



# BioRID-II

Model ARA-001



The **Biofidelic Rear Impact Dummy II** (BioRID-II) was developed in collaboration with Denton ATD, Inc. and the Department of Machine and Vehicle Design at Chalmers University of Technology in Göteborg, Sweden to meet the need for a testing tool to measure automotive seat and head restraint performance in rear end collisions. It allows for repeatable and reproducible evaluations of neck injuries during low speed rear-end collisions.

The BioRID-II was developed as a 50<sup>th</sup> percentile male dummy to measure responses in low speed rear-end impact tests. The dummy is comprised of an articulated thoracic-lumbar spine and neck made from a composite material. Each human spinal pivot point is reproduced in the BioRID-II. The torso construction includes a water filled abdomen and a pliable molding fitted around the flexible spinal assembly and attached through spine torso pins protruding outward from the central structure. Torsion bars are used in each of the Thoracic-Lumbar pivot joints to control the motion. The motion of the cervical vertebra assembly is controlled by a single cable attached to a damper and two cables attached to springs that act as neck-muscle substitutes. Also included between the vertebra are elastomer bumpers to control the end of travel response.

The arms and legs are standard Hybrid III 50<sup>th</sup> components. The molded pelvis is a modified Hybrid III 50<sup>th</sup> type with increased range of motion about the H Point. The head is a modified Hybrid III 50<sup>th</sup>. The BioRID-II performance has been validated against low speed volunteer data.

*The BioRID has been shown to be an effective device for evaluating the designs of car seat systems during low impact rear collisions.*

### The calibration tests performed prior to shipment include:

- Complete Spine Flexion and Extension
- Head Drop

### Standard equipment included in the base price of this device:

- Accelerometer mounts for head, spine, chest and pelvis\*
- Structural replacement for upper and lower neck load cells
- User's manual

\*User must specify the accelerometer manufacturer and type at the time of order placement



<b>WEIGHTS:</b>	<b>Pounds (lbs.)</b>	<b>Kilograms</b>
Head	10.0	4.54
Torso (Upper and Lower)	93.5	42.41
Upper Arm	4.4	2.0
Lower Arm with Hand	5.0	2.27
Upper Leg	13.2	6.17
Lower Leg with Foot	12.0	5.44
<b>Total Weight</b>	<b>171.3</b>	<b>77.70</b>
<b>DIMENSIONS:</b>	<b>Inches</b>	<b>Centimeters</b>
H-Point Above Seat	3.4	8.6
H-Point from Seat Rear	5.4	13.7
Thigh Clearance	5.8	14.7
Buttock to Knee Length	23.3	59.2
Knee Pivot Height	19.4	49.3
Foot Length	10.2	25.9
Foot Breadth	3.96	9.9
<b>Seated Height</b>	<b>34.8</b>	<b>88.4</b>

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