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

GB/T 43253.4-2023

**Road Vehicles—Functional Safety Audit and  
Assessment Method—Part 4: Hardware Level**

**道路车辆 功能安全审核及评估方法**

**第 4 部分：硬件层面**

*(English Translation)*

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## FOREWORD

This document is drafted in accordance with the rules given 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 43253 “Road vehicles - Functional safety audit and assessment method”. The following parts of GB/T 43253 have been issued:

- Part 1: General requirements;
- Part 2: Concept phase and system level;
- Part 3: Software level;
- Part 4: Hardware level.

*Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The organizations issuing this document shall not be held responsible for identifying any or all such patent rights.*

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

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# INTRODUCTION

GB/T 43253 “Road vehicles - Functional safety audit and assessment method” is applicable to the audit and assessment activities for the safety-related electrical and/or electronic (E/E) systems within road vehicles during the safety lifecycle, based on GB/T 34590 “Road Vehicles - Functional Safety”.

Safety is one of the key issues in the development of road vehicles, and the increasing number of electrical, electronic and software related functions contained in vehicles strengthens the need for functional safety and the need to provide evidence that functional safety objectives are satisfied.

In order to confirm the compliance of E/E systems with the functional safety process and functional safety requirements, GB/T 43253:

- a) Provides the general processes, implementation methods and requirements for conducting functional safety audit and assessment at the organization level;
- b) Provides the processes, methods and requirements for the functional safety audit and assessment of safety-related E/E systems at the concept phase, system level, software level and hardware level;
- c) Provides the checklists and reference examples for functional safety audit and assessment.

GB/T 43253 consists of the following four parts:

- Part 1: General requirements, which aims to specify the general requirements for functional safety audit and assessment activities in different phases.
- Part 2: Concept phase and system level, which aims to specify the requirements for functional safety audit and assessment activities during the concept phase and at the system level.
- Part 3: Software level, which aims to specify the requirements for functional safety audit and assessment activities at the software level.
- Part 4: Hardware level, which aims to specify the requirements for functional safety audit and assessment activities at the hardware level.

The functional safety audit and assessment activities accompany the iterative functional safety development process. Figure 1 shows the overall structure of GB/T 43253, and is based upon a V-model as a reference process model of audit and assessment for the different phases, objects and scopes of product development.

