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INTELLIGENT EXHAUSTRIAL DOCUMENTATION - PROCEDURE AND CONTROL FOR ADDITIONAL CHARACTERISTICS FOR AN EMISSION QUANTITY-DEPENDENT FLEXIBLE DISTRIBUTION SCHEME

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IED - INTELLIGENT EXHAUSTRIAL DOCUMENTATION - PROCEDURE AND CONTROL FOR ADDITIONAL CHARACTERISTICS FOR AN EMISSION QUANTITY-DEPENDENT FLEXIBLE DISTRIBUTION SCHEME

Technical task:
The task is to create a vehicle-side basis for a levy system in relation to a levy system dependent on emission volumes and/or road use, for example for a taxation procedure by an authority. This means that a vehicle-side procedure can be used with a control system to provide a completely individual vehicle-side parameter, in accordance with the polluter-pays principle 13, for an interface to an external body, for example to an authority for the tax regulation. A vehicle-specific use and/or combinatorics with a road-specific use of a traffic route is taken into account, i.e. a total environmental pollution caused by a motor vehicle.

Initial situation:
The documentation of consumption values on the vehicle side and thus indirectly also emission values is displayed in the on-board computer display via memory modules from the engine control unit. This display could look like the following, for example: BC 1, BC 2, BC 1-n, i.e. short-term or long-term consumption displays or displays of average consumption from the last tank.

The registration authorities will determine the tax or tax exemption data applicable to the vehicle.
Of importance for the taxation of passenger cars are according to the SDT:
- Type of engine (petrol, diesel, Wankel or electric)
- CO_2 standard test values of the vehicle
- the cylinder capacity or twice the nominal chamber volume for vehicles with a Wankel engine
- the emission class of the vehicle

The actual emissions of pollutants also depend to a large extent on the individual use of the vehicle in everyday operation. According to the SDT, there is no documentation procedure on the vehicle side that allows a clearly assigned emission quantity to be determined for a specific person with a specific vehicle from a specific registration date.

Solution:
The IED procedure describes a control system in the form of a long-term memory that calculates an average pollutant emission based on the registration date, for example a real annual emission, which can be made available for external processing by means of a wireless interface, for example for an authority or a main customs office that regulates vehicle taxation.
The aim of the patent idea is to provide a further, additional criterion to the SDT on the vehicle side by means of a method and a control in the motor vehicle, which provides a user-dependent parameter that enables an extended, modified taxation procedure for the future. The latter can be structured differently for each country, can also be handled differently throughout Europe or the world and can meet future energy saving visions from world climate summits.
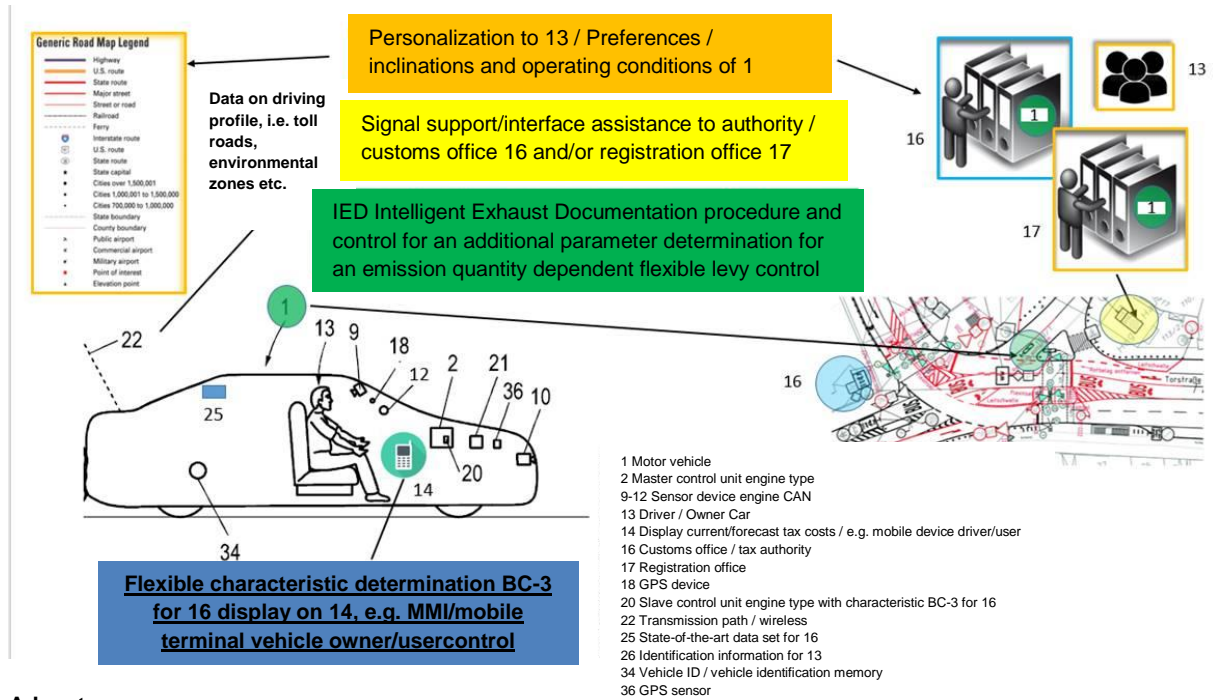
The focus is on an additional automated parameter determination, e.g. BC-3, for a motor vehicle, which enables an "extended levy or tax regulation" for a very specific motor vehicle from a specific registration date for a specific owner, which records a motor vehicle and user-specific driving profile behaviour and thus a real, i.e. actual pollutant emission. Of particular importance in this respect are vehicles with combined E-/h-tron/CNG-/Hybrid engine systems which break down the actual driving profile of the individual drive systems. A vehicle-specific use and/or combinatorics with a road-specific use of a traffic route is also taken into account. This means that the displayed procedure with IED takes into account the overall environmental impact of a motor vehicle.

