DEKRA greenpaper on eCall (EU 2017/79)

Since April 2018, eCall has had the potential to be a life saver for car drivers: estimations say this emergency system could save hundreds of lives annually in Europe alone. Following an accident, eCall automatically calls emergency services. The system is mandatory in all new passenger cars and light commercial vehicle models (M1 and N1) in the EU.

For a system with such an effect on safety, it goes without saying that it needs to be reliable. It needs to function constantly, no matter the location of the car or the type of emergency. That is the only way its users will profit from its safety features. Car manufacturers, importers and suppliers therefore need to make sure that their product complies with the European regulations EU 2017/79 and EU 2017/78, which detail the (technical) requirements and test procedures for the EC type approval of motor vehicles for 112-based eCall in-vehicle systems, units and components.

But how do you comply exactly? And what is in the scope of the type approval and what is not? DEKRA's greenpaper on eCall is here to help.

What is eCall?

Immediately after an accident or collision has happened, the eCall unit in a vehicle sends, among other, the following information to the 112 emergency services: the time and location of the accident, the direction of the vehicle and the number of passengers in the vehicle.

Next, the 112 operator can see the location of the accident on their screen and they receive the information that was sent to them from the eCall unit. They can start talking with the driver and passengers and let them know that help is being sent. The operator will also forward any relevant information to the traffic information and traffic management services.

The eCall system can be triggered in automatic mode, for example through airbag deployment after a collision. However, car passengers can also trigger eCall in manual mode, in case of an emergency.

How did eCall come into existence?

In 1991, more than 100 different organizations and institutions involved in the production of Intelligent Transport Systems (ITS) founded ERTICO – ITS Europe. This partnership came into being through one common vision: to make mobility safer, smarter and cleaner. From ERTICO, the Harmonised eCall European Pilot (HeERO) consortium was created, tasked with the implementation of a Europe-wide eCall system based on the general European emergency services number 112. The project was financed by the European Commission. Of course, the safety and reliability of the system has been priority number one from the start.

Trialing eCall

From 2011 onwards, various European countries started trialling eCall with successful outcomes. To harmonize their work, the eCall Implementation Platform was set up, bringing together all major stakeholders involved in the implementation of eCall. Finally, to harmonize the ecosystem and as a final agreement, it

was decided to make eCall type approval mandatory for all new vehicles (in class M1 and N1) according to the EU 2017/78 and EU 2017/79 regulations from April 2018. With just some time to go, let us help you explain how you can comply.

Most likely, the majority of vehicles (95%) will be equipped with both systems. A third party service needs to comply with the following requirements:

- It needs to comply with EN 16102 – the TPS eCall standard
- Only one system can work at the same time; however, 112-based eCall always needs to be in standby

What is the technology behind it?

The eCall ecosystem consists of two main technologies: a communications network and a positioning system. Its communications network works using GSM and UMTS technologies. The positioning system functions through GPS, Galileo or EGNOSS: this is a critical aspect in providing the correct location information to the emergency services. A system only using GPS is not allowed. A cellular module inside the car, similar to the one you have in your smart phone, inside the car will make the call. It is a dormant system until it is activated into emergency mode. It will not communicate with the network when it is in dormant mode.

What about a third party eCall system?

The European regulation leaves room for third party eCall systems, next to the Pan European eCall system that is based on the emergency call number 112. Customers can choose the state or publically managed eCall system or a private service. They always have the right to switch to the state-managed system. Third party systems may be promoted by car manufacturers to offer users extra services, such as maintenance alerts. Note: privacy of third party systems is not in the scope of the type approval.

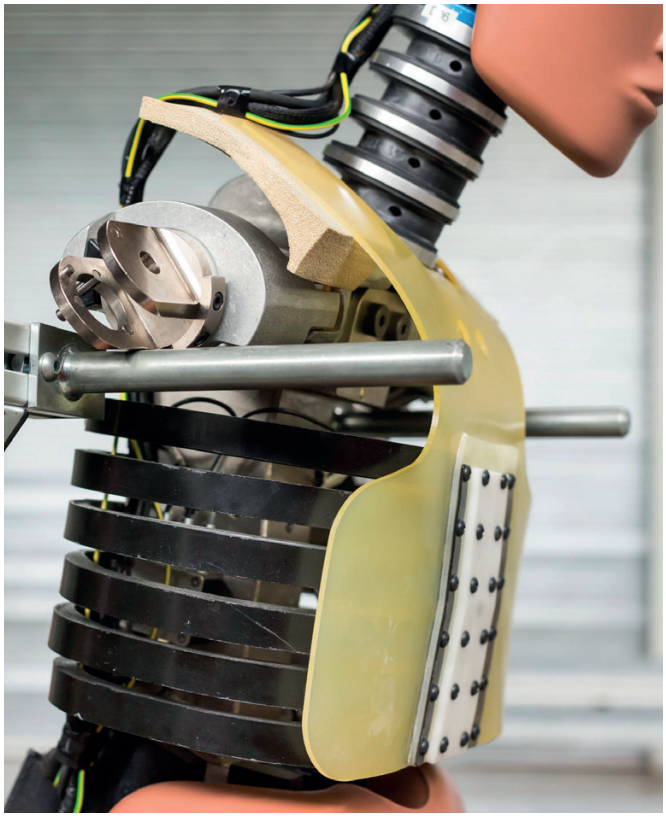
- At any time, the vehicle user may choose to use 112-based eCall instead of the third party service version

