



TNCAP工作組第三十四次會議簡報

財團法人車輛安全審驗中心

115年 7月 1日



簡 報 大 綱

■ TNCAP第三版規章(草案)

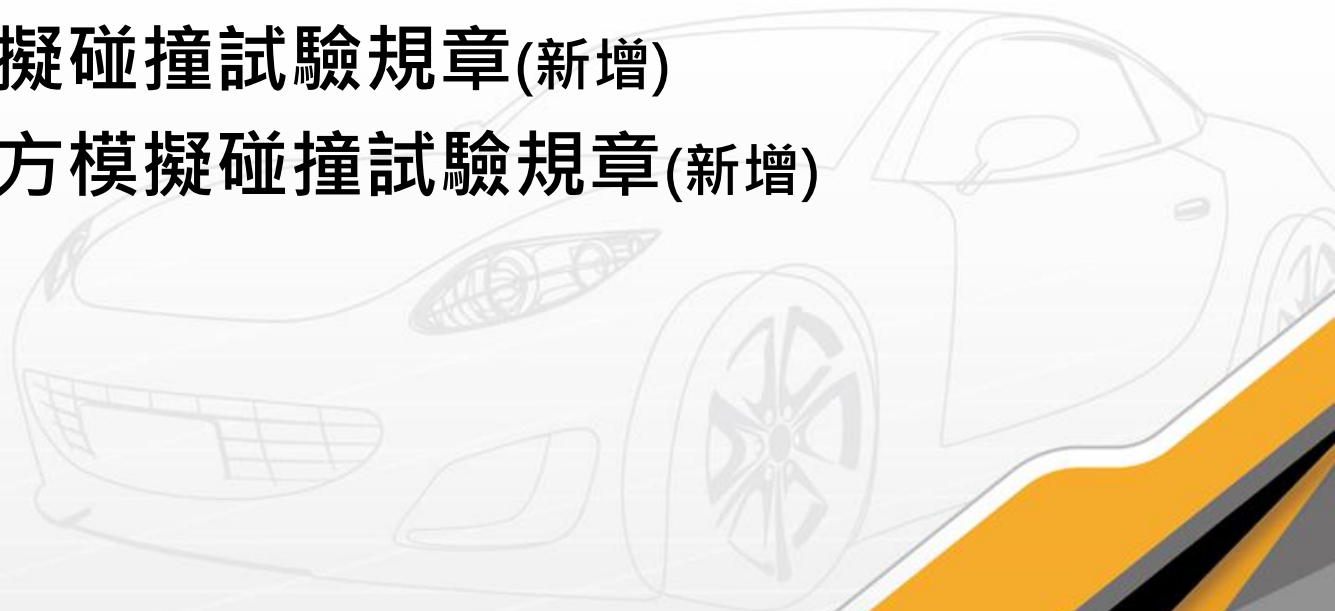
- 3.3 側方撞擊試驗規章(修訂)

- 3.4 側方立柱撞擊試驗規章(修訂)

- 3.17 遠端側方模擬碰撞試驗規章(新增)

- 3.18 虛擬遠端側方模擬碰撞試驗規章(新增)

■ 臨時動議



TNCAP第三版制度規章架構

- TNCAP第三版規章共計有34份規章(含在地化項目5份)，其中8份規章已於先前會議討論完成(如灰底)
- 本次會議擬討論3.3、3.4、3.17、3.18規章。

運作管理規章

評等規章

試驗規章

1.1 組織管理規章

1.2 整體星級評等規章

1.3 星級評等應用程序規章

1.4 車型挑選提名、自費申請評等、車輛規格及試驗管理規章

1.5 錄影及拍照規章

1.6 視覺標識使用規範

2.1 安全駕駛評等規章

2.2 碰撞預防評等規章

2.3 碰撞保護評等規章

2.4 碰撞後安全評等規章

3.1 前方偏置撞擊試驗規章

3.2 前方全寬撞擊試驗規章

3.3 側方撞擊試驗規章

3.4 側方立柱撞擊試驗規章

3.5 前座鞭甩試驗規章

3.6 後座鞭甩試驗規章

3.7 膝部撞擊區域之台車試驗程序規章

3.8 兒童保護試驗規章

3.9 弱勢道路使用者試驗規章

3.10 緊急煞車輔助系統車對車試驗規章

3.11 緊急煞車輔助系統弱勢道路使用者試驗規章

3.12 車道輔助系統試驗規章

3.13 車速輔助系統試驗規章

3.14 盲點輔助系統試驗規章

3.15 電動車碰撞後之觸電保護試驗規章

3.16 緊急救援、事故脫困及安全技術試驗規章

3.17 遠端側方模擬碰撞試驗規章

3.18 虛擬遠端側方模擬碰撞試驗規章

3.19 兒童遺留偵測試驗規章

3.20 防止誤踩踏板之加速控制系統試驗規章

3.21 轉向輔助系統試驗規章

3.22 頭燈性能試驗規章

3.23 後方視野輔助系統試驗規章

3.24 車頂抗壓強度試驗規章

該五項係依TNCAP工作組第33次會議決議之在地化建議項目

TNCAP第三版規章參考國際NCAP版次(1/2)

類別	TNCAP規章	參考Euro NCAP版次	參考其他NCAP版次
運作管理規章	1.1 組織管理規章	NIL	-
	1.2 整體星級評等規章	9.1.1	-
	1.3 星級評等應用程序規章	1.8.1	-
	1.4 車型挑選提名、自費申請評等、車輛規格及試驗管理規章	7.4.3	-
	1.5 錄影及拍照規章	1.4	-
	1.6 視覺標識使用規範	NIL	-
評等規章	2.1 成人保護評等規章	9.3	-
	2.2 兒童保護評等規章	8.1	-
	2.3 弱勢道路使用者評等規章	11.4	-
	2.4 安全輔助評等規章	Safe Driving 10.4 Collision Avoidance 10.4.1	-
試驗規章	3.1 前方偏置撞擊試驗規章	MPDB 1.1.4	-
	3.2 前方全寬撞擊試驗規章	1.2.1	-
	3.3 側方撞擊試驗規章	8.3	-
	3.4 側方立柱撞擊試驗規章	7.2	-
	3.5 前座鞭甩試驗規章	4.2	-
	3.6 後座鞭甩試驗規章	1.1	-
	3.7 膝部撞擊區域之台車試驗程序規章	4.1	-

TNCAP第三版規章參考國際NCAP版次(2/2)

類別	TNCAP規章	參考Euro NCAP版次	參考其他NCAP版次
試驗規章	3.8 兒童保護試驗規章	7.3.2	-
	3.9 行人保護試驗規章	9.1	-
	3.10 緊急煞車輔助系統試驗規章	4.3.1	-
	3.11 緊急煞車輔助之弱勢道路使用者系統試驗規章	4.5.1	-
	3.12 車道輔助系統試驗規章	4.3	-
	3.13 車速輔助系統試驗規章	2.0	-
	3.14 盲點輔助系統試驗規章	-	ASEAN NCAP 1.0
	3.15 電動車碰撞後之觸電保護試驗規章	-	JNCAP 試驗程序 2024/05/02 JNCAP 安全評等 2024/05/02
	3.16 緊急救援、事故脫困及安全技術試驗規章	2.3	-
	3.17 遠端側方模擬碰撞試驗規章	2.5	-
	3.18 虛擬遠端側方模擬碰撞規章	1.0	-
	3.19 兒童遺留偵測試驗規章	1.3	-
	3.20 防止誤踩踏板之加速控制系統試驗規章	-	JNCAP 2023/04/25 UN R175 01版
	3.21 轉向輔助系統試驗規章	Assisted Driving Highway Assist Systems v2.2	-
	3.22 頭燈性能試驗規章	-	JNCAP 2024/05/02
	3.23 後方視野輔助系統試驗規章	-	ASEAN NCAP v2.0
	3.24 車頂抗壓強度試驗規章	-	IIHS Version V

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■ TNCAP第三版規章(草案)

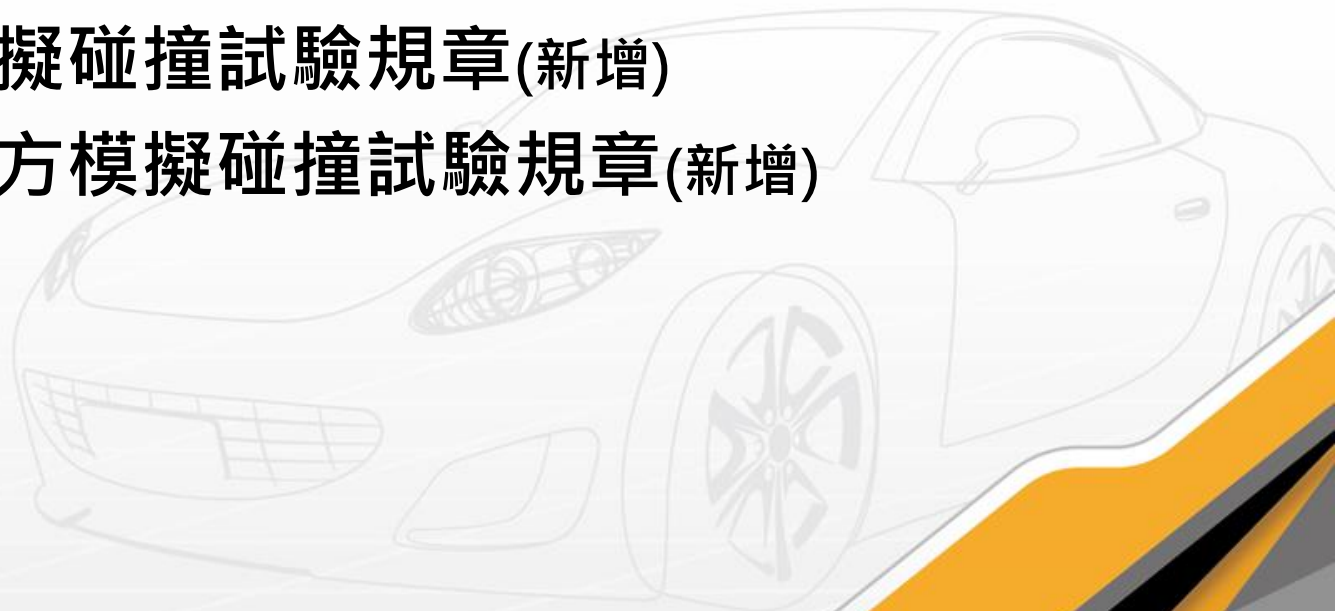
■ 3.3 側方撞擊試驗規章(修訂)

■ 3.4 側方立柱撞擊試驗規章(修訂)

■ 3.17 遠端側方模擬碰撞試驗規章(新增)

■ 3.18 虛擬遠端側方模擬碰撞試驗規章(新增)

■ 臨時動議

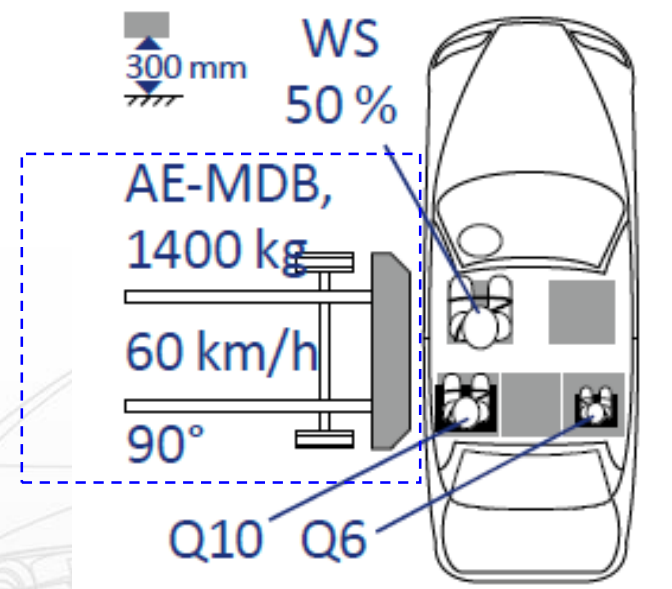


3.3 側方撞擊試驗規章修訂摘要

修訂章節	修訂摘要
3.3 側方撞擊試驗規章	- 將試驗條件加嚴，目標速度由 <u>50km/h</u> 提高至 <u>60km/h</u>，且台車總重量由 <u>1,300kg</u> 增加至 <u>1,400kg</u>。 - 新增駕駛人偶<u>頭部角速度</u>感測器(Angular velocity, ω_x, ω_y, ω_z)，相關頻道數量由<u>35</u>個增加到<u>38</u>個。 - 修訂駕駛人偶姿態，當椅背角度為 $23 \pm 1^\circ$ 且未宣告胸部肋骨角度，由原「朝下 2°」修訂為「依胸部感測器讀值 -2° (脊椎屈曲) $\pm 1^\circ$」設定。 - 修訂試驗設定概覽，明確規範如後座橫向位置於最外側、第一排乘客氣囊須啟動，以及兒童安全鎖處於解鎖狀態等。 - 新增車輛標記要求，於儀表板與中控台標註車輛中心線，以利攝影辨識。

3.3 側方撞擊試驗規章修訂摘要

- 試驗人偶：World SID百分之五0 成年男性人偶(駕駛座)；
Q6及Q10兒童人偶(屬兒童保護領域)。
- 試驗方法：**1,400Kg**台車以**60km/h**速度撞擊靜止的受驗車輛駕駛側。
- 評分標準：計算人偶各部位傷害指數，且考量車輛及乘員狀態（例如車門開啟、氣囊開展情形等）進行扣分後，將**駕駛人偶各身體部位分數加總除以16，再乘以6**，即為本項試驗分數（**總分6分**）。



側方撞擊評等規章修訂摘要(1/3)

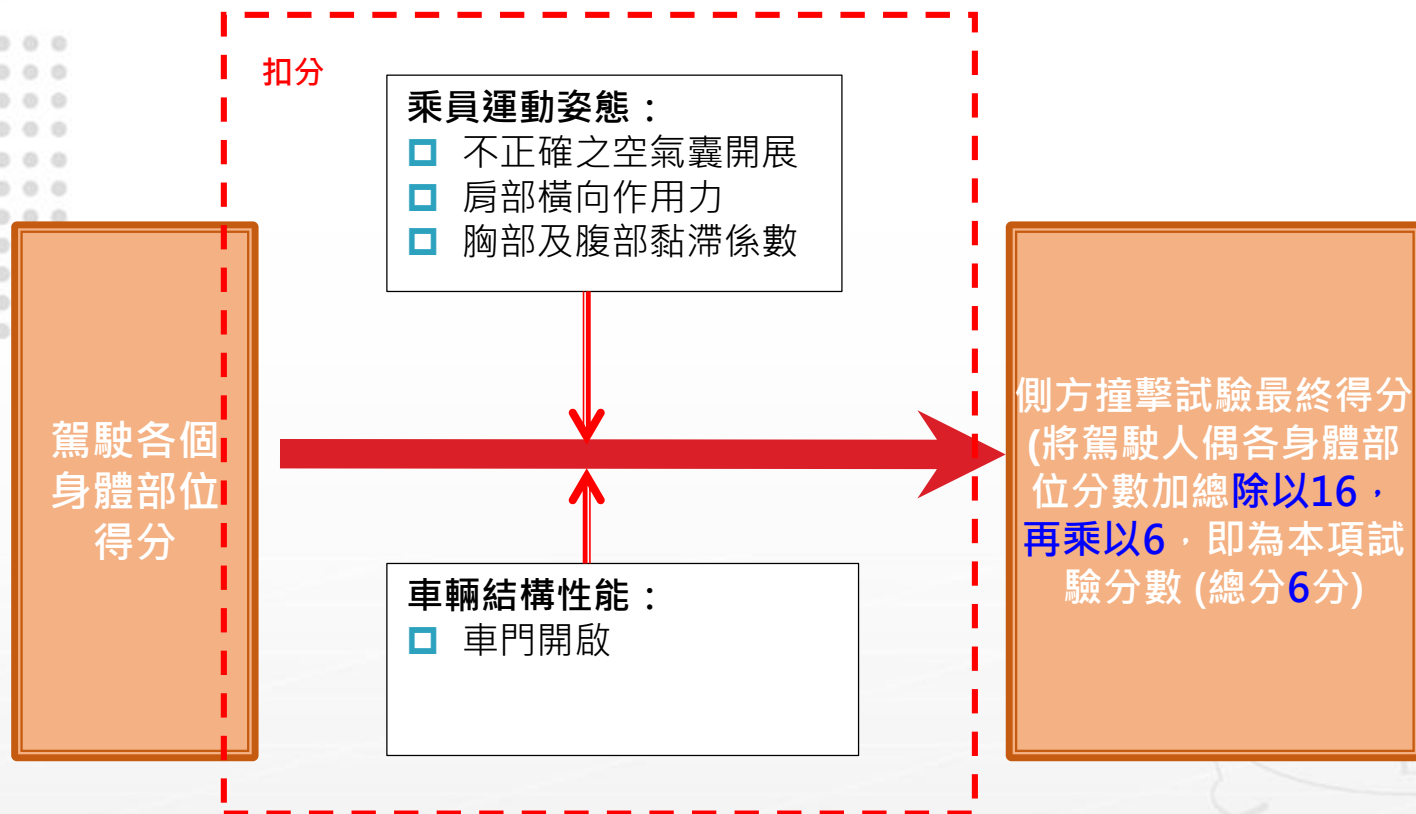
修訂章節		修訂摘要					
2.1 成人保護評等規章		修訂側方撞擊評等分數由8分下修為6分，將該2分配置於新增之「遠端側方模擬碰撞評等」。					
人偶	分數	部位	標準	4分	0分	底線限制	扣分
WS 50%	4分	頭部	HIC ₁₅	<500	>700	>700	• 不正確之空氣囊開展(-1分)
			a _{3ms} (g)	<72	>80	>80	
	4分	胸部	壓縮量(mm)	<28	>50	>50	• 不正確之空氣囊開展(-1分) • 肩部橫向作用力≥3.0kN (胸部0分) • 胸部黏滯係數≥1.0m/s(胸部0分)
	4分	腹部	壓縮量(mm)	<47	>65	>65	• 不正確之空氣囊開展(-1分) • 腹部黏滯係數≥1.0m/s(腹部0分)
	4分	骨盆	恥骨聯合力(kN)	<1.7	>2.8	>2.8	• 不正確之空氣囊開展(-1分)
						其他	• 車門開啟(-1分)

- 若單一身體部位使用多重標準，則該部位性能判定將使用最低分之參數。
- 若超過規定之底線限制，則側方撞擊試驗0分。

<<本案暫以2.1規章編號說明評等條文修訂內容，後續擬修訂至2.3碰撞保護評等規章>>

側方撞擊評等規章修訂摘要(2/3)

➤ 側方撞擊試驗總分：修訂本項試驗分數之計算方式



➤ 評分與視覺說明：修訂本項最高可獲得6分

範例：



- 側方撞擊6分
- 立柱撞擊6分
- 遠端側方碰撞4分

顏色	分數
綠 ■	4
黃 ■	2.670~3.999
橘 ■	1.330~2.669
棕 ■	0.001~1.329
紅 ■	0

側方撞擊評等規章修訂摘要(3/3)

- 計分範例試算：新版側方撞擊評等由原先 8 分下修為 6 分（本項試驗 6 分）

步驟一	步驟二	步驟三
計算駕駛分數	進行車門開啟扣分	計算側方撞擊評等分數
➤ 加總各身體部位分數： 4+1.273+2.778+2.636 =10.687	➤ 試驗時有兩車門開啟，分數則調整為 10.687-2=8.687	➤ 將左列分數除以16，再乘以6： $8.687 \times 6 / 16 = 3.258$ (將3.2576取至小數點第3位)

範例：

Side MDB Test		Driver	
		Value	Points
SUMMARY			
Head assessment		4.000	
Chest assessment		1.273	
Abdomen assessment		2.778	
Pelvis assessment		2.636	
DUMMY SCORE		10.687	
Door Opening		-2.000	
TOTAL SIDE MDB		3.258	

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■ TNCAP第三版規章(草案)

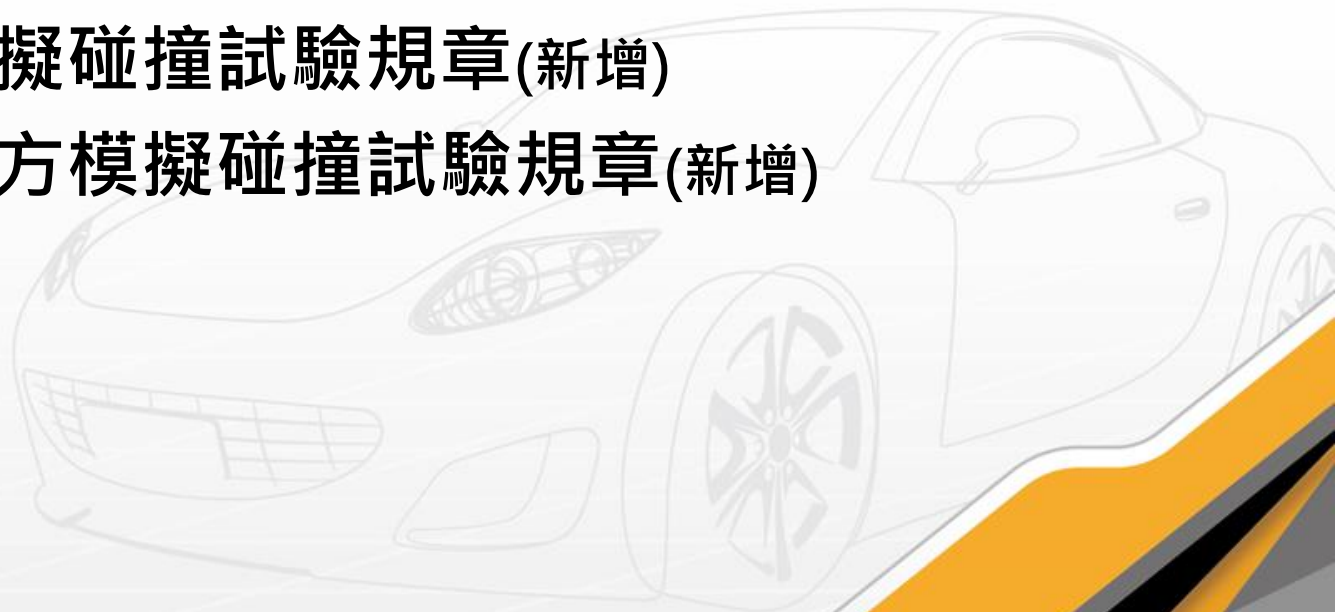
- 3.3 側方撞擊試驗規章(修訂)

- **3.4 側方立柱撞擊試驗規章(修訂)**

- 3.17 遠端側方模擬碰撞試驗規章(新增)

- 3.18 虛擬遠端側方模擬碰撞試驗規章(新增)

■ 臨時動議



3.4 側方立柱撞擊試驗規章修訂摘要

修訂章節	修訂摘要
3.4 側方立柱碰撞	- 新增駕駛人偶<u>頭部角速度</u>感測器(Angular velocity, ω_x, ω_y, ω_z)，相關頻道數量由35個增加到38個(單乘員)。另雙乘員試驗中，駕駛人偶感測器之頻道數量為41個，前乘客人偶感測器之頻道數量為 19個。 <u>新增雙乘員試驗及整備要求</u>，雙乘員試驗僅適用配備遠端側方碰撞保護性對策(如中央空氣囊)之車輛；行李廂配重為額定貨物或61kg之較低者；新增人偶頭部塗色(駕駛為紅色、乘客為藍色)；若乘客頭部重心偏後，則應向前調整座椅使其對準撞擊線。雙乘員試驗之撞擊對準亦應符合規章之撞擊位置規定。 - 修訂試驗設定概覽，明確規範如後座橫向位置於最外側、第一排乘客氣囊須啟動，以及兒童安全鎖處於解鎖狀態等。 - 新增若台車地板於人偶頭部與頭部接觸前發生減速，則必須證明對於人偶之運動並無影響。 - 新增車輛標記要求，於儀表板與中控台標註車輛中心線，以利攝影辨識。

3.4 側方立柱撞擊試驗規章修訂摘要

□ 試驗人偶：

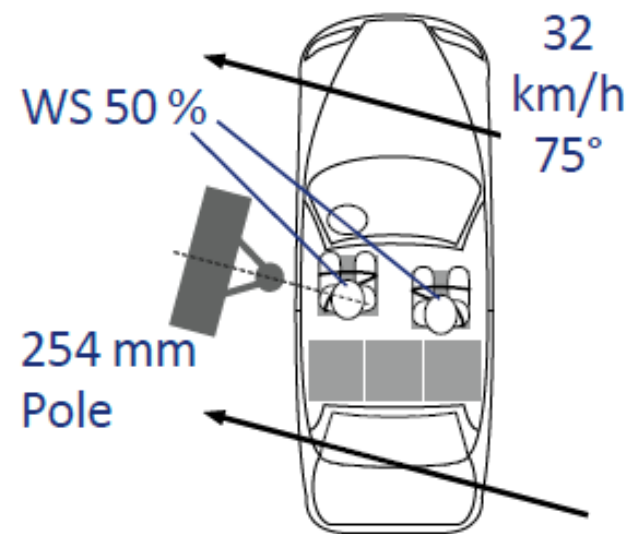
- 配備遠端側方碰撞保護性對策（如中央空氣囊）之車輛：

WorldSID 百分之五 0 成年男性人偶 × 2 (駕駛座/乘客座各一個人偶)

- 未配備遠端側方碰撞保護性對策：WorldSID 百分之五 0 成年男性人偶 × 1 (駕駛座)

□ 試驗方法：受驗車輛以32km/h速度斜角75°撞擊固定剛性立柱

- 評分標準：計算人偶各部位傷害指數，且考量車輛及乘員狀態（例如車門開啟、氣囊開展情形、頭部保護裝置評等）進行扣分後，將駕駛人偶各身體部位分數加總除以16，再乘以6，即為本項試驗分數（總分6分）。



配備遠端側方碰撞
保護性對策

側方立柱撞擊評等規章修訂摘要(1/3)

修訂章節	修訂摘要
2.1 成人保護評等規章	修訂側方立柱撞擊評等分數由8分下修為6分，將該2分配置於新增之「<u>遠端側方模擬碰撞評等</u>」。

人偶	分數	部位	標準	4分	0分	底線限制	扣分
WS 50%	4分	頭部	HIC ₁₅			>700	• 不正確之空氣囊開展(-1分)
			a _{peak} (g)			>80	
	4分	胸部	壓縮量(mm)	<28	>50	>55	• 不正確之空氣囊開展(-1分) • 肩部橫向作用力≥3.0kN (胸部0分) • 胸部黏滯係數≥1.0m/s(胸部0分)
	4分	腹部	壓縮量(mm)	<47	>65	>65	• 不正確之空氣囊開展(-1分) • 腹部黏滯係數≥1.0m/s(腹部0分)
	4分	骨盆	恥骨聯合力(kN)	<1.7	>2.8	>2.8	• 不正確之空氣囊開展(-1分)
其他							• 車門開啟(-1分) • 頭部保護裝置評等(-4分)

- 若單一身體部位使用多重標準，則該部位性能判定將使用最低分之參數。
- 若未配備側方頭部保護裝置、試驗人偶頭部與立柱接觸、超過規定之底線限制，則側方立柱撞擊試驗0分。

<<本案暫以2.1規章編號說明評等條文修訂內容，後續擬修訂至2.3碰撞保護評等規章>>

側方立柱撞擊評等規章修訂摘要(2/3)

➤ 側方撞擊試驗總分：修訂本項試驗分數之計算方式

扣分

乘員運動姿態：

- ☐ 不正確之空氣囊開展
- ☐ 肩部橫向作用力
- ☐ 胸部及腹部黏滯係數

駕駛各
個身體
部位得
分

車輛結構性能：

- ☐ 車門開啟
- 安全配備：
- ☐ 側方頭部保護裝置

側方立柱撞擊試驗最終得分
(各個身體部位分數加總後除
以16，再乘以6，即為本項試
驗分數 (總分6分)。

➤ 評分與視覺說明：修訂本項最高可獲得6分

範例：

側方碰撞

10.23分



側方撞擊



立柱撞擊

頭部 4分

胸部 4分

腹部 4分

骨盆 4分

顏色	分數
綠	4
黃	2.670~3.999
橘	1.330~2.669
棕	0.001~1.329
紅	0

側方碰撞共計16分

- 側方撞擊6分
- 立柱撞擊6分
- 遠端側方碰撞4分

側方立柱撞擊評等規章修訂摘要(3/3)

- 計算範例：新版側方立柱撞擊由原先 8 分下修為 6 分(本項試驗 6 分)

步驟一	步驟二	步驟三
計算駕駛分數	進行頭部保護裝置(HPD) 與車門開啟扣分	計算Side Pole分數
➤ 加總各身體部位分數： $4+1.273+2.778+2.636=10.687$	➤ 若後座HPD評估區域未符合規定 且試驗時有兩車門開啟，分數則 調整為：$10.687-2-2=6.687$	➤ 將左列分數除以16，再乘以6： $6.687*6/16=2.508$ (將2.5076取至小數點第3位)

範例：

Side Pole Test	Driver	
	Value	Points
SUMMARY		
Head assessment	4.000	
Chest assessment	1.273	
Abdomen assessment	2.778	
Pelvis assessment	2.636	
DUMMY SCORE	10.687	
HPD Assessment	Row 1	Row 2
HPD modifier (-2/-4)	0.000	-2.000
HPD assessment zone coverage	Pass	Fail
seems within HPD no wider than 15mm	Pass	Pass
uninflated areas no larger than 50mm	Pass	Pass
HPD assessment	-2.000	
Door Opening	-2.000	
TOTAL SIDE POLE	2.508	

簡 報 大 綱

■ TNCAP第三版規章(草案)

- 3.3 側方撞擊試驗規章(修訂)

- 3.4 側方立柱撞擊試驗規章(修訂)

- 3.17 遠端側方模擬碰撞試驗規章(新增)

- 3.18 虛擬遠端側方模擬碰撞試驗規章(新增)

■ 臨時動議



3.17遠端側方模擬碰撞試驗規章摘要說明

章節	主題	摘要說明
3.17.1	簡介	- 遠端側方模擬碰撞(Far-side)乘員保護評等之介紹。 - 車輛業者應依規定提交台車試驗資料。
3.17.2	前提條件	本項評等之前提條件要求，包括側方撞擊與側方立柱撞擊試驗分數、束縛系統、車體結構等。
3.17.3	硬體設定	執行Far-side台車試驗之硬體設定相關要求，包括台車設備、車體整備、主動式束縛系統、車輛標記等。
3.17.4	試驗程序	Far-side台車試驗程序，包括台車加速度脈衝、車室調整、人偶設置及塗色。
3.17.5	影像紀錄	台車試驗之高速攝影與靜態影像相關要求。
3.17.6	數據處理及提報	數據處理與提交資料要求，包括車輛與試驗設定、參考脈衝資料、感測器數據與曲線、高速攝影、照片等。
3.17.7	遠端側方模擬碰撞評等	- 身體各部位標準與底線限制，包括頭部、頸部、胸部。 - 扣分相關規定。
3.17.8	決定偏移線	最大內側侵入點(即最大侵入線(紅線))之判定方法。
3.17.9	台車脈衝	台車試驗脈衝之適用性檢查。
3.17.10	扶手設置	扶手或中控台置物盒之使用位置與非使用位置圖例。

