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GB/T 41590.1-2022 / ISO 14230-1:2012

**Road Vehicles – Diagnostic Communication over K-Line
(DoK-Line) – Part 1: Physical Layer**

(ISO 14230-1:2012, IDT)

道路车辆 基于 K 线的诊断通信 第 1 部分：物理层

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Table of Contents

| | |
|---|----|
| Foreword | 3 |
| Introduction..... | 4 |
| 1 Scope | 6 |
| 2 Normative References | 6 |
| 3 Terms, Definitions, Symbols and Abbreviated Terms | 7 |
| 3.1 Terms and definitions..... | 7 |
| 3.2 Abbreviated terms | 7 |
| 4 Conventions..... | 7 |
| 5 Document Overview..... | 8 |
| 6 Vehicle to External Test Equipment Connection | 8 |
| 6.1 K- and L-line configurations..... | 8 |
| 6.2 Configuration requirements | 9 |
| 7 Signal and Communication Specifications | 10 |
| 7.1 Signal..... | 10 |
| 7.2 Communication specification | 11 |
| 8 Requirements of External Test Equipment | 12 |
| 8.1 Minimum functional requirements | 12 |
| 8.2 Electrical specifications | 12 |
| 9 Requirements of ECU..... | 13 |
| 9.1 Minimum functional requirements | 13 |
| 9.2 Input and output lines | 14 |
| 9.3 Electrical specifications | 14 |
| 9.4 Minimum functional capabilities..... | 15 |
| 10 Wiring Requirements | 15 |
| Bibliography | 16 |

Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 *Directives for Standardization – Part 1: Rules for the Structure and Drafting of Standardizing Documents*.

This Document was Part 1 of GB/T 41590 *Road Vehicles – Diagnostic Communication over K-Line (DoK-Line)*. GB/T 41590 has published the following parts:

- Part 1: Physical Layer;
- Part 2: Data Link Layer;
- Part 3: Application Layer;
- Part 4: Requirements for Emission-Related Systems.

This Document equivalently adopts ISO 14230-1:2012 *Road Vehicles – Diagnostic Communication over K-Line (DoK-Line) – Part 1: Physical Layer*.

Please note some contents of this Document may involve patents. The issuing agency of this Document shall not assume the responsibility to identify these patents.

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Road Vehicles – Diagnostic Communication over K-Lin (DoK-Line) – Part 1: Physical Layer

1 Scope

This Document specifies the physical layer, based on ISO 9141 (all parts), on which the diagnostic services shall be implemented.

This Document is based on the physical layer described in ISO 9141-2, but expanded to allow for road vehicles with either 12 V D.C. or 24 V D.C. voltage supply.

NOTE: In this Document, values given in parentheses apply to 24 V D.C. systems.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

ISO 7637-1 Road Vehicles – Electrical Disturbances from Conduction and Coupling – Part 1: Definitions and General Considerations

NOTE: GB/T 21437.1-2021 Road Vehicles - Test Method of Electrical Disturbances from Conduction and Coupling - Part 1: Definitions and General Considerations (ISO 7637-1:2015, MOD)

ISO 7637-2 Road Vehicles – Electrical Disturbances from Conduction and Coupling – Part 2: Electrical Transient Conduction along Supply Lines Only

NOTE: GB/T 21437.2-2021 Road Vehicles - Test Method of Electrical Disturbances from Conduction and Coupling - Part 2: Electrical Transient Conduction along Supply Lines Only (ISO 7637-2:2011, MOD)

ISO/IEC 10731 Information Technology – Open Systems Interconnection – Basic Reference Model – Conventions for the Definition of OSI Services

NOTE: GB/T 17967-2000 Information Technology - Open Systems Interconnection - Basic Reference Model - Convention for the Definition of OSI Services (idt ISO/IEC 10731:1994)

ISO 14230-2 Road Vehicles – Diagnostic Communication over K-Line (DoK-Line) – Part 2: Data Link Layer

NOTE: GB/T 41590.2-2022 Road Vehicles – Diagnostic Communication over K-Line (DoK-Line)
– Part 2: Data Link Layer (ISO 14230-2:2016, IDT)

ISO 15031-2 Road Vehicles – Communication between Vehicle and External Equipment
for Emissions-Related Diagnostics – Part 2: Guidance on Terms, Definitions,
Abbreviations and Acronyms

3 Terms, Definitions, Symbols and Abbreviated Terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15031-2 and the following apply.

3.1.1 Rise time

<Transmitters> time taken for the voltage to change from 20% V_B to 80% V_B , where V_B is the vehicle battery voltage.

3.1.2 Fall time

<Transmitters> time taken for the voltage to change from 80% V_B to 20% V_B , where V_B is the vehicle battery voltage

3.2 Abbreviated terms

C_{ECU} : capacitance contribution of electronic control unit.

C_{OBW} : Capacitance contribution of on-board wiring.

C_{TE} : Capacitance contribution of external test equipment and associated cables.

V_B : vehicle battery voltage.

ECU: electronic control unit.

EMI: electromagnetic interference.

NRZ: non-return to zero.

4 Conventions

This Document is based on the conventions discussed in the OSI Service Conventions (ISO/IEC 10731) as they apply for communication services.

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