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**Road vehicles — Dummies for restraint  
system testing —**

Part 1:  
**Adult dummies**

*Véhicules routiers — Mannequins pour essais de systèmes de retenue —  
Partie 1: Mannequins adultes*



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## Foreword

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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is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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ISO/TR 12349-1 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 12, *Restraint systems*.

ISO/TR 12349 consists of the following parts, under the general title *Road vehicles — Dummies for restraint system testing*:

- *Part 1: Adult dummies*
- *Part 2: Child dummies*

# Road vehicles — Dummies for restraint system testing —

## Part 1: Adult dummies

### 1 Scope

This Technical Report describes the adult crash test dummies which are recommended by ISO for use in evaluating the occupant protection potential of restraint systems in frontal and side impact test procedures.

### 2 Recommended dummies

A review of the available adult crash test dummies was carried out by the experts of ISO/TC 22/SC 12, Working Group WG 5, *Anthropomorphic test devices*. The following adult crash test dummies are recommended for use in frontal and side impact crash tests.

- Recommended frontal crash test dummies:
  - HYBRID III mid-size male;
  - HYBRID III small female;
  - HYBRID III large male.
- Recommended adult side impact crash test dummies:
  - EUROSID-1 mid-size male;
  - BIOSID mid-size male.

The mid-size male SID dummy which is specified by the USA Federal Motor Vehicle Safety Standard 214 is not recommended for use in side impact test procedures because of its poor impact biofidelity and inadequate instrumentation.

### 3 Dummy instrumentation

Table 1 lists the instrumentation that are commonly used with the frontal and side impact dummies. Interpretations of the significance of the various measurements relative to occupant protection levels that are used by various groups are cited in the bibliography, references [7] to [10].

Table 1 — Instrumentation for adult frontal and side impact dummies

Dummy instrumentation	Frontal			Side	
	HIII-5 Female	HIII-50 Male	HIII-95 Male	EUROSID-1	BIOSID
<b>Head</b> Acceleration ( $A_x, A_y, A_z$ )	Yes	Yes	Yes	Yes	Yes
<b>Neck</b> H/C1 ( $F_x, F_y, F_z, M_x, M_y, M_z$ )	Yes	Yes	Yes	No	Yes
C7/T1 ( $F_x, F_y, F_z, M_x, M_y, M_z$ )	Yes	Yes	Yes	Yes	Yes
<b>Shoulder</b> Loads ( $F_x, F_y, F_z$ )	$F_x, F_z$	$F_x, F_z$	$F_x, F_z$	$F_x, F_y, F_z$	$F_y, F_z$
Deflection ( $\delta_y$ )	No	No	No	No	Yes
<b>Thorax</b> Spine acceleration ( $A_x, A_y, A_z$ )	Yes	Yes	Yes	Yes	Yes
Sternal deflection ( $\delta_x$ )	Yes	Yes	Yes	No	No
Sternal acceleration ( $A_x$ )	Yes	Yes	No	No	No
Rib deflection ( $\delta_y$ )	No	No	No	Yes	Yes
Rib acceleration ( $A_y$ )	No	No	No	Yes	Yes
<b>Abdomen</b> Force ( $F_y$ )	No	No	No	Yes	No
Deflection ( $\delta_y$ )	No	No	No	No	Yes
<b>Lumbar</b> ( $F_x, F_y, F_z, M_x, M_y$ )	Yes	Yes	Yes	$F_y, F_z, M_x$	Yes
<b>Pelvis</b> Acceleration ( $A_x, A_y, A_z$ )	Yes	Yes	Yes	Yes	Yes
Ilium ( $F_x, F_y$ )	$F_x$	$F_x$	No	No	$F_y$
Pubic ( $F_y$ )	No	No	No	Yes	Yes
<b>Lower extremities</b> Femur ( $F_x, F_y, F_z, M_x, M_y, M_z$ )	Yes	Yes	Yes	$F_z$	Yes
Tibia/femur displacement ( $\delta_x$ )	Yes	Yes	Yes	No	No
Knee clevis ( $F_z$ )	Yes	Yes	Yes	No	Yes
Tibia loads and moments ( $F_x, F_y, F_z, M_x, M_y, M_z$ )	Yes	Yes	Yes	No	Yes