3.17遠端側方模擬碰撞試驗規章摘要

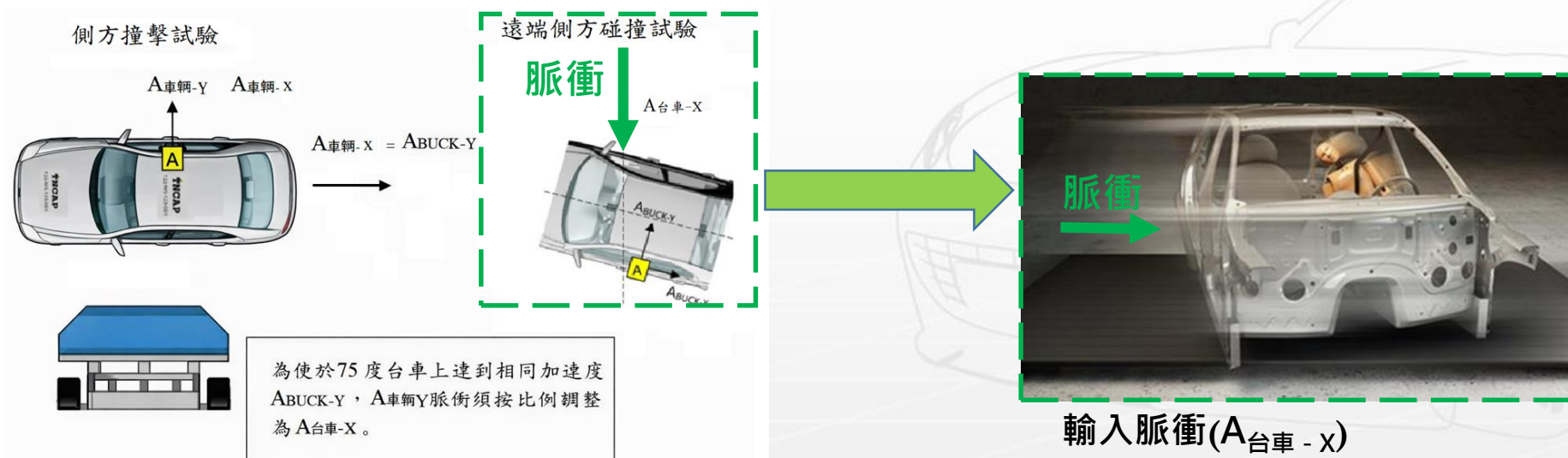
修訂章節	修訂摘要
2.1 成人保護評等規章	- 遠端側方碰撞保護於成人保護評等中佔 4 分。 頭部偏移量若進入「限制區域」以 0 分計，否則將依據頭部偏移情形（綠/黃/橘/棕/紅）設定各身體部位的得分上限。另骨盆或腰椎負載過大將扣 4 分。 - 若遠端側方碰撞保護對策無法提供乘員間有效保護對策，總分扣 1 分。 - 若側方撞擊與側方立柱撞擊試驗分數加總後低於10分（滿分12分）或遠端側方碰撞乘員保護之束縛系統失效，則無法獲得本項分數。
3.17 遠端側方模擬碰撞試驗規章	- 將車體安裝於試驗台車（車體中線與移動方向呈75°），分別以側方撞擊試驗（60km/h）脈衝及側方立柱撞擊試驗（32km/h）脈衝執行試驗。 - 駕駛座（非撞擊側）放置WorldSID 50th成年男性試驗人偶，並收集人偶感測數據。 - 車內標記四條垂直偏移線（紅、橘、黃、綠）以判定頭部移動範圍。 - 以至少 5 台 1000fps 高速攝影機記錄人偶運動軌跡。 - 車輛業者應於正式試驗前提交由交通部指定TNCAP檢測機構執行台車試驗資料。

<<本案暫以2.1規章編號說明評等條文修訂內容，後續擬修訂至2.3碰撞保護評等規章>>

遠端側方模擬碰撞試驗摘要

(新增文字)

- ❑ 車輛業者應於TNCAP正式試驗前提交由交通部指定TNCAP檢測機構所執行之實體台車試驗資料，不接受實車碰撞試驗或CAE數據資料。
- ❑ 試驗人偶：World SID百分之五0成年男性人偶 (駕駛座)
- ❑ 試驗方法：將車體安裝於試驗台車 (車體中線與移動方向呈75°)，且所有影響乘員運動及乘員保護之功能皆安裝於車體上，並依下列規定執行兩項試驗：
 1. 試驗1 (SLED1)：以側方撞擊試驗(60km/h)脈衝執行試驗 ($A_{\text{台車-X}} = A_{\text{車輛-Y(側方撞擊)}} \times 1.035$)
 2. 試驗2 (SLED2)：以側方立柱撞擊試驗(32km/h)脈衝執行試驗 ($A_{\text{台車-X}} = A_{\text{車輛-Y(立柱撞擊)}} \times 1.035$)



遠端側方模擬碰撞試驗說明-車輛標記/偏移區域



車輛標記

□ 車輛標記

■ 藍線：車輛中線

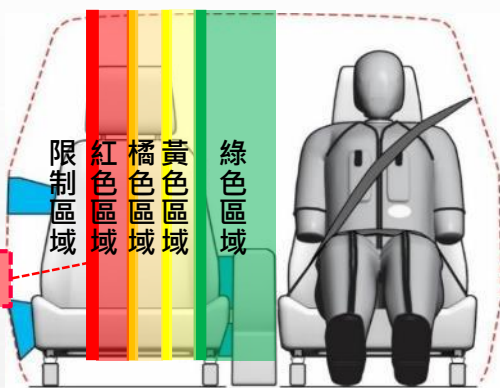
兩個台車試驗情境中，車體內皆應標記四條垂直且平行之偏移線。每條線的最內側邊緣作為偏移限值。

■ 綠線：乘客座中心線內側250mm

■ 黃線：乘客座中心線內側125mm

■ 橘線：乘客座中心線

■ 紅線：來自於側方撞擊及側方立柱撞擊之最大偏移線（紅）



頭部偏移區域

□ 偏移區域

■ 綠色區域：綠線以內的區域

■ 黃色區域：黃線和綠線之間的區域

■ 橘色區域：橘線和黃線之間的區域

■ 紅色區域：紅線和橙色線之間的區域

■ 限制區域：紅線以外區域

遠端側方模擬碰撞試驗說明-高速攝影機記錄人偶運動軌跡

- 至少配置5台 1000fps 的高速攝影機，記錄人偶運動軌跡，並採集人偶頻道之感測數據。其中2台攝影機必須架設於頭部偏移預期區域之兩側。

攝影機1(對準紅線)



攝影機2(對準橘線)



攝影機3(對準黃線)



攝影機4(對準綠線)



攝影機5(對準人偶側方門框中心)



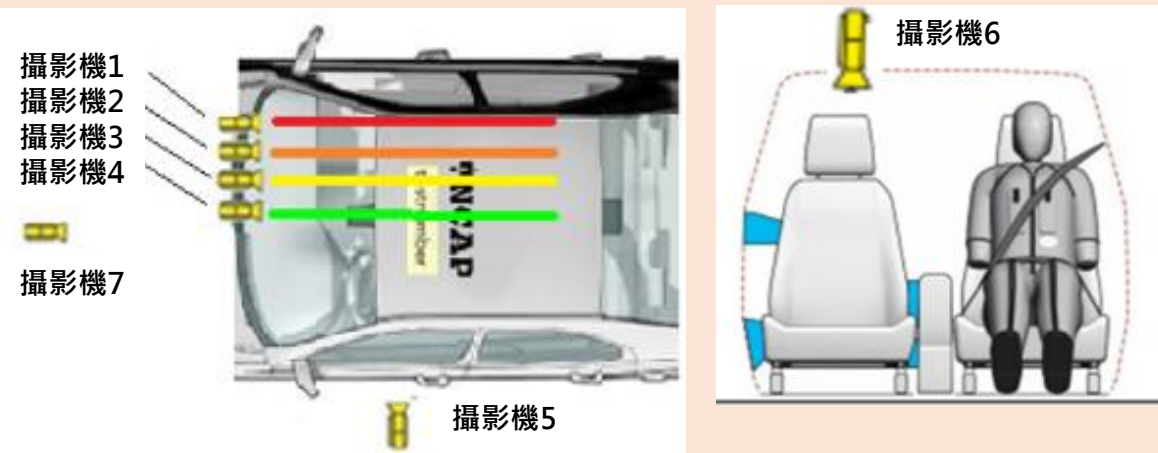
攝影機6(橘線正上方，由上往下)



攝影機7(對準車體之車後方向)



攝影機1-7位置示意



遠端側方模擬碰撞評等說明-人偶身體部分數計算(1/2)

遠端側方乘員保護



前提條件：

- 車門之結構性能、車門與車體連接、車頂/側樑及門檻在結構上必須具有穩定性→若側方撞擊或立柱撞擊試驗中發生門闕/鉸鏈脫離、車門完全開啟或車頂/側樑及門檻結構失效，則不接受側方遠端模擬碰撞資料。
- 側方撞擊與側方立柱撞擊試驗分數加總 ≥ 10 分→若未符合，則無法獲得本項分數。
- 側方撞擊或立柱撞擊試驗時，遠端側方碰撞乘員保護之束縛系統不得失效→若未符合，則無法獲得本項分數。

人偶	分數	部位		標準	最高分	0分	底線限制	部位區域	標準	性能限制值	扣分
WS 50%	4分	頭部		HIC ₁₅	<500	>700	>700	WS 50% 骨盆與腰椎	骨盆聯合力(kN)	>2.8	每個試驗中，若超出任一限制值，則該人偶分數扣4分
				a _{3ms} (g)	<72	>80	>80		腰椎F _y (kN)	>2.0	
	4分	頸部	上頸部	張力F _z (kN)	<3.74	>3.74	-		腰椎F _z (kN)	>3.5	
				橫向彎曲M _x OC(Nm)	<162	>248	-		腰椎M _x (NM)	>120	
				反向彎曲M _y OC(Nm)	<50	>50	-				
			下頸部	張力F _z (kN)	<3.74	>3.74	-				
				橫向彎曲M _{x(頸底)} (Nm)	<162	>248	-				
				反向彎曲M _{y(頸底)} (Nm)	-	>100	-				
	4分	胸部與腹部		胸部壓縮量(mm)	<28	>50	>50				
				腹部壓縮量(mm)	<47	>65	>65				





- 各部位最高分將依頭部最大偏移量及是否配備保護性對策(如中央空氣囊)判定，詳如下頁說明。
- 若單一身體部位區域使用多重標準，則該區域性能判定將使用最低分之參數。
- 若超過規定之底線限制，則該項試驗0分。
- 若頭部合成加速度峰值超過 80g，或有其他硬碰撞證據，則判定為頭部硬碰撞。

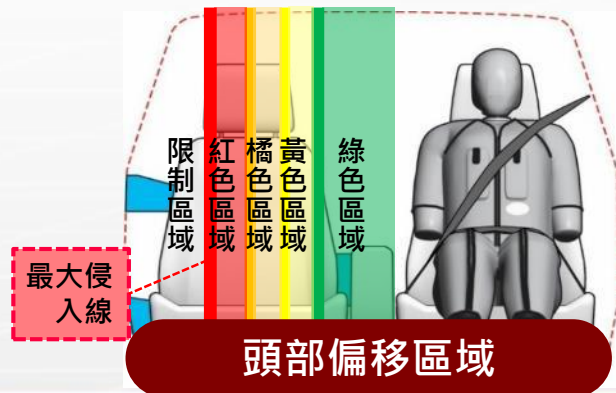
遠端側方模擬碰撞評等說明-人偶身體部分數計算(2/2)

各部位最高分

部位區域	保護性對策	頭部最大偏移區域					
		限制區域*	紅色區域**		橘色區域	黃色區域	綠色區域
			≤125mm	>125mm			
頭部	具備	0	0	2	3	4	4
	未具備	0	0		1	2	4
頸部	具備	0	4	4	3	4	4
	未具備	0	1		1	2	4
胸部與腹部	具備	0	0	0	3	4	4
	未具備	0	0		1	2	4
最高得分	具備	0	4	6	9	12	12
	未具備	0	1		3	6	12

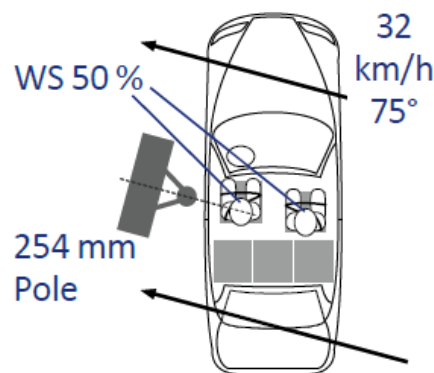
* 若任一車試驗發生頭部偏移進入限制區域，則遠端側方模擬碰撞試驗給予 0 分。

** 若頭部偏移進入紅色區域，則頭部最高分數將取決於紅色偏移線與橘色偏移線之距離是否超過 125mm。當頭部偏移進入紅色區域，車輛配備有遠端側方碰撞保護性對策，且紅色偏移線於橘色偏移線外側>125mm，則偏移情形將以棕色替代紅色。



遠端側方模擬碰撞評等說明-TNCAP正式側方立柱撞擊試驗之乘員間保護

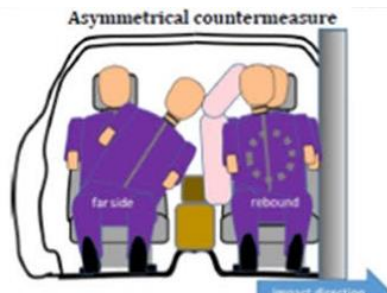
□ TNCAP側方立柱撞擊試驗 - 針對配備限制頭部偏移遠端側方碰撞保護性對策之車輛



圖片來源: carths



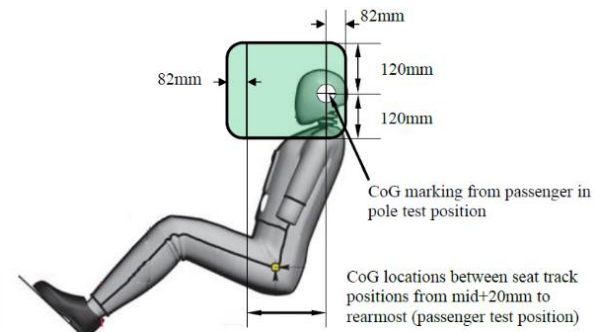
對稱保護性對策



非對稱保護性對策



2022年Tesla Model Y
Euro NCAP中央空氣囊開展



保護區域

➤ 乘員間保護(Occupant Interaction)扣分說明

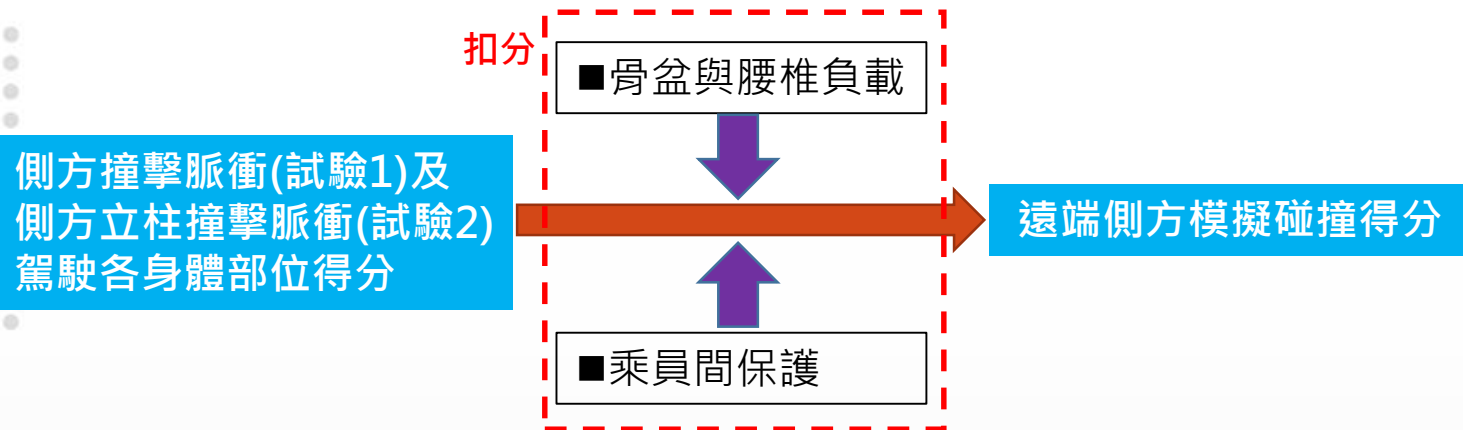
配備遠端側方碰撞保護性對策之車輛，應於TNCAP側方立柱撞擊試驗中，使用兩個WorldSID人偶證明能否提供乘員間相互影響之額外保護（如下四項要求）。若無法提供有效之頭部保護，則本項試驗應扣1分。

1. 頭部HIC₁₅ 與a_{3ms}不超過700及80g
2. 遠端乘員頭部未與近端乘員任何部位直接接觸
3. 若為非對稱保護性對策，車輛業者須提供兩側撞擊時之保護性佐證(CAE或實車碰撞)
4. 保護性對策須涵蓋所需保護區域

遠端側方模擬碰撞評等說明-總分計算

總分計算：遠端側方模擬碰撞最高可獲得4分

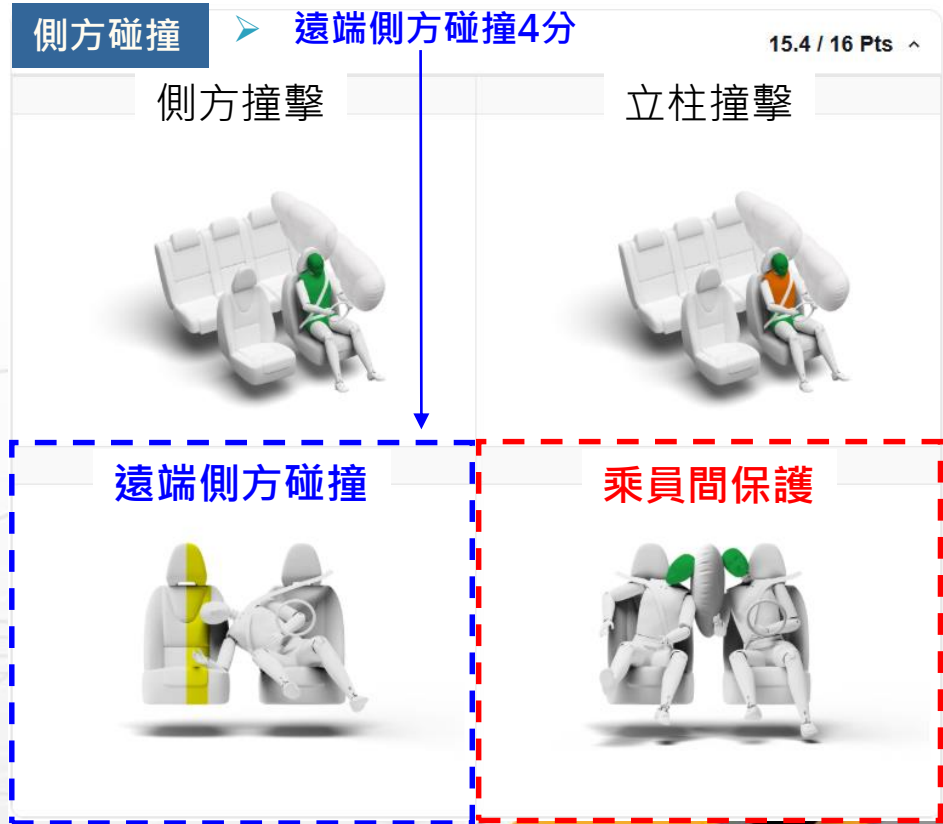
- 以兩個台車試驗分數按比例計算；其中頭部最大偏移量為核心指標，且各身體部位採線性插值計分。
- 保護性對策若無法提供頭部有效保護，則總分再扣1分。



測試項目	方法	得分
試驗1 (SLED1)	側方撞擊試驗脈衝	2
試驗2 (SLED2)	側方立柱撞擊試驗脈衝	2
側方立柱撞擊之乘員間保護 (Occupant Interaction)	實車碰撞前排放置兩個 World SID人偶	-1~0
合計		滿分4分

側方碰撞共計16分

- 側方撞擊6分
- 立柱撞擊6分
- 遠端側方碰撞4分



遠端側方模擬碰撞評等說明-計分範例

步驟一	步驟二	步驟三	步驟四
計算試驗1及試驗2之人偶分數	分數轉換	扣分項目	計算Far Side分數
加總各身體部位分數： 試驗1： $2.000 + 1.500 + 1.600 + 0 = 5.100$ 試驗2： $2.000 + 1.500 + 1.600 + 0 = 5.100$	將左列分數加總除以12，再乘以2， 試驗分數為 試驗1： $5.100 \times 2 / 12 = 0.850$ 試驗2： $5.100 \times 2 / 12 = 0.850$ (將0.850取至小數點第3位)	若側方立柱撞擊試驗之 乘員間未符合規定，應 扣1分	將左列分數加總： $0.850 + 0.850 - 1.000 = 0.700$ (將0.700取至小數點第3位)

範例：

Far Side Tests		AE-MDB		Pole	
OEM DATA		Value	Points	Value	Points
PREREQUISITE					
Structural failure		No		No	
Restraint failure		No		No	
EXCURSION ZONE					
Excursion zone		Yellow		Yellow	
Red line >125 mm outboard of the orange line		No		No	
Excursion zone scaling factor		50%		50%	
SUMMARY					
Head assessment		2.000		2.000	
Neck assessment		1.500		1.500	
Chest & Abdomen assessment		1.600		1.600	
Pelvis assessment		0.000		0.000	
DUMMY SCORE		5.100		5.100	
TEST SCORE		0.850		0.850	
Occupant-to-Occupant Head Contact Assessment			-1.000		
TOTAL FAR SIDE			0.700		

假設車輛未具備保護性對策(如中央空氣囊)，且頭部最大偏移進入黃色區域，依照規章對應各部位滿分為2分：

- 頭部分數：經調整後為2.000分
- 頸部分數：經調整後為1.500分
- 胸部與腹部分數：經調整後為1.600分
- 骨盆與腰椎分數：0.000分
- 側方立柱撞擊之乘員間保護：扣1分

簡 報 大 綱

■ TNCAP第三版規章(草案)

- 3.3 側方撞擊試驗規章(修訂)

- 3.4 側方立柱撞擊試驗規章(修訂)

- 3.17 遠端側方模擬碰撞試驗規章(新增)

- 3.18 虛擬遠端側方模擬碰撞試驗規章(新增)

■ 臨時動議



3.18 虛擬遠端側方模擬碰撞試驗規章摘要說明

章節	主題	摘要說明
3.18.1	簡介	名詞釋義、整體流程及一般規定，車輛業者須執行台車試驗及CAE模擬。
3.18.2	WorldSID模擬模型	WorldSID模擬模型須預先通過資格認定，確保其與實體對應人偶表現一致。
3.18.3	車輛模擬模型	車輛模型須預先進行校準，且確保其具備預測試驗案例中乘員反應之能力。
3.18.4	模擬設定	模擬時長、全域座標系統、車內人偶定位及負載案例之規定。
3.18.5	模擬數據	所有模擬結果必須依照規定格式上傳至VTC伺服器。
3.18.6	模擬設置之資格	當所有負載案例之品質標準及驗證標準皆滿足，模擬設置才被接受用於虛擬測試。
3.18.7	調整邊界條件後重新執行模擬	若模擬模型之資格認定未成功，車輛業者能調整特定參數重新執行模擬，並重新上傳兩個驗證負載案例之模擬數據。
3.18.8	虛擬遠端側方碰撞之乘員評等	若不符合要求，實體遠端側方模擬碰撞之台車試驗分數將被減半。
3.18.9	輸出定義及VTC伺服器處理	說明頻道輸出格式要求及數據處理規範。

3.18 虛擬遠端側方模擬碰撞試驗規章摘要

修訂章節	修訂摘要
2.1 成人保護評等規章	- 若模擬數據未上傳或未通過驗證，實體台車試驗分數將被減半。 - 現階段虛擬測試負載案例之評估標準值不予計分。
3.18 虛擬遠端側方模擬碰撞試驗規章	- 透過額外的CAE模擬，增強遠端側方碰撞保護評等之穩健性。 - 須執行實體台車試驗及虛擬模擬： 2組驗證負載案例+6組虛擬負載案例。

<<本案暫以2.1規章編號說明評等條文修訂內容，後續擬修訂至2.3碰撞保護評等規章>>

為何要做虛擬測試？

用數位模擬擴展實體試驗的「深度、廣度與效率」，提升真實世界的安全效益。

實體測試受限於人偶種類與測試情境，而虛擬測試可納入不同體型、姿態、碰撞角度與負載組合，提升真實事故的代表性

部分人體生物力學反應或極端情境難以透過實體測試取得，可透過虛擬人體模型與數值模擬補足，提升預測乘員傷害情形

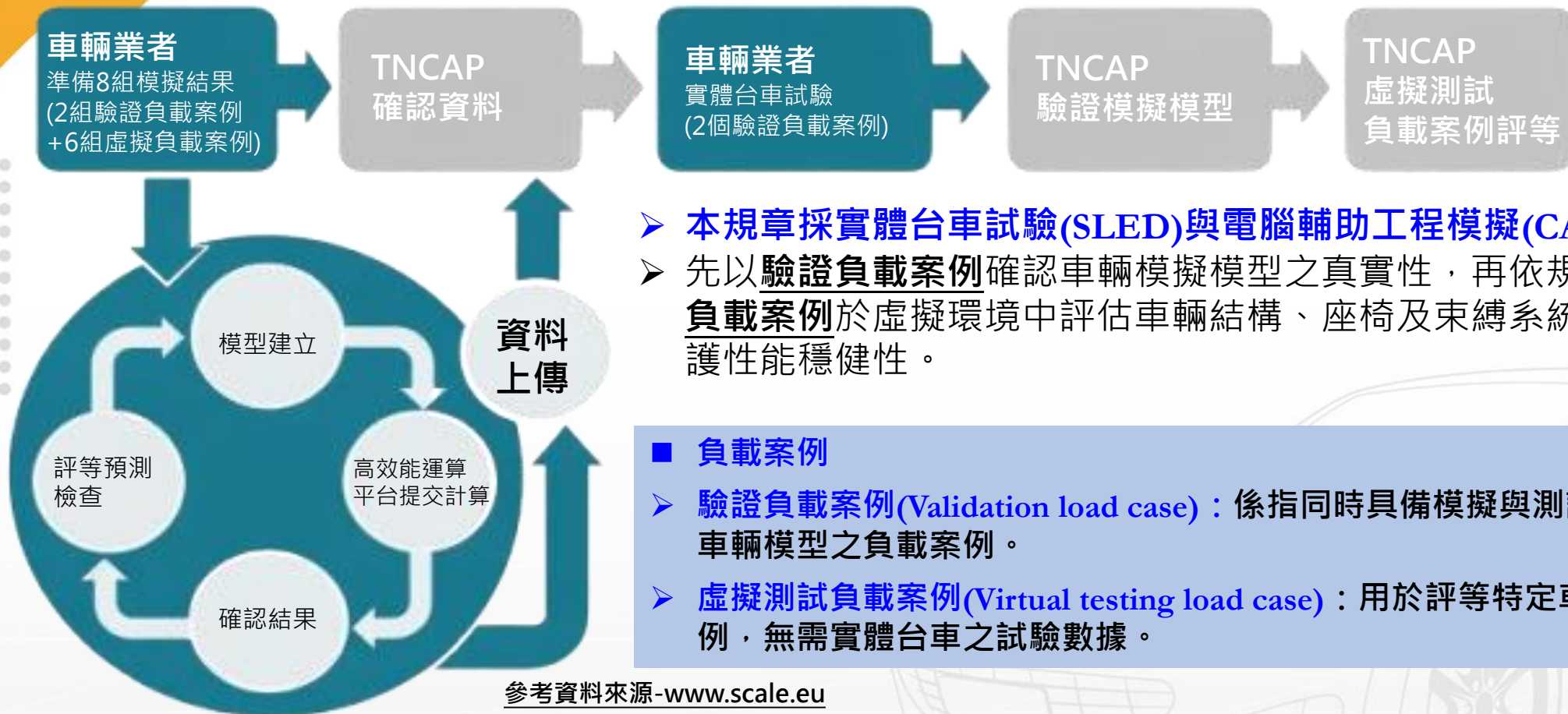
以模擬補強實體測試，提升真實世界的安全效益

可跨系統分析結構、束縛系統、座椅、空氣囊、主被動安全功能之整合性

減少反覆實體測試次數，提升時程效率



虛擬遠端側方模擬碰撞試驗流程說明-1/2



- 本規章採實體台車試驗(SLED)與電腦輔助工程模擬(CAE)雙軌機制
- 先以驗證負載案例確認車輛模擬模型之真實性，再依規章所定之虛擬測試負載案例於虛擬環境中評估車輛結構、座椅及束縛系統於負載變異下之保護性能穩健性。

■ 負載案例

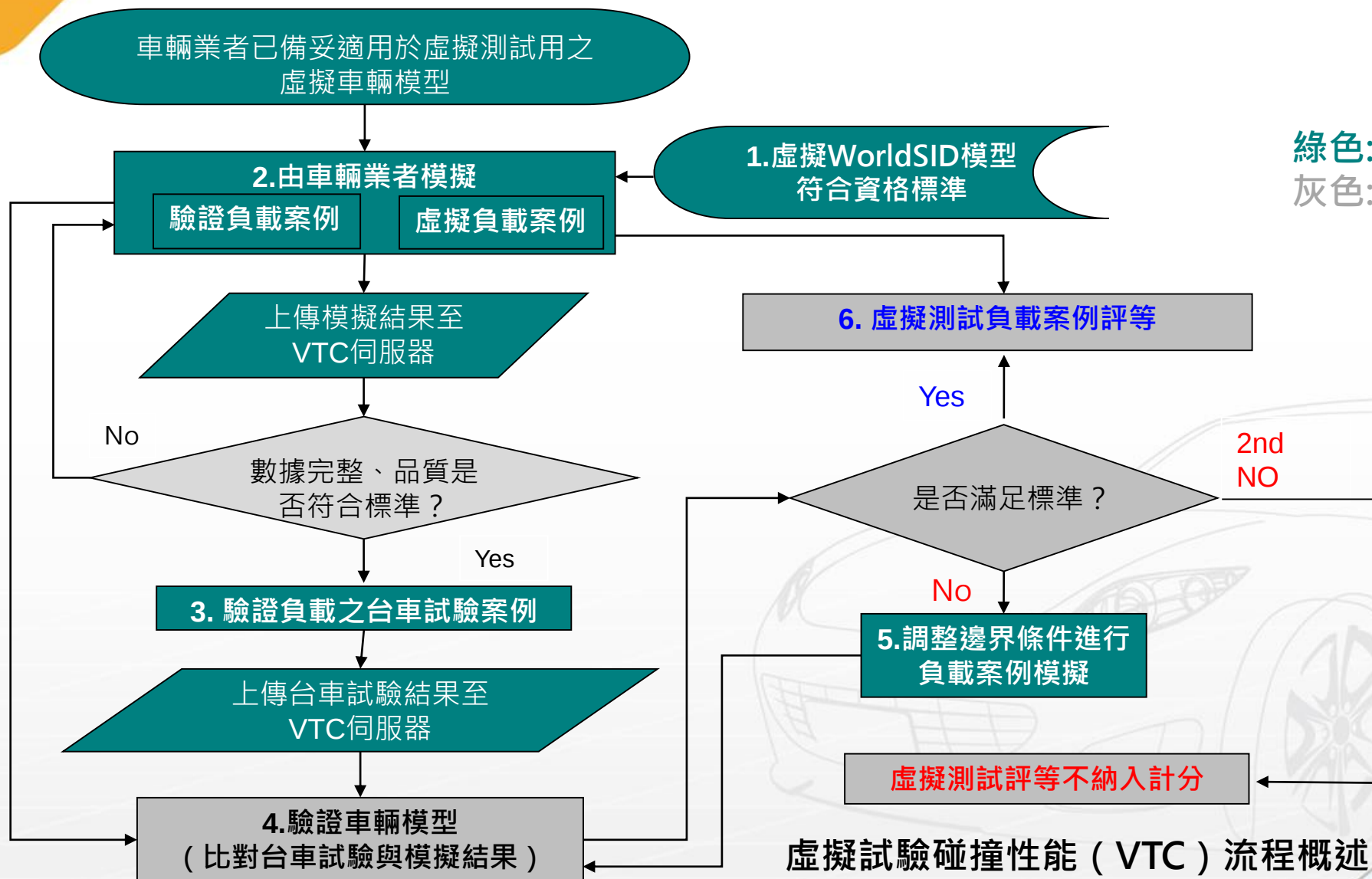
- **驗證負載案例(Validation load case)**：係指同時具備模擬與測試，可用於驗證虛擬車輛模型之負載案例。
- **虛擬測試負載案例(Virtual testing load case)**：用於評等特定車輛穩健性之負載案例，無需實體台車之試驗數據。

