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Global Navigation Satellite System

**ROAD ACCIDENT EMERGENCY RESPONSE
SYSTEM**

**Functional test methods of in-vehicle emergency call systems
and data transfer protocols**

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Foreword

1 DEVELOPED by Non-Profit Partnership "Promotion of Development and Use of Navigation Technologies" (NP "GLONASS")

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4 INTRODUCED FOR THE FIRST TIME

The rules of this standard application are established in GOST R 1.0-2012 (section 8). Information on the amendments to this standard is published in the annual (as of January, 1st, of the current year) information index «National standards» and the official text of the amendments and corrections is published in the monthly information index «National standards». In case of revision (replacement) or cancellation of this standard an appropriate notice will be published in the nearest release of the monthly issued information index «National standards». The appropriate information, notice and texts shall also be placed in the general-use information system — on official site of Federal Agency of Technical regulating and metrology in Internet (gost.ru)

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NATIONAL STANDARD OF THE RUSSIAN FEDERATION**Global Navigation Satellite System****ROAD ACCIDENT EMERGENCY RESPONSE SYSTEM****Functional test methods of in-vehicle emergency call systems and data transfer protocols**

Date of Introduction — 2014—01—01**1 Scope**

This Standard applies to in-vehicle emergency call systems/devices intended for vehicles of relevant categories specified in Technical Regulations [1] and [2] on the safety of wheeled vehicles.

This Standard defines the methods that shall be used for functional tests of in-vehicle emergency call systems/devices in regard to the requirements of GOST R 54620, and for functional tests of data exchange protocols between such systems/devices and the infrastructure of a road accident emergency response system in regard to the requirements of GOST R 54619.

The Standard may be used in conformity assurance tests of in-vehicle emergency call systems/devices as regards the requirements of Technical Regulations [1] and [2] on the safety of wheeled vehicles.

2 Normative references

The following standards are referred to in this Standard:

GOST R 52230-2004 Electrical equipment for vehicles and tractors. General specifications

GOST R 52928-2010 Global navigation satellite system. Terms and definitions

GOST R 54619-2011 Global navigation satellite system. Accident emergency response system. Road accident emergency response system. Protocols of data transmission from in-vehicle emergency call system to emergency response system infrastructure

GOST R 54620-2011 Global navigation satellite system. Road accident emergency response system. In-vehicle emergency call system. General technical requirements

GOST 28751-90 Electrical equipment for vehicles. Electromagnetic compatibility. Electrical disturbance by conduction along supply lines. Technical requirements and tests

Note — When using this standard it is expedient to check the validation of the reference standards in the general-use information system — on official site of Federal Agency on Technical regulating and Metrology in Internet or according to the annual information index «National standards» which is published as of January, 1st, of current year, and according to releases of monthly issued information index «National standards» in the current year. If a reference standard which the dated reference is provided to is replaced, it is recommended to use a version of this standard with the above specified year of approval (acceptance). If after the approval of this standard an amendment is inserted in a reference standard which the dated reference is provided to, and this amendment regards the provision referred to, it is recommended to apply this provision without regard to this amendment. If a reference standard is cancelled without a replacement, it is recommended to apply the provision which refers to it to a part which does not engage this reference.

3 Terms and definitions

3.1 The terms defined in GOST R 52928 and GOST R 54620, as well as the following terms with their respective definitions are used for the purposes of this Standard:

3.1.1 **in-vehicle emergency call system/device; (IVS):** System/device installed on a wheeled vehicle of a relevant Category and used to evaluate vehicle location, speed and movement direction data based on the signals generated by the GLONASS Global Navigation Satellite System (GNSS) either alone or in cooperation with other active GNSS, to transmit messages containing vehicle data in automatic (system) or manual (device) mode when a road accident or an accident of other type occurs, and to ensure duplex voice connection with emergency services over wireless mobile communication networks.

Notes:

1 In-vehicle emergency call systems are intended for Category M1 or N1 vehicles of permitted design weight less than 2.5 t.

2 In-vehicle emergency call devices are intended for Category M1 or N1 vehicles of permitted design weight above 2.5 t, as well as for Category M2, M3, N2 and N3 vehicles.

3 In case of road accidents or accidents of other type, in-vehicle emergency call systems are capable of transmitting vehicle data messages in manual mode as well.

4 In case of road accidents or accidents of other type, an in-vehicle emergency call device may also be capable of transmitting vehicle data messages in automatic mode. The types of accidents to be detected automatically and the timing parameters of the automatic message transmission function implemented in the device are established in [1], [2].

3.1.2 **minimum set of data; (MSD):** Set of data transmitted by the in-vehicle emergency call system/device in case of a road accident, including location and movement parameters of the affected vehicle, accident time, vehicle VIN-code and other information necessary for emergency response.

3.1.3 **data transmission protocol:** Set of rules and conventions that define the contents, format, timing parameters, order and error correction of messages exchanged by network devices.

3.1.4 **accident emergency response system; ERA-GLONASS System:** Automated geographically distributed Federal and State Information System that uses the signals of the GLONASS Global Navigation Satellite System and of other active GNSS to provide for prompt collection of data related to road accidents or other emergencies on the roads of the Russian Federation as well as for processing, storage and transmission of such data to emergency services, and to enable access to the said data for the concerned governmental or local authorities, officials, legal and natural persons.

Note — The ERA-GLONASS System is analogous to the European eCall system currently in development, and is harmonised with it in regard to its main functional features (the use of in-band modem as the main data transmission tool, unified content and format of mandatory data transmitted in the MSD for road accidents, uniform procedures for initiation and termination of duplex voice connection with the persons in the vehicle cabin, etc.).

4 Designations and abbreviations

The following designations and abbreviations are used in this Standard:

eCall	— Emergency Call (European Emergency Response System);
GLONASS	— Global Navigation Satellite System of the Russian Federation;
GPRS	— General Packet Radio Service;
GPS	— Global Positioning System (GNSS used in the United States of America);
GSM	— Global System for Mobile communications (global digital standard for cellular mobile communications);
IU	— Interface Unit;
IVS	— In-Vehicle Emergency Call System/Device;
MSD	— Minimum Set of Data;
NAD	— Network Access Device;
OM	— Operation Manual;

OS	— Operating System;
PC	— Personal Computer;
PIN	— Personnel Identification Number (SIM-card authorisation code);
PS	— Power Supply;
RAM	— Random Access Memory;
RTA	— Road Traffic Accident;
SD	— Service Documentation;
SE	— ERA-GLONASS System Emulator;
SIM	— Subscriber Identity Module (SIM-card);
SMS	— Short Message System;
SW	— Software;
UIM	— User Interface Module;
UMTS	— Universal Mobile Telecommunications System (European version of the 3G cellular communication system);
USB	— Universal Serial Bus;
VH	— Vehicle;
VIN	— Vehicle Identification Number.

