

ISO/TR 24935:2025-07 (E)

Road vehicles - Software update over the air using mobile cellular network

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Abbreviated terms	2
5	General	3
5.1	Purpose	3
5.2	Structure of this document	4
5.3	Reference model	6
5.4	Cybersecurity model	7
5.4.1	General	7
5.4.2	Use of cryptography	7
5.4.3	Cryptographic key management model	9
6	Preparation of the SUP	11
6.1	General	11
6.2	Format of the SUP	11
6.2.1	General	11
6.2.2	Information to resolve the target vehicles and recipients into recipient vehicles	12
6.2.3	Information to resolve the target ECUs into recipient ECUs	12
6.2.4	Vehicle state for successful software update operation	12
6.2.5	Compatibility with the related ECUs in the recipient vehicles	12
6.2.6	Dependency with the related ECUs in the recipient vehicles	12
6.2.7	Interaction with the vehicle user	13
6.2.8	Information for the prerequisite of the installation and the activation during the software update operation	13
6.3	Verification and validation of an SUP	13
7	Operation between infrastructure and vehicles	13
7.1	General	13
7.2	Capabilities and functions in the infrastructure	14
7.2.1	Structure of update server	14
7.2.2	Cybersecurity check	15
7.2.3	Resolving the target vehicles into recipients	15
7.2.4	Failure handling	16
7.2.5	Mobile cellular network	16
7.3	Flow of activities	16
7.3.1	Uploading and storing SUP	17
7.3.2	Resolving target vehicles into recipients	18
7.3.3	Verifying the VCI	19
7.3.4	Transferring SUPs and receiving the results of the software update operation	20
7.3.5	Managing and maintaining of software update campaign	22
8	Software update operation in vehicles	22
8.1	General	22

8.1.1	General	22
8.1.2	Overview of EE architecture in vehicle	23
8.1.3	Generic functions of components	24
8.2	Overview of procedures for software update operation	25
8.2.1	General	25
8.2.2	Preparation and receipt of software update operations	25
8.2.3	Installation of software update operation	26
8.2.4	Activation of software update operation	27
8.3	Generic redundant flash bootloader	28
8.3.1	General	28
8.3.2	General operation of the bootloader in an ECU	28
8.3.3	BSBs receipt and installation operations of the bootloader in an ECU	29
8.3.4	Fail recovery operation of the bootloader in an ECU	31
8.4	Communications within the vehicle	32
8.4.1	General	32
8.4.2	Generic Ethernet protocols in vehicle	32
8.4.3	UDSonIP in AVTP for update in vehicle	32
9	Evaluation of overall software update operation	34
9.1	General	34
9.2	Evaluation of software update operation	35
9.2.1	General	35
9.2.2	Evaluation of transmission speed between CM server and ECUs	35
9.2.3	Evaluation of successful transfer	36
	Annex A (informative) KMIP request/response message	38
	Bibliography	44