EURO NCAP

#FORSAFERCARS

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BioRid-II UN Specification and Certification

Crash Protection

Technical Bulletin CP 301

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PREFACE

During the test preparation, vehicle manufacturers are encouraged to liaise with the laboratory and to check that they are satisfied with the way cars are set up for testing. Where a manufacturer feels that a particular item should be altered, they should ask the laboratory staff to make any necessary changes. Manufacturers are forbidden from making changes to any parameter that will influence the test, such as dummy positioning, vehicle setting, laboratory environment etc.

It is the responsibility of the test laboratory to ensure that any requested changes satisfy the requirements of Euro NCAP. Where a disagreement exists between the laboratory and manufacturer, the Euro NCAP secretariat should be informed immediately to pass final judgment. Where the laboratory staff suspect that a manufacturer has interfered with any of the set up, the manufacturer's representative should be warned that they are not allowed to do so themselves. They should also be informed that if another incident occurs, they will be asked to leave the test site.

Where there is a recurrence of the problem, the manufacturer’s representative will be told to leave the test site and the Secretary General should be immediately informed. Any such incident may be reported by the Secretary General to the manufacturer and the person concerned may not be allowed to attend further Euro NCAP tests.

DISCLAIMER: Euro NCAP has taken all reasonable care to ensure that the information published in this protocol is accurate and reflects the technical decisions taken by the organisation. In the unlikely event that this protocol contains a typographical error or any other inaccuracy, Euro NCAP reserves the right to make corrections and determine the assessment and subsequent result of the affected requirement(s).

CONTENTS

1 BIORID-II UN SPECIFICATION

1.1 General

The BioRID-II UN ATD must conform to the specification detailed in Mutual Resolution No. 1 (M.R.1), Addendum 1.

1.2 Additions and modifications

The instrumentation umbilical shall exit at the front/side of the pelvis such that it is ensured there will be no seatbelt interaction.

1.3 Certification

Full details of the BioRID-II UN certification requirements are available in dummy user manual, which is available at:

https://unece.org/sites/default/files/2022-02/ECE_TRANS_WP.29_1101a3e_1.pdf

The dummy shall comply with both spine stature and all dynamic response specifications.

No manufacturer shall have access to any pre-test information regarding any of the test equipment to be used by Euro NCAP, or be permitted to influence its selection in any way.

The BioRID-II UN shall be re-certified after every 16 tests.

If an injury criterion reaches or exceeds its normally accepted limit (e.g. HIC of 700) then that part should be re-certified.

If any part of the dummy is broken in a test, then the part shall be replaced with a fully certified component.

A copy of the dummy certification certificate will be provided as part of the full report for a test.

1.4 Dummy instrumentation

All instrumentation used in the dummy shall meet be:

Calibrated before the test programme.

Re-calibrated after one year, regardless of the number of tests for which it has been used.

Re-calibrated if it reaches its channel amplitude class (CAC) during any test.

Listed in the test report along with calibration dates

Mounted according to procedures laid out in SAE J211.

Transducer sign convention is detailed in SAE J1733.

In accordance with the performance specifications detailed in SAE J2570.

The CAC for each transducer shall be chosen to cover the Minimum Amplitude listed in the table. In order to retain sensitivity, CACs which are orders of magnitude greater than the Minimum Amplitude may not be used.

The BioRID-II UN shall be instrumented to record the channels listed below. Additional channels may be recorded.

Location	Parameter	Minimum amplitude
Head	Linear acceleration, Ax	100g
	Head Restraint Contact Time (T-HRC), ms	-
	Tilt sensor, X, Y	NA
Upper Neck	Forces and moments, Fx, Fz, My	5kN, 200Nm
Thorax - T1 (L & R)	Linear acceleration, Ax	200g
	Forces and moments, Fx, Fz, My	5kN, 200Nm
Spine - T8	Acceleration, Ax	200g
Lumbar – L1	Acceleration, Ax, Az	200g
Pelvis	Acceleration, Ax, Az	200g
	Tilt sensor, X, Y	NA

The T1 acceleration shall be the average of right and left side accelerometer measurements.

