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

GB/T 34590.5-2022

**Road vehicles - Functional safety - Part 5: Product development
at the hardware level**

道路车辆 功能安全 第5部分：产品开发：硬件层面

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Foreword

This document was issued on 30 December 2022 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 July 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

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 5 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 replaces GB/T 34590.5-2017 "Road vehicles - Functional safety - Part 5. Product development at the hardware level". Compared with GB/T 34590.5-2017, the main technical changes in this document are as follows.

- Change the scope of application of the standard from "mass-produced passenger cars" to "mass-produced road vehicles other than mopeds" (see Clause 1 of this Edition, Clause 1 of Edition 2017);
- Add the suitability requirements for motorcycles (see 4.5 of this Edition);
- Add the applicability requirements for cargo trucks, buses, special vehicles and trailers (see 4.6 of this Edition);
- Change the title of Clause 5 (see Clause 5 of this Edition, Clause 5 of Edition 2017);
- Change the description about the purpose (see 5.1 of this Edition, 5.1 of Edition 2017);
- Change Figure 2 (see 5.2 of this Edition, 5.2 of Edition 2017);
- Delete the content in 5.3, 5.4, and 5.5 about "inputs, requirements and suggestions, and work products of this Clause" (see Annex D of Edition 2017);
- Delete "safety plan (refined)" (see 6.3.1 of Edition 2017);
- Add hardware specification (from outside) (see 6.3.2 of this Edition);
- Change the description about the purpose (see 7.1 of this Edition, 7.1 of Edition 2017);
- Delete the safety plan (refined) (see 7.3.1 of Edition 2017);
- Add non-safety-related hardware requirements specification (from outside) (see 7.3.2 of this Edition);
- Change Table 1 from "modular hardware design principles" to "hardware architecture design principles" (see 7.4.1.6 of this Edition, 7.4.1.6 of Edition 2017);

- Add requirements for noise factors (see 7.4.1.7 of this Edition);
- Add requirements for ASIL (A) (see 7.4.3.3 of this Edition);
- Add requirements for ASIL (A) (see 7.4.3.4 of this Edition);
- Add the content about "provide evidence according to the hardware design verification methods listed in Table 3" (see 7.4.4.1 of this Edition);
- Add the requirement to verify the validity of assumptions of SEooC (see 7.4.4.3 of this Edition);
- Add requirements for the production, operation, service and scrapping of hardware elements generated during the hardware design process (see 7.4.5.5 of this Edition);
- Add the requirements for "additional safety mechanisms" in items a) and b) (see 8.4.4 of this Edition);
- Add examples of formulas related to SPFM target values (see 8.4.7 of this Edition);
- Change the description of the general provisions (see 9.2 of this Edition, 9.2 of Edition 2017);
- Add the content about "ASIL application level of this requirement" (see 9.4.1.1 of this Edition);
- Add the content of the argument "to prove that the probability of a single point of failure of a single hardware component is sufficiently low" (see 9.4.1.2 of this Edition);
- Add the content of the argument "to prove that the probability of residual failure of a hardware component is sufficiently low" (see 9.4.1.3 of this Edition);
- Add the requirements for multiple systems constituting related items (see 9.4.2.3 of this Edition);
- Delete the content about "failure rate combination and scale factor conversion" (see 9.4.2.7 of Edition 2017);
- Add applicable ASIL levels (see 9.4.3.4 of this Edition);
- Delete the content of failure rate conversion (see 9.4.3.12 of Edition 2017);
- Add the requirements for acceptable conditions for double-point failures that may be caused by double-point failures (see 9.4.3.12 of this Edition);