參考資料來源-www.scale.eu

虛擬試驗碰撞性能（VTC）流程概念示意圖

虛擬遠端側方模擬碰撞試驗流程說明-2/2

綠色:車輛業者
灰色:TNCAP



虛擬試驗碰撞性能 (VTC) 流程概述

虛擬遠端側方模擬碰撞試驗說明-1/2

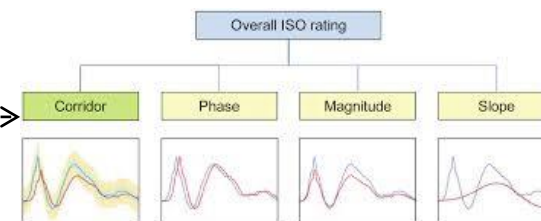
- ❑ **模型驗證程序**：車輛業者必須於交通部指定TNCAP檢測機構執行特定的對照試驗，比對虛擬模擬與實體台車試驗之一致性。
(新增文字) ↑

 - 驗證負載案例包含「75度側方立柱 (Pole)」與「75度側方撞擊 (AE-MDB)」，兩者均須完成模擬與實體台車試驗。
- ❑ **驗證標準**：所有數據經VTC伺服器自動檢查，未符合下列要求將不予採納。

 - **ISO 分數 (波形相似度)**：感測器通道之 ISO 分數(S_{sensor}) > 0.5。
(ISO 分數係根據ISO/TS 18571非模糊訊號客觀評等指標方案計算)
 - **傷害標準比例差異 (d_{AC})**： $d_{AC} < 30\%$
(d_{AC} 係指模擬結果與實體台車試驗結果之傷害比例差異程度，用以評估兩者傷害預測之一致性)
- ❑ **品質標準**：VTC伺服器自動計算，確保模擬之物理合理性。

 - 判定指標包含「沙漏能量須小於內能 10%」、「質量縮放增量須小於初始總量5%」、「初期5毫秒內H 點z軸向位移須小於 10mm」、「模擬時長須超過頭部最大位移時間+20%」等。
- ❑ **資料提交**：

 - 所有模擬數據 (包含每個負載情境未濾波原始數據之 .mme 文件、6個視角的動畫模擬結果及相關報告等) 必須於執行實體台車試驗前至少兩週前上傳至 VTC 伺服器提交給TNCAP。



側方視角



前方視角
(聚焦於中控台)



上方視角



前方視角
(全部)



前方視角
(聚焦於安全帶)



剖面圖

虛擬遠端側方模擬碰撞試驗說明-2/2

- 藉由驗證負載案例驗證虛擬模型與實體台車試驗間之相關性。
- 於模型驗證完成後，計算虛擬測試負載案例之評等分數。

➤ 2 個驗證負載案例

脈衝	撞擊角度	座椅位置 X	座椅位置 Z	測試子類型	實體試驗之虛擬測試參考ID ¹	模擬之虛擬測試參考ID ²
側方立柱 (Pole)	75°	x-ref	z-ref	Pole 75度	FS_Pole_75_x-ref_z-ref_50M_Test_1	FS_Pole_75_x-ref_z-ref_50M_Sim_1 - FS_Pole_75_x-ref_z-ref_50M_Sim_3
側方撞擊 (AE-MDB)	75°	x-ref	z-ref	AE-MDB 75度	FS_AEMDB_75_x-ref_z-ref_50M_Test_1	FS_AEMDB_75_x-ref_z-ref_50M_Sim_1 - FS_AEMDB_75_x-ref_z-ref_50M_Sim_3

➤ 6個虛擬測試負載案例

脈衝	撞擊角度	座椅位置 X	座椅位置 Z	測試子類型	模擬之虛擬測試參考ID ²
側方立柱 (Pole)	75°	x-ref@z- high	Z- high	Pole 75度 (Z- high)	FS_Pole_75_x-ref_z-high_50M_Sim_1
	90°	x-ref	z-ref	Pole 90度	FS_Pole_90_x-ref_z-ref_50M_Sim_1
側方撞擊 (AE-MDB)	60°	x-ref	z-ref	AE-MDB 60度	FS_AEMDB_60_x-ref_z-ref_50M_Sim_1
	75°	x-ref@z-high	z-high	AE-MDB 75 度 (Z- high)	FS_AEMDB_75_x-ref_z-high_50M_Sim_1
	90°	x-ref	z-ref	AE-MDB 90 度	FS_AEMDB_90_x-ref_z-ref_50M_Sim_1
	90°	x-ref@z-high	z-high	AE-MDB 90 度 (Z- high)	FS_AEMDB_90_x-ref_z-high_50M_Sim_1

1.實體試驗之虛擬測試參考ID：用於實體台車驗證試驗資料

2.模擬之虛擬測試參考：用於虛擬模擬資料

虛擬遠端側方模擬碰撞評等說明-分數計算

□ 基於台車試驗與虛擬測試結果之遠端側方模擬碰撞評分

	性能限制之最高分	比例因子	納入評等之最高分
1.未上傳模擬數據至 VTC 伺服器	4	0.5	2
2.上傳數據不完整或未被接受 - 模擬未滿足所有品質標準 - 未上傳所有要求的負載案例	4	0.5	2
3.驗證負載案例之驗證標準未符合要求	4	0.5	2
4.數據集完整且兩個驗證負載案例所需之驗證標準皆符合要求	4	1	4

遠端側方模擬碰撞評等
滿分4分

若未上傳數據、數據未完成、未通過品質標準或驗證標準，則遠端側方模擬碰撞評等分數除以2



簡報結束
敬請指教



項次	規章名稱	修訂內容	新增項目	頁碼	說明
1	2.1成人保護評等規章	◎		1	參考 Euro NCAP 成人保護評等規章 9.3 版，修訂側方撞擊與側方立柱撞擊評等分數。
2	3.3側方撞擊試驗規章	◎		6	參考 Euro NCAP 側方撞擊試驗規章 8.3 版，修訂台車重量及試驗速度、駕駛人偶感測器頻道數量及試驗設定概覽要求。
3	3.4側方立柱撞擊試驗規章	◎		36	參考 Euro NCAP 側方立柱撞擊試驗規章 7.2 版，增訂雙乘員試驗相關要求，並修訂駕駛人偶感測器頻道數量、試驗設定概覽要求。
4	3.17遠端側方模擬碰撞試驗規章		◎	85	參考 Euro NCAP 遠端側方模擬碰撞試驗規章 2.5 版，新增 3.17 遠端側方模擬碰撞試驗相關要求。
5	3.18虛擬遠端側方模擬碰撞試驗規章		◎	162	Euro NCAP 虛擬遠端側方模擬碰撞試驗規章 1.0 版，新增 3.18 虛擬遠端側方模擬碰撞試驗相關要求。

2.1成人保護評等規章<<本案暫以2.1規章編號說明側方撞擊試驗、側方立柱撞擊試驗評等條文修訂內容，後續擬修訂至2.3碰撞保護評等規章 >>

Euro NCAP Assessment Protocol – Adult Occupant Protection Version 9.3

Technical Bulletin TB017 IR-TRACC Absolute Length and Angle Calibration Version 1.0

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5 SIDE BARRIER AND POLE IMPACT ASSESSMENT	5 SIDE BARRIER AND POLE IMPACT ASSESSMENT	2.1.4 側方碰撞壁與側方立柱撞擊評等	2.1.4 側方碰撞壁與側方立柱撞擊評等
...	...	...	...
5.1 Criteria and Limit Values	5.1 Criteria and Limit Values	2.1.4.1 標準與限制值	2.1.4.1 標準與限制值
5.1.1 Head	5.1.1 Head	2.1.4.1.1 頭部	2.1.4.1.1 頭部
5.1.1.1 Side barrier impact	5.1.1.1 Side impact	2.1.4.1.1.1 側方撞擊	2.1.4.1.1.1 側方撞擊
	Higher performance limit		較高性能限制值

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		Higher limit	Lower limit	Capping limit	HIC ₁₅ 500 Resultant Acc. 3 msec exceedence 72g Lower performance and capping limit HIC15 700 (20% risk of injury≥ AIS3 [1,2]) Resultant Acc. 3 msec exceedence 80g			較高限制	較低限制	底線限制	HIC ₁₅ 500 合成加速度累積時間超過 3ms 72g 較低 性能 限制值與底線限制 HIC ₁₅ 700 合成加速度累積時間超過 3ms 80g								
HIC ₁₅	-	500.00	700.00	700.00		HIC ₁₅	=	500.00	700.00	700.00		HIC ₁₅							
Resultant Acc 3msec exceedance	g	72.00	80.00	80.00		合成加速度累積時間超過 3ms	g	72.00	80.00	80.00		合成加速度累積時間超過 3ms							
5.1.1.2 Side pole impact					5.1.1.2 Pole impact Capping limits HIC15 <700 Peak Resultant Acc <80g No direct head contact with the pole	2.1.4.1.1.2 側方立柱撞擊					2.1.4.1.1.2 側方立柱撞擊								
		Higher limit	Lower limit	Capping limit				較高限制	較低限制	底線限制			底線限制						
HIC ₁₅	-			700.00		HIC ₁₅	=			700.00	HIC ₁₅	<700							
Peak resultant Acceleration	g			80.00		合成加速 度峰值	g			80.00	合成加速度峰值 <80g								
Direct head contact with the pole				Capping applied		頭部與立柱 直接 接觸				適用底線限制	頭部與立柱 未直接 接觸								
5 SIDE BARRIER AND POLE IMPACT ASSESSMENT ...					5 SIDE BARRIER AND POLE IMPACT ASSESSMENT ... 5.1 Criteria and Limit Values 5.1.2 Chest The assessment is based on the worst performing individual rib lateral	2.1.4 側方碰撞壁與側方立柱撞擊評等 ...					2.1.4 側方碰撞壁與側方立柱撞擊評等 ...								
5.1 Criteria and Limit Values						2.1.4.1 標準與限制值					2.1.4.1 標準與限制值								
5.1.2 Chest						2.1.4.1.2 胸部					2.1.4.1.2 胸部								
The assessment is based on the worst performing individual rib lateral					The assessment is based on the worst performing individual rib lateral	本項係依照最差之肋骨橫向壓縮量表現進行評等。					本項係依照最差之肋骨橫向壓縮量表現進行評等。								

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compression. <table><tr><td></td><td></td><td>Higher limit</td><td>Lower limit</td><td>Capping limit</td></tr><tr><td>Lateral Compression</td><td>mm</td><td>28.00</td><td>50.00</td><td>50.00 (MDB) 55.00 (pole)</td></tr></table>			Higher limit	Lower limit	Capping limit	Lateral Compression	mm	28.00	50.00	50.00 (MDB) 55.00 (pole)	compression. MDB and Pole Higher performance limit Lateral Compression 28mm (5% risk of AIS3, 67YO) MDB Lower performance and capping limit Lateral Compression 50mm (30% risk of AIS3, 45YO) Pole Lower performance limit Lateral Compression 50mm (30% risk of AIS3, 45YO) Pole Capping limit Lateral Compression 55mm (50% risk of AIS3, 45YO)	<table><tr><td></td><td></td><td>較高限制</td><td>較低限制</td><td>底線限制</td></tr><tr><td>橫向壓縮量</td><td>mm</td><td>28.00</td><td>50.00</td><td>50.00 (側方撞擊) 55.00 (側方立柱撞擊)</td></tr></table>			較高限制	較低限制	底線限制	橫向壓縮量	mm	28.00	50.00	50.00 (側方撞擊) 55.00 (側方立柱撞擊)	移動式可變形碰撞壁與側方立柱撞擊較高性能限制值 橫向壓縮量 28mm 移動式可變形碰撞壁較低性能限制值與底線限制 橫向壓縮量 50mm 側方立柱撞擊較低性能限制值 橫向壓縮量 50mm 側方立柱撞擊底線限制 橫向壓縮量 55mm
		Higher limit	Lower limit	Capping limit																			
Lateral Compression	mm	28.00	50.00	50.00 (MDB) 55.00 (pole)																			
		較高限制	較低限制	底線限制																			
橫向壓縮量	mm	28.00	50.00	50.00 (側方撞擊) 55.00 (側方立柱撞擊)																			
5 SIDE BARRIER AND POLE IMPACT ASSESSMENT ... 5.1 Criteria and Limit Values 5.1.3 Abdomen <table><tr><td></td><td></td><td>Higher limit</td><td>Lower limit</td><td>Capping limit</td></tr><tr><td>Lateral Compression</td><td>mm</td><td>47.00</td><td>65.00</td><td>65.00</td></tr></table>			Higher limit	Lower limit	Capping limit	Lateral Compression	mm	47.00	65.00	65.00	5 SIDE BARRIER AND POLE IMPACT ASSESSMENT ... 5.1 Criteria and Limit Values 5.1.3 Abdomen Higher performance limit Lateral Compression 47mm (33% risk of AIS3, 67YO) Lower performance and capping limit Lateral Compression 65mm	2.1.4 側方碰撞壁與側方立柱撞擊評等 ... 2.1.4.1 標準與限制值 2.1.4.1.3 腹部 <table><tr><td></td><td></td><td>較高限制</td><td>較低限制</td><td>底線限制</td></tr><tr><td>橫向壓縮量</td><td>mm</td><td>47.00</td><td>65.00</td><td>65.00</td></tr></table>			較高限制	較低限制	底線限制	橫向壓縮量	mm	47.00	65.00	65.00	2.1.4 側方碰撞壁與側方立柱撞擊評等 ... 2.1.4.1 標準與限制值 2.1.4.1.3 腹部 較高性能限制值 橫向壓縮量 47mm 較低性能限制值與底線限制 橫向壓縮量 65mm
		Higher limit	Lower limit	Capping limit																			
Lateral Compression	mm	47.00	65.00	65.00																			
		較高限制	較低限制	底線限制																			
橫向壓縮量	mm	47.00	65.00	65.00																			
5 SIDE BARRIER AND POLE IMPACT	5 SIDE BARRIER AND POLE	2.1.4 側方碰撞壁與側方立柱撞擊評	2.1.4 側方碰撞壁與側方立柱																				

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ASSESSMENT ... 5.1 Criteria and Limit Values 5.1.4 Pelvis <table><tr><td></td><td></td><td>Higher limit</td><td>Lower limit</td><td>Capping limit</td></tr><tr><td>Pubic Symphysis Force</td><td>kN</td><td>1.70</td><td>2.80</td><td>2.80</td></tr></table>			Higher limit	Lower limit	Capping limit	Pubic Symphysis Force	kN	1.70	2.80	2.80	IMPACT ASSESSMENT ... 5.1 Criteria and Limit Values 5.1.4 Pelvis Higher performance limit Pubic Symphysis Force 1.7kN (5% risk of AIS3, 67YO) Lower performance and capping limit Pubic Symphysis Force 2.8kN (20% risk of AIS3, 45YO)	等 ... 2.1.4.1 標準與限制值 2.1.4.1.4 骨盆 <table><tr><td></td><td></td><td>較高限制</td><td>較低限制</td><td>底線限制</td></tr><tr><td>恥骨聯合力</td><td>kN</td><td>1.70</td><td>2.80</td><td>2.80</td></tr></table>			較高限制	較低限制	底線限制	恥骨聯合力	kN	1.70	2.80	2.80	撞擊評等 ... 2.1.4.1 標準與限制值 2.1.4.1.4 骨盆 較高性能限制值 恥骨聯合力 1.7kN 較低性能限制值與底線限制 恥骨聯合力 2.8kN
		Higher limit	Lower limit	Capping limit																			
Pubic Symphysis Force	kN	1.70	2.80	2.80																			
		較高限制	較低限制	底線限制																			
恥骨聯合力	kN	1.70	2.80	2.80																			
5 SIDE BARRIER AND POLE IMPACT ASSESSMENT ... 5.2 Modifiers 5.2.3 Side Head Protection Device (Near-side Occupant in Pole Impact Only) ...	5 SIDE BARRIER AND POLE IMPACT ASSESSMENT ... 5.2 Modifiers 5.2.3 Side Head Protection Device (Pole Impact Only) ...	2.1.4 側方碰撞壁與側方立柱撞擊評等 ... 2.1.4.2 扣分 2.1.4.2.3 側方頭部保護裝置(僅側方立柱撞擊試驗之近端乘員) ...	2.1.4 側方碰撞壁與側方立柱撞擊評等 ... 2.1.4.2 扣分 2.1.4.2.3 側方頭部保護裝置(僅側方立柱撞擊試驗) ...																				
5 SIDE BARRIER AND POLE IMPACT ASSESSMENT ... 5.3 Scoring & Visualisation ... The contribution of the side and pole impact tests along with the far side occupant assessment to the Adult Occupant	5 SIDE BARRIER AND POLE IMPACT ASSESSMENT ... 5.3 Scoring & Visualisation ... The contribution of the side and pole impact tests to the Adult Occupant Protection Score is	2.1.4 側方碰撞壁與側方立柱撞擊評等 ... 2.1.4.3 評分與圖示說明 ... 成人保護分數中，側方撞擊、側方立柱撞擊試驗及遠端側方模擬碰撞評等之分數係加總所有相關身體	2.1.4 側方碰撞壁與側方立柱撞擊評等 ... 2.1.4.3 評分與圖示說明 ... 成人保護分數中，側方撞擊與側方立柱撞擊試驗之分數係加總所有相關身體部位之分																				

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Protection Score is calculated by summing the body scores for the relevant body regions in each of the tests. The total score in the side barrier and pole tests together is limited to 12 points and the total score for far side occupant protection is limited to 4 points. The individual scores (after modifiers have been applied) for the side impact test (max. 16 points) and the pole test (max. 16 points) are summed and scaled down to 12 points and combined with the far side score to produce the total score.	calculated by summing the body scores for the relevant body regions in each of the tests. The total score in side barrier and pole tests together is limited to 16 points. This is achieved by adding up the individual scores (after modifiers have been applied) for the side impact test (max. 16 points) and the pole test (max. 16 points) and dividing the result by two.	部位之分數。側方撞擊與側方立柱撞擊試驗總分為 12 分，遠端側方模擬碰撞總分為 4 分。側方撞擊（總分 16 分）與側方立柱撞擊試驗（總分 16 分）之個別分數（適用扣分後）按比例調降為 12 分，並與遠端側方模擬碰撞之分數相加得出總分。	數。側方撞擊與側方立柱撞擊試驗總分為 16 分。藉由加總側方撞擊（總分 16 分）與側方立柱撞擊試驗（總分 16 分）之個別分數（適用扣分後）再除以二，以計算試驗總分。

3.3側方撞擊試驗規章

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1 VEHICLE PREPARATION	1 VEHICLE PREPARATION	3.3.1 車輛整備	3.3.1 車輛整備
...	...	...	...
1.2 Reference Loads	1.2 Reference Loads	3.3.1.2 參考負載(Reference Loads)	3.3.1.2 參考負載(Reference Loads)
...	...	...	...
1.2.4 In the child restraints to be used for testing, place masses equivalent to Q10 and Q6 child dummies on the second-row driver's seat and passenger's seats respectively (23kg and 36kg). If the child restraints are not available at this time then default masses of 7kg and 2kg should be added to the dummy masses.	1.2.4 In the child restraints to be used for testing, place masses equivalent to Q10 and Q6 child dummies on the second-row driver's side seat and passenger's side seat respectively (23kg and 36kg). If the child restraints are not available at this time then default masses of 7kg and 2kg should be added to the dummy masses.	(修訂不影響 TNCAP 規章)	3.3.1.2.4 於第二排駕駛側座椅與乘客側座椅之試驗用兒童保護裝置，分別放置相當於 Q10 及 Q6 兒童人偶之重量(36kg 及 23kg)。若此時無法使用兒童保護裝置，則於人偶重量分別加上 2kg 及 7kg 之預設重量(Default masses)
...	...	...	...
1.4 Vehicle Preparation	1.4 Vehicle Preparation	3.3.1.4 車輛整備	3.3.1.4 車輛整備
...	...	...	...
1.4.5 In the child restraints to be used for testing, place masses equivalent to Q6 and Q10 child dummies on the second-row driver's side seat and passenger's seats respectively (23kg and 36kg). If the child restraints are not available at this time then default masses of 7kg and	1.4.5 In the child restraints to be used for testing, place masses equivalent to Q6 and Q10 child dummies on the second-row driver's side seat and passenger's side seat respectively (23kg and 36kg). If the child restraints are not available at this time then default masses of 7kg and	(修訂不影響 TNCAP 規章)	3.3.1.4.5 於第二排駕駛側座椅與乘客側座椅之試驗用兒童保護裝置，分別放置相當於 Q10 及 Q6 兒童人偶之重量(36kg 及 23kg)。若此時無法使用兒童保護裝置，則於人偶重量分別加上 2kg 及 7kg 之預設重量。

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2kg should be added to the dummy masses. ... 1.4.11 Mark the centreline of the vehicle on the facia and centre console so that it can be seen from the offboard camera views.	2kg should be added to the dummy masses.	... 3.3.1.4.11 在儀表板及中控台上標記車輛中線，且可從車外攝影機視角看見。	
2 DUMMY PREPARATION AND CERTIFICATION 2.1 General 2.1.1 A WorldSID 50th percentile male test dummy shall be used in the front driver's position. It shall conform to the specification detailed in ISO 15830 parts 1-4:2013 & part 5:2018. Note: From 1st January 2026, ISO 15830 parts 1-4:2022 & part 5:2018 shall be applied. ... 2.2 Certification ...	2 DUMMY PREPARATION AND CERTIFICATION 2.1 General 2.1.1 A WorldSID 50th percentile male test dummy shall be used in the front driver's position. It shall conform to the specification detailed in ISO 15830, parts 1-5. ... 2.2 Certification ... 2.2.2 Deatils of the IR Tracc length calculation procedure are described in Technical Bulletin TB017. 2.2.3 If an injury criterion reaches or exceeds its normally accepted limit (eg	3.3.2 人偶整備及查驗(Certification) 3.3.2.1 通則 3.3.2.1.1 WorldSID 百分之五 0 成年男性試驗人偶應安裝於駕駛座，該人偶應符合 2013 年 ISO 15830 第 1 至 4 部分，及 2018 年 ISO 15830 第 5 部分 詳述之規格。 ... 3.3.2.2 查驗 ... 3.3.2.2.2 若某傷害指數 (Injury criterion) 達到或超過其正常接受	3.3.2 人偶整備及查驗(Certification) 3.3.2.1 通則 3.3.2.1.1 WorldSID 百分之五 0 成年男性試驗人偶應安裝於駕駛座，該人偶應符合 ISO 15830 第 1 至 5 部詳列之規格。 ... 3.3.2.2 查驗 ... 3.3.2.2.2 IR Tracc 長度計算步驟詳列於 Euro NCAP 技術通報 TB017 (Technical Bulletin TB017)。 3.3.2.2.3 若某傷害指數 (Injury criterion) 達到或超過其正常接受

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HIC of 700) then that part should be re-certified.	HIC of 700) then that part should be re-certified.	範圍 (如頭部傷害指數 HIC 達 700), 則該部位應重新查驗。	範圍 (如頭部傷害指數 HIC 達 700), 則該部位應重新查驗。
2.2.3 If any part of a dummy is broken in a test then the part shall be replaced with a fully certified component.	2.2.4 If any part of a dummy is broken in a test then the part shall be replaced with a fully certified component.	3.3.2.2.3 若人偶任一部位於試驗中損壞, 則該部位應以完全查驗之零件(Fully certified component) 替換。	3.3.2.2.4 若人偶任一部位於試驗中損壞, 則該部位應以完全查驗之零件(Fully certified component) 替換。
2.2.4 Copies of the dummy certification certificates will be provided as part of the full report for a test.	2.2.5 Copies of the dummy certification certificates will be provided as part of the full report for a test.	3.3.2.2.4 人偶查驗證書(Certificate) 副本應檢附於完整試驗報告。	3.3.2.2.5 人偶查驗證書(Certificate) 副本應檢附於完整試驗報告。
...	...	...	...
2.4 Dummy Clothing and Footwear	2.4 Dummy Clothing and Footwear	3.3.2.4 人偶衣著及鞋履	3.3.2.4 人偶衣著及鞋履
2.4.1 WorldSID	2.4.1 WorldSID	3.3.2.4.1 WorldSID 百分之五 0 成年男性人偶。	3.3.2.4.1 WorldSID 百分之五 0 成年男性人偶。
2.4.1.1 The dumm(ies) shall be clothed in a sleeveless suit or a modified version of the sleeved suit with sleeves removed.	2.4.1.1 The dummy shall be clothed in a sleeveless suit or a modified version of the sleeved suit with sleeves removed.	3.3.2.4.1.1 人偶應穿著無袖上衣或改良版可移除衣袖式上衣。	3.3.2.4.1.1 人偶應穿著無袖上衣或改良版可移除衣袖式上衣。
...	...	...	...
2.5 WorldSID Test Condition	2.5 WorldSID Dummy Test Condition	3.3.2.5 WorldSID 百分之五 0 成年男性人偶試驗條件	3.3.2.5 WorldSID 百分之五 0 成年男性人偶試驗條件
...	...	...	...
2.5.2.6 After switching on the data acquisition, the air inside the dummy and also the sensors may warm up whereas the dummy itself is still at a lower temperature. Such sudden temperature		3.3.2.5.2.6 開啟資料擷取系統後, 人偶內空氣及感測器可能升溫, 而人偶本身仍處於較低溫度。此突然溫度升高並非反映人偶實際溫度, 因此只要持續時間不超過	

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risers do not reflect the actual dummy temperature and maybe ignored as long as they do not exceed a duration of 20 minutes. ... 2.6 WorldSID painting and marking ... 2.6.1 The dummies shall have masking tape placed on the areas to be painted using the sizes detailed below. The tape should be completely covered with the following coloured paints. The paint should be applied close to the time of the test to ensure that the paint will still be wet on impact. ... Tape Sizes: Driver Head = 100mm square, centreline of head with lower edge at C of G. Head = 200mm x 20mm strip, centre located at head C of G Arm = 25mm x 150mm, starting at bottom edge of shoulder fixing hole.	... 2.6 WorldSID Dummy painting and marking ... 2.6.1 The dummies shall have masking tape placed on the areas to be painted using the sizes detailed below. The tape should be completely covered with the following coloured paints. The paint should be applied close to the time of the test to ensure that the paint will still be wet on impact. ... Tape Sizes: Driver Head = 100mm square, centreline of head with lower edge at C of G. Arm = 25mm x 150mm, starting at bottom edge of shoulder fixing	<u>20 分鐘，則可被忽略。</u> ... 3.3.2.6 WorldSID 百分之五 0 成年男性人偶塗色及標記 3.3.2.6.1 應於人偶預定塗色之區域，以下方詳列之範圍黏貼紙膠帶。膠帶應徹底塗滿下列指定顏色，唯駕駛頭部僅於膠帶邊緣塗色，顏料應於接近試驗時間時塗上，以確保撞擊時顏料未乾。 ... 膠帶範圍： 駕駛 頭部 = 100mm 正方形，頭部中心線且下緣位於重心處。 <u>頭部 = 200mmx20mm 長條形，中心位於頭部重心。</u> 手臂 = 25mmx150mm，從肩部固定孔底部開始。	... 3.3.2.6 WorldSID 百分之五 0 成年男性人偶塗色及標記 3.3.2.6.1 應於人偶預定塗色之區域，以下方詳列之範圍黏貼紙膠帶。膠帶應徹底塗滿下列指定顏色，唯駕駛頭部僅於膠帶邊緣塗色，顏料應於接近試驗時間時塗上，以確保撞擊時顏料未乾。 ... 膠帶範圍： 駕駛 頭部 = 100mm 正方形，頭部中心線且下緣位於重心處。 手臂 = 25mmx150mm，從肩部固定孔底部開始。 肋骨 = 25mmx150mm 長條形，從

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Ribs = 25mm x 150mm strip, starting at the rearmost accessible point at seat back. Pelvis = 50mm x 100mm, centred on hip joint point	hole. Ribs = 25mm x 150mm strip, starting at the rearmost accessible point at seat back. Pelvis = 50mm x 100mm, centred on hip joint point.	肋骨 = 25mm×150mm 長條形，從最後方可觸及椅背的點開始。 骨盆 = 50mm×100mm，以髖關節點為中心	最後方可觸及椅背的點開始。 骨盆 = 50mm×100mm，以髖關節點為中心
3 INSTRUMENTATION 3.1 Dummy Instrumentation 3.1.1 The WorldSID shall be instrumented to record the channels listed below. Additional channels may be recorded. 3.1.2 Where the number of channels in the WorldSID is 45 or more, only in-dummy data acquisition systems may be used. Where there are less than 45 channels, the use of umbilical cables is at the laboratories discretion. Details of the child dummy instrumentation is contained in the Euro NCAP Child Occupant Protection Testing Protocol.	3 INSTRUMENTATION 3.1 Dummy Instrumentation 3.1.1 The WorldSID dummy shall be instrumented to record the channels listed below. Additional channels may be recorded. 3.1.2 Where the number of channels in the WorldSID dummy is 45 or more, only in-dummy data acquisition systems may be used. Where there are less than 45 channels, the use of umbilical cables is at the laboratories discretion. Details of the child dummy instrumentation is contained in the Euro NCAP Child Occupant Protection Testing Protocol.	3.3.3 感測器及資料擷取系統設置 (Instrumentation) 3.3.3.1 人偶感測器及資料擷取系統設置 3.3.3.1.1 WorldSID 百分之五 0 成年男性人偶之感測器及資料擷取系統應設定至得以記錄下列頻道。另可記錄額外頻道。 3.3.3.1.2 若 WorldSID 百分之五 0 成年男性人偶具有 45 個以上的頻道，則僅能使用人偶內部的資料擷取系統。若頻道數少於 45 個，則檢測機構可酌情決定是否使用連接線連至外部資料擷取系統之方式進行(Umbilical cable)。關於兒童人偶之感測器及資料擷取系統設置，詳見 3.8 兒童乘員保護試驗規章。	3.3.3 感測器及資料擷取系統設置 (Instrumentation) 3.3.3.1 人偶感測器及資料擷取系統設置 3.3.3.1.1 WorldSID 百分之五 0 成年男性人偶之感測器及資料擷取系統應設定至得以記錄下列頻道。另可記錄額外頻道。 3.3.3.1.2 若 WorldSID 百分之五 0 成年男性人偶具有 45 個以上的頻道，則僅能使用人偶內部的資料擷取系統。若頻道數少於 45 個，則檢測機構可酌情決定是否使用連接線連至外部資料擷取系統之方式進行(Umbilical cable)。關於兒童人偶之感測器及資料擷取系統設置，詳見 3.8 兒童乘員保護試驗規章。

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(請參考末頁圖表)	(請參考末頁圖表)	(請參考末頁圖表)	(請參考末頁圖表)
...	...	...	...
3.3 Trolley and Barrier Instrumentation	3.3 Trolley and Barrier Instrumentation	3.3.3.3 台車與碰撞壁之感測器及資料擷取系統設置頻道總數	3.3.3.3 台車與碰撞壁之感測器及資料擷取系統設置頻道總數
TOTAL CHANNELS	TOTAL CHANNELS	(請參考末頁圖表)	(請參考末頁圖表)
(請參考末頁圖表)	(請參考末頁圖表)		
4 PASSENGER COMPARTMENT ADJUSTMENT	4 PASSENGER COMPARTMENT ADJUSTMENT	3.3.4 車室(Passenger compartment)調整	3.3.4 車室(Passenger compartment)調整
4.1 Overview of Settings	4.1 Overview of Settings	3.3.4.1 設定綜覽	3.3.4.1 設定綜覽
(請參考末頁圖表)	(請參考末頁圖表)	(請參考末頁圖表)	(請參考末頁圖表)
...	...	...	...
4.6 Setting the rear seat (if adjustable)	4.6 Setting the rear seat (if adjustable)	3.3.4.6 後座設置(若可調整)	3.3.4.6 後座設置(若可調整)
4.6.1 If the vehicle rear seat position is adjustable put it in the same fore/aft position as that used in the frontal impact ODB test with the same seat back angle.	4.6.1 If the vehicle rear seat position is adjustable put it in the same fore/aft position as that used in the frontal impact ODB test with the same seat back angle.	3.3.4.6.1 若車輛後座可調整,則將座椅前後位置、椅背角度調整至與前方偏置撞擊試驗時相同。	3.3.4.6.1 若車輛後座可調整,則將座椅前後位置、椅背角度調整至與前方偏置撞擊試驗時相同。
5. DUMMY POSITIONING AND MEASUREMENTS	5. DUMMY POSITIONING AND MEASUREMENTS	3.3.5 人偶位置及量測	3.3.5 人偶位置及量測
5.2 Dummy Placement	5.2 Dummy Placement	3.3.5.2 人偶放置	3.3.5.2 人偶放置
5.2.3 H-point	5.2.3 H-point	3.3.5.2.3 H 點	3.3.5.2.3 H 點
Note that the H-point of the WorldSID is situated 20mm forward of that of the H-point determined by the H-	Note that the H-point of the WorldSID dummy is situated 20mm forward of that of the H-point determined by the	WorldSID 人偶的 H 點位於 H 點人體模型所決定之 H 點前方 20mm 處。	WorldSID 人偶的 H 點位於 H 點人體模型所決定之 H 點前方 20mm 處。