What needs to be tested?

EU 2017/79 meticulously describes the test procedures and requirements for the eCall system. The regulation consists of nine annexes, all of which go into a specific topic related to, amongst others, safety, coexistence and privacy:

- Resistance of eCall in-vehicle systems to severe crashes
- A full-scale impact test assessment
- Crash resistance of the audio equipment used
- Coexistence of third party services with the 112-based eCall system
- Automatic triggering mechanisms
- Compatibility of the eCall system with positioning services Galileo and EGNOS
- In-vehicle system self-test
- Requirements related to privacy and data protection
- Involved vehicle classes

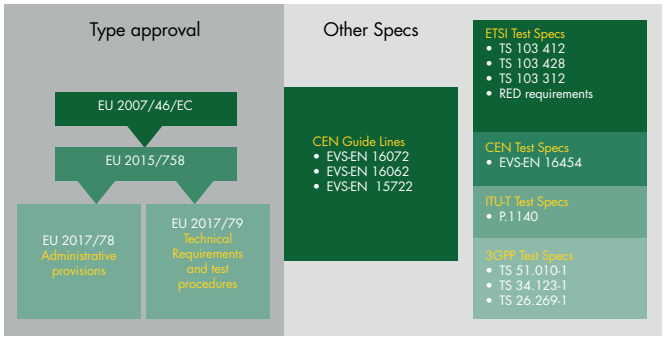
In addition to testing, the administrative process and analysis that need to be executed can be found in EU 2017/78.



How can DEKRA help?

DEKRA has been accredited to provide the full eCall testing and type approval services by Kraftfahrt-Bundesamt (KBA). From the technical service to the testing and administration; customers can rely on DEKRA for the entire process. DEKRA also tests and certifies in accordance with Global Certification Forum (GCF) regulations, based on the 3GPP standard.

We can also help you with other types of testing in, for example, debugging and developing the system. In the below scheme you will find other specifications outside of the type approval process that DEKRA can offer you:



eCall reference standards and test specifications

Reference standards / guidelines

- EVS-EN 16072:2015 Intelligent transport systems – ESafety – Pan- European eCall operating requirements
- EVS-EN 16062:2015 Intelligent transport systems – ESafety – eCall high level application requirements (HLAP) using GSM/UMTS circuit switched networks.
- EVS-EN 16102:2011 Intelligent transport systems – eCall – Operating requirements for third party support
- EVS-EN 15722:2015 Intelligent transport systems – ESafety – ECall minimum set of data

European Directives (eCall Type approval)

- EU 2007/46/EC Establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles
- EU 2015/758 Concerning type-approval requirements for the deployment of the eCall in-vehicle system based on the 112 service
- EU 2017/78 Commission implementing Regulation administrative provisions eCall Type approval
- EU 2017/79 Commission delegated Regulation technical requirements and test procedures for eCall Type approval

Other testing specifications (not needed to get the type approval)

- 3GPP Conformance Testing
  - TS 51.010-1 GSM
  - TS 34.123-1 UMTS
  - TS 26.269 In-Band Modem
- ETSI Conformance Testing
  - TS 103 412 Mobile Standards Group (MSG); Pan-European eCall end to end and in-band modem conformance testing; Prose test specification
  - TS 103 428 Mobile Standards Group (MSG); eCall HLAP Interoperability Testing
  - TS 103 321 Mobile Standards Group (MSG); eCall HLAP Conformance Testing; Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)
  - RED (Radio Equipment Directive) requirements. EMC, Safety and RF.
- ITU-T Conformance Testing
  - P.1140 Speech communication requirements for emergency calls originating from vehicles
- CEN Conformance Testing
  - EVS-EN 16454:2015 Intelligent transport systems – Esafety– ECall end to end conformance testing

Sources & acknowledgements

EU 2017/79

EENA eCall fact sheet

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