5 Requirements for tests

5.1 Test item

5.1.1 The test items shall be in-vehicle emergency call systems/devices.

5.1.2 The number of test samples shall be at least three.

5.1.3 For IVS installed in standard equipment configuration (on the conveyor line of the vehicle manufacturer), the complete delivery set of the IVS shall be determined by the vehicle manufacturer taking into account the requirements of GOST R 54620 (sections 5 and 21).

For IVS installed in auxiliary equipment configuration (in service/installation centres or at the manufacturer's dealer site, after vehicle production/manufacture), the complete delivery set of the IVS shall be determined by the IVS manufacturer in accordance with the requirements of GOST R 54620 (sections 5 and 21).

5.1.4 In-vehicle emergency call systems/devices shall be submitted to tests with a SIM-card installed.

5.2 Purpose of tests

The tests shall be aimed at the assessment of IVS conformity to the functional requirements established in GOST R 54620, and to the requirements established in GOST R 54619 for implementation of data exchange protocols.

5.3 Scope of tests (checks)

The list and order of IVS tests (checks) in part of conformity to the functional requirements are specified in Table 1.

Note — The order of checks may be changed provided that the test conditions and schedule remain the same.

Table 1 — List and order of IVS tests (checks) in regard to functional requirements

Parameter to be assessed (property to be checked)	Test methods (clause number)
Checking MSD transfer in automatic mode	6.1
Checking MSD transfer using in-band modem	6.1.1
Checking MSD transfer by SMS	6.1.2

Table 1 (continued)

Parameter to be assessed (property to be checked)	Test methods (clause number)
Checking MSD transfer in manual mode	6.2
Checking MSD transfer using in-band modem	6.2.1
Checking MSD transfer by SMS	6.2.2
Checking that transferred MSD contains last known vehicle location as for detection time of RTA event	6.3
Checking that transferred MSD contains expected last known vehicle location as for detection time of RTA event	6.4
Checking that transferred MSD contains valid vehicle location data	6.5
Checking that transferred MSD contains vehicle movement direction data	6.6
Checking that loud voice communication is possible during emergency calls	6.7
Checking IVS status indicators (for IVS in auxiliary equipment configuration) ¹⁾	6.8
Checking IVS operation in Test mode	6.9
Checking IVS operation in "Service Station" mode (for IVS in auxiliary equipment configuration) ¹⁾	6.10
Checking IVS operation in "Software Downloading" mode (for IVS in auxiliary equipment configuration) ¹⁾	6.11
Checking UIM (for IVS in auxiliary equipment configuration) ¹⁾	6.12
Checking internal memory of IVS	6.13
Checking operation of IVS backup battery and power supply	6.14
Checking IVS registration in network	6.15
Checking electric power supply and power consumption requirements (for IVS in auxiliary equipment configuration) ¹⁾	6.16
¹⁾ These checks are mandatory for IVS in auxiliary equipment configuration and optional for standard systems installed on the assembly line of the vehicle manufacturer.	

The list and sequence of IVS tests (checks) regarding the conformity to data exchange protocols, availability of backlighting, and protection of the emergency call button from accidental pressing are specified in Table 2.

Table 2 — List and sequence of IVS test (checks) in regard to requirements of data exchange protocols

Parameter to be assessed (property to be checked)	Test methods (clause number)
Checking transfer of SMS command for setting SMS transmission number when SMS is used as a redundant data channel	6.17
Checking transfer of SMS command for setting emergency call number used in tests	6.18
Checking transfer of MSD in manual activation mode using in-band modem	6.19
Checking transfer of MSD in manual activation mode using SMS	6.20
Checking transfer of SMS command for initiation of test emergency call	6.21
Checking transfer of MSD with test call attribute using in-band modem	6.22

Table 2 (continued)

Parameter to be assessed (property to be checked)	Test methods (clause number)
Checking transfer of MSD with test call attribute using SMS	6.23
Checking transfer of SMS command for repeated MSD transfer in regard to RTA event recorded earlier	6.24
Checking packet transmission of firmware data specific to a given IVS type (for IVS in auxiliary equipment configuration) ¹⁾	6.25
Checking that emergency call button is protected from accidental pressing	6.26
Checking that backlighting of emergency call button is available	6.27
¹⁾ These checks are mandatory for IVS in auxiliary equipment configuration and optional for standard systems installed on the assembly line of the vehicle manufacturer.	

5.4 Test conditions

5.4.1 Test conditions and safety measures

Each IVS shall be tested in normal climatic conditions characterised by the following values of climatic factors as per GOST R 52230 (subsection 4.2):

- air temperature: (25 ± 10) °C;
- relative humidity: from 45 to 80 %;
- atmospheric pressure: from 84.0 to 106.7 kPa (from 630 to 800 Hg mm).

No IVS maintenance operations shall be carried out during the tests.

The test modes described by the values of external influencing factors are discussed in the respective sections pertaining to test methods.

The access to IVS tests and to processing of measurement results shall be granted for those trained technicians who have at least one year practice in the subject, are experienced in measurements of electrical parameters and familiar with the following technical documentation:

- IVS operation manual;
- this Standard;
- service documentation for testing, control and measuring equipment used in tests;
- safety instructions for tests.

The following occupation safety requirements shall apply to such tests:

- all kinds of works shall be carried out in accordance with [3];
- measuring instruments and testing equipment may be turned on only after their external grounding is connected;
- connection and disconnection of cables, devices and measuring instruments is only permitted when the power for all devices included in the testing apparatus is turned off, and the IVS is disconnected from all power circuits.

5.4.2 Testing equipment details

5.4.2.1 Table 3 lists testing/auxiliary equipment and measuring instruments used for IVS tests.

Table 3 — Testing equipment, auxiliary equipment and measuring instruments for IVS tests

Designation of equipment	Required specifications of instruments and equipment
Test bench	5.4.2.2, Appendix A
Dummy on-board network	As per GOST 28751
Oscilloscope	Frequency band up to 100 MHz, inaccuracy not exceeding 3 %
Electric test gauge	Voltage range up to 500 V, resistance 2 MOhm

Table 3 (continued)

Designation of equipment	Required specifications of instruments and equipment
Power supply	Output voltage from 0 to 30 V, maximum load current 10A
PC	External interface — USB 2.0
Metallic screen	Flat, made of steel, dimensions 500 × 500 × 2 mm
<p>Note — The use of equipment of other types is permitted provided that such equipment is capable of ensuring the required accuracy of measurements in a given range.</p>	

5.4.2.2 Each IVS shall be tested on a test bench designated for such purpose. The bench shall include:

- ERA-GLONASS system emulator allowing to configure the IVS in accordance with GOST R 54620 (Appendix A), to transmit and receive the required data during the IVS tests (using an in-band modem, SMS exchanges, or packet data transmission) and to interpret the test results;
- peripheral devices, antennas and other equipment used to simulate the conditions taking place on the intended vehicle board when the IVS is used.

