

# SID IIs Small Side Impact

The SID-IIs Small Side Impact Dummy (pronounced SID-2-s) is a new generation crash test dummy to specifically evaluate advanced automotive side impact protection systems, particularly side airbags. SID-IIs was jointly developed in 1994 and 1995 by First Technology Safety Systems (FTSS) and the Occupant Safety Research Partnership (OSRP) of the USCAR program. The dummy has been extensively tested worldwide and is capable of measuring over 100 data channels for injury assessment of the head, neck, arm, thorax, abdomen, pelvis and leg. Anthropometry is based on the Hybrid III 5th Female Dummy and also closely matches size and weight of the 12-13 year old child.

## Simulation Models

Humanetics offers highly detailed and fully validated Finite Element (FE) Models of its dummies in the codes LS-DYNA, PAM-CRASH, ABAQUS and RADIOSS, along with FE modeling consultancy services.

## Dummy Features

### Head & Neck

The head and neck are based on the Hybrid III 5th Female and are certified to biomechanical corridors simulating the small human response in a lateral impact. A fitted urethane shield prevents airbag interference with the chin and neck during inflation. The neck cable is insulated with plastic bushings to eliminate mechanical noise and ground straps through the dummy minimize electrical noise. Upper and lower neck load cells are available.

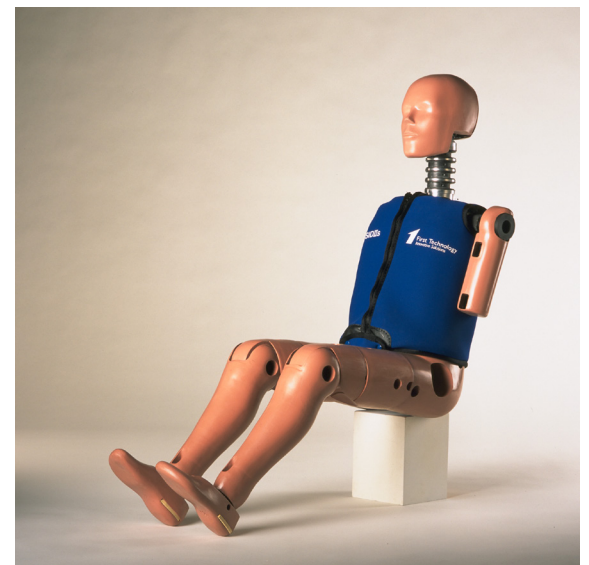
### Upper Torso

The thorax uses Vascomax® ultra-high strength steel bands bonded with a polymer damping material to simulate the human shoulder, ribs and abdomen. The asymmetrical upper torso can be rotated 180 degrees for left or right impacts. Spine mounted, gimballed, linear potentiometers attached directly

to the ribs for maximum response and calculation of V\*C. Triaxial accelerometer packs can be attached to spine and ribs for V\*C verification and acceleration based injury assessment. Load cells measure forces applied by the ribs to the spine box. A neoprene jacket covers the complete chest assembly with replaceable foam pads in the impact area. The stub arm is mounted to the shoulder through a three axis load cell. Triaxial accelerometer packs can be installed at the shoulder and the upper and lower arm for side airbag inflation injury assessment. A replaceable rubber insert in the shoulder improves calibration testing.

### Lower Torso

A cylindrical straight stepped lumbar spine maintains the dummy in the upright seated posture. The pelvis is a machined assembly with detachable hard urethane iliac wings. The lower torso can be impacted from either side and uses disposable foam crush plugs for maximum repeatability. Design allows increased adduction and measures loads at pubic symphysis, acetabulum and ilium. The pelvis flesh is a detachable vinyl skin over urethane foam molded in the seated position. The legs are a modified Hybrid III 5th Female design available with full instrumentation.



# Technical Specifications

## Weight Specification

Body Segment	Mass (lb)	Tol. (lb +/-)
Head	8.16	.10
Neck	2.00	.20
Upper Torso w/o Jacket	24.50	.45
Lower Torso	27.60	.40
Arm (Left or Right)	2.00	.10
Upper Leg (Left or Right)	6.90	.20
Lower Leg (Left or Right)	7.20	.20
Foot (Left or Right)	1.75	.10
Chest Jacket	1.30	.15
Total Weight	97.26	2.40

## Instrumentation

Location	Description	Channels
Head	3 Uniaxial Accels	Ax, Ay, Az (for HIC)
Neck	6-Axis Upper Neck Load Cell 6-Axis Lower Neck Load Cell	Fx, Fy, Fz, Mx, My, Mz Fx, Fy, Fz, Mx, My, Mz
Shoulder	3 Uniaxial Accels 3-Axis Shoulder Load Cell	Ax, Ay, Az Fx, Fy, Fz
Arm	3 Uniaxial Accels - Upper Arm 3 Uniaxial Accels- Lower Arm 18-Axis Instrum. Arm- Accels not included	Ax, Ay, Az Ax, Ay, Az
Thorax	3 Uniaxial Accels-T1 3 Uniaxial Accels-T4-opposite Thorax Rib 1 3 Uniaxial Accels-Thorax Rib 2&3, Abd. Rib 2 3 Uniaxial Accels-T12-opposite Abd. Rib 1 15 Uniaxial Accels-3 Thorax & 2 Abd. Ribs Uniaxial Rib Load Cell 6 Linear Potentiometers	Ax, Ay, Az Ax, Ay, Az Ay, Ay, Ay Ax, Ay, Az Ax, Ay, Az Fy
Lumbar Spine	6-Axis Lumbar Spine Load Cell	Fx, Fy, Fz, Mx, My, Mz
Pelvis	Uniaxial Ilium Crest Load Cell Uniaxial Acetabulum Load Cell Uniaxial Pubic Load Cell 3 Uniaxial Accels A.S.I.S. Load Cell (Iliac Wings)	Fy Fy Fy Fy Ax,Ay,Az,Fx,My (one per side)
Femur	Uniaxial Femur Load Cell Six-Axis Upper Femur Load Cell	Fy (per leg) Fx, Fy, Fz, Mx, My, Mz (per leg)
Lower Legs	Biaxial Knee Clevis Load Cells Four Axis Upper Tibia Load Cells Four Axis Lower Tibia Load Cells	Fz (per leg) Fx,Fz,Mx,My (per leg) Fx,Fy,Mx,My (per leg)

## Dimensions

Measurement	Dim. (in)	Tol. (in +/-)
Total Sitting Height	30.70	.30
Shoulder Pivot Height	17.50	.30
H-Point Height	3.30	.20
H-Point Forward	5.75	.20
Shoulder Pivot from Backline	4.00	.20
Thigh Clearance	5.00	.30
Head Breadth	5.65	.15
Head Back from Backline	1.70	.10
Head Depth	7.20	.20
Head Circumference	21.25	.20
Buttock to Knee	20.75	.50
Popliteal Height	14.00	.50
Knee Pivot to Floor	15.80	.30
Buttock Popliteal Length	16.90	.50
Chest Depth w/o Jacket	8.00	.30
Foot Length	18.80	.30
Hip Breadth	12.50	.20
Arm Length	10.00	.20
Knee Joint to Seat Back	19.10	.30
Shoulder Width (only one arm installed, Left or Right)	13.75	.30
Foot Width	3.40	.30
Chest Circumference W/Jacket	34.10	.60
Waist Circumference	30.30	.60