



TY **QUALITY**

A close-up of a gauge or speedometer with a blue needle pointing towards the right. The word "QUALITY" is written in large, bold, blue letters across the top of the gauge, and "TY" is visible to its left.

Assessment • Certification • Expert Opinion

After market devices

User Consultation Platform - sAFE – After-Market eCall for Europe

NavCert GmbH

01-12-2020

Type approval

Pre-testing and type approval according Delegated Regulation 2017/79

First car with built-in eCall system type approved by contribution of NavCert

Showcase with GSA on ITS World Congress 2018 – Copenhagen

Today support to OEMs worldwide

Development of certification scheme for aftermarket solutions



sAFE After-Market eCall für Europa

funded by Innovation and Networks Executive Agency (INEA)

Runtime 01.01.2019 – 31.12.2020, now extended to 30.06.2021

- Definition of standards and specifications for eCall after market
- Definition of Certification scheme
 - Determination of minimum performance and conformity requirements for 112 eCall systems and devices in the aftermarket => Preventing PSAPs from being overloaded by incorrect calls and assurance correct operation in case of incident
 - Development of necessary variants of eCall systems in the aftermarket that can use the single emergency number 112 for all types of vehicles
 - Cooperation with the European standardisation bodies to develop the necessary technical standards for the eCall system in the aftermarket Great

Conformity assessment for aftermarket eCall devices

Identification existing operational requirements for eCall today based on

- standards such as EN 16072, EN16062
- relevant directives, regulations and delegated acts on European level

Adjustment to corresponding ones for aftermarket 112 eCall devices

Result:

- Specification for operational and installation requirements,
- Identification of most suitable accreditation / qualification profiles -> Draft as input for CEN for aftermarket 112 eCall devices,
- Development of scheme with procedure for authorization to assess the readiness of aftermarket 112 eCall devices

Delegated Regulation 2017/79

Applicable to IVS

- Annex I: Resistance against acceleration (IVS)
- Annex IV: Assessment of TPS (IVS)
- Annex V: Assessment of triggering (IVS)
- Annex VI: Compatibility to Galileo and EGNOS(IVS)
- Annex VII: Self-test (IVS)
- Annex VIII: Privacy and data protection(IVS)

Applicable to vehicle

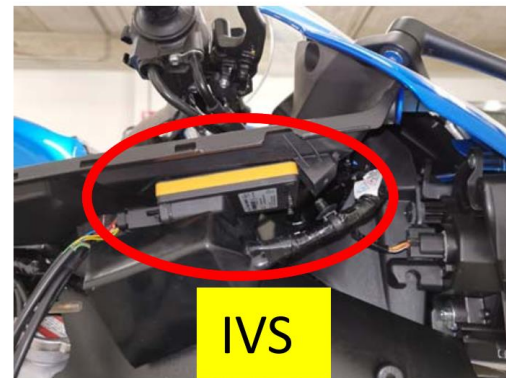
- Annex II: Full scale impact assessment (vehicle)
- Annex III: Audio quality (vehicle)

Requirements passenger vehicles (M1/N1)

- ✓ Automatic initiation of an emergency call 112 in case of an incident
- ✓ Manual initiation of an emergency call 112 on request of driver
- ✓ Determination of position of the vehicle and sharing up to three positions

But voice communication between driver and emergency centre (PSAP) ?

Pictures by Suzuki Corporation, sAFE 3.5
Presented at eCall Days 2020



Ongoing analysis of three options

No voice communication at all (biker in case of incident typically away from bike)

Only microphone (enabling call taker analysing noise for recognition of false alarms in case of motor sound)

Microphone and loudspeaker for voice communication (forwarding audio to device in bikers helmet)

Mapping Vehicle classes to Annexes

	Passenger, Light Goods		Powered Two Wheeler		Long Distance Coach		Large Goods Vehicle	
	M1/N1 112	M1/N1 TPS	P2W 112	P2W TPS	LD Coach 112	LD Coach TPS	LGV 112	LGV TPS
Annex I	+	+	+	+	-	-	-	-
Annex II	-	-	-	-	-	-	-	-
Annex III	-	-	-	-	-	-	-	-
Annex IV	-	+	-	+	-	+	-	+
Annex V	+	+	+	+	-	-	-	-
Annex VI	+	+	+	+	+	+	+	+
Annex VII	+	+	+	+	+	+	+	+
Annex VIII	+	+	+	+	+	+	+	+
	+ Applicable				- Not applicable			

Annex I: Resistance against acceleration (IVS)
 Annex II: Full scale impact assessment (vehicle)
 Annex III: Audio quality (vehicle)
 Annex IV: Assessment of TPS (IVS)

