

Towards safe use of general controls in cars



Problem description

The current trend to replace physical knobs, buttons and levers by a touch screen has implications for usability. Customer complaints and several recent pragmatic studies by journalists¹ indicate a concern regarding the safe operation of general in-vehicle controls: it takes drivers a lot of time to operate general controls such as adjusting the climate control or tuning the radio. One could wonder whether drivers can safely use such functions that are often hidden under several layers in a touch-screen based menu². As yet, regulations covering the safe use of general controls is lacking: there is no overarching internal-HMI (iHMI) regulation, neither is it sufficiently covered in regulations for specific systems. Therefore, Euro NCAP has decided it is time to set new standards. Euro NCAP means to address this issue through its star rating, thus influencing the automotive sector. Therefore, an easy-to-use assessment methodology needs to be devised. How to assess 'safe use of general controls'? Which controls should be assessed? The focus lies on daily-used controls and controls needed in case of emergency. But which controls are these? The aim of this Master thesis project is to clarify which controls to take into account and to propose an assessment methodology. This research contributes to Euro NCAPs Working Group on HMI and Human Factors and may serve as input for drafting new regulations.

Assignment

The study consists of two parts: 1) identifying which controls should be taken into account, 2) identifying an easy-to-use assessment methodology that allows for differentiating between the iHMI of different car brands. The study should take validity into account, e.g. by being based on real-world driving. For the identification of the controls in passenger cars, a task analysis is suggested to identify both daily used controls as well as controls in case of emergency. For the development of the assessment methodology first a literature review will be performed to reveal existing measuring methods, which may be enriched by interviews with test labs (who perform Euro NCAP tests). Based on this an easy-to-use methodology is then proposed for the assessment of the safe operation of general controls of passenger cars.

Information:

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¹ For example: <https://www.vibilagare.se/english/physical-buttons-outperform-touchscreens-new-cars-test-finds>

² For example: <https://youtu.be/fEbnz6ed0Q?t=545>