Notes

1 The data structures used when SMS plays a role of redundant communication channel shall comply with GOST R 54619.

2 Test benches may be equipped with peripheral devices selected by IVS and vehicle manufacturers if such devices ensure the required accuracy of measurements in the specified range.

5.4.2.3 The setup and configuration of the IVS, as well as the retrieval of its current configuration parameters, shall be performed in accordance with the operation manual.

5.4.2.4 The antennas used to receive GLONASS or GLONASS/GPS satellite signals shall be arranged so that no structural component might obstruct them during the tests, except for the tests where the operational condition of the IVS is checked.

5.4.3 The test bench shall have a reliable power supply rated for 12 and/or 24 V d.c.

5.4.4 Equipment used in tests shall be certified as per GOST R 8.568 and provided with a certificate of approval valid for the period of tests.

Measuring instruments used in tests shall be verified (and have either verification certificates, or verification marks applied to the device or stamped in the operating documentation; the verification period thereof shall not expire during the period of tests).

The test conditions shall correspond to typical conditions in working areas where the software and hardware complexes are operated by the personnel.

5.5 Reporting

The test and inspection report compiled basing on the results of tests (checks) shall include:

- designation, location, telephone, fax and e-mail of testing laboratory (centre);
- identification of item under test;
- test conditions;
- description of test and measurement methods with a reference to this Standard;
- list of testing equipment and measuring instruments used in tests;
- list of sections of normative documents (technical regulations, GOST R, etc.) that contain the requirements the conformity was checked against, and the conformity assessment results as to each particular requirement;
- conclusion on conformity of item under test to the requirements specified;
- title, name and signature of employee who completed the tests and measurements;
- title, name and signature of director of test laboratory (centre), affixed with the seal of that laboratory (centre);
- date of tests and measurements, issue date, and report registration number.

6 Methods used in tests of conformity to functional requirements

6.1 Checking MSD transfer in automatic mode

6.1.1 Checking MSD transfer using in-band modem

6.1.1.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.1.1.2 Check that the correct telephone number for emergency calls in Test mode is set in the IVS.

Note — The telephone number to be used in Test mode for emergency calls and MSD transfer by SMS is set by the ERA-GLONASS system operator.

6.1.1.3 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.1.1.4 Simulate an emergency call in automatic mode.

Note — The IVS manufacturer shall ensure that the latter operation is technically feasible. The specific procedure of the operation is defined by the IVS developer. The IVS manufacturer shall provide for all appropriate security measures to ensure that this procedure may not be exploited by the end user of the IVS.

6.1.1.5 Using the emulator UI, check that the following has succeeded:

- data received successfully using the in-band modem within 20 s after the start of transfer;
- MSD decoded successfully (MSD contains the vehicle VIN-number and type, energy carrier type, vehicle location details, RTA time, and correct attribute of emergency call activation, i.e., automatic).

6.1.2 Checking MSD transfer by SMS

6.1.2.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.1.2.2 Using the emulator UI, disable data reception by the in-band modem.

6.1.2.3 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.1.2.4 Simulate an emergency call in automatic mode.

Note — The IVS manufacturer shall ensure that the latter operation is technically feasible. The specific procedure of the operation is defined by the IVS developer. The IVS manufacturer shall provide for all appropriate security measures to ensure that this procedure may not be exploited by the end user of the IVS.

6.1.2.5 Check that the voice connection has been established, but no proper data reception by the in-band modem has occurred.

6.1.2.6 Using the emulator UI, check that the following has succeeded:

- data received successfully by SMS;
- MSD decoded successfully (MSD contains the vehicle VIN-number and type, energy carrier type, vehicle location details, RTA time, and correct attribute of emergency call activation, i.e., automatic).

6.2 Checking MSD transfer in manual mode

6.2.1 Checking MSD transfer using in-band modem

6.2.1.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.2.1.2 Check that the correct telephone number for emergency calls in Test mode is set in the IVS.

6.2.1.3 Power on the IVS and wait for indication that the IVS is in ERA mode.

6.2.1.4 Press the "Emergency Call" button on the user interface module of the IVS.

6.2.1.5 Using the emulator UI, check that the following has succeeded:

- data received successfully using the in-band modem within 20 s after the start of transfer;
- MSD decoded successfully (MSD contains the vehicle VIN-number and type, energy carrier type, vehicle location details, RTA time, and correct attribute of emergency call activation, i.e., manual).

6.2.2 Checking MSD transfer by SMS

6.2.2.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.2.2.2 Using the emulator UI, disable data reception by the in-band modem.

6.2.2.3 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.2.2.4 Press the "Emergency Call" button on the user interface module of the IVS.

6.2.2.5 Check that the voice connection has been established, but no proper data reception by the in-band modem has occurred.

6.2.2.6 Using the emulator UI, check that the following has succeeded:

- data received successfully by SMS;
- MSD decoded successfully (MSD contains the vehicle VIN-number and type, energy carrier type, vehicle location details, RTA time, and correct attribute of emergency call activation, i.e., manual).

6.3 Checking that transferred MSD contains last known vehicle location as for detection time of RTA event

6.3.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.3.2 Make sure that the interface on the emulator side has been configured for viewing the results of RTA data reception.

6.3.3 Using the diagnostic software, verify the IVS parameter settings in set-up inspection mode and check that the correct telephone number for emergency calls in Test mode is set.

6.3.4 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.3.5 Simulate an emergency call in automatic mode.

6.3.6 Using the emulator UI, check that the following has succeeded:

- data received successfully using the in-band modem within 20 s after the start of transfer;
- MSD decoded successfully (MSD contains the vehicle VIN-number and type, energy carrier type, information on the last known vehicle location determined by the GNSS receiver (in the Vehicle_Location parameter), RTA time, and correct attribute of emergency call activation, i.e., automatic).

Note — It is conceivable that no valid information on the last known vehicle location as for the RTA detection time is available when the MSD is generated. In such case, the "no valid vehicle location data" attribute shall be included in the MSD.

6.4 Checking that transferred MSD contains expected last known vehicle location as for detection time of RTA event

6.4.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.4.2 Make sure that the interface on the emulator side has been configured for viewing the results of RTA data reception.

6.4.3 Using the diagnostic software, verify the IVS parameter settings in set-up inspection mode and check that the correct telephone number for emergency calls in Test mode is set.

6.4.4 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.4.5 Simulate an emergency call in automatic mode.

6.4.6 Using the emulator UI, check that the following has succeeded:

- data received successfully using the in-band modem within 20 s after the start of transfer;
- MSD decoded successfully (MSD should not contain information on the last known vehicle location; it should contain the vehicle VIN-number and type, energy carrier type, information on the expected last known vehicle location (in the Recent_Vehicle_Location_n-1 parameter), RTA time, and correct attribute of emergency call activation, i.e., automatic).

Note — The data used to determine the vehicle location may include those obtained using the GNSS navigation module and/or the inertial systems (e.g., gyroscope) installed in the vehicle.

6.5 Checking that transferred MSD contains valid vehicle location data

6.5.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.5.2 Make sure that the interface on the emulator side has been configured for viewing the results of RTA data reception.