Annex V: Assessment of triggering (IVS)
 Annex VI: Compatibility to Galileo and EGNOS(IVS)
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 Annex VIII: Privacy and data protection(IVS)

Sample of Certificate

Certification mark PPP 800xy Conformity of eCall after market

Examination based on:

The test mark is awarded as part of a voluntary certification based on test criteria derived from the applicable eCall standards for assessing conformity with the applicable requirements from:

- DR (EU) 2017/79 Annex I, IV, V, VI, VII, VIII
- DR 2017/78 (EU)
- R (EU) 2015/758
- EN 16454:2015
- EN 16102:2012

The continuous adaptation to current standards and the procedures for quality control of the software and hardware development process are evaluated annually during the validity period of the certificate.

Vehicle type supported: selection of M1/N1, P2W, LD Coaches, HGV

TPS Supported: additional requirements DR (EU) 2017/79 Annex IV and part of Annex VIII





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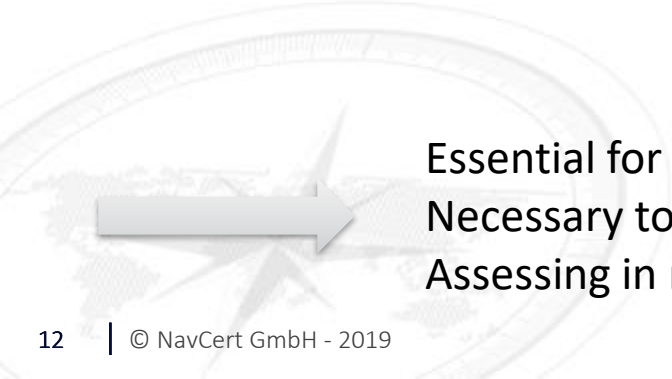
Transfer of type approval of a vehicle type to assessment of retrofit

Annex 1:

- IVS installed on a sled with all modules, the provided mounting and further components like antenna, battery, etc
- Sled is accelerated with up to 77g according to the specifications
- Test eCall initiated via existing mobile network or a mobile network simulator establishing call to certified PSAP simulator (public mobile network) or via a TS12 eCall (network simulator)
- MSD is evaluated with respect to accuracy and the timeliness of the call

No requirement to repeat test for every type approval
Sufficient to validate “applicability” of IVS to vehicle assessing location and method of mounting
But more than one option -> more than one test

Annex IV Co-existence of third party services (TPS) with the 112-based eCall in-vehicle systems

A faint background image of a map with a large grey arrow pointing to the right, overlaid on a circular graphic element.

Essential for all TPS devices
Necessary to know which TPS will be used
Assessing in real time the TPSP

Annex V Automatic triggering mechanism

Documentation of triggering automatic eCall ensuring triggering at a lower severity than simulated in full-scale crash tests

Providing explanation and technical documentation about implementation

Documentation of prevention of unjustified eCalls at lower severity level

Providing failure mode analysis showing that hardware or software faults not result in automatic triggering of eCall e.g. via airbag control unit
specification drawings, specification data notes, sensitivity drawings,
relevant circuit diagrams or similar documents



Assessment of documentation

Providing Fault Tree Analysis or similar

Sharing test results for proof of evidence

Annex VI Compatibility to Galileo and EGNOS

Three receivers are tested in static, dynamic "open sky" and dynamic "shadow areas"

Combination of Galileo, GPS and EGNOS signals followed by only Galileo as well as only GPS signals and optionally with Glonass.

Determination times for cold start and re-acquisition of the signals

Determination of sensitivity of receiver after cold start, during operation and during re-acquisition

A faint, large compass rose graphic is visible in the background of the slide, centered behind the text.

All test cases:

Accuracy of position in static and dynamic scenarios

Acquisition times for cold and warm start in defined range

Annex VII Self-test

Examination of errors for the following states

- eCall ECU in working order (e.g. no internal hardware failure, processor/memory is ready, logic function in expected default state)
- External mobile network antenna connected
- Mobile network communication device in working order (no internal hardware failure, responsive)
- External GNSS antenna connected
- GNSS receiver in working order (no internal hardware failure, output within expected range)
- Crash control unit is connected
- No communication failures (bus connection failures) of relevant components
- SIM present for removable SIM
- Power source is connected
- Power source has sufficient charge (threshold at the discretion of the manufacturer)



All test cases

Annex VIII Privacy and data protection

Verification that IVS initiates de-registration from the mobile network after eCall

Determination how long log data stored and that only a maximum of 3 positions stored.

In case of TPS, validation that no data transferred from 112-based eCall to TPS



All test cases