GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 43.040

CCS T 35

GB/T 34590.12-2022

Road Vehicles - Functional Safety - Part 12: Adaptation for Motorcycles

道路车辆 功能安全 第 12 部分：摩托车的适用性

(ISO 26262-12:2018, Road Vehicles - Functional Safety - Part 12: Adaptation of ISO 26262 for Motorcycles, MOD)

Issued on: December 30, 2022 **Implemented on: July 1, 2023**

Issued by: State Administration for Market Regulation;

Standardization Administration of the People's Republic of China.

Table of Contents

Foreword

This document was 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 12 of GB/T 34590 *Road Vehicles - Functional Safety*. GB/T 34590 has issued the following parts:

-- Part 1: Vocabulary;

-- Part 2: Management of Functional Safety;

-- Part 3: Concept Phase;

-- Part 4: Product Development at the System Level;

-- Part 5: Product Development at the Hardware Level;

-- Part 6: Product Development at the Software Level;

-- Part 7: Production, Operation, Service and Decommissioning;

-- Part 8: Supporting Processes;

-- Part 9: Automotive Safety Integrity Level (ASIL)-oriented and Safety-oriented Analyses;

-- Part 10: Guideline;

-- Part 11: Guidelines on Applications to Semiconductors;

-- Part 12: Adaptation for Motorcycles.

This document has been modified using ISO 26262-12:2018 *Road Vehicles - Functional Safety - Part 12: Adaptation of ISO 26262 for Motorcycles*.

The technical differences between this document and ISO 26262-12:2018, and the causes for these differences are as follows:

-- The normative reference GB/T 34590.1-2022 is used to replace ISO 26262-1, so as to adapt to the technical conditions of China and enhance the operability (see Chapter 3);

---The description of T&B is modified from “truck, bus, trailer and semi-trailer” into “goods vehicle, bus, special vehicle, trailer” (see 4.6; 4.6 of ISO 26262-8:2018), so as to maintain the consistency with the types of vehicles specified in GB/T 3730.1-2022 *Terms and Definitions of Motor Vehicles, Trailers and Combination Vehicle - Part 1: Types*;

---The description of "stress test" is modified from "stress tests" into "stress tests (such as: high load test and high environment test)" (see 10.4.3.4);

---The description of a suitable rationale for the CCP selection is modified from "a suitable rationale can be provided for the CCP selected" into "a suitable rationale shall be provided for the CCP selected" (see C.2).

This document also makes the following editorial modifications:

-- The sequence of paragraphs in the Scope is adjusted;

---The sub-clauses 8.4.5.1, 10.4.2.1 and 10.4.4.1 are deleted;

---The Introduction and its expression of the International standard are modified.

Please be noted that certain content of this document may involve patents. The institution issuing this document does not undertake the responsibility of identifying these patents.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document shall be under the jurisdiction of National Technical Committee 114 on Auto of Standardization Administration of China (SAC/TC 114).

The drafting organizations of this document: China Automotive Technology and Research Center Co., Ltd.; Tianjin Internal Combustion Engine Research Institute (Tianjin Motorcycle Technology Center); CCIC West Co., Ltd.; BOSCH Auto Parts (Suzhou) Co., Ltd.; Hitachi Astemo Automotive Electronics (Shanghai) Co., Ltd.; Schaeffler (China) Co., Ltd.; Hella Shanghai Electronics Co., Ltd.; CRRCTIMES Electric Vehicle Co., Ltd.; BYD Auto Industry Co., Ltd.; Hubei e-CarX Technology Co., Ltd.; Suzhou Inovance United Power System Co., Ltd.; United Automotive Electronic Systems; Beijing Borgward Automotive Co., Ltd.

The main drafters of this document: Guo Lingsong, Fu Yue, Li Bo, Zhang Liwei, Qu Yuanning, Tian Zhihui, Jiang Zhaojuan, Yu Jianye, Li Yong, Ma Fangping, Zhao Jinfu, Liu Chang, Zheng Yan, Wang Yu, Zhao Tianli.

Road Vehicles - Functional Safety - Part 12: Adaptation for Motorcycles

1 Scope

This document specifies the requirements for adaptation for motorcycles, including the following:

---general topics for adaptation for motorcycles;

---safety culture;

---confirmation measures;

---hazard analysis and risk assessment;

---vehicle integration and testing; and

---safety validation.

This document is intended to be applied to safety-related systems that include one or more electrical and/or electronic (E/E) systems and that are installed in series production road vehicles, excluding mopeds.

This document does not address unique E/E systems in special vehicles such as E/E systems designed for drivers with disabilities.

NOTE: other dedicated application-specific safety standards exist and can complement this document, or vice versa.

Systems and their components released for production, or systems and their components already under development prior to the publication date of this document, are exempted from the scope of this edition. This document addresses alterations to existing systems and their components released for production prior to the publication of this document by tailoring the safety lifecycle depending on the alteration. This document addresses integration of existing systems not developed according to this document and systems developed according to this document by tailoring the safety lifecycle.

This document addresses possible hazards caused by malfunctioning behavior of safety-related E/E systems, including interaction of these systems. It does not address hazards related to electric shock, fire, smoke, heat, radiation, toxicity, flammability, reactivity, corrosion, release of energy and similar hazards, unless directly caused by malfunctioning behavior of safety-related E/E systems.

