a minimum set of diagnostic Ethernet connector requirements which are based on ISO 15031-3.

The diagnostic connection specified in this document consists of two mating connectors: the vehicle connector and the external test equipment connector as specified in ISO 15031-3.

This document specifies:

- the functional requirements for the vehicle connector. These functional requirements are separated into two principal areas: connector contact allocation and electrical requirements for connector and related electrical circuits;
- the functional requirements for the external test equipment connector. These functional requirements are separated into two principal areas: connector contact allocation and electrical requirements for connector and related electrical circuits.

Two different connector layouts and pin-outs are specified in this document:

- Ethernet pin assignment option 1;
- Ethernet pin assignment option 2.

Historically, option 1 is specified to meet Ethernet pin assignment of road vehicles already launched onto the market and may be used to resolve conflicts with vehicle manufacturer-specific usage of discretionary pins, e.g. pins 1 and 9.

Option 2 is specified to meet the Ethernet pin assignment of road vehicles to resolve conflicts with vehicle manufacturer-specific usage of discretionary pins, e.g. pins 3 and 11.

A discovery/identification and activation method of the vehicle's Ethernet via the "Ethernet Activation Line" is specified in ISO 13400-3.

This document applies to the design and use based on 100BASE-TX diagnostic Ethernet connector.

2 Normative references

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

ISO 13400-2, Road vehicles - Diagnostic communication over Internet Protocol - Part 2: Transport protocol and network layer services

Note: GB/T 43258.2-2023, Road vehicles - Diagnostic communication over Internet Protocol - Part 2: Transport protocol and network layer services (ISO 13400-2:2019, MOD)

ISO 13400-3, Road vehicles - Diagnostic communication over Internet Protocol (DoIP) - Part 3: Wired vehicle interface based on IEEE 802.3

Note: GB/T 43258.3-2023, Road vehicles - Diagnostic communication over Internet Protocol (DoIP) - Part 3: Wired vehicle interface based on IEEE

802.3 (ISO 13400-3:2016, MOD)

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

Note: GB/T 42193.3-2022, Road vehicles - Communication between vehicle and external equipment for emissions-related diagnostics - Part 3: Diagnostic connector and related electrical circuits: specification and use (ISO 15031-3:2016, IDT)

SAE J1962-09/2015, Diagnostic Connector

3.1 Terms and definitions

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

3.1.1

connection

two mated connectors (3.1.2) or contacts (3.1.3)

3.1.2

connector

XFRM: Ethernet transformer

xMII: Cross wire Media Independent Interface

100BASE-TX: Fast Ethernet

4 Conventions

ISO 13400 (all parts) is based on the conventions discussed in the OSI Service Conventions (see ISO/IEC 10731) as they apply for diagnostic services.

5.1 General

Vehicle manufacturers of road vehicles have the choice to implement one of two different Ethernet connector layouts and pin assignments. This is needed to meet the in-vehicle electrical architecture design.

Discovery/identification of the vehicle's Ethernet option (configuration) is a requirement for external test equipment in order to properly connect to the Ethernet without causing any damage either to the vehicles or external test equipment bus circuitry. In addition, any bus interference like bus errors shall be avoided.

The solution for external test equipment to identify the vehicle's Ethernet option is based on reading the vehicle's identification signal provided on the "Ethernet activation line" available on the diagnostic connector prior to enabling the multiplexer switches to establish an electrical Ethernet connection to the vehicle's Ethernet.

5.2 Normative references to ISO 15031-3

This document specifies additional requirements to support ISO 13400-2, and ISO 13400-3 to be implemented when accessed through the ISO 15031-3 diagnostic connector.