6.5.3 Using the diagnostic software, verify the IVS parameter settings in set-up inspection mode and check that the correct telephone number for emergency calls in Test mode is set.

6.5.4 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.5.5 Simulate an emergency call in automatic mode.

6.5.6 Using the emulator UI, check that the following has succeeded:

- data received successfully using the in-band modem within 20 s after the start of transfer;
- MSD decoded successfully (MSD contains the vehicle VIN-number and type, energy carrier type, information on geographic location of the vehicle (coordinates determined by the GNSS receiver), RTA time, and correct attribute of emergency call activation, i.e., automatic).

6.6 Checking that transferred MSD contains vehicle movement direction data

6.6.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.6.2 Make sure that the interface on the emulator side has been configured for viewing the results of RTA data reception.

6.6.3 Using the diagnostic software, verify the IVS parameter settings in set-up inspection mode and check that the correct telephone number for emergency calls in Test mode is set.

6.6.4 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.6.5 Simulate an emergency call in automatic mode.

6.6.6 Using the emulator UI, check that the following has succeeded:

- data received successfully using the in-band modem within 20 s after the start of transfer;
- MSD decoded successfully (MSD contains the vehicle VIN-number and type, energy carrier type, information on geographic location of the vehicle, information on movement direction of the vehicle (in the VehicleDirection parameter), RTA time, and correct attribute of emergency call activation, i.e., automatic).

6.7 Checking that loud voice communication is possible during emergency calls

6.7.1 Apply external power to the IVS.

6.7.2 Apply the "Ignition" signal to the input of the vehicle ignition line.

- 6.7.3 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.
- 6.7.4 Using the oscilloscope, check that the "Disable sound" signal is not present on the output that is used to turn off the vehicle radio recorder.
- 6.7.5 Using the IVS diagnostic software, check that the correct telephone number for emergency calls is set in the IVS.
- 6.7.6 Press the "Emergency Call" button on the user interface module and check sure that the duplex voice communication is established.
- 6.7.7 Using the oscilloscope, check that the "Disable sound" signal is present on the output that is used to turn off the vehicle radio recorder.
- 6.7.8 Using the emulator UI, hang up the emergency call that has arrived from the IVS, and check that the duplex voice communication has terminated.
- 6.7.9 Using the oscilloscope, check that the "Disable sound" signal is not present on the output that is used to turn off the vehicle radio recorder.

Note — For IVS in standard equipment configuration, availability of loud voice communication providing for shutdown of all audio playback devices and systems during the emergency call is left to the discretion of the vehicle manufacturer.

6.8 Checking IVS status indicators (for IVS in auxiliary equipment configuration)

- 6.8.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.
- 6.8.2 Apply external power to the IVS, or "Ignition" signal to the input of the vehicle ignition line.
- 6.8.3 Check that the IVS status indicator displays the IVS operation status for a short time (from 3 to 10 s) as specified in the OM.
- 6.8.4 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.
- 6.8.5 Using the IVS diagnostic software, check that the correct telephone number for emergency calls is set in the IVS.
- 6.8.6 Press the "Emergency Call" button on the user interface module.
- 6.8.7 Check that the IVS status indicator displays the "Emergency Call" status according to the OM.
- 6.8.8 Check that the IVS status indicator displays the "Dial-up in Emergency Mode" status according to the OM.
- 6.8.9 Check that the IVS status indicator displays the "MSD Transfer in Emergency Mode" status according to the OM.
- 6.8.10 Using the emulator UI, check that the following has succeeded:
- data received successfully using the in-band modem within 20 s after the start of transfer;
 - MSD decoded successfully (MSD contains the vehicle VIN-number and type, energy carrier type, information on geographic location of the vehicle, RTA time, and correct attribute of emergency call activation, i.e., manual).
- 6.8.11 Check that the duplex voice communication is established.
- 6.8.12 Using the emulator UI, hang up the emergency call that has arrived from the IVS, and check that the duplex voice communication has terminated.
- 6.8.13 Check that the IVS status indicator does not display the "Emergency Call" status anymore, in accordance with the OM.
- 6.8.14 Using the IVS diagnostic software, set the ECALL_ON parameter to FALSE.
- 6.8.15 Simulate an emergency call in automatic mode.
- 6.8.16 Check that nothing has changed in the emulator UI intended for viewing data reception results and decoding MSD data.
- 6.8.17 Check that the IVS status indicator displays the "Emergency Call Not Possible" status in accordance with the OM.
- 6.8.18 Turn off external power of the IVS and disconnect the external GSM/UMTS or GNSS antenna (if the external antenna is included in the IVS delivery set), or disconnect the microphone from the IVS (if such disconnection is possible).

- 6.8.19 Apply external power to the IVS, or "Ignition" signal to the input of the vehicle ignition line.
- 6.8.20 Make sure that the IVS is in ERA mode.
- 6.8.21 Check that the IVS status indicator displays the "Fault" status according to the OM.
- 6.8.22 Remove the "Ignition" signal from the input of the vehicle ignition line, or disconnect external power from the IVS.
- 6.8.23 Connect the external GSM/UMTS or GNSS antenna (if the external antenna was disconnected before), or connect the microphone to the IVS (if it was disconnected earlier).
- 6.8.24 Apply external power to the IVS, or "Ignition" signal to the input of the IVS ignition line.
- 6.8.25 Make sure that the IVS is in ERA mode.
- 6.8.26 Check that the IVS status indicator does not display the "Fault" status.
- 6.8.27 Apply external power to the IVS, or "Ignition" signal to the input of the vehicle ignition line.
- 6.8.28 Check that the correct telephone number for test calls is set in the ECALL_TEST_NUMBER parameter for the IVS.
- 6.8.29 Switch the IVS to Test mode:
- for IVS in auxiliary equipment configuration — press the "Additional Functions" button on the user interface module of the IVS;
 - for standard IVS — using the procedure described in the OM for the system.
- 6.8.30 Check that the IVS status indicator displays the "Test Mode" status according to the OM.
- 6.8.31 Turn off external power of the IVS, or remove the "Ignition" signal from the input of the ignition line.
- 6.8.32 Apply external power to the IVS, and make sure that the IVS has switched to ERA mode.
- 6.8.33 Simulate an emergency call in automatic mode.
Check that the emulator UI informs that the maximum number of event messages has been received.
- 6.8.34 Check that the IVS status indicator displays the "Internal Event Memory Overflow" or "Fault" status in accordance with the OM.
- 6.8.35 Using the IVS diagnostic software, clear RAM.
- 6.8.36 Simulate an emergency call in automatic mode.
- 6.8.37 Using the emulator UI, check that the following has succeeded:
- data received successfully using the in-band modem within 20 s after the start of transfer;
 - MSD decoded successfully (MSD contains the vehicle VIN-number and type, energy carrier type, information on geographic location of the vehicle, and correct attribute of emergency call activation, i.e., automatic).
- 6.8.38 Terminate the emergency call, and check that the IVS status indicator displays the "Service Station" state in accordance with the OM.