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point manikin. ... 5.2.4 Head and torso 5.2.4.2 If the rib angle is not specified by the manufacturer and the seat back is $23^{\circ} \pm 1^{\circ}$, adjust the dummy until the thorax tilt sensor reads -2° (spine flexion) $\pm 1^{\circ}$. ... 5.2.8 After positioning the dummy measure and record the dummy position according to Section 5.4 and determine the impact location as described in Section 1.4. ... 5.4 Dummy Positioning Measurements Figure 1: Driver dummy measurements (請參考末頁圖表)	H-point manikin. ... 5.2.4 Head and torso 5.2.4.2 If the rib angle is not specified by the manufacturer and the seat back is $23^{\circ} \pm 1^{\circ}$, adjust the dummy until the thorax tilt sensor reads -2° (2° downwards) $\pm 1^{\circ}$. ... 5.2.8 After positioning the dummy measure and record the dummy position according to Section 6.4 and determine the impact location as described in Section 1.4. ... 5.4 Dummy Positioning Measurements (請參考末頁圖表)	... 3.3.5.2.4 頭部及軀幹 3.3.5.2.4.2 若車輛業者未宣告肋骨角度且椅背角度為 23 ± 1 度，則調整人偶，使其胸部感測器讀數為 -2 度 (<u>脊柱屈曲 (Spine flexion)</u>) ± 1 度。 ... 3.3.5.2.8 人偶位置調整好後，依照 3.3.5.4 進行量測並記錄人偶位置，再依 3.3.1.3 所述決定撞擊位置。 ... 3.3.5.4 人偶位置量測 <u>圖 1：駕駛人偶量測</u> (請參考末頁圖表)	... 3.3.5.2.4 頭部及軀幹 3.3.5.2.4.2 若車輛業者未宣告肋骨角度且椅背角度為 23 ± 1 度，則調整人偶，使其胸部感測器讀數為 -2 度 (<u>朝下 2 度</u>) ± 1 度。 ... 3.3.5.2.8 人偶位置調整好後，依照 3.3.5.4 進行量測並記錄人偶位置，再依 3.3.1.3 所述決定撞擊位置。 ... 3.3.5.4 人偶位置量測 (請參考末頁圖表)
6 BARRIER AND TROLLEY ... 6.1 Trolley Preparation 6.1.2 The total mass shall be $1400 \pm 20\text{kg}$.	6 BARRIER AND TROLLEY ... 6.1 Trolley Preparation 6.1.2 The total mass shall be $1300 \pm 20\text{kg}$.	3.3.6 碰撞壁及台車 ... 3.3.6.1 台車整備 3.3.6.1.2 總重量應為 $1400 \pm 20\text{kg}$。	3.3.6 碰撞壁及台車 ... 3.3.6.1 台車整備 3.3.6.1.2 總重量應為 $1300 \pm 20\text{kg}$。

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7 TEST PARAMETERS	7 TEST PARAMETERS	3.3.7 試驗參數	3.3.7 試驗參數
...	...	...	...
7.1 Impact Speed	7.1 Impact Speed	3.3.7.1 撞擊速度	3.3.7.1 撞擊速度
7.1.2 Record the actual test speed in the test details.	7.1.2 Record the actual test speed in the test details.	3.3.7.1.2 目標速度應為 60km/h ± 1km/h，並將實際試驗速度記錄於試驗資料。	3.3.7.1.2 目標速度應為 50km/h ± 1km/h，並將實際試驗速度記錄於試驗資料。
TARGET SPEED = 60 km/h ± 1km/h	TARGET SPEED = 50 km/h ± 1km/h	...	...
...	...	3.3.7.4 試驗後	3.3.7.4 試驗後
7.4 After Test	7.4 After Test	...	...
...	...	3.3.7.4.1.3 確認非撞擊側車門未上鎖，且手動將車門開啟（依序前車門至後車門）。	3.3.7.4.1.3 確認非撞擊側車門未上鎖，且手動將車門開啟（依序前車門至後車門）。 對於配備自動門鎖之車輛參見 3.16 緊急救援及事故脫困試驗規章。
7.4.1.3 Check that the unstruck side doors are not locked and open the doors by hand (front door followed by rear door).	7.4.1.3 Check that the unstruck side doors are not locked and open the doors by hand (front door followed by rear door).	3.3.7.4.1.4 若車門無法開啟，則將此情況記錄於試驗資料。	3.3.7.4.1.4 若車門無法開啟，則將此情況記錄於試驗資料。
7.4.1.4 If the doors do not open, record this in the test details.	7.4.1.4 If the doors do not open, record this in the test details.	3.3.7.4.2 試驗後評等之詳細資訊 ，參見「 緊急救援 、 事故脫困 及 安全技術 試驗規章」。	3.4.7.4.2 車門開啟力量程序 參見 3.16 緊急救援及事故脫困試驗規章。
7.4.2 Refer to the Rescue and Extrication protocol for further details of post-test assessment.	7.4.2 Refer to the Rescue and Extrication protocol for further details of post-test assessment.		

(2025 年版 Euro NCAP 規章)

3.1 Dummy Instrumentation

3.1.2

Location	Parameter	Minimum amplitude	Channel count
Head	Linear acceleration, A_x, A_y, A_z	250g	3
	<u>Angular velocity, $\omega_x, \omega_y, \omega_z$</u>	<u>4000deg/sec</u>	<u>3</u>
Upper neck	Forces and moments $F_x, F_y, F_z, M_x, M_y, M_z$	5kN, 300Nm	6
Shoulder(s) – Joint	Forces, F_x, F_y, F_z	8kN	3
Shoulder – Rib	Displacement & rotation	100mm	2
Thorax - Upper rib	Displacement & rotation	100mm	2
Thorax - Mid rib	Displacement & rotation	100mm	2
Thorax - Lower rib	Displacement & rotation	100mm	2
Thoracic temperature ¹	Temperature, see 2.5.1.3	30°C	1
Abdomen - Upper rib	Displacement & rotation	100mm	2
Abdomen - Lower rib	Displacement & rotation	100mm	2
Spine - T12	Acceleration, A_x, A_y, A_z	200g	3
Pelvis	Acceleration, A_x, A_y, A_z	200g	3
Pelvis – Pubic	Force	5kN	1
Femoral neck – struck side only	Force, F_x, F_y, F_z	5kN	3
	<u>Total Channels</u>		<u>38</u>

¹ It is not necessary for this channel to be recorded through the dummy onboard DAU.

(2019 年 Euro NCAP 規章)

3.1 Dummy Instrumentation

3.1.2

Location	Parameter	Minimum amplitude	Channel count
Head	Linear acceleration, A_x , A_y , A_z	250g	3
Upper neck	Forces and moments F_x , F_y , F_z , M_x , M_y , M_z	5kN, 300Nm	6
Shoulder – Joint	Forces, F_x , F_y , F_z	8kN	3
Shoulder – Rib	Displacement & rotation	100mm	2
Thorax - Upper rib	Displacement & rotation	100mm	2
Thorax - Mid rib	Displacement & rotation	100mm	2
Thorax - Lower rib	Displacement & rotation	100mm	2
Thoracic temperature*	Temperature, see 2.5.1.3	30°C	1
Abdomen - Upper rib	Displacement & rotation	100mm	2
Abdomen - Lower rib	Displacement & rotation	100mm	2
Spine - T12	Acceleration, A_x , A_y , A_z	200g	3
Pelvis	Acceleration, A_x , A_y , A_z	200g	3
Pelvis – Pubic	Force	5kN	1
Femoral neck – struck side only	Force, F_x , F_y , F_z	5kN	3
	Total Channels		35

* It is not necessary for this channel to be recorded through the dummy onboard DAU.

(修正後 TNCAP 規章草案)

3.3.3.1.2

位置	參數	最低振幅	頻道數量
頭部	線性加速度(Linear acceleration) , A_x 、 A_y 、 A_z	250g	3
	<u>角速度(Angular velocity) , ω_x、 ω_y、ω_z</u>	<u>4000deg/sec</u>	<u>3</u>
上頸部	力與力矩 F_x 、 F_y 、 F_z 、 M_x 、 M_y 、 M_z	5kN, 300Nm	6
肩部－關節	力 , F_x 、 F_y 、 F_z	8kN	3
肩部－肋骨	位移及旋轉	100mm	2
胸部－上肋骨	位移及旋轉	100mm	2
胸部－中肋骨	位移及旋轉	100mm	2
胸部－下肋骨	位移及旋轉	100mm	2
胸部溫度 ¹	溫度，如 3.3.2.5.1.3	30°C	1
腹部－上肋骨	位移及旋轉	100mm	2
腹部－下肋骨	位移及旋轉	100mm	2
脊椎- T12	加速度 , A_x 、 A_y 、 A_z	200g	3
骨盆	加速度 , A_x 、 A_y 、 A_z	200g	3
骨盆－恥骨	力	5kN	1
股骨頸－僅撞擊側	力 , F_x 、 F_y 、 F_z	5kN	3
	頻道總數		<u>38</u>

備註：¹此頻道無須透過人偶裝載之資料擷取設備(Data acquisition unit，DAU)進行記錄。

(修正前 TNCAP 規章)

3.3.3.1.2

位置	參數	最低振幅	頻道數量
頭部	線性加速度(Linear acceleration) , A_x 、 A_y 、 A_z	250g	3
上頸部	力與力矩 F_x 、 F_y 、 F_z 、 M_x 、 M_y 、 M_z	5kN, 300Nm	6
肩部－關節	力， F_x 、 F_y 、 F_z	8kN	3
肩部－肋骨	位移及旋轉	100mm	2
胸部－上肋骨	位移及旋轉	100mm	2
胸部－中肋骨	位移及旋轉	100mm	2
胸部－下肋骨	位移及旋轉	100mm	2
胸部溫度*	溫度，如 3.3.2.5.1.3	30°C	1
腹部－上肋骨	位移及旋轉	100mm	2
腹部－下肋骨	位移及旋轉	100mm	2
脊椎- T12	加速度， A_x 、 A_y 、 A_z	200g	3
骨盆	加速度， A_x 、 A_y 、 A_z	200g	3
骨盆－恥骨	力	5kN	1
股骨頸－僅撞擊側	力， F_x 、 F_y 、 F_z	5kN	3
	頻道總數		35

備註：*此頻道無須透過人偶裝載之資料擷取設備(Data acquisition unit，DAU)進行記錄。

(2025 年 Euro NCAP 規章)

3.3

TOTAL CHANNELS

1x Driver	<u>38</u>
1 x Q10	30
1 x Q6	13
1x Vehicle	2
1x Trolley	1
TOTAL	<u>84</u>

(2019 年 Euro NCAP 規章)

3.3

TOTAL CHANNELS

1x Driver	<u>35</u>
1x Q10	30
1 x Q6	13
1x Vehicle	2
1x Trolley	1
TOTAL	<u>81</u>

(修正後 TNCAP 規章草案)

3.3.3.3

頻道總數

1 x 駕駛	<u>38</u>
1 x Q10	30
1 x Q6	13
1 x 車輛	2
1 x 台車	1
總數	<u>84</u>

(修正前 TNCAP)

3.3.3.3

頻道總數

1 x 駕駛	<u>35</u>
1 x Q10	30
1 x Q6	13
1 x 車輛	2
1 x 台車	1
總數	<u>81</u>

(2025 年 Euro NCAP 規章)

4 PASSENGER COMPARTMENT ADJUSTMENT

4.1 Overview of Settings

Adjustment	Required setting	Notes	Methods
Front seat fore/aft	As defined in 4.4		
Front seat cushion tilt	As defined in 4.4		
Front seat height	As defined in 4.4		
Front seat_torso angle	Manufacturer's design position.	Where no design position is given, set to 23° to vertical, as defined by Torso angle. Must be the same in Pole test.	See Section 5.1
Front seat lumbar support	Fully retracted.		See Section 4.2
Front seat cushion length	Fully retracted.		
Front head restraint height & tilt	See Section 6, Whiplash testing protocol	As whiplash test position. If there is any interference with the rear of the dummy head, move the HR to the most rearward position.	
Front seat belt anchorage	Manufacturer's 50th percentile design position	If no design position, then set to mid position, or nearest notch upwards	See Section 5.2.7. Webbing must not be in contact with the neck.
Steering wheel	Highest position and most outward		See Section 4.5
Rear seat facing	Forwards		See Section 4.6
Rear seat lateral position	Most outboard		
Rear seat fore/aft	Manufacturer's design position	Where no details are provided in the handbook, set to mid	See Section 4.6
Rear seat cushion tilt	Manufacturer's design position	Permissible up to mid position, otherwise lowest	

Adjustment	Required setting	Notes	Methods
Rear seat height	Manufacturer's design position	Where no design position is given, set to lowest	
Rear seat torso angle	Manufacturer's design position	Where no design position is given, set to 25° to vertical, as defined by torso angle	
Rear seat lumbar support	Fully retracted.		
Rear seat cushion length	Fully retracted.		
Rear head restraint height & tilt	As recommended in vehicle handbook.	Where no details are provided in the handbook, set to mid or next lowest position for height and mid locking position for tilt. Must not interfere with child/CRS installation	
Rear seat belt anchorage	As recommended in vehicle handbook for CRS installation	If no recommendation then set to midposition, or nearest notch upwards. MUST be same as MPDB	
Arm-rests (Front seats)	Lowered	May be left up if dummy positioning does not allow lowering. Single occupancy test only	
Arm-rests (Rear seats)	Stowed		
Side window glazing	All raised		
Gear change lever	In the neutral position		
Parking brake	Engaged		
Pedals	Normal position of rest	Adjustable pedals fully forward	See Section 4.2
Doors	Closed, not locked	For automatic door locks, refer to the Rescue and Extrication protocol. Rear child locks disengaged.	
Roof	Raised		
Sunroof	Closed	Fixed sunroofs should not be modified for test	

Adjustment	Required setting	Notes	Methods
Sun visors	Stowed		
Rear view mirror	Normal position of use		
Front passenger airbag	Enabled		

Adjustments not listed will be set to mid-positions or nearest positions rearward, lower or outboard.

(2019 年 Euro NCAP 規章)

4 PASSENGER COMPARTMENT ADJUSTMENT

4.1 Overview of Settings

Adjustment	Required Setting	Notes	Methods
Seat fore/aft	As defined in 4.4		
Seat base tilt	As defined in 4.4		
Seat height	As defined in 4.4		
Torso angle	Manufacturer's design position	Otherwise 23° to Vertical	See Section 5.1
Seat lumbar support	Fully retracted		See Section 4.2
Front head restraint height & tilt	Mid locking position	As whiplash test position. If there is any interference with the rear of the dummy head, move the HR to the most rearward position.	See Section 6.2 Whiplash testing protocol.
Front seat belt anchorage (where adjustable)	Initially, manufacturer's 50th percentile design position	If no design position then set to mid position, or nearest notch upwards	See Section 5.2.7
Steering wheel	Highest position and most outward		See Section 0
Rear seat fore/aft (where adjustable)	Manufacturer's design position	Where no details are provided in the handbook, set to mid	See Section 4.6

Adjustment	Required Setting	Notes	Methods
Rear seat back angle (where adjustable)	Manufacturer's design position	Otherwise 25° to Vertical	See Section 4.6
Rear seat facing	Forwards		
Rear head restraint height & tilt	As recommended in vehicle handbook.	Where no details are provided in the handbook, set to mid or next lowest position for height and mid locking position for tilt. Must not interfere with child/CRS installation	See Section 6.2 Whiplash testing protocol.
Rear seat belt anchorage (where adjustable)	As recommended in vehicle handbook for CRS installation.	If no recommendation then set to midposition, or nearest notch upwards. MUST be same as ODB	
Arm-rests (Front seats)	Lowered position	May be left up if dummy positioning does not allow lowering. Where adjustable place in horizontal position	
Arm-rests (Rear seats)	Stowed position		
Side window glazing	All raised		
Gear change lever	In the neutral position		
Parking brake	Engaged		
Pedals	Normal position of rest	Adjustable pedals fully forward	See Section 4.2
Doors	Closed, not locked		
Roof /sunroof	Raised /fully closed	Where applicable	
Sun visors	Stowed position		

Adjustment	Required Setting	Notes	Methods
Rear view mirror	Normal position of use		

Adjustments not listed will be set to mid-positions or nearest positions rearward, lower or outboard.

(修正後 TNCAP 規章草案)

3.3.4 車室(Passenger compartment)調整

3.3.4.1 設定綜覽

調整	設定要求	附註	做法
<u>第一排</u> 座椅前後位置	如 3.3.4.4 定義		
<u>第一排</u> 座椅 <u>座墊</u> 傾斜度	如 3.3.4.4 定義		
<u>第一排</u> 座椅高度	如 3.3.4.4 定義		
<u>第一排座椅</u> 軀幹角度	車輛業者設計位置	<u>若無設計位置，則設定至垂直向後傾斜 23 度（如軀幹角度所定義）。須與側方立柱撞擊之位置相同。</u>	如 3.3.5.1
<u>第一排</u> 座椅腰部支撐	完全縮回		如 3.3.4.2
<u>第一排座椅座墊長度</u>	<u>完全縮回</u>		
第一排座椅頭枕高度及傾斜度	如「 <u>前座鞭甩試驗規章</u> 」3.5.5.2	同鞭甩試驗位置。頭枕若會影響人偶頭部後方，則將頭枕移至最後方的位置。	
<u>第一排座椅</u> 安全帶固定裝置	初始為車輛業者之第 50 百分位設計位置	若無設計位置，則設定至中間位置或至向上最接近的段位	如 3.3.5.2.7。 <u>織帶不得與頸部接觸。</u>
方向盤	最高且最向後（靠人偶）的位置		如 3.3.4.5
後座面對方向	朝前		<u>如 3.3.4.6</u>
<u>後座橫向位置</u>	<u>最外側</u>		
後座前後位置	車輛業者設計位置	若手冊未提供詳細資訊，則 <u>設定至</u> 中間位置	如 3.3.4.6
<u>後座座墊傾斜度</u>	<u>車輛業者設計位置</u>	<u>最多允許至中間位置，否則為最低位置</u>	

調整	設定要求	附註	做法
後座座椅高度	車輛業者設計位置	若無設計位置，則設定至最低位置	
後座軀幹角度	車輛業者設計位置	若無設計位置，則設定至垂直向後傾斜 25 度（如軀幹角度所定義）	
後座腰部支撐	完全縮回		
後座座墊長度	完全縮回		
後座頭枕高度及傾斜度	如車主手冊建議	若手冊未提供詳細資訊，則將高度 設定至 中間或向下最接近的位置，將傾斜度 設定至 中間鎖定位置。不可影響兒童/兒童保護裝置安裝。	
後座安全帶固定裝置	如車主手冊對於兒童保護裝置安裝之建議。	若無建議，則 設定至 中間位置或至向上最接近的段位，須與前方偏置撞擊 試驗 之位置相同。	
扶手（第一排座椅）	使用位置	若人偶放置後扶手無法位於使用位置，則可保持於非使用位置。 僅限單乘員之試驗。	
扶手（後座）	收納位置		
車窗	全部升起		
變速箱	空檔		
駐煞車	致動(Engaged)		
踏板	未踩踏之正常位置(Position of rest)	可調整式踏板設於完全向前的位置	如 3.3.4.2
車門	關閉但不上鎖(除自動門鎖外)	自動門鎖參見「緊急救援、事故脫困及 安全技術 試驗規章」。 後門兒童安全鎖處於解鎖狀態。	
車頂	升起		
天窗	關閉	固定式天窗不應為了測試而改裝	

調整	設定要求	附註	做法
遮陽板	收合位置		
照後鏡	正常使用位置		
第一排乘客空氣囊	啟動		

備註：未列出之調整將設定在中間位置，或向後、向下或向外最接近的位置

(修正前 TNCAP 規章)

3.3.4 車室(Passenger compartment)調整

3.3.4.1 設定綜覽

調整	設定要求	附註	做法
座椅前後位置	如 3.3.4.4 定義		
座椅底座傾斜度	如 3.3.4.4 定義		
座椅高度	如 3.3.4.4 定義		
軀幹角度	車輛業者之設計位置	否則為 垂直向後傾斜 23 度	如 3.3.5.1
座椅腰部支撐	完全縮回		如 3.3.4.2
第一排座椅頭枕高度及傾斜度	中間鎖定位置	同鞭甩試驗位置。頭枕若會影響人偶頭部後方，則將頭枕移至最後方的位置。	如「 前座鞭甩試驗規章 」3.5.5.2
前座安全帶固定裝置（若可調整）	初始為車輛業者之第 50 百分位設計位置	若無設計位置，則調整至中間位置或至向上最接近的段位	如 3.3.5.2.7
方向盤	最高且最向後（靠人偶）的位置		如 3.3.4.5
後座前後位置（若可調整）	車輛業者之設計位置	手冊若未提供相關資訊，則調至中間位置	如 3.3.4.6

調整	設定要求	附註	做法
後座 <u>椅背</u> 角度（若可調整）	車輛業者之設計位置	否則為垂直向後傾斜 25 度	如 3.3.4.6
後座方向	朝前		
後座頭枕高度及傾斜度	如車主手冊建議	手冊若未提供相關資訊，則將高度調整至中間或向下最接近的位置，將傾斜度調整至中間鎖定位置。不可影響兒童/兒童保護裝置安裝。	如「前座鞭甩試驗規章」3.5.5.2
後座安全帶固定裝置 <u>（若可調整）</u>	如車主手冊對於兒童保護裝置安裝之建議。	若無建議，則調整至中間位置或至向上最接近的段位，須與 <u>偏置撞擊</u> 之位置相同	
扶手（第一排座椅）	使用位置	若人偶放置後扶手無法位於使用位置，則可保持於非使用位置。 <u>於水平位置可調整處。</u>	
扶手（後座）	收納位置		
車窗	全部升起		
變速箱	空檔		
駐車煞車	致動(Engaged)		
踏板	未踩踏之正常位置 (Position of rest)	可調整式踏板設於完全向前的位置	如 3.3.4.2
車門	關閉但不上鎖 (除自動門鎖外)	自動門鎖參見 3.16 緊急救援 <u>及</u> 事故脫困試驗規章	
車頂/ <u>天窗</u>	升起/ <u>完全關閉</u>	<u>依實際狀況</u>	
遮陽板	收合位置		
照後鏡	正常使用位置		

備註：未列出之調整將設定在中間位置，或向後、向下或向外最接近的位置

(2025 年版 Euro NCAP 規章)

5.4 Dummy Positioning Measurements

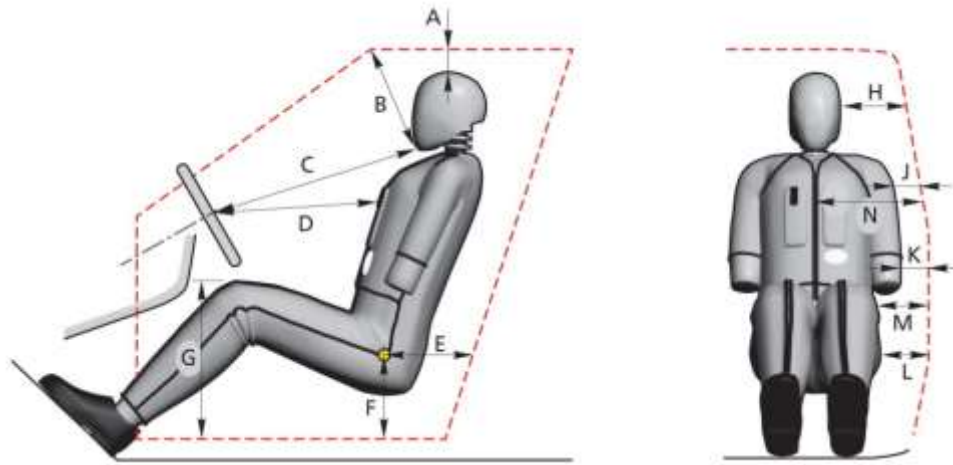


Figure 1: Driver dummy measurements

Driver measurements

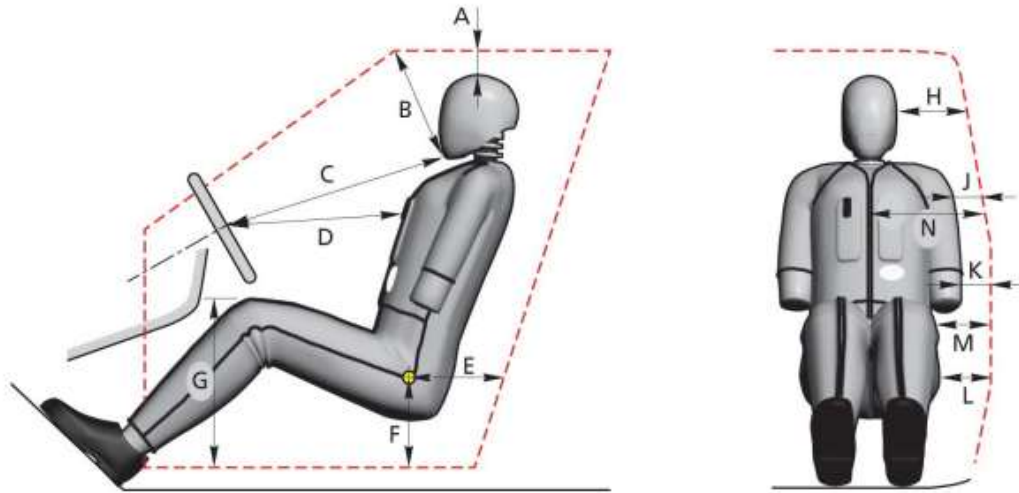
- A Head/roof panel
- B Chin/windscreen joint
- C Chin/centre of the steering
- D* Thorax strap/centre of the steering wheel
- E Hip-joint point/inside opening of the door (horizontal)
- F Hip-joint point/inside opening of the door (vertical)
- G Knee/floor covering (vertical)
- H Head/side window pane (or padding)
- J Shoulder/window pane (or padding)
- K Elbow/door (or padding)
- L Pelvis/door (or padding)

- M Knee/door (or padding)
- N Belt webbing to door (horizontally)

* Horizontal distance from steering wheel centre

(2019 年 Euro NCAP 規章)

5.4 Dummy Positioning Measurements



Driver measurements

- A Head/roof panel
- B Chin/windscreen joint
- C Chin/centre of the steering
- D* Thorax strap/centre of the steering wheel
- E Hip-joint point/inside opening of the door (horizontal)
- F Hip-joint point/inside opening of the door (vertical)
- G Knee/floor covering (vertical)

H	Head/side window pane (or padding)
J	Shoulder/window pane (or padding)
K	Elbow/door (or padding)
L	Pelvis/door (or padding)
M	Knee/door (or padding)
N	Belt webbing to door (horizontally)

* Horizontal distance from steering wheel centre

(修正後 TNCAP 規章草案)

3.3.5.4 人偶位置量測

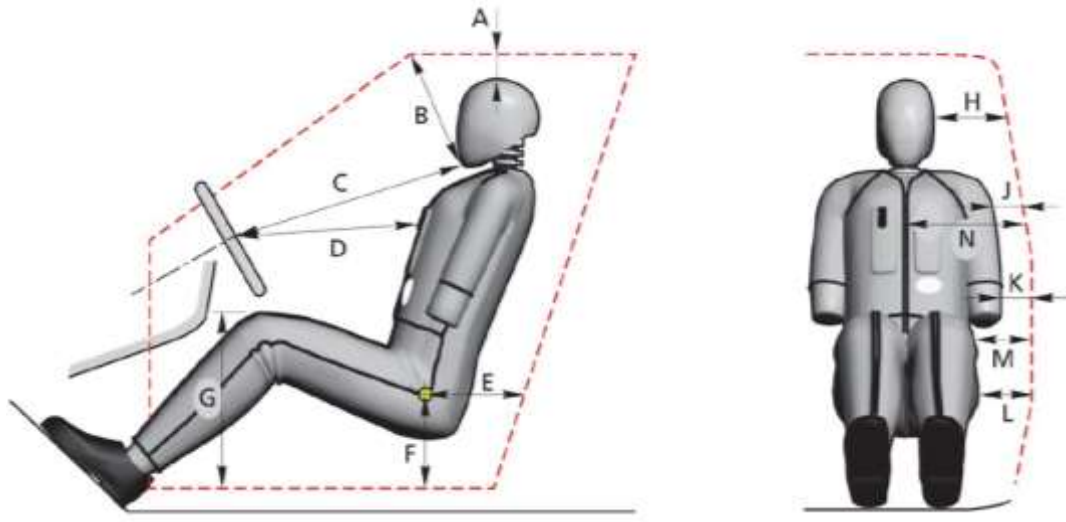


圖 1：駕駛人偶量測

駕駛量測值

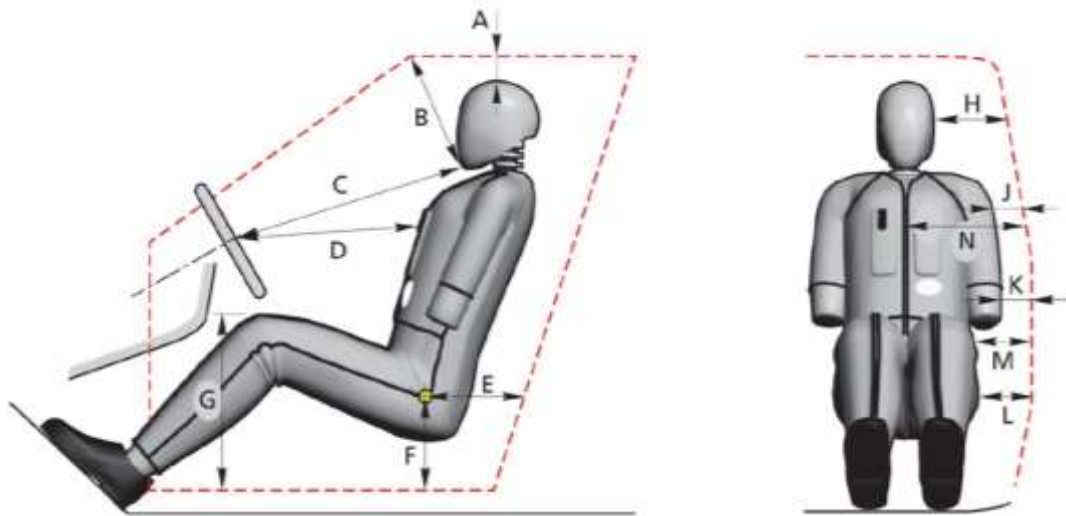
- A 頭部至車頂飾板
- B 下巴至擋風玻璃接合點(Windscreen joint)
- C 下巴至方向盤中心
- D* 對角式織帶至方向盤中心
- E 髖關節點至門檻(Inside opening of the door) (水平)
- F 髖關節點至門檻 (垂直)
- G 膝部至地板表面材(Floor covering) (垂直)
- H 頭部至側窗玻璃(Pane) (或填充物)
- J 肩部至車窗玻璃 (或填充物)
- K 肘部至車門 (或填充物)

- L 骨盆至車門（或填充物）
- M 膝部至車門（或填充物）
- N 安全帶織帶至車門（水平）

備註：*與方向盤中心的水平距離

(修正前 TNCAP 規章)

3.3.5.4 人偶位置量測



駕駛量測值

- A 頭部至車頂飾板
- B 下巴至擋風玻璃接合點(Windscreen joint)
- C 下巴至方向盤中心
- D* 對角式織帶至方向盤中心
- E 髖關節點至門檻(Inside opening of the door)（水平）
- F 髖關節點至門檻（垂直）

