



AECD/AECS self-test and status indication

9th AECS meeting

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Self-test and status indication

Outline of the proposed procedure

- Purpose
 - Verify that a warning will be given to the occupants of the vehicle in the event of a critical system failure which would result in an inability to execute an emergency call.
 - Create consistent expectations of the items to be covered by the self-test across type-approval authorities.
- Proposed procedure
 - Procedure based on documentation and selected physical verification test (analogous to UN R13-H and UN R79).
 - Compromise for type-approval testing between having to test each failure and relying on documentation only.
- Key features
 - Narrows self-test requirements down to detectable system failures only.
 - The self-test function shall cover a set list of items *where technically feasible with the chosen system design and architecture*.
 - Visual tell-tale/warning light: Activated while failure is present; may be cancelled temporarily by the driver, but shall be repeated on ignition-on.
 - Other potential failure cases, which cannot be detected by a system self-test, should be covered during PTI.

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Procedure: Information regarding self-test

- Template of information – example rows

Item	Monitored by self-test?	If yes: Technical principle applied for monitoring	If no: Technical reasons prohibitive of monitoring	Malfunction simulation feasible? If no: technical reasons prohibitive of simulation
AECD/AECS ECU is in working order	yes/no			
External mobile network antenna is connected	yes/no			
Mobile network communication device is in working order (no internal hardware failure, responsive)	yes/no			
External GNSS antenna is connected	yes/no			
...	...			

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Procedure: Information regarding self-test

- “Where technically feasible with the chosen system design and architecture”, the self-test function shall monitor at least the following technical items:
 - **AECD/AECS ECU** is in working order (e.g. no internal hardware failure, processor/memory is ready, firmware is loaded successfully, logic function in expected default state)
 - External **mobile network antenna** is connected
 - **Mobile network communication device** is in working order (no internal hardware failure, responsive)
 - External **GNSS antenna** is connected
 - **GNSS receiver** is in working order (no internal hardware failure, output within expected range)
 - **Crash control unit** is in working order (e.g. no internal hardware failure, processor is ready, logic function in expected default state)
 - No **communication failures** (bus connection failures) of relevant components
 - **SIM** is present
 - **Dedicated battery** is connected
 - State of health of dedicated battery
 - **Microphone(s)** are connected
 - **Loudspeaker(s)** are connected
 - **Manual call button** is connected
 - **Status indicator** is connected
- Items can be omitted based on technical reasons, why it is not feasible to monitor the item with the chosen design/architecture (to the satisfaction of the type-approval authority)
- This means, emphasis is given to pragmatic self-testing: This should be possible without having to significantly change the system design or architecture, which is governed by the vehicle’s communication and information sharing protocols.

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Test procedure: Self-test verification

- Simulate a malfunction of the AECD/AECS by introducing a critical failure in one or more of the items monitored by the self-test function.
 - According to the technical documentation provided by the manufacturer.
 - The item(s) shall be selected at the discretion of the technical service.
- Switch the ignition 'on' and verify that the malfunction indicator illuminates shortly afterwards.
- Switch the ignition 'off' and restore the AECD/AECS to normal operation.
- Switch the ignition 'on' and verify that the malfunction indicator does not illuminate or extinguishes shortly after illuminating initially.

Thank you

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