Note — The latter applies to IVS in auxiliary equipment configuration only.

- 6.8.39 Disconnect external power from the IVS, and discharge the backup battery (if technically feasible) or replace it with the discharged one.

Note — The latter applies if the backup power supply is available in the IVS.

- 6.8.40 Check that the IVS status indicator displays the "Backup battery discharged below the specified limit" or "Fault" status in accordance with the OM.

6.9 Checking IVS operation in Test mode

- 6.9.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.9.2 Make sure that the interface on the emulator side has been configured for viewing the results of reception of the IVS testing details.

6.9.3 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.9.4 Power on the IVS.

6.9.5 Using the IVS diagnostic software, check that the correct telephone number ECALL_TEST_NUMBER is set in the IVS.

6.9.6 Using the IVS diagnostic software, check that the TESTREGISTRATIONPERIOD parameter which defines the network registration period after the completion of tests is set to 5 min. If this is not the case, set the above value for this parameter.

6.9.7 From the IVS side, send the Test mode request signal by pressing the "Additional Function" button (for auxiliary equipment configuration only).

Notes

1 For IVS installed in standard equipment configuration, switching to Test mode from ERA mode should be done from the UI implemented in the vehicle.

2 The instruction that explains how to enter Test mode using the UI shall be prepared in accordance with GOST R 54620 (subsection 7.6.6) and presented in the User Manual for the vehicle.

6.9.8 Perform the following check:

- microphone connection;
- speaker (speakers) connection;
- ignition on/off operation;
- extended UIM test;
- sufficient charge level of backup battery (if such check is technically feasible);
- operational condition of automatic detector of RTA events;
- integrity of software image;
- operational condition of GNSS receiver.

6.9.9 Using the emulator UI, check that the MSD containing the test results has been successfully transferred to ECALL_TEST_NUMBER, and this MSD includes valid data.

6.9.10 Make sure that the voice prompt is played and the IVS indicator displays a proper state when the test is completed.

6.9.11 Turn off external power of the IVS and disconnect the speaker.

6.9.12 Turn on external power of the IVS.

6.9.13 Send the Test mode request signal by pressing the "Additional Function" button (for auxiliary equipment configuration only).

Notes

1 For IVS installed in standard equipment configuration, switching to Test mode from ERA mode should be done from the UI implemented in the vehicle.

2 The instruction that explains how to enter Test mode using the UI shall be prepared in accordance with GOST R 54620 (subsection 7.6.6) and presented in the User Manual for the vehicle.

6.9.14 Using the emulator UI, check that the MSD containing the test results has been successfully transferred to ECALL_TEST_NUMBER, and this MSD includes the required fault data.

6.9.15 Check that the user interface module indicates "Fault" condition in accordance with the OM, and turn off external power of the IVS.

6.10 Checking IVS operation in "Service Station" mode (for IVS in auxiliary equipment configuration)

6.10.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.10.2 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.10.3 Switch the IVS to "Service Station" mode as described in the IVS User Guide.

6.10.4 Measure the voltage level on the GARAGE_MODE_PIN physical line and check that this level corresponds to the one declared in the IVS User Guide.

6.10.5 Press the "Emergency Call" button on the user interface module of the IVS.

6.10.6 Check that nothing has changed in the emulator UI intended for viewing data reception results and decoding MSD data.

6.10.7 Disable the IVS "Service Station" mode as explained in the User Guide.

6.10.8 Measure the voltage level on the GARAGE_MODE_PIN physical line and check that it is equal to zero.

6.10.9 Press the "Emergency Call" button on the user interface module of the IVS.

6.10.10 Using the emulator UI, check that the MSD has been received and decoded successfully. The MSD should contain the expected vehicle parameter data, the expected information on geographic location of the vehicle, and the correct attribute of emergency call activation, i.e., manual.

6.11 Checking IVS operation in "Software Downloading" mode (for IVS in auxiliary equipment configuration)

6.11.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.11.2 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise..

6.11.3 Using the IVS diagnostic software, set AUTOMATIC_REGISTRATION to TRUE.

6.11.4 Apply the "Ignition" signal to the vehicle ignition input and check that the IVS registration in the wireless mobile communication network has completed.

6.11.5 Using the emulator UI for transmission of commands to IVS, send a telematic message requesting the switchover to "Software Downloading" mode.

6.11.6 Make sure that the software downloading is in progress, either by checking the IVS indication or using the emulator UI.

6.11.7 Press the "Emergency Call" button on the user interface module of the IVS.

6.11.8 Using the emulator UI, check that the MSD has been received and decoded successfully. The MSD should contain the vehicle VIN-number and type, energy carrier type, information on geographic location of the vehicle, and correct attribute of emergency call activation, i.e., manual.

6.11.9 Check that the message on interruption of software downloading is displayed in the emulator UI when the data reception results are viewed.

6.11.10 Make sure that the IVS is in ERA mode.

6.11.11 Using the emulator UI for transmission of commands to IVS, send a telematic message requesting the switchover to "Software Downloading" mode.

6.11.12 Make sure that the software downloading is in progress, either by checking the IVS indication or using the emulator UI.

6.11.13 Using the IVS diagnostic software, check that the software image has been loaded into RAM.

6.11.14 Using the IVS diagnostic software, set the SELFTEST_INTERVAL parameter to 2 min.

6.11.15 Using the IVS diagnostic software, check that the POST_TEST_REGISTRATIONTIME parameter which defines the registration period after completion of self-tests is set to 2 min in the IVS.

6.11.16 Wait for at least 2 min.

6.11.17 Check that the following changes has taken place in the interface for viewing IVS self-diagnostic results on the system operator side:

- self-diagnostic results have been received successfully;
- self-diagnostic results have been decoded successfully, and no IVS fault messages are present in the decoded data.

6.12 Checking user interface module (for IVS in auxiliary equipment configuration)

6.12.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.12.2 Apply external power to the IVS.

6.12.3 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.12.4 Press the "Emergency Call" button on the user interface module of the IVS.

6.12.5 Check that the dial-up has started, and press the "Additional functions" button immediately (before the incoming call may be received in the call centre).

6.12.6 Check that the dial-up has stopped and that the IVS is in ERA mode.

6.13 Checking internal memory of IVS

6.13.1 Make sure that the IVS is connected to the test bench as shown in the diagram presented in Appendix A.

6.13.2 Apply external power to the IVS.

6.13.2 Using the IVS diagnostic software, make sure that the correct telephone number for SMS transmission is set in the ECALL_SMS_FALLBACK_NUMBER parameter of the IVS.

6.13.3 Using the IVS diagnostic software, make sure that the use of GPRS for data transmission is disabled in the IVS.

6.13.4 Set up the conditions where no IVS calls or data transmission is possible using wireless mobile communication networks (e.g., cover the antennas used for wireless RF communication with a metal screen).