- G 膝部至地板表面材(Floor covering) (垂直)
- H 頭部至側窗玻璃(Pane) (或填充物)
- J 肩部至車窗玻璃 (或填充物)
- K 肘部至車門 (或填充物)
- L 骨盆至車門 (或填充物)
- M 膝部至車門 (或填充物)
- N 安全帶織帶至車門 (水平)

備註：*與方向盤中心的水平距離

3.4 側方立柱撞擊試驗規章

Euro NCAP Oblique Pole Side Impact Test Protocol Version 7.2

Technical Bulletin TB017 IR-TRACC Absolute Length and Angle Calibration Version 1.0

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1 VEHICLE PREPARATION ... 1.3 Reference Loads 1.3.1 Where a dual occupancy test is to be performed replace Sections 1.3.2 to 1.3.4 with those detailed in Sections 8.1.1 to 8.1.3. 1.3.2 Place both front seats in their mid-positions, this may not be the same. If there is no notch at this position, set the seat in the nearest notch rearward. 1.3.3 Place weights equivalent to a WorldSID 50th dummy (75kg) in the front driver's seating position. 1.3.4 Place weights with a mass of the rated cargo and luggage mass or 136kg whichever is less, in the luggage compartment of the vehicle. The normal luggage compartment should be used i.e. rear seats should not be folded to increase the luggage capacity. Spread the	1 VEHICLE PREPARATION ... 1.3 Reference Loads 1.3.1 Place both front seats in their mid-positions, this may not be the same. If there is no notch at this position, set the seat in the nearest notch rearward. 1.3.2 Place weights equivalent to a WorldSID 50th dummy (75kg) in the front driver's seating position. 1.3.3 Place weights with a mass of the rated cargo and luggage mass or 136kg whichever is less, in the luggage compartment of the vehicle. The normal luggage compartment should be used i.e. rear seats should not be folded to increase the luggage capacity. Spread the	3.4.1 車輛整備 ... 3.4.1.3 參考負載(Reference loads) <u>3.4.1.3.1 若要進行雙乘員試驗，則以 3.4.8.1.1 至 3.4.8.1.3 替代 3.4.1.3.2 至 3.4.1.3.4。</u> 3.4.1.3.2 將第一排兩座椅皆調整至中間位置，該位置可能不是最終試驗位置。若該位置沒有段位，則將座椅向後調整至最接近的段位。 3.4.1.3.3 將相當於 WorldSID 百分之五 0 成年男性人偶的重量 (75kg) 放置駕駛座椅位置。 3.4.1.3.4 於車輛行李廂放置額定貨物及行李重量或 136kg (取兩者當中較低者)。應使用一般狀態的行李廂，即不應摺疊後排座椅來增加行李廂容量，且該重量盡可能均勻攤放於行李廂底部，若無法均勻放置，則將重量集中於	3.4.1 車輛整備 ... 3.4.1.3 參考負載(Reference loads) 3.4.1.3.1 將第一排兩座椅皆調整至中間位置，該位置可能不是最終試驗位置。若該位置沒有段位，則將座椅向後調整至最接近的段位。 3.4.1.3.2 將相當於 WorldSID 百分之五 0 成年男性人偶的重量 (75kg) 放置駕駛座椅位置。 3.4.1.3.3 於車輛行李廂放置額定貨物及行李重量或 136kg (取兩者當中較低者)。應使用一般狀態的行李廂，即不應摺疊後排座椅來增加行李廂容量，且該重量盡可能均勻攤放於行李廂底部，若無法均勻放置，則將重量集中於

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weights as evenly as possible over the base of the luggage compartment. If the weights cannot be evenly distributed, concentrate weights towards the centre of the compartment.	weights as evenly as possible over the base of the luggage compartment. If the weights cannot be evenly distributed, concentrate weights towards the centre of the compartment.	行李廂中間。	行李廂中間。
1.3.5 Roll the vehicle back and forth to ‘settle’ the tyres and suspension with the extra weights on board. Determine the front and rear axle loads of the vehicle. These loads are the “axle reference loads” and the total mass is the “reference mass” of the vehicle.	1.3.4 Roll the vehicle back and forth to ‘settle’ the tyres and suspension with the extra weights on board. Determine the front and rear axle loads of the vehicle. These loads are the “axle reference loads” and the total mass is the “reference mass” of the vehicle.	3.4.1.3.5 將車輛前後移動，使輪胎及避震系統「適應(Settle)」車上額外的重量。測量車輛前後軸負載，該負載即為「輪軸參考負載」(Axle reference load)，而車輛總重量即為其「參考車重」(Reference mass)。	3.4.1.3.4 將車輛前後移動，使輪胎及避震系統「適應(Settle)」車上額外的重量。測量車輛前後軸負載，該負載即為「輪軸參考負載」(Axle reference load)，而車輛總重量即為其「參考車重」(Reference mass)。
1.3.6 Record the axle reference loads and reference mass in the test details.	1.3.5 Record the axle reference loads and reference mass in the test details.	3.4.1.3.6 將輪軸參考負載及參考車重記錄於試驗資料。	3.4.1.3.5 將輪軸參考負載及參考車重記錄於試驗資料。
1.3.7 Measure and record the ride-heights of the vehicle at a point on the wheel arch in the same transverse plane as the wheel centres. Do this for all four wheels.	1.3.6 Measure and record the ride-heights of the vehicle at a point on the wheel arch in the same transverse plane as the wheel centres. Do this for all four wheels.	3.4.1.3.7 於輪拱(Wheel arch)與輪心(Wheel centre)同橫向平面處測量並記錄輪弧距地高，四個輪胎皆須測量。	3.4.1.3.6 於輪拱(Wheel arch)與輪心(Wheel centre)同橫向平面處測量並記錄輪弧距地高，四個輪胎皆須測量。
1.3.8 Remove the weights from the luggage compartment and the dummy weights from the front seat.	1.3.7 Remove the weights from the luggage compartment and the dummy weights from the front seat.	3.4.1.3.8 移除行李廂及第一排座椅人偶的重量。	3.4.1.3.7 移除行李廂及第一排座椅人偶的重量。
...	...	...	...
1.5 Vehicle Preparation	1.5 Vehicle Preparation	3.4.1.5 車輛整備	3.4.1.5 車輛整備

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... 1.5.11 Mark the centreline of the vehicle on the fascia and centre console so that it can be seen from the offboard camera views.	...	... <u>3.4.1.5.11 在儀表板及中控台上標記車輛中線，且可從車外攝影機視角看見。</u>	...
2 DUMMY PREPARATION AND CERTIFICATION 2.1 General 2.1.1 A WorldSID 50th percentile male test dummy shall be used in the front driver's position. It shall conform to the specification detailed in ISO 15830 parts 1-4:2013 & part 5:2018. Note: From 1st January 2026, ISO 15830 parts 1-4:2022 & part 5:2018 shall be applied. 2.1.2 For the dual occupancy test, detailed in Section 8, two WorldSID 50th percentile male test dummy confirming to the above specification shall be used. 2.2 Certification 2.2.1 The WorldSID used on the driver's seat shall be re-certified after every FOUR impact tests.	2 DUMMY PREPARATION AND CERTIFICATION 2.1 General 2.1.1 A WorldSID 50th percentile male test dummy shall be used in the front driver's position. It shall conform to the specification detailed in ISO 15830, parts 1-5. 2.2 Certification 2.2.1 The WorldSID shall be re-certified after every FOUR impact tests. 2.2.2 Deatils of the IR Tracc length calculation procedure are described in	3.4.2 人偶整備及查驗(Certification) 3.4.2.1 通則 3.4.2.1.1 WorldSID 百分之五 0 成年男性試驗人偶應安裝於駕駛座，該人偶應符合 <u>2013 年 ISO 15830 第 1 至 4 部份，及 2018 年第 5 部</u>詳列之規格。 <u>3.4.2.1.2 對於 3.4.2.8 所述之雙乘員試驗，應使用兩個符合上述規格之 WorldSID 百分之五 0 成人男性試驗人偶。</u> 3.4.2 查驗 3.4.2.2.1 <u>駕駛座</u>人偶每經 4 次撞擊試驗後，應重新進行 WorldSID 百分之五 0 成年男性人偶查驗。	3.4.2 人偶整備及查驗(Certification) 3.4.2.1 通則 3.4.2.1.1 WorldSID 百分之五 0 成年男性試驗人偶應安裝於駕駛座，該人偶應符合 ISO 15830 第 1 至 5 部詳列之規格。 3.4.2.2 查驗 3.4.2.2.1 人偶每經 4 次撞擊試驗後，應重新進行 WorldSID 百分之五 0 成年男性人偶查驗。 <u>3.4.2.2.2 IR Tracc 長度計算步驟參見 Euro NCAP 技術通報 TB017</u>

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2.2.2 If an injury criterion reaches or exceeds its normally accepted limit (e.g. HIC of 700) then that part should be re-certified. 2.2.3 If any part of the dummy is broken in a test then the part shall be replaced with a fully certified component. 2.2.4 A copy of the dummy certification certificate will be provided as part of the full report for a test. 2.3 Additions and Modifications to the Dummies 2.3.1 The WorldSID shall be equipped with the half arm assembly on both sides. ... 2.4 Dummy Clothing and Footwear 2.4.1 The dummy(ies) shall be clothed in a sleeveless suit or a modified version of the sleeved suit with sleeves removed. ...	Technical Bulletin TB017. 2.2.3 If an injury criterion reaches or exceeds its normally accepted limit (e.g. HIC of 700) then that part should be re-certified. 2.2.4 If any part of the dummy is broken in a test then the part shall be replaced with a fully certified component. 2.2.5 A copy of the dummy certification certificate will be provided as part of the full report for a test. 2.3 Additions and Modifications to the Dummies 2.3.1 The WorldSID dummy shall be equipped with the half arm assembly on both sides. ... 2.4 Dummy Clothing and Footwear 2.4.1 The dummy shall be clothed in a sleeveless suit or a modified version of the sleeved suit with sleeves removed. ...	3.4.2.2.2 若某傷害指數 (Injury criterion)達到或超過其正常接受範圍 (如頭部傷害指數 HIC 達 700)，則該部位應重新查驗。 3.4.2.2.3 若人偶任一部位於試驗中損壞，則該部位應以完全查驗之零件(Fully certified component)替換。 3.4.2.2.4 人偶查驗證書(Certificate)副本應檢附於完整試驗報告。 3.4.2.3 人偶配件及調整 3.4.2.3.1 WorldSID 百分之五 0 成年男性人偶兩側皆應安裝半臂總成(Half arm assembly)。 ... 3.4.2.4 人偶衣著及鞋履 3.4.2.4.1 人偶應穿著無袖上衣或改良版可移除衣袖式上衣。 ... 3.4.2.5 人偶試驗條件	(Technical Bulletin TB017)。 3.4.2.2.3 若某傷害指數 (Injury criterion)達到或超過其正常接受範圍 (如頭部傷害指數 HIC 達 700)，則該部位應重新查驗。 3.4.2.2.4 若人偶任一部位於試驗中損壞，則該部位應以完全查驗之零件(Fully certified component)替換。 3.4.2.2.5 人偶查驗證書(Certificate)副本應檢附於完整試驗報告。 3.4.2.3 人偶配件及調整 3.4.2.3.1 WorldSID 百分之五 0 成年男性人偶兩側皆應安裝半臂總成(Half arm assembly)。 ... 3.4.2.4 人偶衣著及鞋履 3.4.2.4.1 人偶應穿著無袖上衣或改良版可移除衣袖式上衣。 ... 3.4.2.5 人偶試驗條件

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2.5 Dummy Test Condition 2.5.1 Dummy Temperature 2.5.1.1 The dummy(ies) shall have a stabilised temperature in the range of 20.6°C to 22.2°C. ... 2.5.2 Dummy Joints ... 2.5.2.6 After switching on the data acquisition, the air inside the dummy and also 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 maybe ignored as long as they do not exceed a duration of 20. 2.6 Dummy painting 2.6.1 The dummy shall have masking tape placed on the areas to be painted using the sizes detailed below. The tape should be completely covered with the ollowing coloured paints. The paint should be applied close to the time of the test to ensure that the paint will still be wet on	2.5 Dummy Test Condition 2.5.1 Dummy Temperature 2.5.1.1 The dummy shall have a stabilised temperature in the range of 20.6°C to 22.2°C. ... 2.5.2 Dummy Joints ... 2.6 Dummy painting 2.6.1 The dummy shall have masking tape placed on the areas to be painted using the sizes detailed below. The tape should be completely covered with the ollowing coloured paints. The paint should be applied close to the time of the test to ensure that the paint will still be wet on	3.4.2.5 人偶試驗條件 3.4.2.5.1 人偶溫度 3.4.2.5.1.1 人偶的溫度必須穩定，介於攝氏 20.6°C 至 22.2°C 之間。 ... 3.4.2.5.2 人偶關節 ... <u>3.4.2.5.2.6 開啟資料擷取系統後，人偶內空氣及感測器可能升溫，而人偶本身仍處於較低溫度。此突然溫度升高並非不反映實際人偶溫度，因此只要持續時間不超過 20 分鐘，則可被忽略。</u> ... 3.4.2.6 人偶塗色 3.4.2.6.1 應於人偶預定塗色之區域，以下方詳列之範圍黏貼紙膠帶。膠帶應徹底塗滿下列指定顏色，唯駕駛頭部僅於膠帶邊緣塗色，顏料應於接近試驗時間時塗上，以確保撞擊時顏料未乾。	3.4.2.5.1 人偶溫度 3.4.2.5.1.1 人偶的溫度必須穩定，介於攝氏 20.6°C 至 22.2°C 之間。 ... 3.4.2.5.2 人偶關節 ... 3.4.2.6 人偶塗色 3.4.2.6.1 應於人偶預定塗色之區域，以下方詳列之範圍黏貼紙膠帶。膠帶應徹底塗滿下列指定顏色，唯駕駛頭部僅於膠帶邊緣塗色，顏料應於接近試驗時間時塗上，以確保撞擊時顏料未乾。

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impact. Driver outboard side of head Head (Paint tape outline) Red Head CoG (circle Ø40mm) Yellow Head top along mid sagittal plane Green Shoulder/Arm Blue 2nd Thorax Rib Green 3rd Thorax Rib Red 1st Abdomen Rib Blue 2nd Abdomen Rib Green Pelvis Orange NOTE: The tape should be completely covered with the coloured paints specified, with the exception of the driver head which should have only the outer edge of the tape painted. Tape Sizes: Driver Head = 100mm square, centreline of head with lower edge at C of G. Head = 200mm x 20mm strip, centre located at head C of G. Arm = 25mm x 150mm, starting at bottom edge of shoulder fixing hole. Ribs =	impact. Driver Head (Paint tape outline) Red Head CoG (circle Ø40mm) Yellow Head top along mid sagittal plane Green Shoulder/Arm Blue 2nd Thorax Rib Green 3rd Thorax Rib Red 1st Abdomen Rib Blue 2nd Abdomen Rib Green Pelvis Orange NOTE: The tape should be completely covered with the coloured paints specified, with the exception of the driver head which should have only the outer edge of the tape painted. Tape Sizes: Driver Head = 100mm square, centreline of head with lower edge at C of G. Arm = 25mm x 150mm, starting at bottom edge of shoulder fixing hole. Ribs =	駕駛 <u>頭部外側</u> 頭部（僅膠帶輪廓塗色） 紅 頭部重心（圓圈直徑 40mm） 黃 頭頂沿正中矢狀切面 綠 肩部/手臂 藍 胸部第二肋骨 綠 胸部第三肋骨 紅 腹部第一肋骨 藍 腹部第二肋骨 綠 骨盆 橘 膠帶範圍： 駕駛 頭部= 100mm 正方形，頭部中心線且下緣位於重心處。 <u>頭部= 200mm x 20mm 長條形，中心位於頭部重心。</u> 手臂= 25mm×150mm，從肩部固定孔底部開始。	駕駛 頭部（僅膠帶輪廓塗色） 紅 頭部重心（圓圈直徑 40mm） 黃 頭頂沿正中矢狀切面 綠 肩部/手臂 藍 胸部第二肋骨 綠 胸部第三肋骨 紅 腹部第一肋骨 藍 腹部第二肋骨 綠 骨盆 橘 膠帶範圍： 駕駛 頭部= 100mm 正方形，頭部中心線且下緣位於重心處。 手臂= 25mm×150mm，從肩部固定孔底部開始。 肋骨= 25mm×150mm 長條形，從最

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25mm x 150mm strip, starting at the rearmost accessible point at seat back. Pelvis = 50mm x 100mm, centred on hip joint point. ... 2.7 Post Test Dummy Inspection 2.7.1 The dummy(ies) should be visually inspected immediately after the test. Any lacerations of the skin or breakages of the dummy should be noted in the test details. The dummy may have to be re-certified in this case. Refer to Section 2.2.	25mm x 150mm strip, starting at the rearmost accessible point at seat back. Pelvis = 50mm x 100mm, centred on hip joint point. ... 2.7 Post Test Dummy Inspection 2.7.1 The dummy should be visually inspected immediately after the test. Any lacerations of the skin or breakages of the dummy should be noted in the test details. The dummy may have to be re-certified in this case. Refer to Section 2.2.	肋骨= 25mm×150mm 長條形，從最後方可觸及椅背的點開始。 骨盆= 50mm×100mm 以髖關節點為中心。 ... 3.4.2.7 試驗後人偶檢查 3.4.2.7.1 試驗後應立即以目視檢查所有人偶狀況。若有任何斷裂或皮膚破裂之情形，應記錄於試驗資料，此時人偶參考 3.4.2.2 重新查驗。	後方可觸及椅背的點開始。 骨盆= 50mm×100mm 以髖關節點為中心。 ... 3.4.2.7 試驗後人偶檢查 3.4.2.7.1 試驗後應立即以目視檢查所有人偶狀況。若有任何斷裂或皮膚破裂之情形，應記錄於試驗資料，此時人偶參考 3.4.2.2 重新查驗。
3 INSTRUMENTATION 3.1 Dummy Instrumentation 3.1.1 The WorldSID on the driver's seat shall be instrumented to record the channels listed below. Additional channels may be recorded. 3.1.2 Where the number of channels in the WorldSID is 45 or more, only in - dummy data acquisition systems may	3 INSTRUMENTATION 3.1 Dummy Instrumentation 3.1.1 The WorldSID dummy shall be instrumented to record the channels listed below. Additional channels may be recorded. 3.1.2 Where the number of channels in the WorldSID dummy is 45 or more, only in -dummy data acquisition systems may	3.4.3 感測器及資料擷取系統設置 (Instrumentation) 3.4.3.1 人偶感測器及資料擷取系統設置 3.4.3.1.1 駕駛座 WorldSID 百分之五 0 成年男性人偶之感測器及資料擷取系統應設定至得以記錄下列頻道。另可記錄額外頻道。 3.4.3.1.2 若 WorldSID 百分之五 0 成年男性人偶具有 45 個以上的頻道，則僅能使用人偶內部的資	3.4.3 感測器及資料擷取系統設置 (Instrumentation) 3.4.3.1 人偶感測器及資料擷取系統設置 3.4.3.1.1 WorldSID 百分之五 0 成年男性人偶之感測器及資料擷取系統應設定至得以記錄下列頻道。另可記錄額外頻道。 3.4.3.1.2 若 WorldSID 百分之五 0 成年男性人偶具有 45 個以上的頻道，則僅能使用人偶內部的資

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be used. Where there are less than 45 channels, the use of umbilical cables is at the laboratories discretion. (請參考末頁圖表) ... 3.3 Carrier Instrumentation 3.3.1 The carrier is to be fitted with an accelerometer at its structure at the centre line, near the centre of gravity. The accelerometer is to be fitted in the direction of movement (AX). (請參考末頁圖表)	be used. Where there are less than 45 channels, the use of umbilical cables is at the laboratories discretion. (請參考末頁圖表) ... 3.3 Carrier Instrumentation 3.3.1 The carrier is to be fitted with an accelerometer at its structure at the centre line, near the centre of gravity. The accelerometer is to be fitted in the direction of movement (AX). (請參考末頁圖表)	料擷取系統。若頻數道少於 45 個，則檢測機構可酌情決定是否使用連接線連接至外部資料擷取系統之方式進行 (Umbilical cable)。 (請參考末頁圖表) ... 3.4.3.3 台車感測器及資料擷取系統設置 3.4.3.3.1 台車中線之結構處（靠近重心）應安裝一加速規，並以移動方向安裝（Ax） (請參考末頁圖表)	料擷取系統。若頻數道少於 45 個，則檢測機構可酌情決定是否使用連接線連接至外部資料擷取系統之方式進行 (Umbilical cable)。 (請參考末頁圖表) ... 3.4.3.3 台車感測器及資料擷取系統設置 3.4.3.3.1 台車中線之結構處（靠近重心）應安裝一加速規，並以移動方向安裝（Ax） (請參考末頁圖表)
4 PASSENGER COMPARTMENT ADJUSTMENTS 4.1 Overview of Settings (請參考末頁圖表) ... 4.4 Positioning the driver's seat ... In case of single occupancy the settings for the passenger seat should be as near as possible to being the same as	4 PASSENGER COMPARTMENT ADJUSTMENTS 4.1 Overview of Settings (請參考末頁圖表) ... 4.4 Positioning the seat ... The settings for the passenger seat should be as near as possible to being the same as that of the driver's seat.	3.4.4 車室(Passenger compartment)調整 3.4.4.1 設定綜覽 (請參考末頁圖表) ... 3.4.4.4 調整駕駛座椅位置 ... 3.4.4.4.11 在單乘員情況下，乘客座椅設定應盡可能與駕駛座設定相同。	3.4.4 車室(Passenger compartment)調整 3.4.4.1 設定綜覽 (請參考末頁圖表) ... 3.4.4.4 調整座椅位置 ... 3.4.4.4.11 乘客座椅設定應盡可能與駕駛座設定相同。

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that of the driver's seat.			
5 DUMMY POSITIONING AND MEASUREMENTS	5 DUMMY POSITIONING AND MEASUREMENTS	3.4.5 人偶位置及量測	3.4.5 人偶位置及量測
5.2 Head Protection Device marking	5.2 Head Protection Device marking	3.4.5.2 頭部保護裝置 (Head Protection Device, HPD)標記	3.4.5.2 頭部保護裝置 (Head Protection Device, HPD)標記
5.2.1 Using the location of the H-point as measured in Section 5.1.21 for the front seating position, calculate and record the corresponding 5th female and 95th male head centre of gravity positions for the front seat to determine the corners of the head CoG-boxx (Figure 2): (請參考末頁圖表)	5.2.1 Using the location of the H-point as measured in Section 5.1.21 for the front seating position, calculate and record the corresponding 5th female and 95th male head centre of gravity positions for the front seat to determine the corners of the head CoG-box: (請參考末頁圖表)	3.4.5.2.1 使用 3.4.5.1.21 測得之第一排座椅 H 點位置，計算並記錄第一排座椅第 5 百分位女性及第 95 百分位男性之頭部重心位置，以決定頭部重心方塊(CoG-box)之四角 (如圖 2)： (請參考末頁圖表)	3.4.5.2.1 使用 3.4.5.1.21 測得之第一排座椅 H 點位置，計算並記錄第一排座椅第 5 百分位女性及第 95 百分位男性之頭部重心位置，以決定頭部重心方塊(CoG-box)之四角： (請參考末頁圖表)
...	...	...	...
5.2.3 Using the location of the H-point for the rear seating position as measured for the Rear Whiplash protocol, calculate and record the corresponding head centre of gravity positions in the most forward and rearward seating positions (Figure 3): (請參考末頁圖表)	5.2.3 Using the location of the H-point for the rear seating position as measured for the Rear Whiplash protocol, calculate and record the corresponding head centre of gravity positions in the most forward and rearward seating positions: (請參考末頁圖表)	3.4.5.2.3 使用後座鞭甩規章(Rear Whiplash)所測得之後座 H 點位置，計算並記錄後座最前方與最後方座椅位置其分別對應之頭部重心位置 (如圖 3)： (請參考末頁圖表)	3.4.5.2.3 使用後座鞭甩規章(Rear Whiplash)所測得之後座 H 點位置，計算並記錄後座最前方與最後方座椅位置其分別對應之頭部重心位置： (請參考末頁圖表)
...	...	...	...
5.2.6 Mark the vertical lines X5 and X95 and the horizontal lines Z95 and Z5 on both the vehicle interior at the struck	5.2.6 Mark the vertical lines X5 and X95 and the horizontal lines Z95 and Z5 on both the vehicle interior at the struck	3.4.5.2.6 於撞擊側之車輛內部及非撞擊側的車輛外部，標記垂直線 X5、X95 與水平線 Z95、Z5(如	3.4.5.2.6 於撞擊側之車輛內部及非撞擊側的車輛外部，標記垂直線 X5、X95 與水平線 Z95、Z5。

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side and on the vehicle exterior on the non-struck side(Figure 4). (請參考末頁圖表) ...	side and on the vehicle exterior on the non-struck side. (請參考末頁圖表) ...	圖 4)。 (請參考末頁圖表) ...	(請參考末頁圖表) ...
5.3 Dummy Placement	5.3 Dummy Placement	3.4.5.3 人偶放置	3.4.5.3 人偶放置
5.3.1 It is the intention that the dummies should not be left to sit directly on the seat for more than 2 hours prior to the test. It is acceptable for the dummy to be left in the vehicle for a longer period, provided that the dummy position is checked no more than one hour prior to test. It is not acceptable for the dummy to be left in the vehicle overnight or for a similarly lengthy period. ...	5.3.1 It is the intention that the dummy should not be left to sit directly on the seat for more than 2 hours prior to the test. It is acceptable for the dummy to be left in the vehicle for a longer period, provided that the dummy position is checked no more than one hour prior to test. It is not acceptable for the dummy to be left in the vehicle overnight or for a similarly lengthy period. ...	3.4.5.3.1 試驗前，人偶不應直接坐在座椅上超過 2 小時。若試驗前 1 小時內檢查人偶定位，則允許人偶放置車內較長時間。不應將試驗人偶整晚留置車內或類似長度的時間。	3.4.5.3.1 試驗前，人偶不應直接坐在座椅上超過 2 小時。若試驗前 1 小時內檢查人偶定位，則允許人偶放置車內較長時間。不應將試驗人偶整晚留置車內或類似長度的時間。
5.3.3 Head and torso	5.3.3 Head and torso	3.4.5.3.3 頭部及軀幹	3.4.5.3.3 頭部及軀幹
5.3.3.2 If the rib angle is not specified by the manufacturer and the torso angle is $23^{\circ} \pm 1^{\circ}$, adjust the dummy until the thorax tilt sensor reads -2° (spine flexion) $\pm 1^{\circ}$	5.3.3.2 If the rib angle is not specified by the manufacturer and the torso angle is $23^{\circ} \pm 1^{\circ}$, adjust the dummy until the thorax tilt sensor reads -2° (2° downwards) $\pm 1^{\circ}$	3.4.5.3.3.2 若車輛業者未宣告肋骨角度且軀幹角度為 23 ± 1 度，則調整人偶，使其胸部感測器讀數為-2 度(脊柱屈曲(Spine flexion)) ± 1 度。 ...	3.4.5.3.3.2 若車輛業者未宣告肋骨角度且軀幹角度為 23 ± 1 度，則調整人偶，使其胸部感測器讀數為-2 度(朝下 2 度) ± 1 度。 ...
5.4 Dummy Positioning Measurements	5.4 Dummy Positioning Measurements	3.4.5.4 人偶位置量測	3.4.5.4 人偶位置量測

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The following measurements are to be recorded prior to the test after the dummy settling and positioning procedures have been carried out. (請參考末頁圖表)	The following measurements are to be recorded prior to the test after the dummy settling and positioning procedures have been carried out. (請參考末頁圖表)	應於試驗前完成人偶放置及位置調整程序後記錄下列量測值。 (請參考末頁圖表)	應於試驗前完成人偶放置及位置調整程序後記錄下列量測值。 (請參考末頁圖表)
6 CARRIER AND POLE 6.2 Pole ... 6.2.3 Where floor deceleration occurs before head to head contact it must be shown that there has not been an influence on the dummy kinematics. 6.2.4 Mark a line along the vertical centreline of the pole which may be used to check the alignment of the test vehicle on the carrier.	6 CARRIER AND POLE 6.2 Pole ... 6.2.3 Mark a line along the vertical centreline of the pole which may be used to check the alignment of the test vehicle on the carrier.	3.4.6 台車及立柱 3.4.6.2 立柱 ... <u>3.4.6.2.3 若台車地板於頭部與頭部接觸前發生減速，則必須證明對於人偶之運動並無影響。</u> <u>3.4.6.2.4 沿著立柱垂直中線標記直線，用以檢查台車上受驗車輛之對準。</u>	3.4.6 台車及立柱 3.4.6.2 立柱 ... <u>3.4.6.2.3 沿著立柱垂直中線標記直線，用以檢查台車上受驗車輛之對準。</u>
7 TEST PARAMETERS 7.2 Alignment 7.2.5 It should be noted that the point of first contact between the pole and vehicle does not align with the impact reference line marked on the vehicle, see Figure 6. (請參考末頁圖表) 7.3 After test	7 TEST PARAMETERS 7.2 Alignment 7.2.5 It should be noted that the point of first contact between the pole and vehicle does not align with the impact reference line marked on the vehicle, see Figure 2. (請參考末頁圖表) 7.3 After test	3.4.7 試驗參數 3.4.7.2 對準 3.4.7.2.5 立柱與車輛首次接觸點不會對準車輛上標記之撞擊參考線，如圖 6 所示。 (請參考末頁圖表) 3.4.7.3 試驗後	3.4.7 試驗參數 3.4.7.2 對準 3.4.7.2.5 立柱與車輛首次接觸點不會對準車輛上標記之撞擊參考線，如圖 2 所示。 (請參考末頁圖表) 3.4.7.3 試驗後

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...	...	...	...
7.3.1.3 Check that the unstruck side doors are not locked and open the doors by hand (front door followed by rear door).	7.3.1.3 Check that the unstruck side doors are not locked and open the doors by hand (front door followed by rear door).	3.4.7.3.1.3 確認非撞擊側車門未上鎖，且手動將車門開啟（依序前車門至後車門）。	3.4.7.3.1.3 確認非撞擊側車門未上鎖，且手動將車門開啟（依序前車門至後車門）。 <u>對於配備自動門鎖之車輛參見 3.16 緊急救援及事故脫困試驗規章。</u>
7.3.1.4 If the doors do not open, record this in the test details.	7.3.1.4 If the doors do not open, record this in the test details.	3.4.7.3.1.4 若車門無法開啟，則將此情況記錄於試驗資料。	3.4.7.3.1.4 若車門無法開啟，則將此情況記錄於試驗資料。
7.3.2 Refer to the Rescue and Extrication protocol for further details of post-test assessment.	7.3.2 Refer to the Rescue and Extrication protocol for further details of post-test assessment.	3.4.7.3.2 <u>試驗後評等之詳細資訊</u> 參見「緊急救援、事故脫困及安全技術試驗規章」。	3.4.7.3.2 <u>車門開啟力量程序</u> 參見 3.16 緊急救援及事故脫困試驗規章。
...	...	...	...
7.5 Side Airbag Head Protection Evaluation (for near-side impact protection devices)	7.5 Side Airbag Head Protection Evaluation	3.4.7.5 側方空氣囊頭部保護評估 <u>(近端側方撞擊保護裝置)</u>	3.4.7.5 側方空氣囊頭部保護評估
7.5.3 Evaluate coverage area of the airbag(s), record and check the dimensions of any joined, stitched or seamed areas, <u>see Figure 7.</u> (請參考末頁圖表)	7.5.3 Evaluate coverage area of the airbag(s), record and check the dimensions of any joined, stitched or seamed areas. (請參考末頁圖表)	3.4.7.5.3 評估空氣囊之覆蓋區域，記錄並檢查連接、縫合或接縫區域的範圍， <u>如圖 7 所示</u> 。 (請參考末頁圖表)	3.4.7.5.3 評估空氣囊之覆蓋區域，記錄並檢查連接、縫合或接縫區域的範圍。 (請參考末頁圖表)
8 DUAL OCCUPANCY TEST 8.1 Vehicle Preparation 8.1.1 Place weights equivalent to a WorldSID 50th dummy (75kg) in the front passenger's seating position in its		<u>3.4.8 雙乘員試驗</u> <u>3.4.8.1 車輛整備</u> <u>3.4.8.1.1 將相當於 WorldSID 百分之五 0 人偶的重量 (75kg) 放置第一排乘客座椅位置，該座椅位</u>	

