



## Hybrid III 50th Male

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### File Downloads

- [Standard 50th Product Catalog](http://www.humaneticsatd.com/sites/default/files/file/Hybrid-III%2050th%20Harmonized%20Parts%20Catalog.pdf) (<http://www.humaneticsatd.com/sites/default/files/file/Hybrid-III%2050th%20Harmonized%20Parts%20Catalog.pdf>)
- [Ball Bearing Knee Slider 50th Product Catalog](http://www.humaneticsatd.com/sites/default/files/file/Hybrid-III%2050th%20Harmonized%20Ball%20Slider%20Parts%20Catalog.pdf) (<http://www.humaneticsatd.com/sites/default/files/file/Hybrid-III%2050th%20Harmonized%20Ball%20Slider%20Parts%20Catalog.pdf>)
- [User Manual \(Rev. A\)](#) (/system/files/limited/UM-H-H3-50M\_REV\_A.pdf)
- [Euro NCAP Optimized ATD](/sites/default/files/limited/H350_EuroNCAP_ATD_Bulletin.pdf) (/sites/default/files/limited/H350\_EuroNCAP\_ATD\_Bulletin.pdf)

### Available Product Lines

- **ATD Assembly**
  - 78051-218-H
- **ATD Assembly with Ball Slider Knees**
  - 78051-218-BKS-H

### Overview

The Hybrid III 50th Percentile Male Crash Test Dummy is the most widely used crash test dummy in the world for the evaluation of automotive safety restraint systems in frontal crash testing. Originally developed by General Motors, the Hybrid III 50th design is now maintained and developed by Humanetics in conjunction with the Society of Automotive Engineers' (SAE) Biomechanics Committees and the National Highway Transport and Safety Administration (NHTSA). The dummy is a regulated test device in the USA Code of Federal Regulations (Part 572, Subpart E) and also in the European ECE Regulations. It is considered to have excellent biofidelity and instrumentation capability. Recent revisions have improved the biofidelity in the femur range of motion and the ankle and foot. The dummy can also be used in many non-automotive applications such as wheelchairs and medical and sport equipment.

### Simulation Models

Humanetics offers highly detailed and fully validated [Finite Element Models](http://www.humaneticsatd.com/virtual-models) (<http://www.humaneticsatd.com/virtual-models>) of its dummies in the codes LS-DYNA, PAM-CRASH, ABAQUS and RADIOSS, along with [FE modeling consultancy services](http://www.humaneticsatd.com/services/consulting-training/fe-modeling) (<http://www.humaneticsatd.com/services/consulting-training/fe-modeling>).

### Dummy Features

#### Head and Neck

The skull and skull cap are one piece cast aluminum parts with removable vinyl skins. The neck is a segmented rubber and aluminum construction with a center cable. It accurately simulates the human dynamic moment/rotation flexion and extension response.

#### Upper Torso

The rib cage is represented by six high strength steel ribs with polymer based damping material to simulate human chest force-deflection characteristics. Each rib unit comprises left and right anatomical ribs in one continuous part open at the sternum and anchored to the back of the thoracic spine.

A sternum assembly connects to the front of the ribs and includes a slider for the chest deflection rotary potentiometer. The angle between the neck and upper torso is determined by the construction of the neck bracket which can incorporate a six-axis neck transducer. A two-piece aluminum clavicle and clavicle link assemblies have cast integral scapulae to interface with shoulder belts.

#### Lower Torso

A curved cylindrical rubber lumbar spine mounts provides human-like slouch of a seated person and mounts to the pelvis through an optional three axis lumbar load cell. The pelvis is a vinyl skin/urethane foam molded over an aluminum casting in the seated position. The ball-jointed femur attachments carry bump stops to reproduce the human leg to hip moment/rotation characteristics. The femur, tibia and ankle can be instrumented to predict bone fracture and the knee can evaluate tibia to femur ligament injury. The foot and ankle simulates heel compression and ankle range of motion.

#### Technical Specifications

##### Instrumentation

##### Test Equipment

##### Assembly Weights

Part	Weight (lb)	Weight (kg)
Head	10.00 ± 0.10	4.54 ± 0.05
Neck	3.40 ± 0.10	1.54 ± 0.05
Upper Torso	37.90 ± 0.30	17.19 ± 0.14
Lower Torso	50.80 ± 0.30	23.04 ± 0.14
Upper Arm, Left or Right	4.40 ± 0.20	2.00 ± 0.09
Hands, Left or Right	1.25 ± 0.10	0.57 ± 0.05
Lower Arms, Left or Right	3.75 ± 0.10	1.70 ± 0.05
Upper Leg, Left or Right	13.20 ± 0.20	5.99 ± 0.09
Lower Legs, Left or Right	9.45 ± 0.15	4.29 ± 0.07
Feet, Left or Right	2.55 ± 0.15	1.16 ± 0.07
Total Weight	171.30 ± 2.60	77.70 ± 1.18

##### Center of Gravity

##### External Dimensions

Description	Dimension (In)	Dimension (mm)
Total Sitting Height	34.8 ± 0.2	883.9 ± 5.1
Shoulder Pivot Height	20.2 ± 0.3	513.1 ± 7.6
H-Point Height - ref.	3.4 ± 0.1	86.4 ± 2.5
H-Point from Seat Back - ref.	5.4 ± 0.1	137.2 ± 2.5
Shoulder Pivot from Backline	3.5 ± 0.2	88.9 ± 5.1
Thigh Clearance	5.8 ± 0.3	147.3 ± 7.6
Elbow to Wrist Pivot	11.7 ± 0.3	297.2 ± 7.6
Shoulder to Elbow	13.3 ± 0.3	337.8 ± 7.6
Elbow Rest Height	7.9 ± 0.4	200.7 ± 10.2
Buttock to Knee	23.3 ± 0.5	591.8 ± 12.7
Popliteal Height	17.4 ± 0.5	442.0 ± 12.7
Knee Pivot to Floor	19.4 ± 0.3	492.8 ± 7.6
Buttock Popliteal Length	18.3 ± 0.5	464.8 ± 12.7
Chest Depth	8.7 ± 0.3	221.0 ± 7.6
Foot Length	10.2 ± 0.3	259.1 ± 7.6
Foot Width	3.9 ± 0.3	99.1 ± 7.6
Shoulder Width	16.9 ± 0.3	429.3 ± 7.6
Chest Circumference	38.8 ± 0.6	985.5 ± 15.2
Waist Circumference	33.5 ± 0.6	850.9 ± 15.2