6.13.5 Press the "Emergency Call" button three times.

6.13.6 Check that nothing has changed in the emulator UI intended for viewing data reception results.

6.13.7 Check that nothing has changed in the emulator UI intended for viewing SMS data reception results and for decoding MSD data.

6.13.8 Set up the conditions where the IVS calls or data transmission using wireless communication networks are possible (e.g., remove the metal screen).

6.13.10 Check that nothing has changed in the emulator UI intended for viewing data reception results.

6.13.11 Check that the following operations have succeeded in the emulator UI intended for viewing data reception results:

- data received successfully three times by SMS;
- MSD decoded successfully three times (each MSD containing vehicle parameters data, information on geographic location of the vehicle, and correct attribute of emergency call activation, i.e., manual).

6.13.12 Using the IVS diagnostic software, disable data transmission using the in-band modem and data transmission by SMS, and make sure that the use of GPRS for data transmission is disabled in the IVS.

6.13.13 Using the IVS diagnostic software, set the INT_MEM_TRANSMIT_INTERVAL parameter to 1 min.

6.13.14 Simulate an emergency call in automatic mode.

6.13.15 Check that nothing has changed in the emulator UI intended for viewing data reception results.

6.13.16 Check that nothing has changed in the emulator UI intended for viewing SMS data reception results and for decoding MSD data.

6.13.17 Using the IVS diagnostic software, enable the use of GPRS for data transmission.

6.13.18 Wait for 1 min.

6.13.19 Using the emulator UI, check that the following has succeeded:

- data received successfully using the in-band modem;
- MSD contains the vehicle VIN-number and type, energy carrier type, information on geographic location of the vehicle, and correct attribute of emergency call activation, i.e., automatic.

6.13.20 Using the IVS diagnostic software, disable data transmission using the in-band modem and data transmission by SMS, and make sure that the use of GPRS for data transmission is disabled in the IVS.

6.13.21 Using the IVS diagnostic software, set INT_MEM_TRANSMIT_ATTEMPTS to 10.

6.13.22 Simulate an emergency call in automatic mode.

6.13.23 Check that nothing has changed in the emulator UI intended for viewing data reception results.

6.13.24 Check that nothing has changed in the emulator UI intended for viewing SMS data reception results and for decoding MSD data.

6.13.25 Using the IVS diagnostic software, keep track of MSD transmission attempts.

6.13.26 After the tenth failed attempt, the IVS status indicators on the user interface module should notify that the MSD can not be transmitted, as described in the OM.

6.13.27 Using the IVS diagnostic software, clear RAM.

6.13.28 Turn off external power of the IVS.

6.14 Checking operation of IVS backup battery and power supply

6.14.1 Apply external power to the IVS, or "Ignition" signal to the input of the vehicle ignition line of the IVS.

6.14.2 Make sure that the IVS is in ERA mode.

6.14.3 Using the IVS diagnostic software, check that correct telephone number for SMS transmission ECALL_SMS_FALLBACK_NUMBER is set in the IVS.

6.14.4 Using the IVS diagnostic software, check that the following IVS parameter settings are active: CALL_AUTO_ANSWER_TIME — 5 min, NAD_DEREGISTRATION_TIME — 5 min.

6.14.5 Make sure that the IVS backup battery is charged completely, and remove the "Ignition" signal from the input of the vehicle ignition line.

6.14.6 Press the "Emergency Call" button on the user interface module of the IVS.

6.14.7 Check that the duplex voice communication is established with the operator, and set the maximum sound level for the speakers connected to the IVS under test (if the IVS User Guide specifies how to set the speaker volume).

6.14.8 From the operator side, read out any text for 5 min.

6.14.9 Using the emulator UI intended for connection control, terminate the emergency call that has arrived from a given IVS.

6.14.10 Leave the IVS working from the backup battery for 8 hours.

6.14.11 Using the emulator UI intended for connection control, establish voice communication with the IVS.

6.14.12 From the emulator side, read out any text for 5 min.

Note — The text of such length may also be reproduced from any media where it has been recorded beforehand.

6.14.13 Apply the "Ignition" signal to the input of the vehicle ignition line of the IVS.

6.14.14 When the minimum permitted battery charge level is reached, the IVS should send a telematic message notifying on low battery condition. The IVS status indicators on the user interface module should display the "Backup battery discharged below the specified limit" or "Fault" status.

Note — If the backup battery is rechargeable, the above requirements shall be checked within 24 h after battery charging, at a non-varying ambient temperature of 20 °C.

6.14.15 The test shall also be considered successful if the battery has discharged during the voice communication, yet the notification on low battery condition has been sent.

6.15 Checking IVS registration in network

6.15.1 Using the IVS diagnostic software, set the AUTOMATIC_REGISTRATION parameter to FALSE and the ECALL_ON parameter to TRUE.

6.15.2 Apply the "Ignition" signal to the input of the vehicle ignition line.

6.15.3 Simulate an emergency call in automatic mode.

6.15.4 Using the emulator UI, check that the following has succeeded:

- data received successfully using the in-band modem;
- MSD contains the vehicle VIN-number and type, energy carrier type, information on geographic location of the vehicle, and correct attribute of emergency call activation, i.e., automatic.

6.15.5 Remove the "Ignition" signal from the input of the vehicle ignition line.

6.15.6 Using the IVS diagnostic software, set AUTOMATIC_REGISTRATION to TRUE.

6.15.7 Apply the "Ignition" signal to the input of the vehicle ignition line.

6.15.8 Make sure that the IVS is in ERA mode; switch it to ERA mode otherwise.

6.15.9 Press the "Emergency Call" button on the user interface module of the IVS.

6.15.10 Using the emulator UI intended for connection control, terminate the emergency call that has arrived from the IVS.

6.15.11 Remove the "Ignition" signal from the input of the vehicle ignition line.

6.15.12 Using the IVS diagnostic software, check that IVS stopped its network registration after the timeout setting for call-back from the operator side had expired.

6.16 Checking electric power supply and power consumption requirements (for IVS in auxiliary equipment configuration)

- 6.16.1 Apply external power to the IVS, or "Ignition" signal to the input of the IVS ignition line.
- 6.16.2 Make sure that the IVS is in ERA mode.
- 6.16.3 Using the IVS diagnostic software, check that the correct telephone number for SMS transmission is set in the ECALL_SMS_FALLBACK_NUMBER parameter, and that the following settings are active: CALL_AUTO_ANSWER_TIME — 5 min, NAD_DEREGISTRATION_TIME — 5 min.
- 6.16.4 Press the "Emergency Call" button on the user interface module of the IVS.
- 6.16.5 Check that the duplex voice connection with the operator is established.
- 6.16.6 As described in the IVS User Guide, set the maximum sound level in the speaker connected to the IVS under test.
- 6.16.7 From the emulator side, read out any text for 3 min.
- 6.16.8 Check that the IVS current consumption does not exceed 1500 mA at 12 V (or 1200 mA at 24 V) during at least 3 min.
- 6.16.9 Using the emulator UI intended for connection control, terminate the emergency call that has arrived from a given IVS, and check that the duplex voice connection with the operator has terminated.
- 6.16.10 Remove the "Ignition" signal from the input of the vehicle ignition line of the IVS.
- 6.16.11 Check that the IVS current consumption does not exceed 10 mA for 12 V (24 V) during at least 1 min.

