

NL doc. Needed Height for Head Restraints, presented 2nd Head Restraint IWG meeting 11-13 April 2005

At the GTR Head restraint meeting in February 2005 the Netherlands stated that the requirement "the height shall not be less than 800 mm" is not enough, **therefore we proposed 850 mm!**
 At earlier meetings of UN/ECE/GRSP the Netherlands has also proposed to raise this limit up to 850mm, however at that time the limit was raised only from 750 to 800 mm (only for front outboard positions). In the meantime the situation has changed, the average stature of people has grown even more. Hereby is provided more information to explain the rationale behind the above statement.

First some data from the Netherlands:

CBS (Central Bureau of Statistics of the Netherlands)

On the internet information is provided with regard to this item by CBS.

I noticed that also people from outside the Netherlands already use our CBS data for their research (an English variant is available which makes it easier), therefore I first mention this source.

The short connection for the internet address of our CBS is:

<http://statline.cbs.nl/StatWeb/start.asp?LA=en&DM=SLEN&ip=Search/Search>

A search command on "average height" and the years 1981-2001 delivers Table 1.

The main lesson that can be learned from this overview over 20 years is about the secular trend of acceleration; in other words **the average stature has increased (this also counts for other countries!)**.

However stature (body length) is not enough, we need items as sitting height and for this we can use other sources.

CAESAR

In the year 2000 the Netherlands has worked together with USA on anthropometry. The recent database CAESAR is the result of a coöperation of scientists with knowledge of 3D-anthropometry from a.o. the USA and the Netherlands.

More information on CAESAR (how did it start, methods of measuring, sampling strategy etc.) can be found on the website www.nedscan.nl

Table 2 provides CAESAR data concerning the year 2000 from the Netherlands as well as from the USA.

Based on these anthropometric data plus the fact that we are discussing a requirement for a static geometric testprocedure which does not take on board matters like ramping, sliding and spine straightening (which count for 30 mm extra), our conclusion stays unchanged that is to say:

a head restraint height of 800 mm is not enough and 850 mm is more appropriate!

Kind regards,

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TABLE 1

Subjects	Total average height	Sex		Type of insurance			Age			<u>Average height</u>					
		Men	Women	Health insurance fund	Private insurance		20-44 yrs	45-64 yrs	65 yrs and older	Primary education	1st stage secondary education	2nd stage secondary education	Vocational college, university	Primary education	
					Total private insurance	<u>I</u> Z/ <u>I</u> ZR									Other
Years (incl. standard error)															
<u>Standard error</u>	0.1	0.1	0.1	0.2	0.2	0.5	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3
1981	171.4	177.2	165.8	170.7	173.0	173.3	172.9	173.1	170.5	167.1	168.3	170.8	173.6	175.6	174.1
1982	171.4	177.2	165.9	170.7	173.1	172.5	173.2	173.2	170.5	167.1	168.3	171.1	173.5	174.7	174.2
1983	171.5	177.3	165.9	170.8	173.0	173.1	172.9	173.3	170.4	167.4	168.2	171.1	173.6	174.6	173.9
1984	171.7	177.7	166.0	171.0	173.2	172.8	173.3	173.5	170.7	167.4	168.2	171.3	173.4	175.4	174.4
1985	171.8	177.7	166.2	171.2	173.1	172.2	173.4	173.5	170.8	167.9	168.4	171.4	173.7	175.0	174.7
1986	172.0	178.0	166.3	171.2	173.4	173.4	173.4	174.0	170.7	167.7	168.6	171.1	174.2	174.9	175.3
1987	172.1	178.2	166.4	171.7	172.9	173.0	172.9	174.0	170.8	167.9	168.7	171.2	174.1	175.1	175.4
1988	172.4	178.4	166.6	171.5	173.7	174.0	173.7	174.2	171.1	168.3	168.7	171.3	174.2	175.2	174.7
1989	172.2	178.4	166.3	171.5	173.3	173.1	173.4	174.3	171.0	167.3	168.0	171.2	174.3	175.5	174.2
1990	172.7	178.8	166.8	171.9	173.8	173.4	173.8	174.7	171.1	168.7	169.1	171.9	174.1	175.4	175.5
1991	172.7	178.7	166.8	172.0	173.7	174.0	173.7	174.6	171.4	168.3	168.9	171.6	174.3	176.2	175.8
1992	172.6	178.6	166.7	171.6	174.1	173.2	174.2	174.7	171.5	167.5	167.3	171.2	174.4	176.4	172.9
1993	172.9	179.1	167.0	172.1	174.1	173.0	174.4	174.8	172.0	168.3	168.8	171.5	174.4	176.2	175.4
1994	172.9	179.3	166.8	172.0	174.4	173.4	174.5	175.0	171.7	168.4	168.8	172.4	174.4	176.3	175.9
1995	172.9	179.2	166.9	172.1	174.4	173.8	174.6	175.1	171.7	168.4	169.0	172.1	174.1	176.4	175.9
1996	173.2	179.4	167.2	172.4	174.6	173.6	174.7	175.4	172.0	168.6	169.4	172.2	174.7	176.2	175.7
1997	173.5	180.0	167.1	172.6	175.1	173.5	175.3	175.7	172.2	168.9	169.4	171.8	175.4	176.4	176.6
1998	173.6	180.1	167.2	172.5	175.4	174.1	175.6	175.6	172.5	169.2	169.2	171.9	175.4	176.6	176.2
1999	173.8	180.3	167.3	172.8	175.5	174.8	175.6	175.9	172.8	169.0	169.1	172.6	175.2	176.7	176.7
2000	174.0	180.4	167.7	172.8	176.1	175.0	176.3	176.2	172.8	169.5	170.0	172.3	175.3	176.8	177.0

TABLE 2

Stature and sitting height

(age 20 - 60 years)

Source: CAESAR database

stature		female					male					female + male							
		N	mean average	standard deviation	P5	P50	P95	N	mean average	standard deviation	P5	P50	P95	N	mean average	standard deviation	P5	P50	P95
USA	2000	1164	1641.2	73.2	1525	1638	1768	1049	1779.8	78.9	1657	1777	1913	2213	1706.9	102.8	1552	1704	1878
Netherlands	2000	640	1679.2	76.1	1553	1678	1806	497	1815.1	88.3	1677	1812	1965	1137	1738.6	105.6	1579	1731	1919
	2004	640	1682.8	76.1	1557	1681	1810	497	1821.5	88.3	1683	1818	1971	1137	1743.4	106.8	1583	1736	1925

sitting height		female					male					female + male							
		N	mean average	standard deviation	P5	P50	P95	N	mean average	standard deviation	P5	P50	P95	N	mean average	standard deviation	P5	P50	P95
USA	2000	1164	866.0	36.1	810	865	925	1049	927.3	40.2	862	928	994	2213	895.1	48.8	819	894	976
Netherlands	2000	637	887.5	37.6	825	888	945	495	945.8	41.4	879	947	1013	1132	913.0	48.8	836	910	995
	2004	637	889.4	37.6	827	890	947	494	949.1	41.5	882	950	1016	1131	915.5	49.2	838	912	998