First edition
2005-12-01

Road vehicles — Ergonomic aspects of in-vehicle presentation for transport information and control systems — Warning systems

Véhicules routiers — Aspects ergonomiques de la présentation des systèmes de commande et d'information des transports à l'intérieur des véhicules — Systèmes avertisseurs

Reference number
ISO/TR 16352:2005(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 16352 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 13, *Ergonomics applicable to road vehicles*.

Introduction

From a task/function analytic perspective, the task of driving is composed of three major interlinked categories of activity (Hancock and Parasuraman, 1992):

a) vehicle control;

b) navigation;

c) collision avoidance.

Each of these functions contribute to the overall workload imposed on the driver. Even under routine, low-traffic conditions, the driver must co-ordinate several tasks together and, generally, can do so quite efficiently. Many of these task components become highly automatized with practice, so that under normal driving conditions the demands of divided attention on the drivers will generally be within the limits of their attentional capacity. However, during more demanding traffic situations, for example, when traffic density increases or at intersections or traffic roundabouts, divided attention demands may sometimes exceed a driver's capabilities.

The driver has to deal with a lot of information which has different situation-dependent priorities and which is more or less expected by the driver. Highly demanding situations are characterized by high time and spatial density or by an extended spatial range of information. Parts of the information are natural and parts are coded within or outside the vehicle. While receiving, processing and reacting to the information, the driver can be overtaxed, which results in critical driving situations with increased accident probability.

This is the motivation to support the driver with assistance systems. The degree of assistance available seems likely to increase considerably over the coming years. Assistance systems can, for example, control speed and distance between vehicles and vehicle position in relation to the road. They not only aim to optimize driver strain and increase driving safety, but also to achieve maximum driver acceptance. For example, the S.A.N.T.O.S system is a (adaptive) driver-assistance system which integrates systems like active cruise control (ACC), heading control (HC), navigation, telephone and radio (Weiße *et al.*, 2002).

Most of these assistance systems announce any abnormal or dangerous state of the car or the driving environment to the driver and require a relatively quick reaction by the driver. These systems warn the driver and convey an appropriate message to the driver. So, with an increasing number of assistance systems, more respective warnings are expected. These warnings need to be designed individually and with respect to their interrelation.