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rearmost position. 8.1.2 Place weights with a mass of the rated cargo and luggage mass or 61kg whichever is less, in the luggage compartment of the vehicle. The normal luggage compartment should be used i.e. rear seats should not be folded to increase the luggage capacity. Spread the weights as evenly as possible over the base of the luggage compartment. If the weights cannot be evenly distributed, concentrate weights towards the centre of the compartment. 8.1.3 Place weights equivalent to a WorldSID 50th dummy (75kg) in the front driver's seat of the car in its test position and front passenger's seat of the car in its test position. 8.2 Passenger Dummy 8.2.1 A WorldSID 50th percentile male test dummy shall be used in the front passenger's position. It shall conform to the specification detailed in ISO 15830, parts 1-5. 8.2.2 The dummy shall conform to the		<u>於最後方位置。</u> <u>3.4.8.1.2 於車輛行李廂放置額定貨物及行李重量或 61kg (取兩者當中較低者)。應使用一般狀態的行李廂，即不應摺疊後排座椅來增加行李廂容量。將重量盡可能均勻攤放於行李廂底部，若無法均勻放置，則將重量集中於行李廂中間。</u> <u>3.4.8.1.3 將相當於 WorldSID 百分之五 0 人偶的重量 (75kg) 放置位於試驗位置之駕駛座及第一排乘客座。</u> <u>3.4.8.2 乘客人偶</u> <u>3.4.8.2.1 WorldSID 百分之五 0 成年男性試驗人偶應安裝於第一排乘客座，該人偶應符合 ISO 15830 第 1 至 5 部份詳列之規格。</u> <u>3.4.8.2.2 人偶應符合 3.4.2 詳列之</u>	

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specifications detailed in Section 2. 8.2.3 The dummy shall be re-certified after every TEN impact tests. 8.2.4 Dummy painting (sizes specified in Section 2.6.1) Driver inboard side of head Head (100 mm x 100mm tape outline) Red Head CoG (circle Ø40mm) Yellow Head top along mid sagittal plane Green Passenger inboard side of head Head (100 mm x 100mm tape outline) Blue Head CoG (circle Ø40mm) Orange Head top along mid sagittal plane Yellow Shoulder/Arm Green 8.2.5 Dummy Instrumentation The WorldSID on the passenger's seat shall be instrumented to record the channels listed below. Additional channels may be recorded. (請參考末頁圖表)		<u>規格。</u> <u>3.4.8.2.3 人偶每經 10 次撞擊試驗後，應重新進行查驗。</u> <u>3.4.8.2.4 人偶塗色（範圍參見 3.4.2.6.1 規定）</u> <u>駕駛 頭部內側</u> <u>頭部（膠帶輪廓 100mm x 100mm）</u> <u>紅</u> <u>頭部重心（圓圈直徑 40mm） 黃</u> <u>頭頂沿中矢狀面 綠</u> <u>乘客 頭部內側</u> <u>頭部（膠帶輪廓 100mm x 100mm）</u> <u>藍</u> <u>頭部重心（圓圈直徑 40mm） 橘</u> <u>頭頂沿中矢狀面 黃</u> <u>肩部/手臂 綠</u> <u>3.4.8.2.5 人偶感測器及資料擷取系統設置</u> <u>乘客座 WorldSID 百分之五 0 成年男性人偶之感測器及資料擷取系統應設定至得以記錄下列頻道。</u> <u>另可記錄額外頻道。</u> <u>(請參考末頁圖表)</u>	

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8.3 Overview of Settings for dual occupancy test (請參考末頁圖表) 8.3.1 Determine the H-point of the passenger's seat as detailed in Section 5.1. 8.3.2 Set the passenger's seat to rearmost with a seat back angle and, where adjustable, height to match that of the driver's seat. 8.3.3 Install the passenger dummy as detailed in Section 5.3. 8.3.4 If the CoG of the passenger's head is rearwards of the impact line, slide the seat forwards until the CoG is in line with the impact line (or the nearest seat notch forwards). 8.3.5 If the CoG of the passenger's head on the inboard side is forwards of the impact line, ensure the seat is in the rearmost position and make no further adjustments. 8.3.6 Dummy Positioning Measurements for passenger side The following measurements are to be		<u>3.4.8.3 雙乘員試驗設定綜覽</u> (請參考末頁圖表) <u>3.4.8.3.1 依照 3.4.5.1 詳述之步驟決定乘客座 H 點。</u> <u>3.4.8.3.2 乘客座椅設置於最後方的位置，椅背角度及高度（若可調整）調整至與駕駛座相同。</u> <u>3.4.8.3.3 依照 3.4.5.3 詳述之步驟安裝乘客人偶。</u> <u>3.4.8.3.4 若乘客頭部重心位於撞擊線後方，則將座椅向前滑動，直到重心對齊撞擊線（或向前最接近的段位）。</u> <u>3.4.8.3.5 若乘客頭部內側重心位於撞擊線前方，則確保座椅位於最後方位置，不再進一步調整。</u> <u>3.4.8.3.6 乘客人偶位置量測</u> 應於試驗前完成人偶放置及位置調整程序後記錄下列量測值，如	

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recorded prior to the test after the dummy settling and positioning procedures have been carried out, see Figure 8. (請參考末頁圖表) 8.4 Impact Alignment The impact alignment in the dual occupancy test shall also be in accordance with Section 1.4, Figure 9. (請參考末頁圖表)		<u>圖 8 所示。</u> <u>(請參考末頁圖表)</u> <u>3.4.8.4 撞擊對準</u> <u>雙乘員試驗之撞擊對準亦應符合</u> <u>3.4.1.4 規定，如圖 9 所示。</u> <u>(請參考末頁圖表)</u>	

(2025 年 Euro NCAP 規章)

3.1.2

Location	Parameter	Minimum amplitude	Channel count
Head	Linear acceleration, Ax, Ay, Az	250g	3
	<u>Angular velocity, ω_x, ω_y, ω_z</u>	<u>4000deg/sec</u>	<u>3</u>
Upper neck	Forces and moments Fx, Fy, Fz, Mx, My, Mz	5kN, 300Nm	6
Shoulder(s) ¹ – Joint	Forces, Fx, Fy, Fz	8kN	3(6)
Shoulder – Rib	Displacement & rotation	100mm	2
Thorax - Upper rib	Displacement & rotation	100mm	2
Thorax - Mid rib	Displacement & rotation	100mm	2
Thorax - Lower rib	Displacement & rotation	100mm	2
Thoracic temperature ²	Temperature, see 2.5.1.3	30°C	1
Abdomen - Upper rib	Displacement & rotation	100mm	2
Abdomen - Lower rib	Displacement & rotation	100mm	2
Spine - T12	Acceleration, Ax, Ay, Az	200g	3
Pelvis	Acceleration, Ax, Ay, Az	200g	3
Pelvis – Pubic	Force	5kN	1
Femoral neck – struck side only	力, F_x , F_y , F_z	5kN	3
	Total Channels		38(41)

¹ In a dual occupancy test, both driver shoulders shall be instrumented.

² It is not necessary for this channel to be recorded through the dummy onboard DAU.

(2019 年 Euro NCAP 規章)

3.1.2

Location	Location	Minimum amplitude	Channel count
Head	Linear acceleration, Ax, Ay, Az	250g	3
Upper neck	Forces and moments Fx, Fy, Fz, Mx, My, Mz	5kN, 300Nm	6
Shoulder – Joint	Forces, Fx, Fy, Fz	8kN	3
Shoulder – Rib	Displacement & rotation	100mm	2
Thorax - Upper rib	Displacement & rotation	100mm	2
Thorax - Mid rib	Displacement & rotation	100mm	2
Thorax - Lower rib	Displacement & rotation	100mm	2
Thoracic temperature*	Temperature, see 2.5.1.3	30°C	1
Abdomen - Upper rib	Displacement & rotation	100mm	2
Abdomen - Lower rib	Displacement & rotation	100mm	2
Spine - T12	Acceleration, Ax, Ay, Az	200g	3
Pelvis	Acceleration, Ax, Ay, Az	200g	3
Pelvis – Pubic	Force	5kN	1
Femoral neck – struck side only	Force, Fx, Fy, Fz	5kN	3
	Total Channels		35

* It is not necessary for this channel to be recorded through the dummy onboard DAU.

(修正後 TNCAP 規章草案)

3.4.3.1.2

位置	參數	最低振幅	頻道數量
頭部	線性加速度(Linear acceleration) , A_x 、 A_y 、 A_z	250g	3
	<u>角速度(Angular velocity) , ω_x、 ω_y、ω_z</u>	<u>4000deg/sec</u>	<u>3</u>
上頸部	力與力矩 F_x 、 F_y 、 F_z , M_x 、 M_y 、 M_z	5kN, 300Nm	6
肩部—關節 ¹	力 , F_x 、 F_y 、 F_z	8kN	3 <u>(6)</u>
肩部—肋骨	位移及旋轉	100mm	2
胸部—上肋骨	位移及旋轉	100mm	2
胸部—中肋骨	位移及旋轉	100mm	2
胸部—下肋骨	位移及旋轉	100mm	2
胸部溫度 ²	溫度 , 如 3.4.2.5.1.3	30°C	1
腹部—上肋骨	位移及旋轉	100mm	2
腹部—下肋骨	位移及旋轉	100mm	2
脊椎—T12	加速度 , A_x 、 A_y 、 A_z	200g	3
骨盆	加速度 , A_x 、 A_y 、 A_z	200g	3
骨盆—恥骨	力	5kN	1
股骨頸—僅撞擊側	力 , F_x 、 F_y 、 F_z	5kN	3
	頻道總數		38 <u>(41)</u>

備註：1 雙乘員試驗中，駕駛兩側肩部皆須記錄。

2 此頻道無須透過人偶裝載之資料擷取設備(Data acquisition unit , DAU)進行記錄。

(修正前 TNCAP 規章)

3.4.3.1.2

位置	參數	最低振幅	頻道數量
頭部	線性加速度(Linear acceleration) , A_x 、 A_y 、 A_z	250g	3
上頸部	力與力矩 F_x 、 F_y 、 F_z 、 M_x 、 M_y 、 M_z	5kN, 300Nm	6
肩部－關節	力， F_x 、 F_y 、 F_z	8kN	3
肩部－肋骨	位移及旋轉	100mm	2
胸部－上肋骨	位移及旋轉	100mm	2
胸部－中肋骨	位移及旋轉	100mm	2
胸部－下肋骨	位移及旋轉	100mm	2
胸部溫度*	溫度，如 3.4.2.5.1.3	30℃	1
腹部－上肋骨	位移及旋轉	100mm	2
腹部－下肋骨	位移及旋轉	100mm	2
脊椎－T12	加速度， A_x 、 A_y 、 A_z	200g	3
骨盆	加速度， A_x 、 A_y 、 A_z	200g	3
骨盆－恥骨	力	5kN	1
股骨頸－僅撞擊側	力， F_x 、 F_y 、 F_z	5kN	3
	頻道總數		35

備註：*此頻道無須透過人偶裝載之資料擷取設備(Data acquisition unit，DAU)進行記錄。

(2025 年 Euro NCAP 規章)

3.3.1

TOTAL CHANNELS

1 x WorldSID	<u>38(41)</u>
1x Vehicle	2
1x Carrier	1
TOTAL	<u>40(43)</u>

(2019 年 Euro NCAP 規章)

3.3.1

TOTAL CHANNELS

1 x WorldSID	<u>35</u>
1x Vehicle	2
1x Carrier	1
TOTAL	<u>38</u>

(修正後 TNCAP 規章草案)

3.4.3.3.1

頻道總數

1 x WorldSID	<u>38(41)</u>
1 x 車輛	2
1 x 台車	1
總數	<u>40(43)</u>

(修正前 TNCAP 規章)

3.4.3.3.1

1 x WorldSID	<u>35</u>
1 x 車輛	2
1 x 台車	1
總數	<u>38</u>

(2025 年 Euro NCAP 規章)

4.1 Overview of Settings

Adjustment	Required setting	Notes	Methods
Front seat fore/aft	As defined in 4.4		
Front seat cushion tilt	As defined in 4.4		
Front seat height	As defined in 4.4		
Front seat torso angle	Manufacturer's design position.	Where no design position is given, set to 23° to vertical, as defined by Torso angle. Must be the same in AE-MDB test	See Section 5.1
Front seat lumbar support	Fully retracted		See Section 4.2

Adjustment	Required setting	Notes	Methods
Front seat cushion length	Fully retracted		
Front head restraint height & tilt	See Section 6, Whiplash testing protocol	As whiplash test position. If there is any interference with the rear of the dummy head, move the HR to the most rearward position	
Front seat belt anchorage	Manufacturer's 50th percentile design position	If no design position, then set to mid position, or nearest notch upwards	See section 5.3.6. Webbing must not be in contact with the neck.
Steering wheel	Highest position and most outward		See Section 4.5
Rear seat facing	Forwards		
Rear seat lateral position	Most outboard		
Rear seat fore/aft	Fully rearward		See Section 4.6
Rear seat cushion tilt	Manufacturer's design position	Permissible up to mid position, otherwise lowest	
Rear seat height	Manufacturer's design position	Where no design position is given, set to lowest	
Rear seat back angle	Manufacturer's design position	Where no design position is given, set to 25° to vertical, as defined by torso angle	
Rear seat lumbar support	Fully retracted		
Rear seat cushion length	Fully retracted		

Adjustment	Required setting	Notes	Methods
Rear head restraint height & tilt	As recommended in vehicle handbook.	Where no details are provided in the handbook, set to mid or next lowest position for height and mid locking position for tilt. Must not interfere with child/CRS installation	
Rear seat belt anchorage	As recommended in vehicle handbook for CRS installation	If no recommendation then set to midposition, or nearest notch upwards. MUST be same as MPDB	
Arm-rests (Front seats)	Lowered / in use position	May be left up if dummy positioning does not allow lowering. Single occupancy test only	
Arm-rests (Rear seats)	Stowed		
Side window glazing	All raised		
Gear change lever	In the neutral position		
Parking brake	Engaged		
Pedals	Normal position of rest	Adjustable pedals fully forward	See Section 4.2
Doors	Closed, not locked	For automatic door locks, refer to the Rescue and Extrication protocol. Rear child locks disengaged.	
Roof	Raised		
Sunroof	Closed	Fixed sunroofs should not be modified for test	

Adjustment	Required setting	Notes	Methods
Sun visors	Stowed		
Rear view mirror	Normal position of use		
Front passenger airbag	Enabled		

Adjustments not listed will be set to mid-positions or nearest positions rearward, lower or outboard.

(2019 年 Euro NCAP 規章)

4.1 Overview of Settings

Adjustment	Required Setting	Notes	Methods
Seat Fore/Aft	As defined in 4.4		
Seat Base Tilt	As defined in 4.4		
Seat Height	As defined in 4.4		
Torso Angle	Manufacturer's design position	Otherwise 23° to Vertical	See Section 5.1
Seat Lumbar Support	Fully retracted		See Section 0
Front Head Restraint Height & Tilt	Mid locking position	As whiplash test position. If there is any interference with the rear of the dummy head, move the HR to the most rearward position.	See Section 6.2 Whiplash testing protocol.
Steering wheel	Highest position and most outward		See Section 4.5
Rear Seat Fore/Aft	Fully rearward		See Section 4.6
Rear Seat Back Angle	Manufacturer's design position	Otherwise 25° to Vertical	See Section 4.6
Rear Seat Facing	Forward		

Adjustment	Required Setting	Notes	Methods
Rear Head Restraint Height & Tilt	As recommended in vehicle handbook.	Where no details are provided in the handbook, set to mid or next lowest position for height and mid locking position for tilt.	See Section 6.2 Whiplash testing protocol.
Arm-rests (Front seats)	Lowered position	May be left up if dummy positioning does not allow lowering. Where adjustable place in horizontal position.	
Arm-rests (Rear seats)	Stowed position		
Side Window Glazing	All raised		
Gear change lever	In the neutral position		
Parking Brake	Engaged		
Pedals	Normal position of rest	Adjustable pedals fully forward	See Section 0
Doors	Closed, not locked		
Roof /sunroof	Raised/fully closed	Where applicable	
Sun Visors	Stowed position		
Rear view mirror	Normal position of use		
Seat belt anchorage (where adjustable)	Initially, manufacturer's 50th percentile design position	If no design position then set to mid position, or nearest notch upwards	See Section 5.3.6

Adjustments not listed will be set to mid-positions or nearest positions rearward, lower or outboard.

(修正後 TNCAP 規章草案)

3.4.4.1 設定綜覽

調整	設定要求	附註	做法
第一排 座椅前後位置	如 3.4.4.4 定義		
第一排 座椅 座墊 傾斜度	如 3.4.4.4 定義		
第一排 座椅高度	如 3.4.4.4 定義		
第一排 座椅軀幹角度	車輛業者設計位置	若無設計位置，則設定至垂直向後傾斜 23 度（如軀幹角度所定義）。須與側方撞擊試驗之位置相同。	如 3.4.5.1
第一排 座椅腰部支撐	完全縮回		如 3.4.4.2
第一排 座椅 座墊 長度	完全縮回		
第一排座椅頭枕高度及傾斜度	如「前座鞭甩試驗規章」3.5.5.2	同鞭甩試驗位置。頭枕若會影響人偶頭部後方，則將頭枕移至最後方的位置。	
第一排 座椅安全帶固定裝置	初始為車輛業者第 50 百分位之設計位置	若無設計位置，則 設定 至中間位置或至向上最接近的段位	如 3.4.5.3.6。 織帶不得與頸部接觸。
方向盤	最高且最向後（靠人偶）位置		如 3.4.4.5
後座 面對 方向	朝前		
後座 橫向 位置	最外側		
後座前後位置	完全向後		如 3.4.4.6
後座 座墊傾斜角度	車輛業者設計位置	最多允許至中間位置，否則為最低位置	
後座 座椅高度	車輛業者設計位置	若無設計位置，則設定至最低位置	
後座 軀幹 角度	車輛業者設計位置	若無設計位置，則設定至垂直向後傾斜 25 度（如軀幹角度所定義）	
後座 腰部支撐	完全縮回		
後座 椅墊長度	完全縮回		

調整	設定要求	附註	做法
後座頭枕高度及傾斜度	如車主手冊建議	手冊若未提供相關資訊，則將高度 <u>設定</u> 至中間或向下最接近的位置，並將傾斜度 <u>設定</u> 至中間鎖定位置。 <u>不可影響兒童/兒童保護裝置安裝。</u>	
<u>後座安全帶固定裝置</u>	<u>如車主手冊對於兒童保護裝置安裝之建議</u>	<u>若無建議，則設定至中間位置或中間向上最接近的段位。須與前方偏置試驗之位置相同</u>	
扶手（第一排座椅）	使用位置	若人偶放置後扶手無法位於使用位置，則可保持於非使用位置。 <u>僅限單乘員之試驗。</u>	
扶手（後座）	收納位置		
車窗	全部升起		
變速箱	空檔		
駐煞車	致動(Engaged)		
踏板	未踩踏之正常位置 (Position of rest)	可調整式踏板設於完全向前的位置	如 3.4.4.2
車門	關閉但不上鎖 (除自動門鎖外)	自動門鎖參見「 <u>緊急救援、事故脫困及安全技術試驗規章</u> 」。 <u>後門兒童安全鎖處於解鎖狀態。</u>	
車頂	升起		
天窗	<u>關閉</u>	<u>固定式天窗不應為了測試而改裝</u>	
遮陽板	收合位置		
照後鏡	正常使用位置		
<u>第一排乘客空氣囊</u>	<u>啟動</u>		

備註：未列出之調整將設定在中間位置，或向後、向下或向外最接近的位置。

(修正前)

3.4.4.1 設定綜覽

調整	設定要求	附註	做法
座椅前後位置	如 3.4.4.4 定義		
座椅 <u>底座(seat base)</u> 傾斜度	如 3.4.4.4 定義		
座椅高度	如 3.4.4.4 定義		
軀幹角度	車輛業者之設計位置	<u>否則</u> 為垂直向後傾斜 23 度	如 3.4.5.1
座椅腰部支撐	完全縮回		如 3.4.4.2
第一排座椅頭枕高度及傾斜度	<u>中間鎖定位置</u>	同鞭甩(Whiplash)試驗位置。頭枕若會影響人偶頭部後方，則將頭枕移至最後方的位置。	如「 <u>前座鞭甩試驗規章</u> 」3.5.5.2
方向盤	最高且最向後（靠人偶）位置		如 3.4.4.5
後座前後位置	完全向後		如 3.4.4.6
後座椅背角度	車輛業者之設計位置	<u>否則為</u> 垂直向後傾斜 25 度	如 3.4.4.6
後座方向	朝前		
後座頭枕高度及傾斜度	如車主手冊建議	手冊若未提供相關資訊，則將高度調整至中間或向下最接近的位置，並將傾斜度調整至中間鎖定位置。	如「 <u>前座鞭甩試驗規章</u> 」3.5.5.2
扶手（第一排座椅）	使用位置	若人偶放置後扶手無法位於使用位置，則可保持於非使用位置。 <u>於水平位置可調整處。</u>	
扶手（後座）	收納位置		
車窗	全部升起		

調整	設定要求	附註	做法
變速箱	空檔		
駐煞車	致動(Engaged)		
踏板	未踩踏之正常位置 (Position of rest)	可調整式踏板設於完全向前的位置	如 3.4.4.2
車門	關閉但不上鎖 (除自動門鎖外)	自動門鎖參見 3.16 緊急救援及事故脫困試驗規章	
車頂/ <u>天窗</u>	升起/ <u>完全關閉</u>	<u>依實際狀況</u>	
遮陽板	收合位置		
照後鏡	正常使用位置		
安全帶固定裝置 (<u>若可調整</u>)	初始為車輛業者第 50 百分位之設計位置	若無設計位置，則調整至中間位置或至向上最接近的段位	如 3.4.5.3.6

備註：未列出之調整將設定在中間位置，或向後、向下或向外最接近的位置。

(2025 年 Euro NCAP 規章)

5.2.1

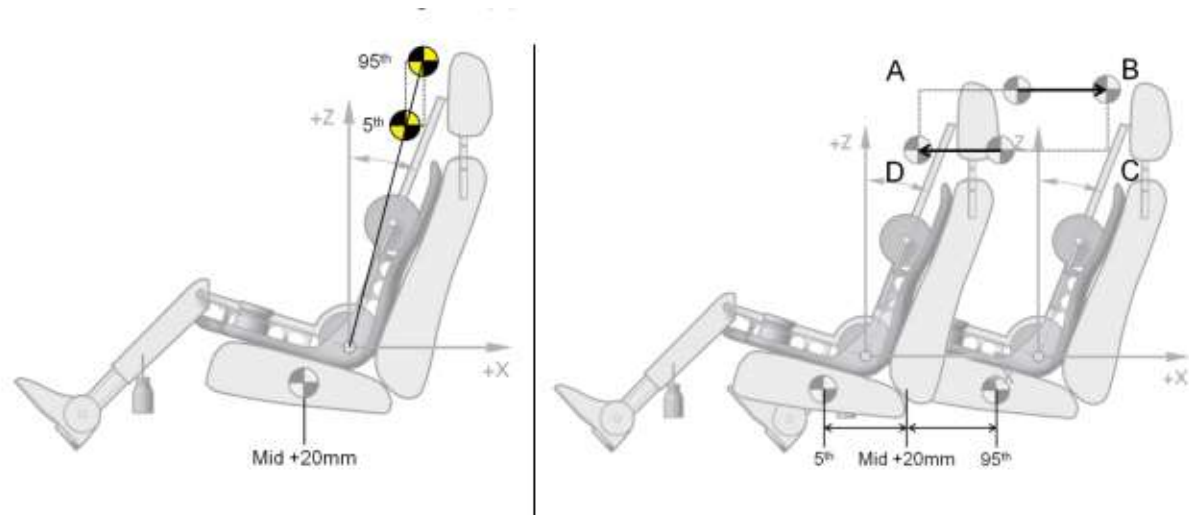


Figure 2

5.2.3

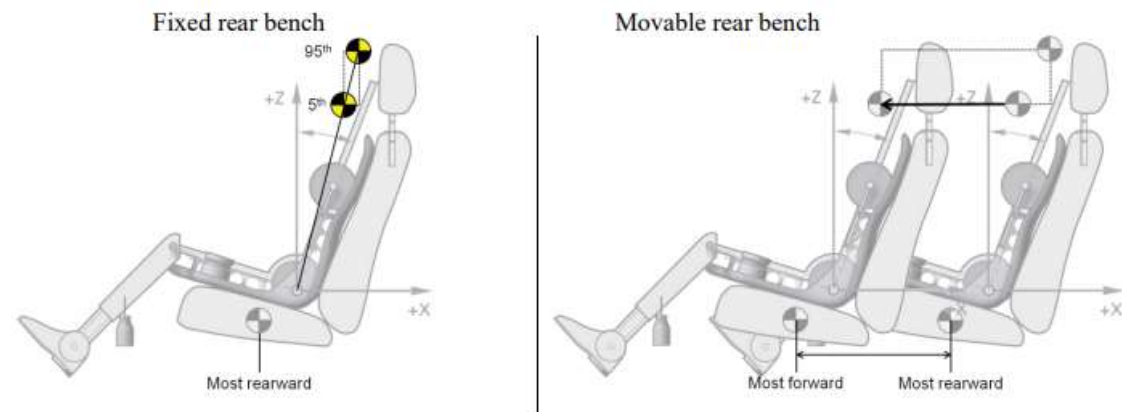


Figure 3

5.2.6

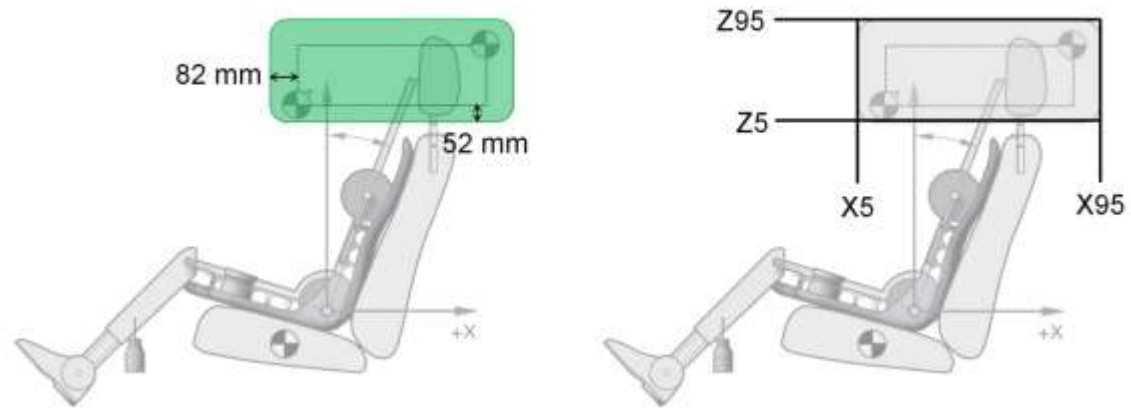
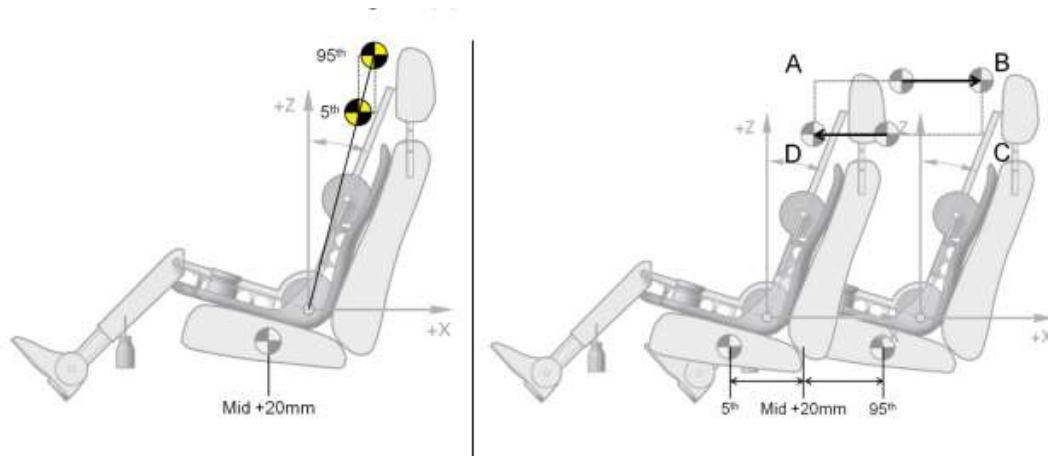


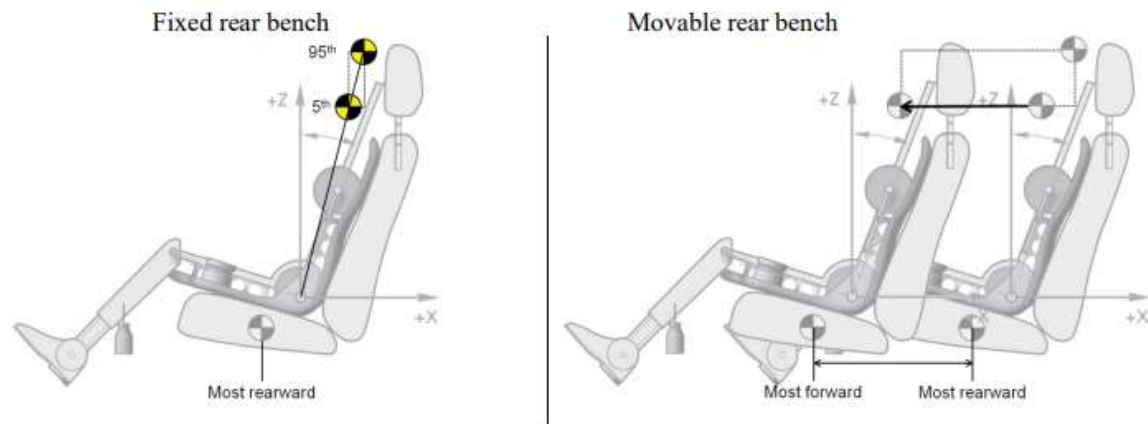
Figure 4

(2019 年 Euro NCAP 規章)

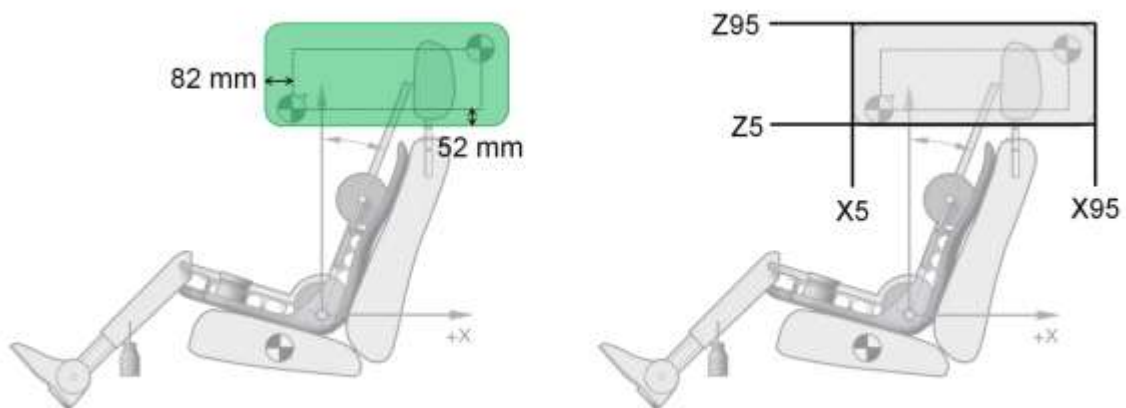
5.2.1



5.2.3



5.2.6



(修正後 TNCAP 規章草案)