6.17 Checking transfer of SMS command for setting SMS transmission number when SMS is used as a redundant data channel

This check requires the sequence of step-by-step operations specified in Table 4.

Table 4 — Steps used for checking transfer of SMS command for setting SMS data transmission number

Step	Sequence of operations on each step	Check results
Initiating transfer of configuration command	Using the software for communication between the IVS and the system emulator, initiate the transfer of the number setting command for SMS data transmission, set the ID of the IVS to 00000001, and specify the number for SMS transmission. Wait for confirmation that the SMS with the configuration command has reached the IVS module	Configuration command used to set the number for SMS data transmission sent from the bench and delivered to the IVS
Receiving confirmation from IVS on completion of configuration command	Wait for up to 5 minutes for confirmation that the configuration command has been completed. The fact that the confirmation has been received shall be reflected in the system emulator UI	Received the confirmation on the completion of configuration command by IVS
Rebooting IVS	Reboot the IVS using the standard procedure	The IVS rebooted
Checking IVS storage for new number to be used for SMS data transmission	Using the IVS diagnostic software, connect to the in-vehicle system. Using the IVS diagnostic software, check that the respective number for SMS data transmission has been stored in the IVS memory.	New number for SMS data transmission stored in the IVS.

The result of this check shall be considered positive if the results specified in "Check results" column have been achieved for each step described in Table 4.

6.18 Checking transfer of SMS command for setting emergency call number used in tests

This check requires the sequence of step-by-step operations specified in Table 5.

Table 5 — Steps used for checking transfer of SMS command for setting emergency call number to be used in tests

Step	Sequence of operations on each step	Check results
Initiating transfer of configuration command	Using the software for communication between the IVS and the system emulator, initiate the transfer of the number setting command for test calls, set the ID of the IVS to 00000001, and specify the number. Wait for confirmation that the SMS with the configuration command has reached the IVS module.	Configuration command used to set the number for test calls sent from the bench and delivered to the IVS.
Receiving confirmation from IVS on completion of configuration command	Wait for up to 5 minutes for confirmation that the configuration command has been completed. The fact that the confirmation has been received shall be reflected in the emulator UI	Received confirmation on completion of configuration command by the IVS.
Rebooting IVS	Reboot the IVS using the standard procedure	The IVS rebooted
Checking IVS storage for new number to be used for test calls	Using the IVS diagnostic software, check that the respective number for test calls has been stored in the IVS memory.	New number for test calls stored in the IVS.

The result of this check shall be considered positive if the results specified in "Check results" column have been achieved for each step described in Table 5.

6.19 Checking transfer of MSD in manual activation mode using in-band modem

This check requires the sequence of step-by-step operations specified in Table 6.

Table 6 — Steps used for checking transfer of MSD in manual activation mode using in-band modem

Step	Sequence of operations on each step	Check results
Simulating an accident	Press the emergency call activation button. Check for UIM indication that the IVS has passed to the accident notification stage (dial-up in "Emergency Call" mode) in accordance with the OM	Accident simulated
Checking MSD delivery using in-band modem	Wait for 20 s. Using the system emulator UI, check that the MSD for the simulated accident has been received, and decoded correctly	MSD received and correctly decoded; it contains manual activation attribute

The result of this check shall be considered positive if the results specified in "Check results" column have been achieved for each step described in Table 6.

6.20 Checking transfer of MSD in manual activation mode using SMS

This check requires the sequence of step-by-step operations specified in Table 7.

Table 7 — Steps used for checking transfer of MSD in manual activation mode using SMS

Step	Sequence of operations on each step	Check results
Simulating an accident	Using the IVS diagnostic software, disable data transfer using the in-band modem. Press the emergency call activation button. Using UIM, check that the IVS has passed to the accident notification stage.	Accident simulated
Checking MSD delivery by SMS	Wait for 30 s. Using the emulator UI, check that the MSD for the simulated accident has been received, and decoded correctly.	MSD received and correctly decoded; decoded MSD data contain manual MSD generation attribute

The result of this check shall be considered positive if the results specified in "Check results" column have been achieved for each step described in Table 7.

6.21 Checking transfer of SMS command for initiation of test emergency call

This check requires the sequence of step-by-step operations specified in Table 8.

Table 8 — Steps used for checking transfer of SMS command for initiation of test emergency call

Step	Sequence of operations on each step	Check results
Initiating transfer of control command	Using the system emulator, initiate the transfer of the test call initiation command after specifying the MSISDN of the IVS SIM-card, 00000001 as the ID of the IVS, in-band modem as the MSD delivery transport, and "manual" as the emergency call type. Wait for confirmation that the SMS with the control command has reached the IVS.	Control command for initiation of emergency call sent from the emulator and delivered to the IVS
Receiving confirmation from IVS on completion of control command	In the emulator UI, wait for confirmation from the IVS that the control command has been completed.	Received confirmation on completion of control command by the IVS
Checking completion of control command by IVS	Wait for 30 s. In the emulator UI, check that the MSD generated in reply to the request has been received, and this MSD has been decoded correctly.	The IVS generated MSD in reply to control command. Manual generation flag and test emergency call attribute must be present in the decoded MSD

The result of this check shall be considered positive if the results specified in "Check results" column have been achieved for each step described in Table 8.

6.22 Checking transfer of MSD with test call attribute using in-band modem

This check requires the sequence of step-by-step operations specified in Table 9.

Table 9 — Steps used for checking transfer of MSD with test call attribute using in-band modem

Step	Sequence of operations on each step	Check results
	<p>Using the IVS diagnostic software, make sure that the correct number for test calls is present in settings (see 6.18).</p> <p>Using the system emulator UI, simulate the start-up of Test mode.</p>	Configuration contains the correct number for test calls
Sending control command for initiation of IVS test emergency call with data to be transmitted using in-band modem; receiving MSD	<p>Wait for confirmation that the control command has been completed.</p> <p>The fact that the confirmation has been received shall be reflected in the emulator UI.</p> <p>Wait for 20 s.</p> <p>In the emulator UI, check that the MSD generated in reply to the request has been received, and this MSD has been decoded correctly.</p>	Received confirmation on completion of control command by the IVS. The IVS generated MSD and transferred it to the number for test calls using in-band modem

The result of this check shall be considered positive if the results specified in "Check results" column have been achieved for each step described in Table 9.

6.23 Checking transfer of MSD with test call attribute using SMS

If the order of tests differs from the one specified in this document, then Step 1 of Table 9 should be completed first.

This check requires the sequence of step-by-step operations specified in Table 10.