1.5 Dummy clothing and footwear

The dummy shall be clothed in two pairs of form-fitting, knee-length, bottoms and two close-fitting, short-sleeved shirts.

The under layer of clothes should be worn with the shiny/smooth side of the fabric facing out and the over-clothes with the shiny/smooth side against the underclothes (i.e. dull side facing out).

The dummies feet shall be shod with size 11 (45 European) 320mm-325mm.

1.6 Dummy joints

The stiffness of both arms and legs shall be checked and adjusted, where necessary, prior to every sled test.

Arms

Extend the complete arm laterally outward to a horizontal position. Twist the arm so the elbow cannot rotate downward. Tighten the shoulder yoke clevis bolt so the arm is suspended at 1g, see Figure 1.

Rotate the complete arm assembly so it points forward and is horizontal. Twist the arm so the elbow cannot rotate downward. Adjust the shoulder yoke rotation hexagonal nut so the arm is suspended at 1g.

Bend the elbow by 90° so the hand moves toward the chest. Adjust the elbow rotation bolt through access in the upper arm to hold the lower arm horizontally suspended at 1g.

Reposition the arm so it points forward and is horizontal. Twist the lower arm at the elbow, so the lower arm can pivot downward to vertical. Adjust the elbow pivot bolt through access holes in the lower arm flesh at the elbow to hold the lower arm suspended at 1g, see Figure 1.

Extend the arm and twist the palm so it faces down. Adjust the wrist pivot bolt at the base of the hand so it is suspended at 1g.

Adjust the wrist rotation bolt through access in the wrist flesh to hold it suspended at 1g.

Repeat procedure for other hand and arm.

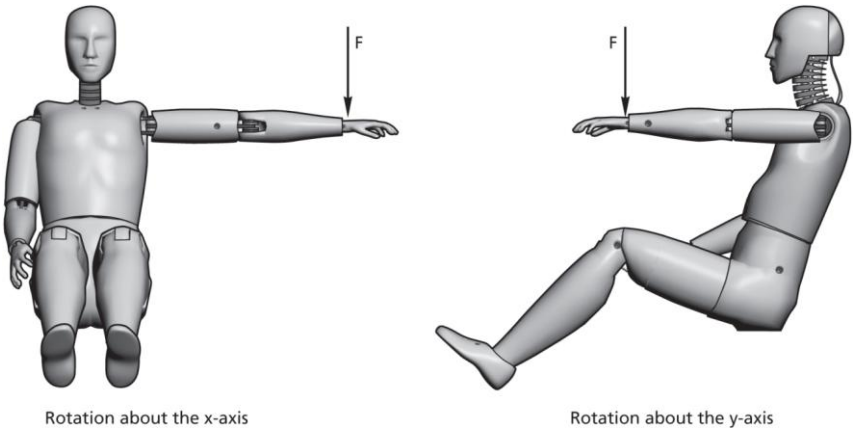

Figure 1: Dummy extremity settings.

Legs

Remove the jacket from the dummy.

With the lower leg at 90° to the upper leg, and the dummy in seated position, lift the upper leg assembly above horizontal. Adjust the femur back set screw so the upper leg is held suspended at 1g.

Rotate the lower leg assembly so it is horizontal. Adjust the knee clevis bolt so the lower leg is held suspended at 1g.

Adjust the ankle ball joint screw so the foot is held suspended at 1g. The ankle adjustment is not critical and is determined by individual feet.

Repeat the procedure on the other leg and foot.

1.7 Dummy positioning measurements

None.

1.8 Dummy painting and marking

None.

1.9 Dummy temperature

The temperature in the test laboratory shall be 22.5º ±3ºC and a relative humidity of between 10% and 70%. The dummy and seat being shall be soaked at this temperature at least 3 hours prior to the test.

1.10 Post test inspection

All dummies shall be visually inspected immediately after the test.

Any lacerations of the skin or breakages must be noted in the test details, a dummy may have to be re-certified in this case.

Any screws that have become loose or detached shall be re-tightened to the required torque or replaced as necessary.