This document describes a framework for functional safety to assist the development of safety-related E/E systems. This framework is intended to be used to integrate functional safety activities into a company-specific development framework. Some requirements have a clear technical focus to implement functional safety into a product; others address the development process and can therefore be seen as process requirements in order to demonstrate the capability of an organization with respect to functional safety.

This document does not address the nominal performance of E/E systems.

Appendix A provides an overview on objectives, prerequisites and work products of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

GB/T 34590.1-2022 Road Vehicles - Functional Safety - Part 1: Vocabulary (ISO 26262-1:2018, MOD)

GB/T 34590.2-2022 Road Vehicles - Functional Safety - Part 2: Management of Functional Safety (ISO 26262-2:2018, MOD)

NOTE: there is no technical difference between the quoted content in GB/T 34590.2-2022 and the quoted content in ISO 26262-2:2018.

GB/T 34590.3-2022 Road Vehicles - Functional Safety - Part 3: Concept Phase (ISO 26262-3:2018, MOD)

NOTE: there is no technical difference between the quoted content in GB/T 34590.3-2022 and the quoted content in ISO 26262-3:2018.

GB/T 34590.4-2022 Road Vehicles - Functional Safety - Part 4: Product Development at the System Level (ISO 26262-4:2018, MOD)

NOTE: there is no technical difference between the quoted content in GB/T 34590.4-2022 and the quoted content in ISO 26262-4:2018.

GB/T 34590.5-2022 Road Vehicles - Functional Safety - Part 5: Product Development at the Hardware Level (ISO 26262-5:2018, MOD)

NOTE: there is no technical difference between the quoted content in GB/T 34590.5-2022 and the quoted content in ISO 26262-5:2018.

GB/T 34590.6-2022 Road Vehicles - Functional Safety - Part 6: Product Development at the

Software Level (ISO 26262-6:2018, MOD)

NOTE: there is no technical difference between the quoted content in GB/T 34590.6-2022 and the quoted content in ISO 26262-6:2018.

GB/T 34590.7-2022 Road Vehicles - Functional Safety - Part 7: Production, Operation, Service and Decommissioning (ISO 26262-7:2018, MOD)

NOTE: there is no technical difference between the quoted content in GB/T 34590.7-2022 and the quoted content in ISO 26262-7:2018.

GB/T 34590.8-2022 Road Vehicles - Functional Safety - Part 8: Supporting Processes (ISO 26262-8:2018, MOD)

NOTE: there is no technical difference between the quoted content in GB/T 34590.8-2022 and the quoted content in ISO 26262-8:2018.

GB/T 34590.9-2022 Road Vehicles - Functional Safety - Part 9: Automotive Safety Integrity Level (ASIL)-oriented and Safety-oriented Analyses (ISO 26262-9:2018, MOD)

NOTE: there is no technical difference between the quoted content in GB/T 34590.9-2022 and the quoted content in ISO 26262-9:2018.

3 Terms and Definitions

The terms and definitions defined in GB/T 34590.1-2022 are applicable to this document.

4 Requirements for Compliance

4.1 Purpose

This chapter describes how:

a) to achieve compliance with GB/T 34590;

b) to interpret the tables used in GB/T 34590; and

c) to interpret the applicability of each clause, depending on the relevant ASIL(s).

4.2 General Requirements

When claiming compliance with GB/T 34590, each requirement shall be met, unless one of the following applies:

a) tailoring of the safety activities in accordance with this document has been performed that shows that the requirement does not apply; or

NOTE 1: controllability can be validated using operating scenarios, including intended use and foreseeable misuse.

NOTE 2: one acceptance criterion for the safety validation might be a sufficient controllability in a safe state defined in GB/T 34590.3-2022, 7.4.2.5.

NOTE 3: a single acceptance criterion might not be sufficient to verify a safe state.

b) the effectiveness of the external measures;

c) the effectiveness of the elements of other technologies; and

d) assumptions that influence the ASIL mapped from MSIL in the hazard analysis and risk assessment (see 8.4.4.4) that can be checked only in the final vehicle.

EXAMPLE: if a mechanical component is assumed to prevent or mitigate a specific hazard potentially caused by a malfunction of an E/E system, the effectiveness of this component to prevent or mitigate that hazard is validated on vehicle level.

10.4.3.3 The safety validation at the vehicle level, based on the safety goals, the functional safety requirements and the intended use, shall be executed as planned using:

a) the safety validation procedures and test cases for each safety goal including detailed pass/fail criteria; and

b) the scope of application. This may include issues such as configuration, environmental conditions, riding situations, operational use cases, etc.

NOTE: operational use cases can be created to help focus the safety validation at the vehicle level.

10.4.3.4 An appropriate set of the following methods shall be applied:

a) repeatable tests with specified test procedures, test cases, and pass/fail criteria;

EXAMPLE 1: positive tests of functions and safety requirements, black box testing, simulation, tests under boundary conditions, fault injection, durability tests, stress tests (such as: high load test and high environment test), highly accelerated life testing (HALT), simulation of external influences.

b) analyses;

EXAMPLE 2: FMEA, FTA, ETA, simulation.

c) long-term tests, such as vehicle driving schedules and captured test fleets;

NOTE 1: long-term tests with targeted users can be infeasible for motorcycles.

d) user tests under real-life conditions, panel or blind tests, expert panels; and

This is an excerpt of the PDF (Some pages are marked off intentionally)

------ The End ------