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Road vehicles — Ergonomic aspects of transport information and control systems — Occlusion method to assess visual demand due to the use of in-vehicle systems

Véhicules routiers — Aspects ergonomiques des systèmes d'information et de contrôle du transport — Méthode par occlusion pour évaluer la distraction visuelle due à l'utilisation des systèmes embarqués

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Foreword

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ISO 16673 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 13, *Ergonomics applicable to road vehicles*.

Introduction

A wide range of information and communication devices and advanced driver assistance systems are being introduced into motor vehicles. These include navigation aids, emergency messaging systems and wireless communication including email and internet access, which are all accessible to the driver of a motor vehicle. Many of these features have associated visual information that can potentially both inform and distract. To help ensure that the use of such devices and features that are meant to be used by the driver while driving do not result in excessive visual demand, a consistent, verifiable and repeatable method to determine the visual demand imposed by such in-vehicle systems is needed.

Developing precise mathematical predictions of the risk of a crash due to driver distraction from using a particular driver interface is difficult. However, it can be reasonably stated that if drivers are not looking at the road (e.g. looking inside the vehicle to operate a control or read a display), then the probability for a crash is increased [1].

This International Standard is not intended to preclude direct measurement of eye glances as a method to assess visual demand. Direct measurement of eye glances is always desirable. However, direct measurements of eyes-off-the-road times, i.e. glance time measurements, are typically difficult and very costly to measure. The occlusion method estimates visual demand, including resumability, of a task using a means for intermittent viewing of the in-vehicle system. Evaluation by occlusion identifies driver interfaces that are likely to take the driver's eyes away from the road for excessively long durations. Additional data collected without occlusion can be combined with occlusion data to calculate R, a measure believed to identify whether or not tasks can be easily resumed after the driver interrupts the task to look back at the road. This procedure does not require extensive resources and can be applied if a functioning prototype of the driver interface exists.