3.4.5.2.1

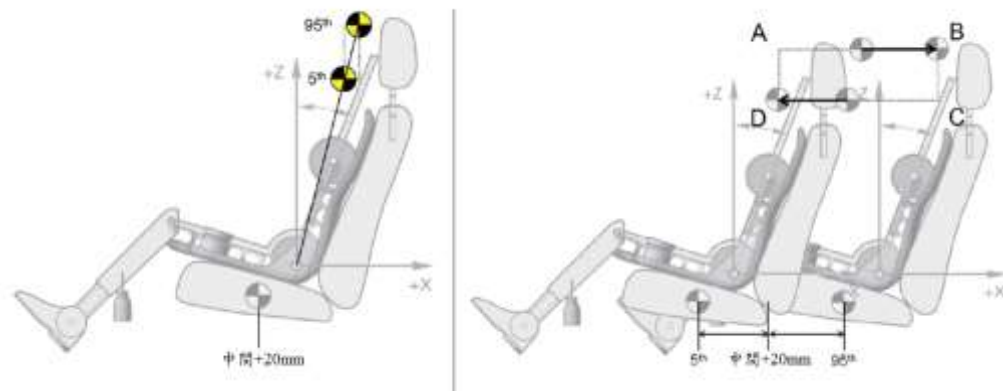


圖 2

3.4.5.2.3

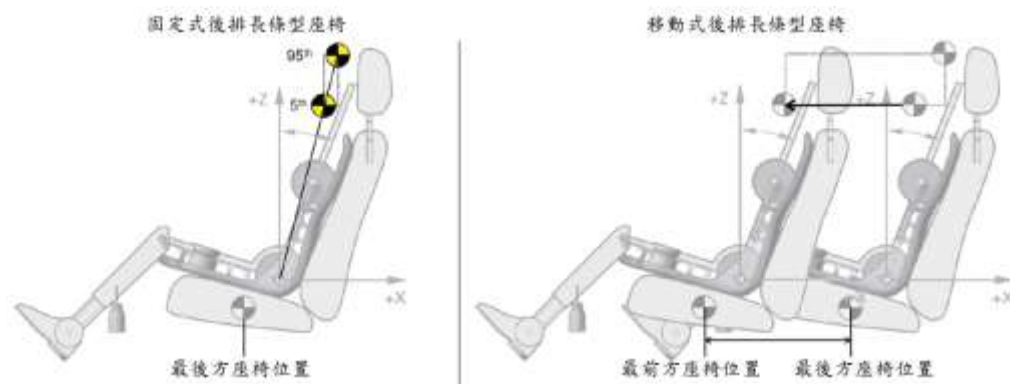


圖 3

3.4.5.2.6

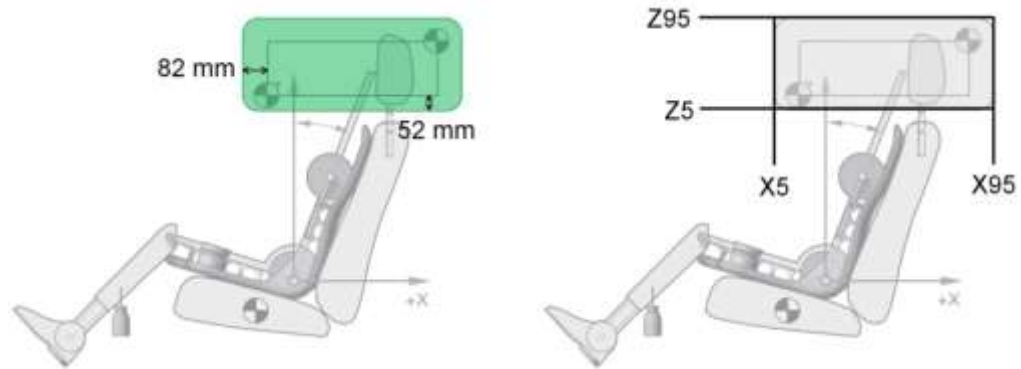
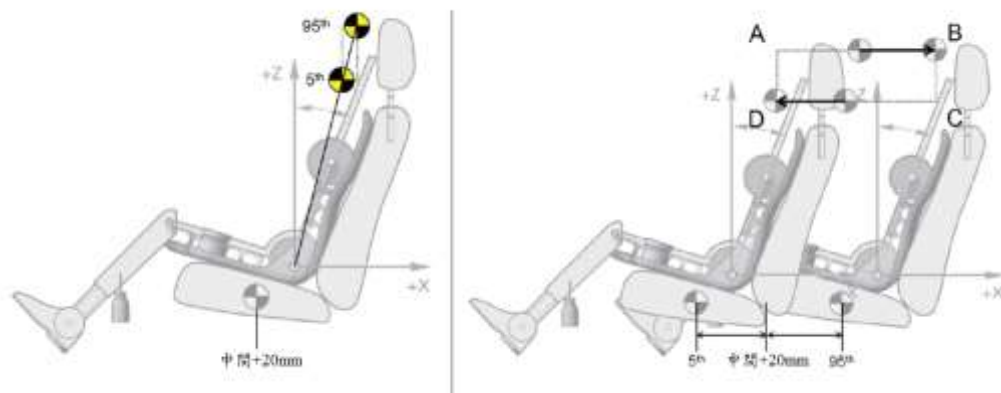


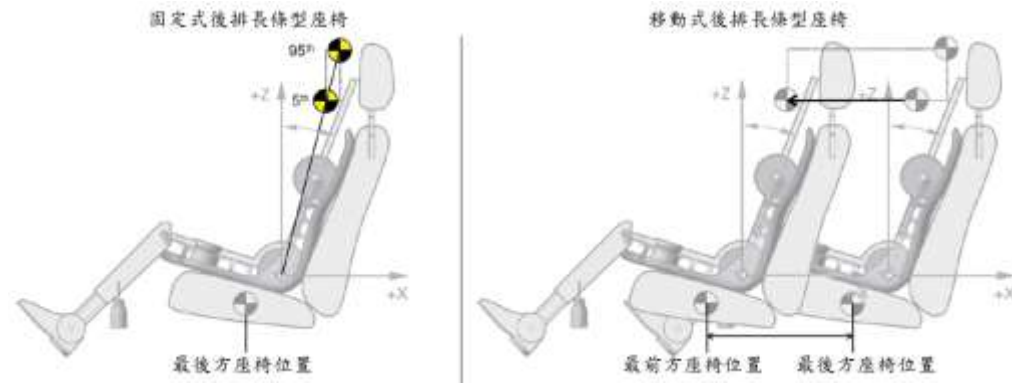
圖 4

(修正前 TNCAP 規章)

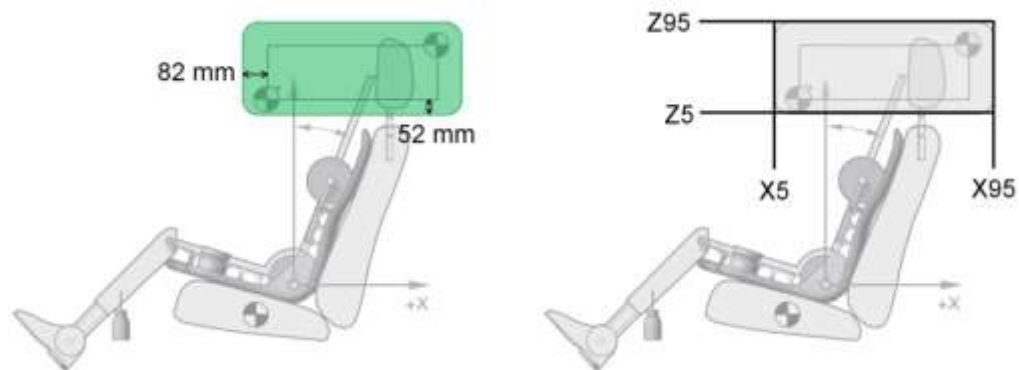
3.4.5.2.1



3.4.5.2.3



3.4.5.2.6



(2025 年 Euro NCAP 規章)

5.4

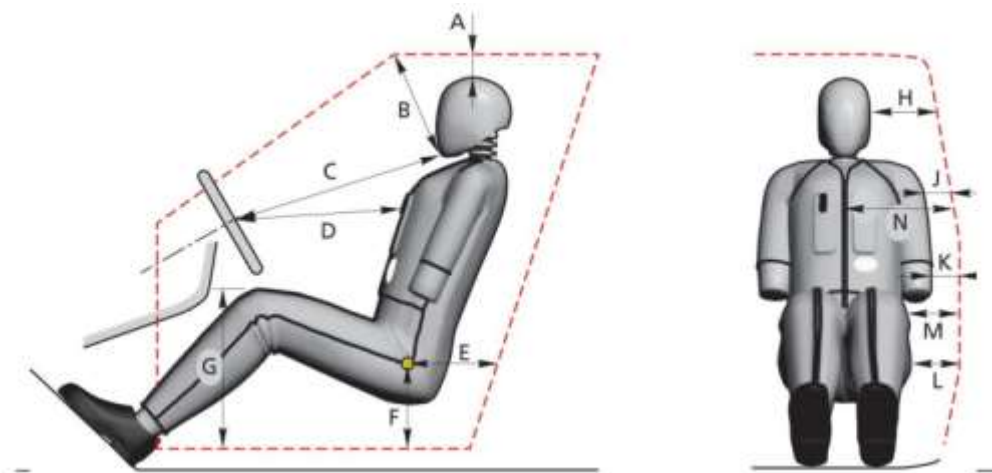
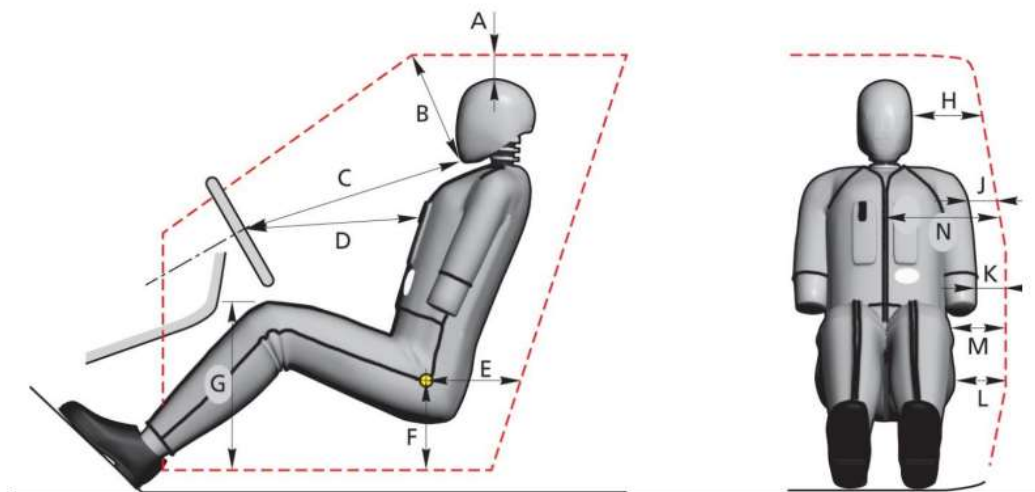


Figure 5

(2019 年 Euro NCAP 規章)

5.4



(修正後 TNCAP 規章草案)

3.4.5.4

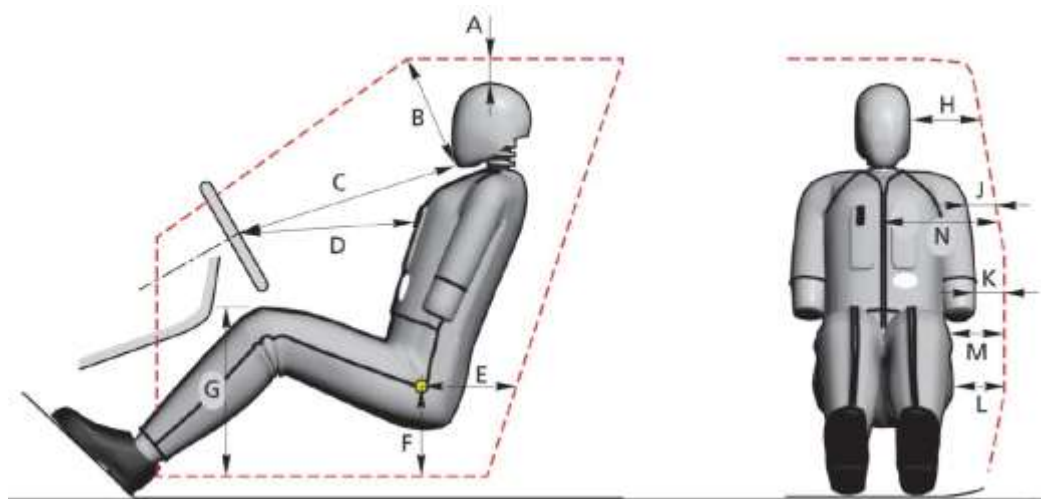
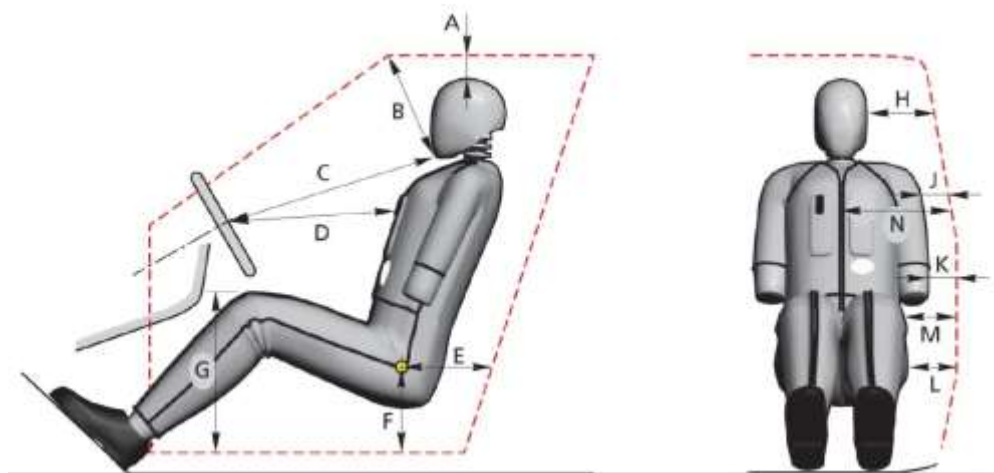


圖 5

(修正前 TNCAP 規章)

3.4.5.4



(2025 年 Euro NCAP 規章)

7.2.5

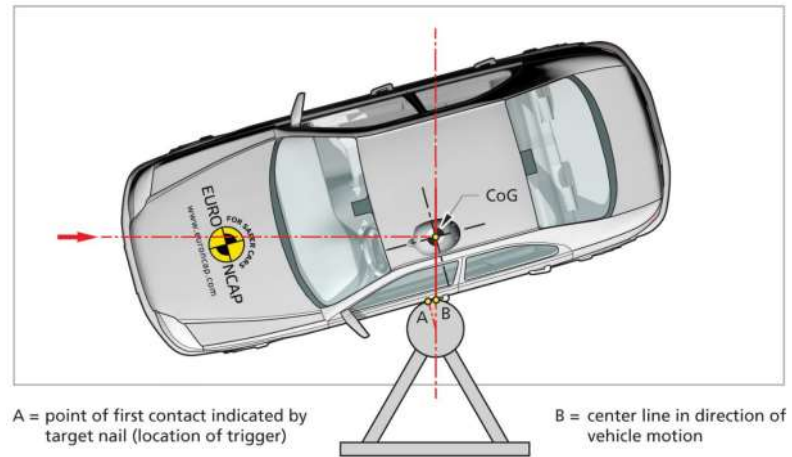


Figure 6: Point of first contact

(2019 年 Euro NCAP 規章)

7.2.5

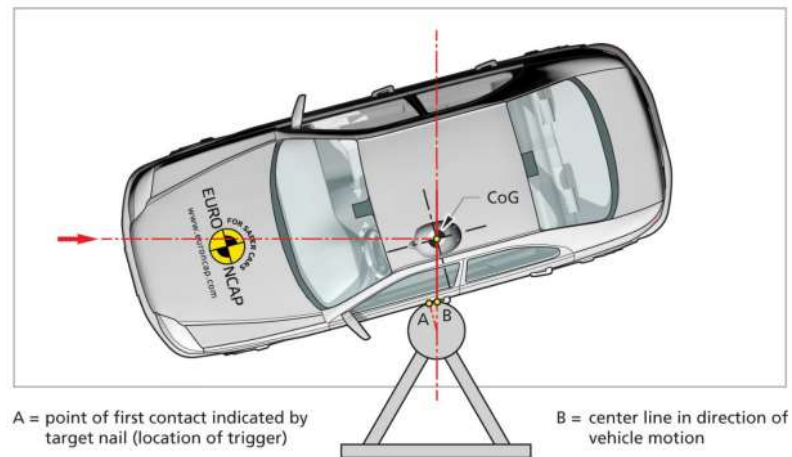


Figure 2: Point of first contact

(修正後 TNCAP 規章草案)

3.4.7.2.5

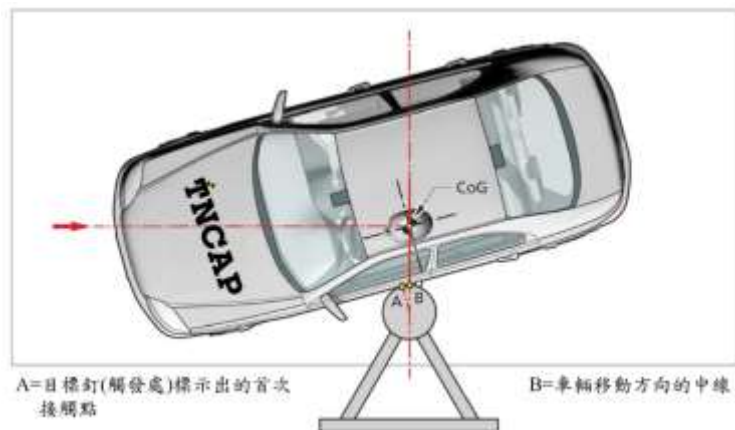


圖 6：首次接觸點

(修正前 TNCAP 規章)

3.4.7.2.5

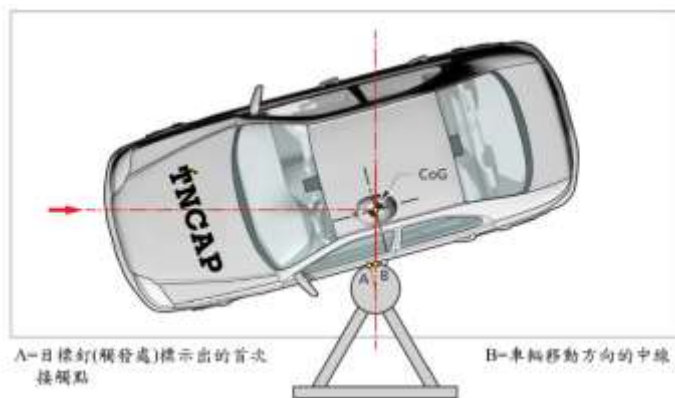


圖 2：首次接觸點

(2025 年 Euro NCAP 規章)

7.5.3

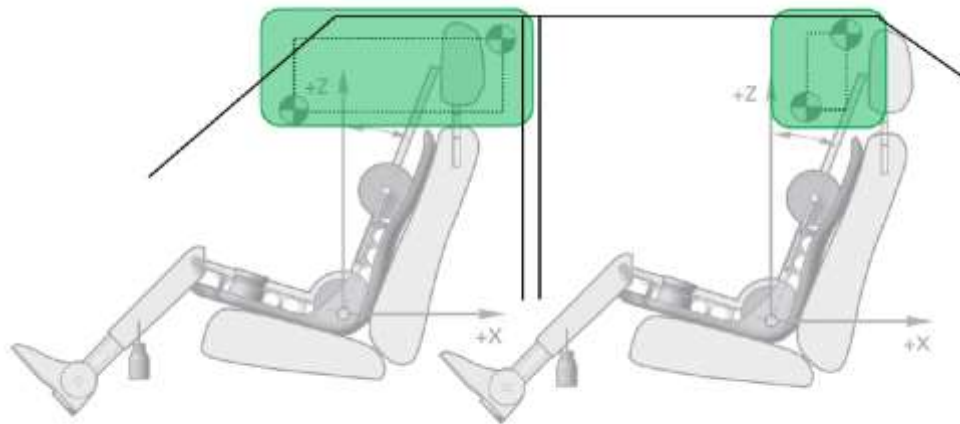
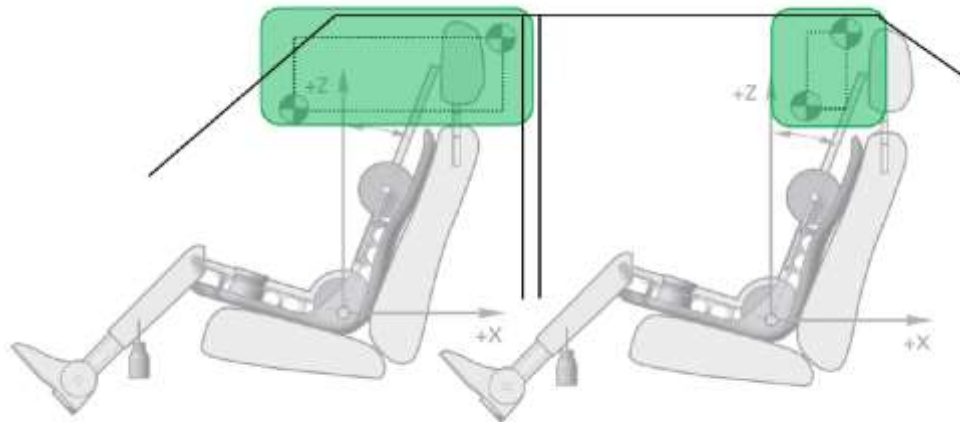


Figure 7

(2019 年 Euro NCAP 規章)

7.5.3



(TNCAP 規章草案)

3.4. 7.5.3

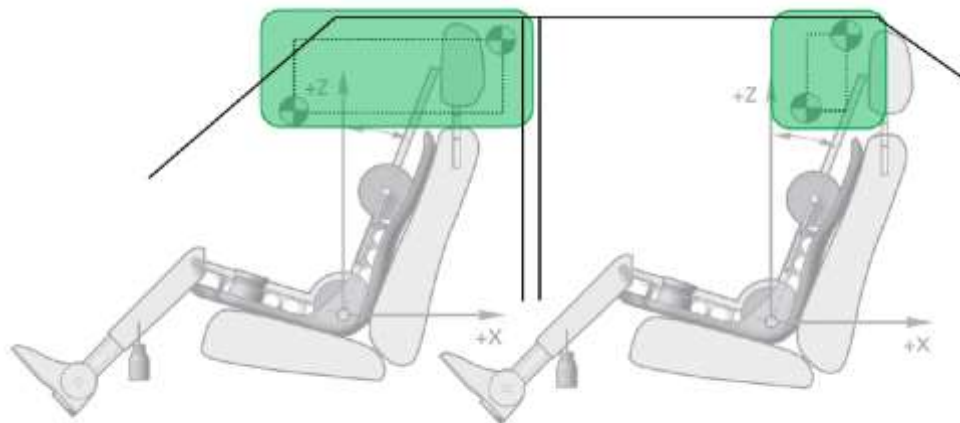
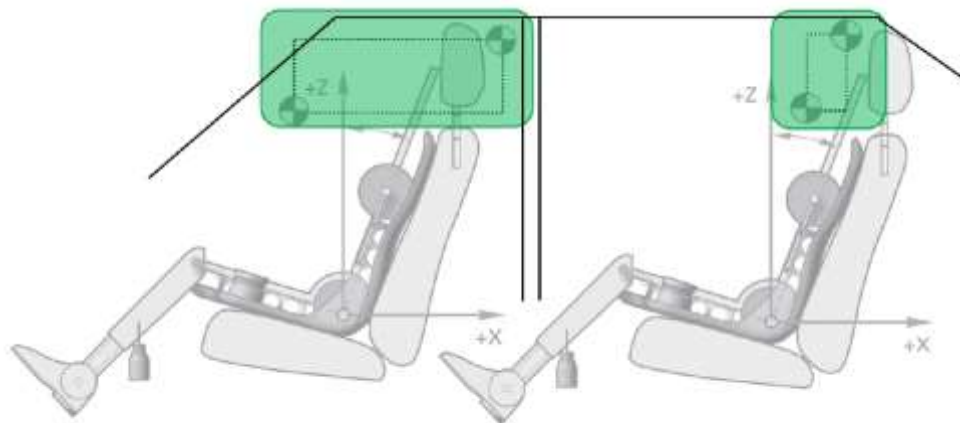


圖 7

(修正前 TNCAP 規章)

3.4.7.5.3



(2025 年 Euro NCAP 規章)

8.2.5

Location	Parameter	Minimum amplitude	Channel count
Head	Linear acceleration, Ax, Ay, Az	250g	3
Upper neck	Forces and moments Fx, Fy, Fz, Mx, My, Mz	5kN, 300Nm	6
Shoulder – Joint	Forces, Fx, Fy, Fz	8kN	3
Spine - T12	Acceleration, Ax, Ay, Az	200g	3
Pelvis	Acceleration, Ax, Ay, Az	200g	3
Pelvis – Pubic	力	5kN	1
	Total Channels		19

(修正後 TNCAP 規章草案)

3.4.8.2.5

<u>位置</u>	<u>參數</u>	<u>最低振幅</u>	<u>頻道數量</u>
<u>頭部</u>	<u>線性加速度(Linear acceleration) , Ax、Ay、Az</u>	<u>250g</u>	<u>3</u>
<u>上頸部</u>	<u>力與力矩 Fx、Fy、Fz、Mx、My、Mz</u>	<u>5kN, 300Nm</u>	<u>6</u>
<u>肩部－關節</u>	<u>力，Fx、Fy、Fz</u>	<u>8kN</u>	<u>3</u>
<u>脊椎－T12</u>	<u>加速度，Ax、Ay、Az</u>	<u>200g</u>	<u>3</u>
<u>骨盆</u>	<u>加速度，Ax、Ay、Az</u>	<u>200g</u>	<u>3</u>
<u>骨盆－恥骨</u>	<u>力</u>	<u>5kN</u>	<u>1</u>
	<u>頻道總數</u>		<u>19</u>

(2025 年 Euro NCAP 規章)

8.3

Adjustment	Required Setting	Notes	Methods
Seat Fore/Aft	As defined in 4.4	Driver	
Seat Fore/Aft	Rearmost	Passenger. The head CoG must be no further rearward than the impact line	See Section 8.3.2
Seat Base Tilt	As defined in 4.4	Driver and Passenger	
Seat Height	As defined in 4.4	Driver and Passenger	
Torso Angle	Manufacturer's design position	Otherwise 23° to Vertical Identical for driver and passenger	See Section 5.1
Seat Lumbar Support	Fully retracted		See Section 4.2
Arm-rests (Front seats)	Raised / not in use position		

Adjustments not listed will be set according to Section 4.1.

(修正後 TNCAP 規章草案)

3.4.8.3

<u>調整</u>	<u>設定要求</u>	<u>附註</u>	<u>做法</u>
<u>座椅前後位置</u>	<u>如 3.4.4.4 定義</u>	<u>駕駛</u>	
<u>座椅前後位置</u>	<u>最後方的位置</u>	<u>乘客。</u> <u>頭部重心不得較撞擊線更後方</u>	<u>如 3.4.8.3.2</u>
<u>座墊傾斜度</u>	<u>如 3.4.4.4 定義</u>	<u>駕駛及乘客</u>	
<u>座椅高度</u>	<u>如 3.4.4.4 定義</u>	<u>駕駛及乘客</u>	

<u>調整</u>	<u>設定要求</u>	<u>附註</u>	<u>做法</u>
<u>軀幹角度</u>	<u>車輛業者設計位置</u>	<u>否則為垂直向後傾斜 23 度。</u> <u>駕駛與乘客相同</u>	<u>如 3.4.5.1</u>
<u>座椅腰部支撐</u>	<u>完全縮回</u>		<u>如 3.4.4.2</u>
<u>扶手（第一排座椅）</u>	<u>收納位置/非使用位置</u>		

備註：未列出之調整依照 3.4.4.1 規定進行設置。

(2025 年 Euro NCAP 規章)

8.3.6

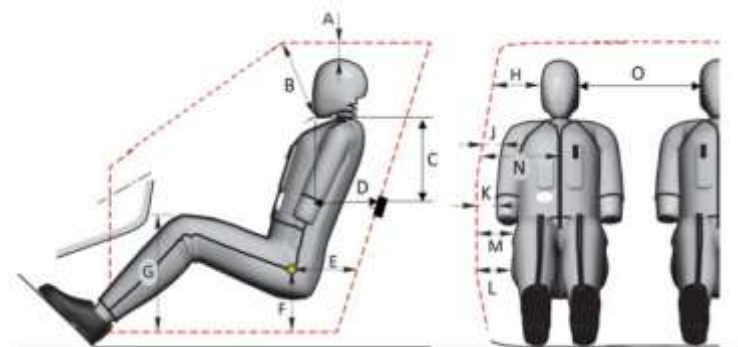


Figure 8: Passenger Dummy Measurements

Driver measurements

- A Head/roof panel
- B Chin/windscreen joint
- C Chin/door hook plate top screw head (vertical)
- D Chin/door hook plate top screw head (horizontal)
- E Hip-joint point/inside opening of the door (horizontal)

- F Hip-joint point/inside opening of the door (vertical)
- G Knee/floor covering (vertical)
- H Head/side window pane (or padding)
- J Shoulder/window pane (or padding)
- K Elbow/door (or padding)
- L Pelvis/door (or padding)
- M Knee/door (or padding)
- N Belt webbing to door (horizontally)
- O Distance between CoG and impact line (horizontally)

(修正後 TNCAP 規章草案)

3.4.8.3.6

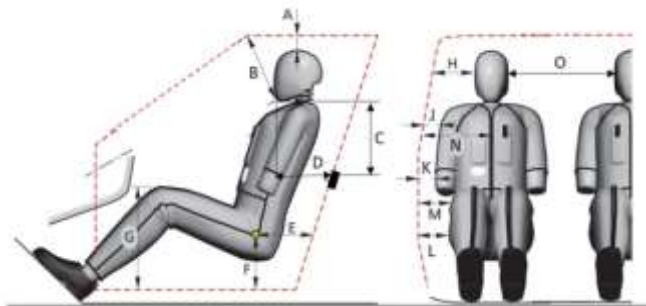


圖 8：乘客人偶量測

乘客量測值

- A 頭部至車頂飾板
- B 下巴至擋風玻璃接合點(Windscreen joint)
- C 下巴至車門鎖頂部螺絲頭(垂直)
- D 下巴至車門鎖頂部螺絲頭(水平)

<u>E</u>	<u>髖關節點至門檻(Inside opening of the door) (水平)</u>
<u>F</u>	<u>髖關節點至門檻 (垂直)</u>
<u>G</u>	<u>膝部至地板表面材(Floor covering) (垂直)</u>
<u>H</u>	<u>頭部至側窗玻璃(Pane) (或填充物)</u>
<u>J</u>	<u>肩部至車窗玻璃 (或填充物)</u>
<u>K</u>	<u>肘部至車門 (或填充物)</u>
<u>L</u>	<u>骨盆至車門 (或填充物)</u>
<u>M</u>	<u>膝部至車門 (或填充物)</u>
<u>N</u>	<u>安全帶織帶至車門 (水平)</u>
<u>O</u>	<u>重心與撞擊線之間的距離 (水平)</u>

(2025 年 Euro NCAP 規章)

