



Euro NCAP
For Safer Cars

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Q6 and Q10 Dummy Specification and Certification

Crash Protection

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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).

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1 Q6 AND Q10 SPECIFICATION

1.1 General

The Q6 ATD must conform to the specification detailed in UN ECE Regulation No. 129 and Mutual Resolution No. 1 (M.R.1). Refer to the dummy user manuals for details of Q6 specification:

Humanetics: 033-9900 User Manual Q6 Revision N.

Cellbond: Q6 ATD User Manual v2.0.

The Q10 ATD must conform to the Euro NCAP 2026 specification, which includes the upgrades and parts detailed below. Refer to the dummy user manuals for details of Q10 specification:

Humanetics: 015-9900 Q10 2026 Revision A.

Cellbond: Q10B NCAP 2020/2026 User Manual Version 3.0.

1.2 Additions and modifications

Test	Q10 part
Frontal e.g. MPDB	Euro NCAP 2020 upgrades components - Shoulder liner, Scapula, Modified Spine box, Pelvis replacement parts, Modified upper and lower legs Euro NCAP 2026 harmonised components - shoulder pad, scapula, clavicle, abdomen, lumbar spine Full arm
Lateral e.g. AE-MDB	Euro NCAP 2020 upgrades components - Shoulder liner, Scapula, Modified Spine box, Pelvis replacement parts, Modified upper and lower legs Euro NCAP 2026 harmonised components - shoulder pad, scapula, clavicle, abdomen, lumbar spine Side impact kit with half arms left and right

Euro NCAP 2026 harmonised components are to be fitted dependent on the dummy manufacturer:

Part	Manufacturer of dummy-part: Cellbond	Manufacturer of dummy-part: Humanetics
Shoulder Liner	-	Replace
Scapulas left and right	-	Replace
Clavicle	Replace	Replace
Abdomen	Replace	-

1.3 Certification

The Q6 and Q10 Euro NCAP 2026 dummies shall be certified in accordance with procedures specified in dummy user manuals defined in Section 1.1.

The Q6 and Q10 child dummies shall be re-certified after every TWENTY impact tests (e.g. 10 frontal and 10 side impacts, or any combination of the two test types). Hip shields and hip liners shall be replaced after every twenty impact tests.

The Q10 dummy shoulder lateral impact certification test is to be performed with the side impact shoulder kit only. All Q10 frontal full body certification tests are to be performed with the frontal dummy definition.

All Q10 lateral full body certification tests are to be performed with the lateral dummy definition.

All tests shall be carried out at a temperature of 18.0-22.0 °C and a relative humidity of 10-70%.

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

If any part of the dummy is broken in a test, 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.

1.3.1 Q6 certification tests and corridors

The component certification tests are carried out on the sub-assemblies prior to conducting the full body test. The individual component tests can be carried out in parallel for each body region, after which the dummy is fully assembled for the full body tests.

Q6 certification				
Group	Body Region	Test	Frontal	Lateral
Component tests	Head	Frontal	x	x
		Lateral – Left and right	x	x
	Neck	Flexion	x	x
		Lateral: Left and right	x	x
	Lumbar	Flexion	x	x
		Lateral – Left and right	x	x
	Abdomen	Static	x	x
Full body tests	Thorax	Frontal	x	
		Struck side		x

1.3.1.1 Q6 Corridors

Table 1 Head drop frontal certification corridors

Parameter	Units	Lower limit	Upper limit
Peak resultant head acceleration	g	105	135
Peak head acceleration in Y-direction	g	-10	10

Table 2 Head drop lateral certification corridors (left and right)

Parameter	Units	Lower limit	Upper limit
Peak resultant head acceleration	g	110	140
Peak head acceleration in X-direction	g	-20	20

Table 3 Neck flexion certification corridors

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	3.8	4.0
Pendulum velocity @ 10ms after T0	m/s	-0.5	-1.5
Pendulum velocity @ 20ms after T0	m/s	-1.3	-2.5
Pendulum velocity @ 30ms after T0	m/s	-2.0	-3.3
Peak head angle (first peak)	°	36.9	45.8
Peak moment	Nm	22.6	28.0

Table 4 Neck lateral certification corridors (left and right)

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	3.8	4.0
Pendulum velocity @ 10ms after T0	m/s	-0.5	-1.5
Pendulum velocity @ 20ms after T0	m/s	-1.3	-2.5
Pendulum velocity @ 30ms after T0	m/s	-2.0	-3.3
Peak head angle (first peak)*	°	41.6	51.6
Peak moment*	Nm	21.6	26.9

* Polarity of signals is dependent upon the impact side.