The task is solved with:
- a vehicle ID/identification number memory (34) which describes all exhaust-related data (25) of a motor vehicle for all engine forms in a motor vehicle, conventional, burner-specific or alternative
- an extended memory or data logger recording of a control unit in the drive train (2/20) for the determination of a user-specific energy consumption
- a slave software (20) in a master control unit (2), which calculates an equivalent user-specific pollutant emission for all conventional and/or alternative drive forms
- an interface of the master control unit (2) which starts a first wireless data transmission (22) if ...

  - the vehicle is registered for the first time with the registration office
  - a motor vehicle is deregistered or re-registered with a registration office
  - a motor vehicle is immobilised

- an interface in the data network (22) of the registration office (17) to the motor vehicle taxation authority (16), for example a main customs office (16)
- an IED software in the slave control unit or engine CAN (20)

- a GPS or navigation unit (36)
- of a display unit (14) about the current or expected tax burden caused by the use of a motor vehicle (1) in the past and in the future

Simplified, exemplary form of presentation:

Personalization to 13 / Preferences / inclinations and operating conditions of 1

Signal support/interface assistance to authority / customs office 16 and/or registration office 17

IED Intelligent Exhaust Documentation procedure and control for an additional parameter determination for an emission quantity dependent flexible levy control

Data on driving profile, i.e. toll roads, environmental zones etc.

Flexible characteristic determination BC-3 for 16 display on 14, e.g. MMI/mobile terminal vehicle owner/usercontrol

1 Motor vehicle
2 Master control unit engine type
9-12 Sensor device engine CAN
13 Driver / Owner Car
14 Display current/forecast tax costs / e.g. mobile device driver/user
16 Customs office / tax authority
17 Registration office
18 GPS device
20 Slave control unit engine type with characteristic BC-3 for 16
22 Transmission path / wireless
25 State-of-the-art data set for 16
26 Identification information for 13
34 Vehicle ID / vehicle identification memory
36 GPS sensor

Advantages:
- Increase of CO_2 savings
- future-oriented procedure and control unit, which do justice to a flexible target definition for future new world climate targets
- user-specific sensitisation and influencing driving behaviour with regard to Visualization in the vehicle, which displays operating costs and tax costs within a flexible billing period as a result of energy consumption, for example via MMI/BC-3 module