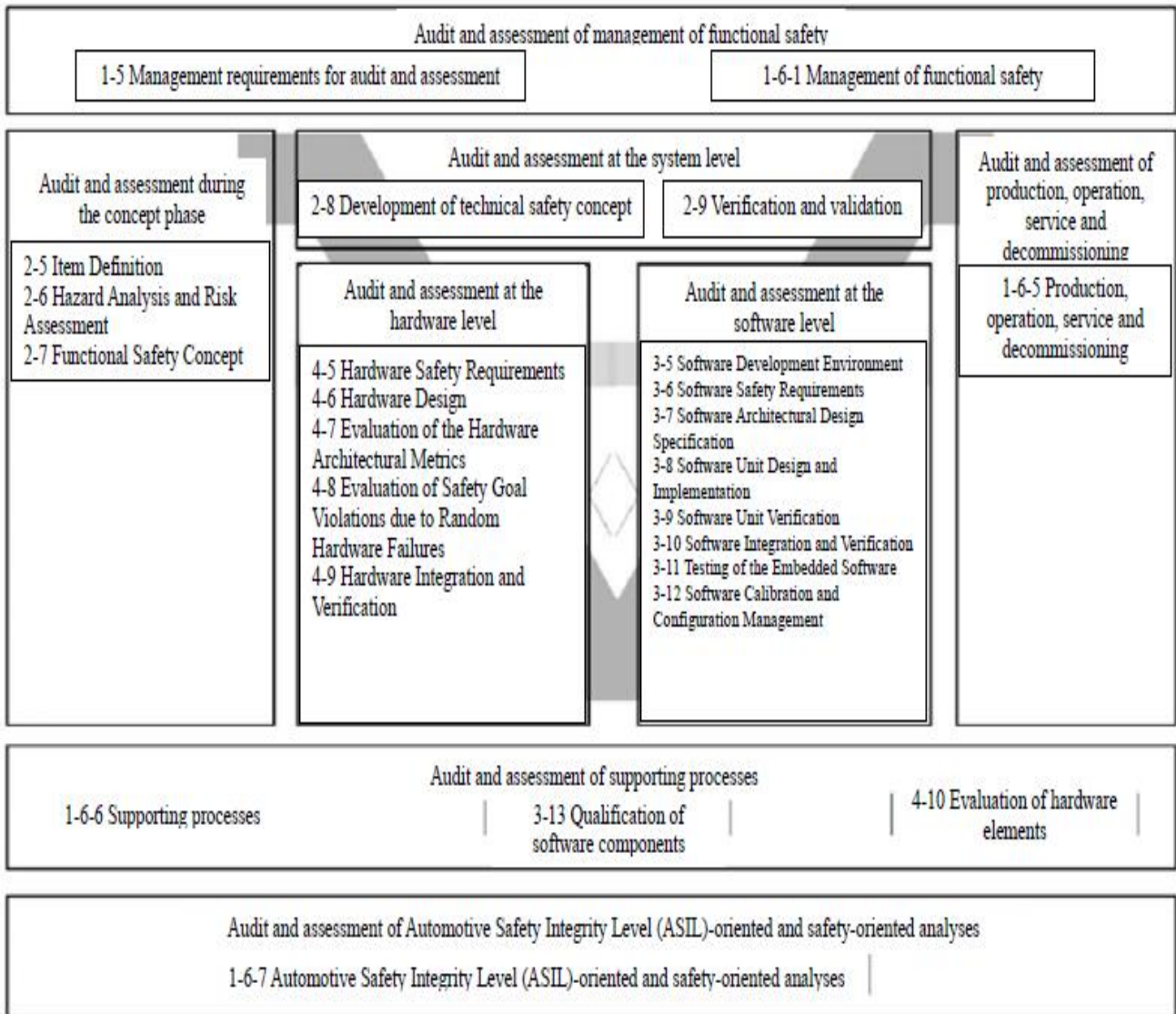


Figure 1 Overview of functional safety audit and assessment

# Road Vehicles—Functional Safety Audit and Assessment Method

## —Part 4: Hardware Level

### 1 SCOPE

This document specifies the functional safety related activities and work products for the safety-related electrical and/or electronic (E/E) systems at the hardware level, and the requirements for and methods of making functional safety audit and assessment, so as to check and verify the compliance of the development process and work products with the functional safety.

This document is applicable to the safety-related systems that include one or more E/E systems and that are installed in series production road vehicles, excluding mopeds.

This document is not applicable to the specific E/E systems in special purpose vehicles such as E/E system designed for drivers with disabilities.

### 2 NORMATIVE REFERENCES

The following normative documents contain provisions which, through normative reference in this text, constitute essential provision of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendment) applies.

GB/T 34590.1~ GB/T 34590.12-2022 Road vehicles - Functional safety

GB/T 43253.1-2023 Road vehicles—Functional safety audit and assessment method—Part 1: General requirements

### 3 TERMS AND DEFINITIONS

For the purpose of this document, the terms and definitions given in GB/T 34590.1-2022 apply.

### 4 GENERAL REQUIREMENTS

For the purpose of this document, the audit and assessment requirements specified in GB/T 43253.1-2023 apply.

The functional safety audit and assessment at the hardware level mainly involve the following information:

- Specification of hardware safety requirements;
- Hardware design;
- Evaluation of the hardware architectural metrics;
- Evaluation of safety goal violations due to random hardware failures;
- Hardware integration and verification;
- Evaluation of hardware elements.

Through audit and assessment, check the functional safety development at the hardware level based on evidences to confirm that:

- The hardware safety requirements are appropriate and complete;
- Ensure the hardware can fulfill the hardware functional safety requirements and meet the hardware-software interface (HSI) specification, through design and verification;
- Provide evidence based on the hardware architectural metrics for the suitability of the hardware architectural design of the item with respect to detection and control of safety-related random hardware failures;
- Ensure the hardware developed meets the hardware safety requirements;
- Ensure the functional behavior of hardware elements is adequate to meet the allocated safety requirements.

**The following pages are left blank intentionally.**

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