Table 5 Lumbar spine flexion certification corridors

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.3	4.5
Pendulum velocity @ 10ms after T0	m/s	-1.3	-1.7
Pendulum velocity @ 20ms after T0	m/s	-2.7	-3.7
Pendulum velocity @ 30ms after T0	m/s	-4.1	-4.9
Peak rotation (first peak)	°	54.0	69.0
Time of peak rotation	ms	45	75
Minimum rotation (first minimum)	°	-33.0	-23.0
Time of minimum rotation	ms	165	195

Table 6 Lumbar spine lateral certification corridors (left and right)

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.3	4.5
Pendulum velocity @ 10ms after T0	m/s	-1.3	-1.7
Pendulum velocity @ 20ms after T0	m/s	-2.7	-3.7
Pendulum velocity @ 30ms after T0	m/s	-4.0	-4.8
Peak rotation (first peak)*	°	55.0	70.0
Time of peak rotation	ms	45	75
Minimum rotation (first minimum)*	°	-33.0	-23.0
Time of minimum rotation	ms	165	195

* Polarity of signals is dependent upon the impact side.

Table 7 Abdomen static certification corridors

Parameter	Units	Lower limit	Upper limit
Deformation of abdomen	mm	-6	-10

Table 8 Thorax impact frontal certification corridors

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.2	4.4
Peak probe force @ peak deflection	kN	-1.15	-1.45
Peak thorax deflection	mm	-21.5	-26.5

Table 9 Thorax impact lateral certification corridors (left OR right)

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.2	4.4
Peak probe force	kN	-1.65	-1.95

1.3.2 Q10 certification tests and corridors

The tests are to be carried out with the dummy structure from section 1.2.

The component certification tests are carried out on the sub-assemblies prior to conducting the full body test. The individual component tests can be carried out in parallel for each body region, after which the dummy is fully assembled for the full body tests.

Q10 certification				
Group	Body Region	Test	Frontal	Lateral
Component tests	Head	Frontal	x	x
		Lateral – Left and right	x	x
	Neck	Flexion	x	x
		Extension	x	x
		Lateral: Left and right	x	x
	Lumbar	Flexion	x	x
		Lateral – Left and right	x	x
		Torsion – Left and right	x	x
	Abdomen	Static	x	x
		Dynamic (monitoring)	x	x
Full body tests	Thorax	Frontal	x	
	Shoulder	Struck side		x
	Thorax	Struck side		x
	Pelvis	Struck side		x

Q10 certification tests for production/batch tests	
Hip shields	Hardness Shore D: 45-55
Clavicle	Stiffness 55-90 N @30mm deflection

1.3.2.1 Corridors

Table 10 Head drop frontal certification corridors

Parameter	Units	Lower limit	Upper limit
Peak resultant head acceleration	g	124.2	151.8
Peak head acceleration in Y-direction	g	-10	10

Table 11 Head drop lateral certification corridors (left and right)

Parameter	Units	Lower limit	Upper limit
Peak resultant head acceleration	g	128.7	157.3
Peak head acceleration in X-direction	g	-20	20

Table 12 Neck flexion certification corridors

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.7	4.9
Pendulum velocity @ 10ms after T0	m/s	-1.0	-2.0
Pendulum velocity @ 20ms after T0	m/s	-2.3	-3.4
Pendulum velocity @ 30ms after T0	m/s	-3.6	-4.8
Peak head angle (first peak)	°	50.4	61.6
Peak moment in head angle corridor	Nm	28.8	35.2

Table 13 Neck extension certification corridors

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	3.6	3.8
Pendulum velocity @ 10ms after T0	m/s	-0.7	-1.7
Pendulum velocity @ 20ms after T0	m/s	-1.7	-2.8
Pendulum velocity @ 30ms after T0	m/s	-2.8	-4.0
Peak head angle (first peak)	°	-69.3	-56.7
Peak moment	Nm	-15.84	-12.96

Table 14 Neck lateral certification corridors (left and right)

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	3.6	3.8
Pendulum velocity @ 10ms after T0	m/s	-0.7	-1.7
Pendulum velocity @ 20ms after T0	m/s	-1.7	-2.8
Pendulum velocity @ 30ms after T0	m/s	-2.8	-4.0
Peak head angle (first peak)*	°	45.9	56.1
Peak moment*	Nm	14.85	18.15

* Polarity of signals is dependent upon the impact side.

