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METHOD AND CONTROL FOR INTELLIGENT ENCRYPTED MESSAGING AND ADDRESSING TO A MOTOR VEHICLE BASED ON FINFIS AND DOMAIN DATA

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Current status / problem / approach of the idea
Ever shorter development times in the PEP - product development process - of motor vehicles, especially highly complex electronically networked motor vehicles with autonomous driving assistants, place ever higher demands on technical development and quality assurance
Supply chain problems, for example with semiconductor components, not infrequently force short-term changeovers and production relocations of purchased/parts components to new locations in an environment of changed control/testing processes. In general, this increases the potential for a „hidden, defective batch" of electronic components that have a very large impact on the safety of a motor vehicle.

With regard to a faster accessibility of end customers in motor vehicles, who may be affected by such discontinuities, and with regard to the avoidance of recourse claims concerning malfunctions of a driving assistance, especially in level 3-5 vehicles, a „high-speed information" directly to the end customer in a motor vehicle is of increasing importance and significance. In this context, the consideration of country-specific message addressing on the basis of special legal foundations is advantageous in order to avoid or demonstrably ward off claims for damages and other liability claims

The aim of the procedure with the associated control is the targeted, extremely fast information to an end customer in the motor vehicle about an equipment-specific component, in particular a driving assistance component of level 3-5 vehicles.

State of the art:
The field of product safety deals with quality problems and their elimination. Motor vehicles are uniquely described with the „VIN", vehicle identification number, and the installed components are documented in databases. Equipment details are combined with type/model/external trim and interior/engine and transmission keys in the production process to form a complete vehicle.
The product safety team not only has an internal duty to inform/notify in the event of product safety hazards. The interface to the Federal Motor Transport Authority (KBA) describes in particular highly safety-relevant issues that may possibly occur in very specific vehicle constellations in certain types of use. A rectification may be instructed/ordered.
Example „Dieselgate". With the SDT, individual motor vehicles can be addressed; addressing purely via the VIN is not flexible enough and requires time-consuming manual individual searches in the various EDP systems

Idea:
The idea describes a procedure and a control system for intelligently encoded notification and addressing of a motor vehicle on the basis of VIN / FIS and domain data.

In simple terms, the idea is a multiflexible database system with programme code identifiers, which is composed of a multitude of qualifiers from planning / production / and control systems from the product development process of a manufacturer, and a motor vehicle, which can be contacted worldwide, partially qualified via this data with „high-speed information"
The procedure also describes an influence on the operation of a motor vehicle.

Aim of the idea:
In addition to the duty to inform, a fast information of an end customer plays a major role with regard to a damage limitation and also for an avoidance/reduction of product liability claims against a company. The notified procedure focuses on this issue, which is dealt with in parallel after the SDT via the product safety team with the KBA authority and the owner of the motor vehicle.

The focus of the idea is on a programme code identifier for an intelligent, addressing of an electronic information to a motor vehicle, which is multiflexibly composed of control/production data of an upstream manufacturing/production control of a product manufacturer and a database.

Functional sequence:
While the KBA addresses an owner/holder of the motor vehicle and informs him/her of the facts, the described procedure addresses the information specifically to a motor vehicle that may have a problem. For example, all vehicles of a type with an electric unit, a certain driving assistance in combination with a certain equipment and/or a special exterior trim component, special equipment. Ergo, a very specific, possibly unique motor vehicle that is stored in the database with the interfaces to the above-mentioned, factory-internal databases „FIN" and „FIS" with control and parts lists of components. With the latter information, e.g. in addition to the component part number, a manufacturer, a production date range and a colour code can be narrowed down.

Programme code identifier of a message addressing
The indicated method generates a programme code identifier with the VIN data and FIS data, i.e. with all data behind a vehicle identification number and the manufacturing, information and control systems“ and uses these as qualifiers multiflexibly when addressing via the wireless connection to the motor vehicle.

Examples of programme code identifiers:

1. FIN from ... to FIN ...@markenname.länderdomaine

2. Produktionsnummer@markenname.de

ditto. for all country-specific domains, e.g. also in combination with a manufacturer’s code from a supplier, e.g. a battery partner in Sweden (FIS data)

Teilenummer_NV-Herstellercode@markenname.se

Depending on the legal situation/executive environment in the country concerned, individual motor vehicles can thus be informed extremely quickly and in a very targeted manner by the manufacturer, including the persons who, for example, are currently experiencing driving assistance in real driving situations. For example, by integrating a country domain, e.g. „us“, a specific vehicle series with a specific drive and driving assistance type can be specifically informed.

Special embodiments include qualifiers from the FIS environment

- Stücklistenteilenummer@markenname.es	All FZGs of the manufacturer with a spec. part no. in Spain
- TMA_IMG@ markenname.ch	All FZGe of the manufacturer with a spec. model code in Switzerland
- Colour code@ markenname.us	All red/black/... FZGe of the manufacturer in USA

Further special designs from the FIS environment (wildcard qualifier)

- all_suv@ brand-name -vip.de	Addressing all VIPs with SUV vehicles
- e-tron@ brand-name _gps_qualifier.no	Addressing e-tron drivers in Norway

Further special designs from the FIS environment (wildcard-qualifier)

- PRNr@Marke1.at	Addressing to all brand1 vehicles in Austria whose vehicles are equipped with a very special additional equipment/PR-No.

Partially qualified addressing entries of multi-digit qualifiers can address a specific group of motor vehicles

- TMA_acceleration_number_engine_type@ markenname.de

- 8WC_40TDI@ brandname.com

The above programme code describes, e.g. all A4 (Advanced, S-Line, incl. Black line), model year 2022 with the engine 2.0l TDI, 150kW.

Programme code identifiers can be composed multiflexibly before the qualifier country domain and specify equipment

- 8WC_40TDI_1BE_7X7@ markenname.de

Describes the A4 with sports suspension (1BE) and Park distance control rear incl. RF camera (7X7)

A special embodiment temporarily deactivates a driving assistance system downstream of the procedure information, e.g. the 7N3 Lane Keeping Assist, Level 4 in borderline cases - imminent danger - until an improvement, e.g. a software update, has taken place.

Summary:
With the procedure described above and the associated control system, the technical information to be transmitted is quickly and verifiably available to the driver at the motor vehicle interface „MMI“. In simple terms, the addressing code informs exactly the person who drives/steers the very individual vehicle, or the vehicle that performs the driving assistance for the person

A time delay between the vehicle owner and the end customer/driver/leasing customer/rental car customer, e.g. with a Europcar customer, is reduced and with it a possible risk of claims for damages. In simple terms, the control of the described procedure provides for a vehicle notification independent of the owner, directly to an MMI device installed in the motor vehicle, or notifies a mobile terminal that is currently coupled to the motor vehicle

Advantage
- Faster and more targeted technical information to a motor vehicle/driver
- Increase in road safety
- Increase in legal/procedural security for the product manufacturer
- Reduction of claims for damages against the manufacturer

Verfahren und Steuerung für eine intelligent verschlüsselte Mitteilung und Adressierung an ein Kraftfahrzeug auf Basis von FIN- / FIS- und Domaine-Daten

Fig. 1 Beispielhafte Darstellung einer Fahrzeugbenachrichtung über ein Programmcode-Kennzeichen