Table 10 — Steps used for checking transfer of MSD with test call attribute using SMS

Step	Sequence of operations on each step	Check results
Sending control command for initiation of IVS test emergency call with data to be transmitted using SMS; receiving MSD	<p>Take the steps described in 6.21, but specify the SMS channel as a transport for emergency call delivery.</p> <p>Wait for up to 20 s.</p> <p>In the emulator UI, check that the MSD generated in reply to the request has been received, and this MSD has been decoded correctly.</p> <p>The decoded MSD must contain the test emergency call attribute.</p>	The IVS generated MSD and delivered it to the number ECALL_SMS_FALLBACK_NUMBER specified in the IVS settings

The result of this check shall be considered positive if the results specified in "Check results" column have been achieved for each step described in Table 10.

6.24 Checking transfer of SMS command for repeated MSD transfer in regard to RTA event recorded earlier

This check requires the sequence of step-by-step operations specified in Table 11.

Table 11 — Steps used for checking transfer of SMS command for repeated MSD transfer in regard to RTA event recorded earlier

Step	Sequence of operations on each step	Check results
Initiating transfer of control command	Using the system emulator, initiate the transfer of the command for repeated MSD transfer after specifying the MSISDN of the IVS SIM-card, 00000001 as the ID of the IVS, SMS as the MSD delivery transport, and the serial number of the emergency call message which must be detailed in the response MSD (this data may be obtained from the Message Identifier field value when the MSD transfer results are analysed, e.g., in the test as per 6.15). Wait for confirmation that the SMS with the control command has been delivered to the IVS module.	Control command for initiation of repeated SMS transfer for emergency call sent from the bench and delivered to the IVS
Receiving confirmation from IVS on completion of control command	Wait for confirmation that the control command has been completed. The fact that the confirmation has been received shall be reported to the emulator UI.	Received confirmation on completion of control command by the IVS
Checking completion of control command by IVS	Wait for up to 30 s. In the system emulator UI, check that the MSD generated in reply to the request has been received, and this MSD has been decoded correctly.	The IVS sent one more MSD on accident event with the specified number in reply to control command. The decoded MSD shall contain the same accident data as those in the initial MSD, including all flags but excluding the data on the current location and location as of time moments p-1 and p-2

The result of this check shall be considered positive if the results specified in "Check results" column have been achieved for each step described in Table 11.

6.25 Checking packet transmission of firmware data specific to a given IVS type (for IVS in auxiliary equipment configuration)

This check requires the sequence of step-by-step operations specified in Table 12.

Table 12 — Steps for checking GPRS transmission of firmware data specific to given IVS type

Step	Sequence of operations on each step	Check results
Initiating transfer of configuration command	Using the system emulator, initiate packet data transfer for a command used to transmit an IVS-specific firmware image to the IVS, with the ID of the IVS set to 00000001 and the full path to the IVS-specific firmware image specified. Wait for confirmation that the configuration command has been delivered to the IVS module by packet data transfer, and the transmission of the firmware image has started.	Configuration command for transfer of IVS-specific firmware image sent from the bench and delivered to the IVS

Table 12 (continued)

Step	Sequence of operations on each step	Check results
Receiving confirmation from IVS on completion of configuration command	Wait for confirmation that the firmware image file has been downloaded to the IVS. The fact that the confirmation has been received shall be reported to the emulator UI.	Received confirmation on downloading completion of IVS firmware image file
Rebooting IVS	Reboot the IVS using the standard procedure	The IVS rebooted
Checking that IVS operation has started with the new firmware image	Using the IVS diagnostic software, check that the IVS is functioning under control of the firmware where the version number thereof coincides with the one stated by the IVS manufacturer when delivering the firmware image	Updated firmware version is operating in the IVS

The result of this check shall be considered positive if the results specified in "Check results" column have been achieved for each step described in Table 12.

6.26 Checking that emergency call button is protected from accidental pressing

6.26.1 Inspect the IVS user interface module visually and check that the "Emergency Call" button has mechanical protected from accidental pressing.

Note — The IVS manufacturer shall select proper technical implementation for mechanical protection of the "Emergency Call" button from accidental pressing.

6.26.2 Check that the OM for the IVS includes instructions on switching the "Emergency Call" button to a state ready for emergency calls.

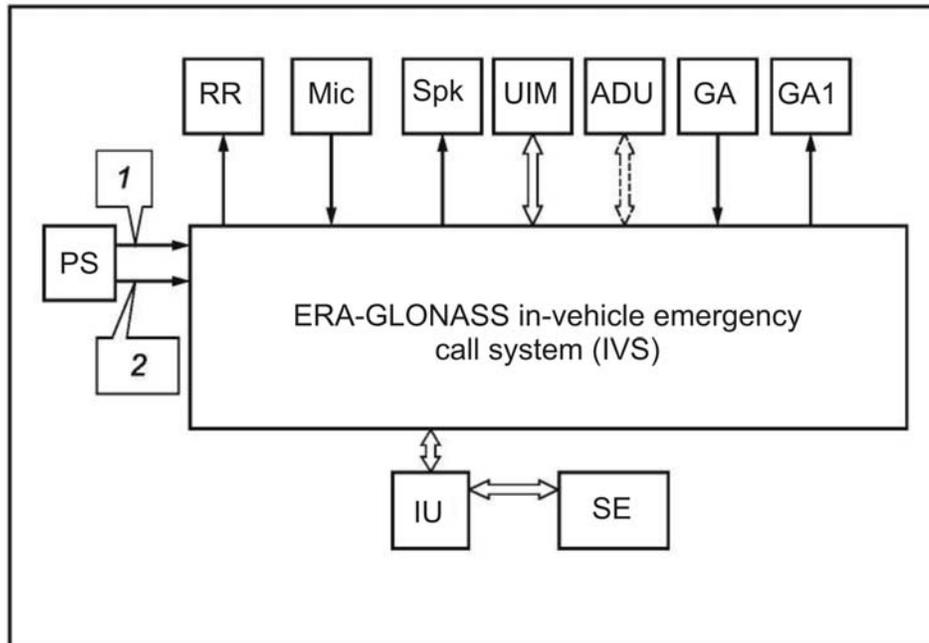
6.27 Checking that backlighting of emergency call button is available

6.27.1 Apply the "Ignition" signal to the input of the vehicle ignition line.

6.27.2 Inspect the IVS user interface module visually and check that the "Emergency Call" button has the backlighting.

Appendix A
(normative)

Block diagram of bench used for tests of in-vehicle emergency call system/device



RR — radio recorder of vehicle; Mic — microphone; Spk — speaker; UIM — user interface module; ADU — accident detector unit; GA —GLONASS antenna; GA1 — GSM/UMTS antenna; PS — power supply (12/24 V); IU — interface unit; SE — ERA-GLONASS system emulator; 1 — power cable; 2 — ignition circuit

Figure A.1 — Connection diagram for IVS in auxiliary equipment configuration

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