Table 15 Lumbar spine flexion certification corridors

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.3	4.5
Pendulum velocity @ 10ms after T0	m/s	-0.9	-1.9
Pendulum velocity @ 20ms after T0	m/s	-2.3	-3.4
Pendulum velocity @ 30ms after T0	m/s	-3.4	-4.6
Peak frontal rotation	°	45.9	56.1
Time of peak rotation	ms	60.3	73.7

Table 16 Lumbar spine lateral certification corridors (left and right)

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.3	4.5
Pendulum velocity @ 10ms after T0	m/s	-0.9	-1.9
Pendulum velocity @ 20ms after T0	m/s	-2.3	-3.4
Pendulum velocity @ 30ms after T0	m/s	-3.4	-4.6
Peak lateral rotation*	°	45.9	56.1
Time of peak rotation	ms	60.3	73.7

* Polarity of signals is dependent upon the impact side.

Table 17 Lumbar spine torsion certification corridors (left and right)

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	2.06	2.14
Pendulum velocity @ 5ms after T0	m/s	0.31	0.44
Pendulum velocity @ 10ms after T0	m/s	0.67	0.85
Pendulum velocity @ 15ms after T0	m/s	1.04	1.26
Pendulum velocity @ 20ms after T0	m/s	1.40	1.67
Peak lateral rotation	°	12.5	16.2
Peak moment Mz	Nm	13.6	17.5

Table 18 Abdomen static certification corridors

Parameter	Units	Lower limit	Upper limit
Deformation of abdomen	mm	-8.4	-12.4

Table 19 Abdomen dynamic certification corridors

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	tbd	tbd
Pendulum velocity @ 5ms after T0	m/s	tbd	tbd
Pendulum velocity @ 10ms after T0	m/s	tbd	tbd
Pendulum velocity @ 15ms after T0	m/s	tbd	tbd
Pendulum velocity @ 20ms after T0	m/s	tbd	tbd
Compression Angle-Y	°	monitoring	

Table 19 Thorax impact frontal certification corridors

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.2	4.4
Peak probe force	N	-1870	-1530
Peak averaged upper and lower thorax deflection	mm	-39.05	-31.95

Table 20 Thorax impact lateral certification corridors (struck side)

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.2	4.4
Peak probe force	N	-2475	-2025
Peak averaged upper and lower thorax deflection*	mm	24.39	29.81

* Polarity of signals is dependent upon the impact side.

Table 21 Pelvis impact lateral certification corridors (struck side)

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.2	4.4
Peak probe force	N	-4565	-3735
Peak pubic symphysis load	N	monitoring	

Table 22 Shoulder impact lateral certification corridors (struck side)

Parameter	Units	Lower limit	Upper limit
Pendulum velocity	m/s	4.2	4.4
Peak probe force	N	-2688	-2199
Peak T1 acceleration	g	41.4	50.6

1.4 Dummy instrumentation

All instrumentation used in the dummy shall 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 compliance with the thorax displacement sensors and their data processing as specified in ISO/TS21002:2021

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 dummies to be used shall be instrumented to record the channels listed in the following tables.

Q6 Dummy

Location	Parameter		CAC
Head	Accelerations, A_x A_y A_z		200g
Upper Neck (OC)	Forces	F_x F_y	5.0kN
		F_z	5.0kN
	Moments	M_x M_y	6.0kN
		M_z	90Nm
			45Nm
Chest	Accelerations, A_x A_y A_z		200g
	Displacement		90mm
Thoracic temperature	Temperature		30°C
Iliac (L & R) OPTIONAL	Force, F_x		9kN
	Moment, M_y		220Nm

See Section 1.9 regarding dummy temperature measurement

Q10 Dummy

Location	Parameter		Minimum amplitude
Head	Accelerations, A_x A_y A_z		200g
Head Tilt sensor (static)	Angle		NA
Upper Neck (OC)	Forces	F_x F_y	8.0kN
		F_z	10.0kN
	Moments	M_x M_y	90Nm
		M_z	45Nm
Shoulder (side only)	Forces	F_x F_z	2.0kN
		F_y	4.0kN
T1 (side only)	Accelerations, A_y		200g
Chest (T4)	Accelerations, A_x A_y A_z		200g
	Displacement & rotation		90mm 40deg
Thoracic temperature	Temperature		30°C
Lumbar spine (Lower)	Forces	F_x F_y	6.0kN
		F_z	8.0kN
	Moments	M_x M_y	150Nm
		M_z	75Nm
Pelvis - Sacrum	Accelerations, A_x A_y A_z		200g
Pelvis – Pubis (side only)	Forces, F_y		2.0kN
Iliac (L & R) (OPTIONAL)	Force, F_x		9kN
	Moment, M_y		220Nm
Pelvis Tilt sensor (static)	Angle		NA

See Section 1.9 regarding dummy temperature measurement.

