

---

---

**Road vehicles — Gearshift patterns —  
Manual transmissions with power-  
assisted gearchange and automatic  
transmissions with manual-gearshift  
mode**

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

*Véhicules routiers — Disposition de la commande de changement de  
vitesse — Boîtes de vitesses à commande manuelle assistée et boîtes  
de vitesse automatiques à commande manuelle*

[ISO/TS 12104:2003](https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003)

[https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-  
7181188ec836/iso-ts-12104-2003](https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003)



**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.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[ISO/TS 12104:2003](#)

<https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003>

© ISO 2003

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

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](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

**Contents**

Page

Foreword .....	iv
Introduction .....	v
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	1
4 Gear modes .....	2
4.1 Gear-select mode .....	2
4.2 Manual-gearshift mode .....	3
5 Application of shift direction principles for manual-gearshift mode .....	4
5.1 General .....	4
5.2 Fore/Aft .....	4
5.3 Left/right (transverse) .....	6
5.4 Up/down (vertical) .....	8
Annex A (informative) Indication of low gear(s) in MSA shift pattern .....	9
Bibliography .....	10

iTeh STANDARD PREVIEW

(standards.iteh.ai)

[ISO/TS 12104:2003](https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003)<https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003>

## 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 other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 12104 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 13, *Ergonomics applicable to road vehicles*.

## Introduction

Electronic controls for vehicle transmissions can make the operation of changing gears for manual and automatic transmissions much more alike. Gear changes in manual transmissions can be made in a similar manner to those in automatics, without the need for a clutch pedal. Conversely, automatic transmissions can incorporate a means for manually shifting between individual gears. When the operation of changing gears is similar for both types of transmissions, drivers expect a similar shift pattern for selecting or changing gears.

This document is published as a Technical Specification because there is controversy about the most appropriate shift direction for fore/aft motion of a floor- or instrument panel-mounted gear lever. Currently, some vehicles use the forward direction of the gear lever for upshifts, while other vehicles use the rearward direction for upshift. National delegations have not achieved consensus on which shift direction to standardize for this particular situation. Consensus has been achieved for all other shift directions shown in Table 1.

TC 22/SC 13 believes that a standard for direction of motion is desirable. Drivers of road vehicles should not have to contend with two opposite shift directions of motion for the floor-mounted lever gearshift controls. Data provided by Japan indicated that there was no stereotype for the upshift direction of motion when gear levers were mounted on the floor and operated in the fore/aft direction. Either direction could have been chosen as the standard. After considering all data and arguments for each direction of motion, SC 13 decided that pull rearward for upshift was the best alternative. By publishing this document as a Technical Specification, SC 13 is giving manufacturers time to provide data to support a different direction of motion, or change their products in order to comply with this Technical Specification.

**(standards.iteh.ai)**

[ISO/TS 12104:2003](https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003)

<https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO/TS 12104:2003

<https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003>

# Road vehicles — Gearshift patterns — Manual transmissions with power-assisted gearchange and automatic transmissions with manual-gearshift mode

## 1 Scope

This Technical Specification establishes the shift patterns for manual transmissions with power-assisted gear changes and automatic transmissions with manual-gearshift mode on road vehicles. It also specifies the location of the gear-select and manual-gearshift modes in relation to one another. It is applicable to road vehicles as defined in ISO 3833, excepting motorcycles. It is not applicable to manual transmissions having gearshift patterns without a +/- manual-gearshift mode, nor to displays or tell-tales.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3833, *Road vehicles — Types — Terms and definitions*

[ISO/TS 12104:2003](https://standards.iteh.ai/iso-ts-12104-2003)

ISO 2575, *Road vehicles — Symbols for controls, indicators and tell-tales*

<https://standards.iteh.ai/standards/iso-ts-12104-2003>

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### **shift pattern**

driver interface indicating the transmission settings, and the arrangement (sequence) of those settings, that are selectable by the driver using the shift control device

### 3.2

#### **power-assisted gear changes**

<manual transmission> gear changes accomplished by an add-on power controller, eliminating the need for driver operation of a clutch pedal

### 3.3

#### **manual-gearshift mode**

gearshift mode, unique in respect of the normal shift pattern, that permits manual upshift (+) or downshift (–) through forward or backward gears using a shift-control device that does not latch in the upshift or downshift setting