1.5 Dummy clothing

Each child dummy shall wear their appropriate suits marked with grids, Q6 (with Cordura patches) and Q10.

The Q10 shall be installed with left and right hand hip shields with Shore D specification $55D \pm 5$. Hip liners may only be used for the Q10 when seated on an integrated CRS. See Section 1.3 for replacement frequency of consumable parts.

The Q6 shall be installed without either hip shields or a hip liner when using a booster seat. Hip liners may only be used for the Q6 when seated on an integrated CRS.

1.6 Dummy joints

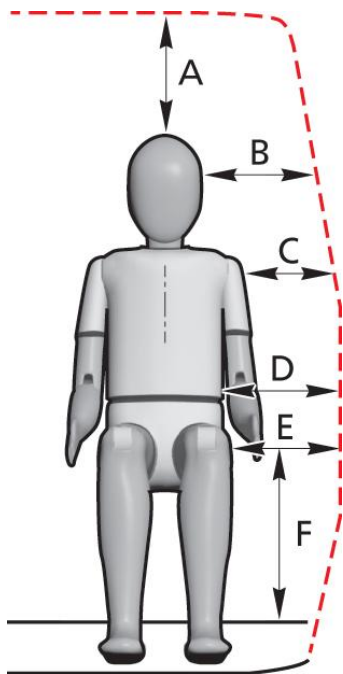
Follow the procedures in the dummy user manual for joint setting.

The dummy joints shall be set as close as possible to the time of the test and, in any case, not more than 24 hours before the test.

Maintain the dummy temperature within the permissible temperature range between the time of setting the limbs and up to a maximum of 5 minutes before the time of the test.

1.7 Q10 dummy positioning measurements

The following measurements are to be recorded prior to the test but after positioning procedures have been carried out.



Q10	
A	Top of head to roof (vertically)
B	Head CoG to door/window (horizontal)
C	Shoulder (pivot point) to door/window (horizontal)
D	Lower rib to door (horizontal)
E	Hip joint (femur mounting hole) to door (horizontal)
F	Hip joint (femur mounting hole) to floor (vertical)
α	Head angle (where fitted)
β	Pelvic angle (tilt sensor)

Figure 1: Q10 dummy measurements

1.8 Dummy painting and marking

The dummies shall have non-metallic, crepe paper based masking tape placed on the areas to be painted using the sizes detailed below. The tape must be completely covered with the following coloured paints. The paint shall be applied close to the time of the test to ensure that the paint will still be wet on impact.

Q6 and Q10	Colours
Top of head	Blue 75 x 75mm square
Head-band (colours from left to right)	Red, Yellow, Green 25mm wide Widest circumference at eyebrow level at front, extending to the head CoG at each side.

Adhesive target markers shall be attached to the top/rear of the child dummy's head in order to aid the assessment of the child head containment.

1.9 Dummy temperature

The Q6 and Q10 shall have a stabilised temperature of 18°C to 22°C.

Both dummies shall be equipped with onboard temperature sensors attached in accordance with ISO TR 27957, and the temperature sensors shall meet the requirements of ISO 6784.

A stabilised temperature shall be obtained by soaking the dummy in temperatures that are within the range specified above for at least 1 hour prior to the test. The temperature shall be recorded at intervals not exceeding 10 minutes and not exceeding 5 minutes before test. All readings shall be supplied as part of the standard output of the test.

After switching on in-dummy data acquisition, the air inside the dummy and the sensors may warm up whereas the dummy itself is still at a lower temperature. Such sudden temperature rises do not reflect the actual dummy temperature and may be ignored as long as they do not exceed a duration of 20 minutes.

1.10 Post test inspection

The dummies should be visually inspected immediately after the test.

Any lacerations of the skin or breakages of a dummy should be noted in the test specification. 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.