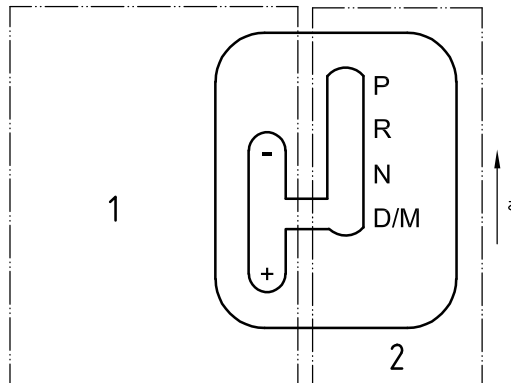
### 3.4

#### **gear-select mode**

mode in which the shift control device is used by the driver to select transmission settings typically used in automatic transmissions (P–R–N–D–L)

NOTE 1 The difference between gear-select mode and manual-gearshift mode is illustrated in Figure 1.

NOTE 2 Gear-select mode includes the operation of switching to and from manual-gearshift mode, but not the operation of changing gears within the manual mode.



- Key**
- downshift
  - + upshift
  - 1 manual-gearshift mode
  - 2 gear-select mode
  - <sup>a</sup> Front of vehicle.

Figure 1 — Example of gear-select mode and manual-gearshift mode — Shift pattern

ITEH STANDARD PREVIEW  
(standards.iteh.ai)

**3.5 shift-control device**

part of the gearshift system directly actuated by the driver to select a transmission setting, or to change gears

[ISO/TS 12104:2003](https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003)

**3.6 automatic-shift manual transmission ASM**

manual transmission converted with add-on parts to act like an automatic transmission, while retaining a manual-gearshift mode that does not require a clutch pedal

<https://standards.iteh.ai/catalog/standards/sist/37981c73-774c-4eb6-9b47-7181188ec836/iso-ts-12104-2003>

**3.7 manual-shift automatic transmission MSA**

automatic transmission with an additional driver-selectable manual-gearshift mode

**4 Gear modes**

**4.1 Gear-select mode**

**4.1.1 Automatic transmission**

For automatic transmissions, the gear-select mode normally has the shift pattern shown immediately below, from most-forward to most-rearward gear position, clockwise from left to right, or vertically from top to bottom (see, also, Annex A):

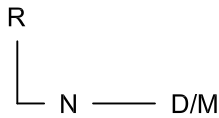
- P** (Park)
- R** (Reverse)
- N** (Neutral)
- D** (Drive) / **M** (Manual)



Only gear positions pertinent to the vehicle should be used: letters or numerals may be added or deleted as applicable.

#### 4.1.2 ASM transmission

For ASM transmissions, the gear-select mode shift pattern normally does not provide the “P” (park) position, as in the following example:

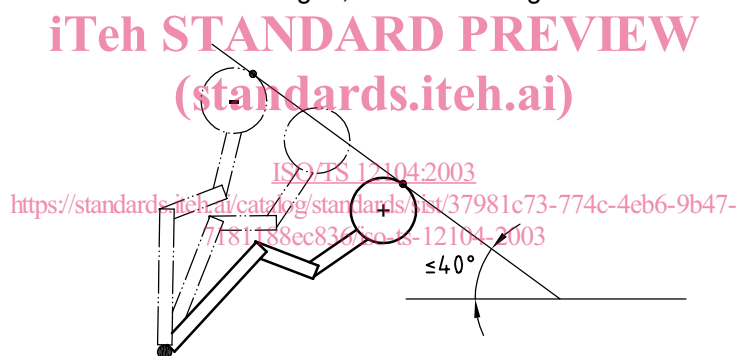


Only gear positions pertinent to the vehicle should be used: thus, letters or numerals may be added or deleted as applicable.

## 4.2 Manual-gearshift mode

**4.2.1** In manual-gearshift mode, the direction of motion for the shift-control devices shall be chosen in accordance with one or another of the shift-direction principles given in Table 1. See Clause 5 for examples.

**4.2.2** In manual-gearshift mode with a shift control lever employing the fore/aft principle, a line drawn from any point on the shift control in its rearmost (+) position to that same point in the foremost (–) position shall not angle upward more than 40° from horizontal grid, as shown in Figure 2.



**Figure 2 — Movement of shift control from rearmost (+) to foremost (–) position — Maximum side-view angle**

**4.2.3** If mounted on the steering wheel, shift control devices that follow the left/right or up/down principle will have +/– shifts that invert with more than 90° of steering wheel rotation and are not recommended, unless they are redundant controls.

**4.2.4** For symbols for downshift and upshift, see ISO 2575.