8.4

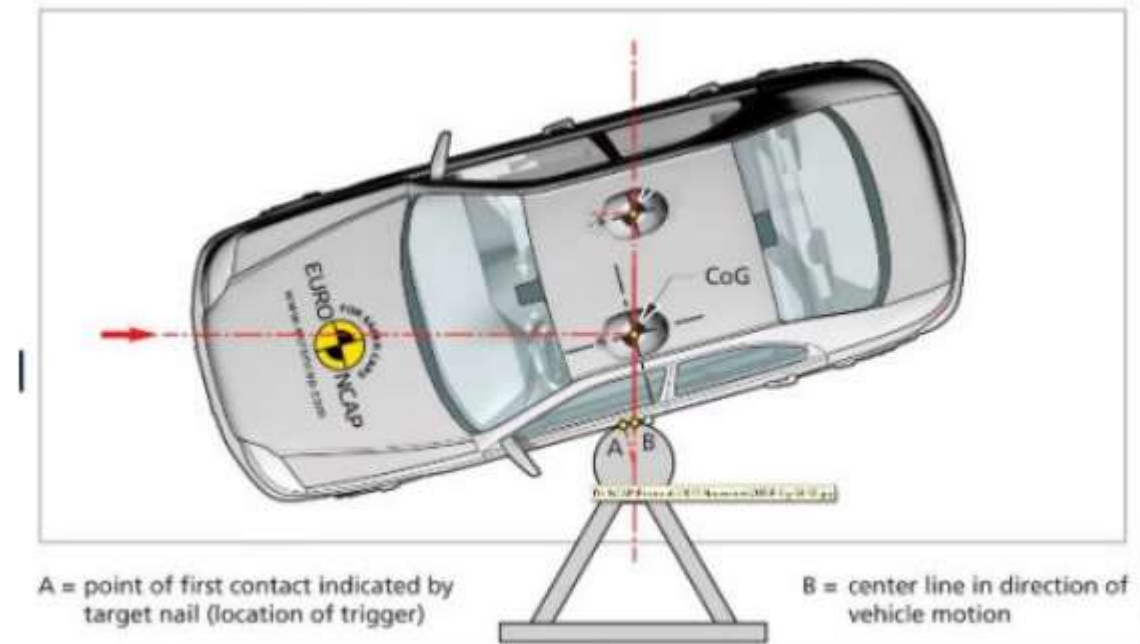


Figure 9: Impact reference line

(修正後 TNCAP 規章草案)

3.4.8.4

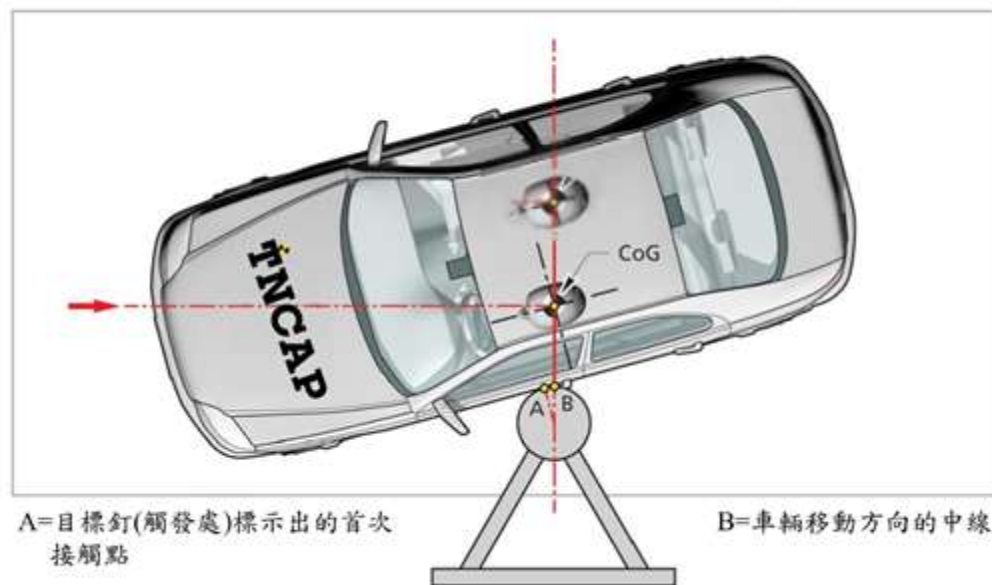


圖 9：撞擊參考線

3.17遠端側方模擬碰撞試驗規章

Euro NCAP Far Side Test & Assessment Protocol Version 2.5

2025 年版 Euro NCAP 規章	修訂 TNCAP 條文草案(第三版)	說明
1 INTERODUCTION	<u>3.17.1 簡介</u>	
1.1 This protocol details the assessments to be performed in far side occupant protection that contribute to the side impact part of the adult occupant protection rating.	<u>3.17.1.1 此規章詳述遠端側方模擬碰撞乘員保護評等如何進行，且本項評等為成人保護評等中側方撞擊之一部分。</u>	
1.2 From 2024 onwards, virtual test data will be required by Euro NCAP. It will then be necessary to use this protocol in combination with the VTC Simulation and Assessment Protocol.	<u>3.17.1.2 TNCAP 將結合此規章與「虛擬遠端側方模擬碰撞試驗規章」進行評等。</u>	
1.3 Far side protection is assessed using two sled tests that are representative of AE-MDB and Oblique Pole test configurations. In addition, data from full-scale testing is required to demonstrate head protection countermeasures for occupant-to-occupant interaction.	<u>3.17.1.3 遠端側方模擬碰撞之乘員保護評等使用兩個代表性之台車試驗：側方撞擊與側方立柱撞擊試驗之設置。另須以實車撞擊試驗之資料證明乘員與乘員間之頭部保護性對策是否有效。</u>	
1.4 The far side occupant sled test data will be supplied to Euro NCAP by the vehicle manufacturer prior to the official tests. From 2024 onwards, the simulation data must be supplied in advance of the physical testing, refer to the VTC Simulation and Assessment Protocol for further details.	<u>3.17.1.4 車輛業者應於正式試驗前將遠端側方模擬碰撞之台車試驗資料提交予 TNCAP。模擬資料必須於實體測試前提交。詳細資訊參見「虛擬遠端側方模擬碰撞試驗規章」。</u>	
1.5 Far side test data will only be accepted in the form of physical sled tests; full scale tests and CAE data will not be accepted.	<u>3.17.1.5 遠端側方碰撞試驗資料須以實體台車試驗取得，且由交通部指定之 TNCAP 檢測機構執行，不接受實車碰撞試驗或電腦輔助工程分析(CAE)資料。</u>	
1.6 Vehicles with three positions on the front row will be assessed in the outboard positions, 1 and 3, only.	<u>3.17.1.6 若車輛第一排具有三個座位，則僅須評等外側座位(即第一與第三座位)。</u>	
2 PREREQUISITES	<u>3.17.2 前提條件</u>	
2.1 In official the AE-MDB and pole impacts, the structural performance of the door; it's attachments to the body, the roof/cant rail and sill must be structurally 'stable' to provide confidence in the position intrusion lines.	<u>3.17.2.1 正式側方撞擊與側方立柱撞擊試驗中，車門之結構性能(與車體穩固連結)、車頂/側樑及門檻需要有穩固之結構，以確保侵入線位置正確。若門門/鉸鏈脫離、車門完全開啟或</u>	

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Detachment of door latches/hinges, fully opened doors or structural failures of the roof/cant rail and sill will preclude the acceptance of far side assessment data. 2.2 Any of the following post-test conditions will disqualify the vehicle from any rewards in far side occupant protection. 2.2.1 Where the total score of the AE-MDB and pole impacts is below 10.0 points (out of 12). 2.2.2 Restraint system failures in either the AE-MDB or pole impacts that are intended for far side occupant protection. For example, incorrect deployment of centre (occupant to occupant) airbags.	<u>車頂/側樑及門檻結構失效，則不接受遠端側方模擬碰撞評等資料。</u> <u>3.17.2.2 若試驗後有下列任一情況，則該車輛將無法獲得遠端側方碰撞乘員保護之分數：</u> <u>3.17.2.2.1 側方撞擊與側方立柱撞擊試驗分數加總後低於 10 分（滿分 12 分）。</u> <u>3.17.2.2.2 遠端側方碰撞乘員保護之束縛系統於側方撞擊或側方立柱撞擊試驗失效，例如中央（乘員與乘員之間）空氣囊不正確開展。</u>	
3 HARDWARE SETUP 3.1 General 3.1.1 An acceleration-based sled rig is to be used along with a ‘body in white’ (BIW) of the car model being assessed. 3.1.2 Deceleration sleds will be permitted provided that clear evidence is given showing that the dummy remains in the initial position and that the duration of the pulse is as long as the vehicle pulse observed in the official tests. 3.1.3 The BIW shall be mounted with the centreline at 75° ±3° towards the direction of travel. 3.1.4 A BIW that is of a pre-production state will be accepted if it is shown to be representative of series production and that any differences have no influence on the far side assessment. 3.1.5 All features which may influence occupant kinematics and protection must be installed in the BIW.	<u>3.17.3 硬體設定</u> <u>3.17.3.1 通則</u> <u>3.17.3.1.1 使用加速型台車以及受評車型之車體(Body in white，BIW)進行試驗。</u> <u>3.17.3.1.2 若提供明確佐證資料證明人偶維持於初始位置，且其脈衝期間與正式試驗所測得之車輛脈衝等長，則允許使用減速型台車。</u> <u>3.17.3.1.3 車體中線須與移動方向呈 75° ±3°</u> <u>3.17.3.1.4 若可證明足以代表批量生產且任何差異皆不影響遠端側方模擬碰撞評等，則可接受使用量產前狀態之車體。</u> <u>3.17.3.1.5 所有可能影響乘員運動及乘員保護之功能皆須安裝於車體上。</u>	

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3.1.6 The BIW may be from either a right or left-hand drive vehicle. 3.1.7 For the purpose of this assessment, the ‘far side occupant’ is on the driver’s side of the vehicle which is also the non-struck side. The struck side is the passenger’s side of the vehicle. 3.1.8 One WorldSID 50th male dummy will be seated on the far side of the vehicle. 3.1.9 The assessment shall be performed on the specification of equipment fitted to the bestselling variant. This includes, but is not limited to, the transmission, front seats, restraints and interior trim/centre console. 3.1.10 The seats of the bestselling variant (as per AE-MDB and pole impacts) will be used in the BIW.	<u>3.17.3.1.6 車體可為右駕車輛或左駕車輛。</u> <u>3.17.3.1.7 本項評等係將「遠端側方模擬碰撞之乘員」放置車輛駕駛座側（亦即非撞擊側）；撞擊側為車輛乘客側。</u> <u>3.17.3.1.8 將 WorldSID 百分之五 0 成年男性人偶置放於車輛非撞擊側。</u> <u>3.17.3.1.9 應以基本安全等級配備車款之配備規格進行評等，此包括但不限於變速箱、第一排座椅、束縛系統及內飾板/中控台。</u> <u>3.17.3.1.10 車體內應裝設基本安全等級配備車款之座椅(側方撞擊與側方立柱撞擊)。</u>	
3.2 Body preparation 3.2.1 The bodyshell shall be mounted on the sled such that there will be no permanent deformation of the body or its mounts during the tests. 3.2.2 Struck side intrusion will not be replicated on the BIW. 3.2.3 Driver and/or passenger doors will not be required. 3.2.4 Structures forwards of the A-pillar and windscreen cowl and rearward of the B-pillar may be removed from the BIW as long as the stability is not compromised 3.2.5 Reinforcement of the BIW is recommended but not required provided the BIW is sufficiently stable. The following areas are suggested: • Pillar and cross members • Seatbelt mountings (“D”-loop & Retractor) • Driver’s seat plinth	<u>3.17.3.2 車體整備</u> <u>3.17.3.2.1 車殼(Bodyshell)應以試驗時不會對車身或其底座造成永久變形之方式安裝於台車上。</u> <u>3.17.3.2.2 撞擊側侵入不會在車體上復現。</u> <u>3.17.3.2.3 不須安裝駕駛座及/或乘客座車門。</u> <u>3.17.3.2.4 只要不影響車體結構之穩定性，可移除車體上 A 柱前方結構、擋風玻璃蓋板(Cowl)及 B 柱後方結構。</u> <u>3.17.3.2.5 建議（但不強制）將車體結構進行強化，使其足夠穩固。下列為建議強化車體之區域：</u> <u>(1)車柱與橫梁</u> <u>(2)安全帶固定裝置（導帶環及捲收器）</u> <u>(3)駕駛座椅基座</u>	

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• roof 3.2.6 To ensure a clear view on dummy kinematics, vehicles with removable roofs, panels or movable sunshine roofs shall be tested without the roof or with them in the open position. The windscreen shall be removed and sufficient reinforcement around the frame/periphery shall be provided. Where there is a fixed roof above the front row seats, it shall be cut away between the cant rails and rearwards of the windscreen surround. Reinforcement should subsequently be applied laterally across the BIW. 3.2.7 Sufficient spacers shall be fitted in the gaps between the struck side (B-pillar or other structure) and passenger seat frame, the passenger seat and centre console to stabilise the front passenger seat. This represents the behaviour of the struck side seat and centre console due to crash induced intrusion and deformation. The spacer shall support the full height of the centre console but does not need to be made from a single piece of foam. It will be necessary to cut the seat cover and foam to access the frame, an example how this can be done is shown in the picture below. Figure 1: Seat spacers viewed from rear (請參考末頁圖表) 3.2.8 The spacers shall have the stiffness characteristics from expanded polypropylene (EPP60) or stiffer with compression properties of about 340KPa for 25% of compression (determined according to ISO 844). 3.2.9 Interior components required for testing will include, but are not limited to: • Driver and passenger front seats. • Full tunnel/centre console components consisting of the full tunnel trim,	<u>(4)車頂</u> <u>3.17.3.2.6 為能清楚看見人偶之運動，若車輛配備可拆卸式車頂、飾板或可移動式天窗，則應在無車頂狀態下或將其設定至開啟位置進行試驗。擋風玻璃應被移除，並於外框/周圍提供足夠強化。</u> <u>若第一排座椅上方為固定式車頂，則應切除兩側樑間、擋風玻璃後方之車頂，並以橫向方式對車體結構進行強化。</u> <u>3.17.3.2.7 在撞擊側（B 柱或其它結構）與乘客座椅骨架之間、乘客座椅與中控台之間的縫隙應放置足夠墊塊(Spacer)，使第一排乘客座椅穩固。墊塊代表撞擊側座椅與中控台因碰撞所產生之侵入與變形而有之行為。墊塊應支撐整個中控台高度，但不須由同一塊泡棉製成。需要切割座椅裱裝及泡棉才能接觸到骨架，如下圖範例：</u> <u>圖1：從後方視角觀看座椅墊塊</u> <u>(請參考末頁圖表)</u> <u>3.17.3.2.8 墊塊應具有發泡聚丙烯（EPP60）之硬度特性，或是在壓縮 25%具有 340Kpa 之壓縮特性（依照 ISO 844 決定）。</u> <u>3.17.3.2.9 試驗所需內部組件應包括但不限於：</u> <u>(1)駕駛座與第一排乘客座椅。</u> <u>(2)整個中控台組件，包含中控台所有飾板、手煞車總成、排檔</u>	

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hand brake assembly, gear lever assembly and storage compartments. • Full facia assembly consisting of the facia, steering column and steering wheel. Infotainment systems may be omitted if appropriate. • Seat belt/pretensioner and anchorage attachments. • Struck side internal door trim assembly (if doors installed). 3.2.10 If fitted, the struck side door trim shall be painted white (or similar) to contrast with the passenger's seat. 3.2.11 The head restraint on the unoccupied seat may be removed in order to get a better view of the grid board and excursion lines. 3.3 Active restraints 3.3.1 Active restraint systems shall be standard equipment and identical to those used in the Euro NCAP impact tests. 3.3.2 Pretensioners must be triggered if the firing strategy is such that they are triggered in the side and pole impact tests. 3.3.3 Triggering of pretensioners will be accepted on the sled if the difference in deployment time from the official tests is no greater than +/- 2ms. Where the difference is greater than 2ms, data must be supplied showing that this did not affect the result. 3.3.4 Triggering of other active restraints, such as the side curtain and seat mounted airbags, will not be permitted unless it can be shown that these systems have been designed as a countermeasure intended to lower the risk of far side occupant injury. For example, a head curtain airbag that extends beneath the door level, or a seat mounted airbag that can remain	<u>桿總成及置物箱。</u> <u>(3)整個儀表板總成，包含儀表板、轉向機柱、方向盤。若合適，娛樂影音系統得以移除。</u> <u>(4)安全帶/預負載裝置及安全帶固定裝置。</u> <u>(5)撞擊側之車門內飾板總成（若有安裝車門）。</u> <u>3.17.3.2.10 若有安裝車門，則撞擊側車門內飾板應塗為白色（或相近色），使其與乘客座有明顯對比。</u> <u>3.17.3.2.11 空座上的頭枕可以拆除，以利觀察網格板(Grid board)及偏移線(Excursion line)。</u> <u>3.17.3.3 主動式束縛</u> <u>3.17.3.3.1 主動式束縛系統應為標準配備，且與 TNCAP 撞擊試驗所使用之組件相同。</u> <u>3.17.3.3.2 若預負載裝置之觸發策略在側方撞擊與側方立柱撞擊試驗中被觸發，則須觸發預負載裝置。</u> <u>3.17.3.3.3 預負載裝置之觸發開展時間必須與正式試驗差異在 +/-2ms 之內。若差異超過 2ms，則須提交資料證明其不影響本試驗結果。</u> <u>3.17.3.3.4 不允許觸發其它主動式束縛系統(例如簾式空氣囊、座椅式空氣囊)，除非可證明該系統設計為降低遠端側方碰撞乘員受傷風險之對策。例如：可延伸至車門底部之頭部保護簾式空氣囊，或可維持足夠充氣時間以限制乘員偏移之座</u>	

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sufficiently inflated for the required length of time to limit occupant excursion. 3.4 Vehicle markings 3.4.1 A chequered or similar grid measuring 50x50mm shall be rigidly mounted to the BIW directly behind, but not attached to the front seats in a way that does not result in interference during the test. 3.4.2 All markings must be extended onto the chequered grid board positioned behind the front seats, the vehicle roof and fascia. 3.4.3 Four vertical and parallel excursion lines will be marked in the BIW for both sled test scenarios. The most inboard edge of each line shall be used as the excursion limit. - Maximum intrusion line from AE-MDB and Pole tests (red) This line is marking the maximum post-test intruding point of the interior door panel from AE-MDB (60km/h) and 75° pole impacts respectively. The method to determine the maximum deformation is detailed in Appendix I. Peak intrusion values will be compared to those observed in the official tests. The OEM shall provide details of the measurement point used for establishing the intrusion lines. Where the red line is further inboard than any of the other excursion lines, those lines will not be marked on the BIW. - Head excursion performance limit (orange) Struck side seat centreline (pre-test, without intrusion) - Head excursion performance limit (yellow) 125mm inboard of the struck side seat centreline	<u>椅式空氣囊。</u> <u>3.17.3.4 車輛標記</u> <u>3.17.3.4.1 將一張量測用 50x50mm 之網紋或類似棋盤格線板牢固安裝於車體正後方，惟不得接觸第一排座椅，避免干擾試驗。</u> <u>3.17.3.4.2 所有標記皆須延伸至第一排座椅後方之網紋方格板、車頂及儀表板。</u> <u>3.17.3.4.3 兩個台車試驗情境中，車體內皆應標記四條垂直且平行之偏移線。每條線之最內側邊緣即其偏移限值。</u> <u>(1)側方撞擊與側方立柱撞擊之最大侵入線（紅）</u> <u>此線為側方撞擊（60km/h）與側方立柱撞擊（75 度）試驗後，車門內飾板之最大侵入點（最大變形量之判定方法詳見 3.17.8）。侵入峰值將與正式試驗結果作比較。車輛業者應提供用以劃定侵入線之量測點詳細資料。若紅線比任何其他偏移線更靠內側，則這些偏移線無須標記於車體上。</u> <u>(2)頭部偏移性能限制（橘）</u> <u>撞擊側座椅中線(試驗前，未侵入)。</u> <u>(3)頭部偏移性能限制（黃）</u> <u>撞擊側座椅中線朝內 125mm。</u>	

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- Occupant interaction limit (green) 250mm inboard from the struck side seat centreline 3.4.4 In addition to the excursion lines, the vehicle centreline shall be marked in blue. Figure 2: Vehicle markings (請參考末頁圖表)	<u>(4)乘員間相互影響限制（綠）</u> <u>撞擊側座椅中線朝內 250mm。</u> <u>3.17.3.4.4 除前述偏移線外，車輛中線應以藍色標記。</u> <u>圖 2：車輛標記</u> <u>(請參考末頁圖表)</u>	
4 SLED TEST PROGRAMME 4.1 Sled Acceleration Pulses 4.1.1 Two sled tests are required for the evaluation of far side occupant excursion. 4.1.1.1 One test shall be performed using a representative 60km/h AE-MDB to car non-struck side B-pillar pulse. 4.1.1.2 One test shall be performed using a representative 32km/h 75° pole test non-struck side B-pillar pulse. 4.1.2 All pulses shall be from the non-struck side B-pillar base and filtered at CFC60. 4.1.3 The sled pulse shall be a scaled B-pillar pulse as measured in the AE-MDB test and pole test due to the angled test sled set-up. To ensure a similar B-pillar pulse between full scale and sled tests the following scaling is applied: $A_{X,SLED} = A_{Y,VEHICLE(AE-MDB)} \times 1.035$ $A_{X,SLED} = A_{Y,VEHICLE(POLE)} \times 1.035$ (請參考末頁圖表) 4.1.4 The OEM shall specify the accelerometer location to be used in the official tests to ensure similar positioning between tests.	<u>3.17.4 台車試驗程序</u> <u>3.17.4.1 台車加速度脈衝</u> <u>3.17.4.1.1 須以兩個台車試驗評估遠端側方碰撞乘員偏移量。</u> <u>3.17.4.1.1.1 試驗 1：施加相當於側方撞擊試驗（60km/h）車輛非撞擊側之 B 柱脈衝。</u> <u>3.17.4.1.1.2 試驗 2：施加相當於側方立柱撞擊試驗（32km/h、75 度）車輛非撞擊側之 B 柱脈衝。</u> <u>3.17.4.1.2 所有脈衝應從非撞擊側 B 柱底部取得，並以 CFC60 進行濾波。</u> <u>3.17.4.1.3 由於試驗台車之角度設定，台車脈衝須為側方撞擊試驗與側方立柱撞擊試驗所測得 B 柱脈衝值按比例調整。為確保實車測試與台車試驗之 B 柱脈衝相似，應依下列比例進行調整：</u> <u>$A_{台車-X} = A_{車輛-Y(側方撞擊)} \times 1.035$</u> <u>$A_{台車-X} = A_{車輛-Y(側方立柱撞擊)} \times 1.035$</u> <u>(請參考末頁圖表)</u> <u>3.17.4.1.4 車輛業者應說明正式測試中加速度計之位置，確保不同試驗間之位置相似。</u>	

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4.1.5 In house test vehicle variants may differ slightly from the official model tested by Euro NCAP e.g. engine etc. This is so that testing can be performed in advance of the official Euro NCAP tests.	3.17.4.1.5 車輛業者內部試驗之車款可能與 TNCAP 正式試驗之受驗車款存在些許差異（例如引擎等）。此舉係為了在 TNCAP 正式試驗前預先執行試驗。	
4.1.6 The suitability of the correlation between the vehicle and sled pulses will be checked according to the method detailed in Appendix II.	3.17.4.1.6 車輛與台車脈衝關聯性之適用檢查方法詳載於 3.17.9。	
4.2 Dummy and instrumentation	3.17.4.2 人偶與感測及資料擷取系統設置	
4.2.1 A WorldSID 50th percentile male test dummy shall be used in the front driver's position. It shall conform to the specification detailed in ISO 15830, parts 1-4:2013 & part 5:2018. Note: From 1st January 2026, ISO 15830 parts 1-4:2022& part 5:2018 shall be applied..	3.17.4.2.1 駕駛座應放置 WorldSID 百分之五 0 成年男性試驗人偶，該人偶應符合 2013 年 ISO 15830 第 1 至 4 部，及 2018 年第 5 部詳列之規格。	
4.2.2 The WorldSID shall be equipped with the half arm assembly on both sides.	3.17.4.2.2 WorldSID 雙臂皆應安裝半臂總成。	
4.2.3 The dummy shall be clothed in a sleeveless suit, or a modified version of the sleeved suit with sleeves removed.	3.17.4.2.3 人偶應穿著無袖上衣或改良版可移除衣袖式上衣。	
4.2.4 The dummy shall have a stabilised temperature in the range of 20.6°C to 22.2°C. A copy of the temperature readings is to be supplied as part of the standard output of the test.	3.17.4.2.4 人偶的溫度必須穩定，介於 20.6°C 至 22.2°C 之間。試驗產出資料中，應檢附一份溫度數值。	
4.2.5 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.	3.17.4.2.5 為達穩定溫度，試驗前應將人偶放置於上述溫度範圍內至少 1 小時。	
4.2.6 Measure the temperature of the dummy for at least 5 hours before test at intervals not exceeding 10 minutes and not exceeding 5 minutes before test.	3.17.4.2.6 試驗前至少 5 小時開始，每隔一段時間（不得超過 10 分鐘）測量人偶溫度，且試驗前 5 分鐘內須測量 1 次。	

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4.2.7 Data processing shall be in accordance with Technical Bulletin 021. Appendix IV details all channels required, both measured from hardware test and calculated. 4.2.8 The WorldSID shall be instrumented on the struck side to record the channels listed below. Additional channels may be recorded. In-dummy data acquisition system is recommended and in case of 45 or more channels it is required. 4.2.9 All lower neck load data is to be supplied, lower neck Mx and My loads moments shall be corrected according to the correction factor in SAE J1733, detailed in Technical Bulletin TB 021. (請參考末頁圖表) 4.3 Sled Instrumentation (請參考末頁圖表) 4.4 Passenger compartment adjustments 4.4.1 Passenger compartment adjustments used in the BIW will be as per the relevant passenger compartment adjustments detailed in the AE-MDB side impact test protocol (where relevant). 4.4.2 The driver and passenger seat fore/aft and seat back angles will be positioned identically. Where a vehicle has different seat travel between the driver and passenger side, the passenger seat travel will be positioned as close as possible to that of the driver and the seat back angle will also be the same as that of the driver. 4.4.3 Arm rests	3.17.4.2.7 數據處理應符合 Euro NCAP 技術通報 TB 021 規定。 3.17.11 詳細說明所需之所有頻道，包括硬體測試量測之頻道及計算之頻道。 3.17.4.2.8 WorldSID 百分之五 0 成年男性人偶撞擊側之感測器及資料擷取系統應設定至得以記錄下列頻道。另可記錄額外頻道。建議使用人偶內部的資料擷取系統，惟若人偶具有 45 個以上之頻道，則須使用人偶內資料擷取系統。 3.17.4.2.9 應提供所有下頸部負載數據，下頸部 Mx 及 My 力矩應依據 SAE J1733 中之修正係數進行修正，詳見 Euro NCAP 技術通報 TB 021。 (請參考末頁圖表) 3.17.4.3 台車感測及資料擷取系統 (請參考末頁圖表) 3.17.4.4 車室調整 3.17.4.4.1 車體之車室調整應依照「側方撞擊試驗規章」所述之車室調整相關要求（與規章中相關者）進行設置。 3.17.4.4.2 駕駛與乘客座椅前/後位置及椅背角度應相同。若駕駛與乘客座椅調整範圍有差異，則乘客座應盡可能調整至與駕駛座相同，且椅背角度應與駕駛座相同。 3.17.4.4.3 扶手	

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4.4.3.1 Any arm-rests or centre console compartments shall be positioned to limit interaction with dummy and maximise lateral excursion. See Appendix III	3.17.4.4.3.1 任一扶手或中控台置物盒應調整至盡可能不影響人偶位置，且不妨礙人偶達最大側向偏移量，詳參 3.17.10。	
4.4.3.2 Vehicles equipped with adjustable arm-rests on the seat back will have them positioned in the ‘not in use’ ‘up-folded’ position aligned with the seat back.	3.17.4.4.3.2 若車輛座椅扶手可調整，則應調整至「非使用」、「向上收起」與椅背對齊之位置。	
4.4.3.3 Vehicles equipped with adjustable arm rests as part of the centre console will have them positioned fully down and fully retracted.	3.17.4.4.3.3 若車輛中控台扶手可調整，則應調整至完全放下且完全縮回位置。	
4.4.3.4 The lid of any arm rest/storage compartment shall be closed.	3.17.4.4.3.4 扶手/置物箱蓋應關閉。	
4.4.3.4 Parts that can be removed from the centre console assembly must be present for the test provided they are equipped on the specification of vehicle tested by Euro NCAP.	3.17.4.4.3.5 若中控台總成上可拆卸零件為 TNCAP 受驗車輛規格之配備，則此試驗亦須安裝相關零件。	
4.4.4 The parking brake shall be in the disengaged position and the gear lever in D or in a gear position.	3.17.4.4.4 駐煞車應位於釋放位置，變速箱檔位應位於 D 檔或入檔位置。	
4.5 Driver dummy positioning	3.17.4.5 駕駛人偶位置	
4.5.1 The dummy shall be installed on the driver’s seat (non struck side) in accordance with the H-point manikin and dummy positioning procedures detailed in the AE-MDB side impact test protocol.	3.17.4.5.1 人偶應依照「側方撞擊試驗規章」詳述之 H 點人體模型與人偶擺放程序放置於駕駛座（非撞擊側）。	
4.6 Dummy painting & Markings	3.17.4.6 人偶塗色及標記	
4.6.1 The dummy shall have masking tape placed on the areas to be painted using the sizes detailed below. The tape should be completely covered with the following coloured paints. The paint should be applied close to the time of the test to ensure that the paint will still be wet on impact.	3.17.4.6.1 應於人偶預定塗色之區域，以下方詳列之範圍黏貼紙膠帶。膠帶應徹底塗滿下列顏色，唯駕駛頭部僅於膠帶邊緣塗色，顏料應於接近試驗時間時塗上，以確保撞擊時顏料未乾。	
Driver	駕駛	
Head inboard (Paint tape outline) Blue, red & green	頭部-內側（僅膠帶輪廓塗色） 藍、紅及綠	

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Head CoG inboard (circle Ø40mm) Orange	<u>頭部重心-內側(圓圈直徑 40mm) 橘</u>	
Head top along mid sagittal plane Green&yellow	<u>頭頂沿正中矢狀切面 綠及黃</u>	
Shoulder Arm Blue	<u>肩部 手臂 藍</u>	
2nd Thorax Rib Green	<u>胸部第二肋骨 綠</u>	
3rd Thorax Rib Red	<u>胸部第三肋骨 紅</u>	
1st Abdomen Rib Blue	<u>腹部第一肋骨 藍</u>	
2nd Abdomen Rib Green	<u>腹部第二肋骨 綠</u>	
Pelvis Orange	<u>骨盆 橘</u>	
NOTE: The tape should be completely covered with the coloured paints specified, except for driver head which should have only the outer edge of the tape painted.	<u>備註：膠帶應徹底塗滿指定顏色，惟駕駛頭部僅於膠帶邊緣塗色。</u>	
Tape Sizes:	<u>膠帶範圍：</u>	
Head = 100mm square, centreline of head with lower edge at CoG.	<u>頭部=100mm 正方形，頭部中心線且下緣位於重心處</u>	
Head = 200mm x 20mm strip, centre located at head CoG	<u>頭部=200mm x 20mm 長條形，中心位於頭部重心</u>	
Arm = 25mm x 150mm, starting at bottom edge of shoulder fixing hole.	<u>手臂=25mm x 150mm，從肩部固定孔底部開始</u>	
Ribs = 25mm x 150mm strip, starting at the rearmost point at seat back.	<u>肋骨=25mm x 150mm 長條形，從最後方可觸及椅背的點開始</u>	
Pelvis = 50mm x 100mm, centred on hip joint point.	<u>骨盆=50mm x 100mm，以髖關節點為中心</u>	
Figure 3: Dummy head painting (請參考末頁圖表)	<u>圖 3：人偶頭部塗色 (請參考末頁圖表)</u>	
4.6.2 The dummy shall have two markers at the front of the dummy head for video analysis. They will be positioned on the head front mould split line at:	<u>3.17.4.6.2 人偶頭部前方應有兩個標記以利影像分析，其分別位於頭部模型前方分模線(Split line)之重心處及重心下方 100mm 處。</u>	
- Centre of Gravity 100mm below Centre of Gravity		

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4.7 Pre-test measurements 4.7.1 To ensure repeatability of dummy seating & positioning - take detailed static 3D measurements of dummy and vehicle interior after the dummy settling and positioning procedures have been carried out. Figure 4: Pre-test measurements (請參考末頁圖表) 4.7.2 In addition to the measurements specified above, the locations of the WorldSID in the table below shall be taken prior to the physical test tests. These are to be used as a reference for comparison with the initial posture and position of the CAE dummy. A suitable origin for the CMM measurements is needed (e.g. door striker) and shall be specified by the vehicle manufacturer. See Appendix V for further information. (請參考末頁圖表)	<u>3.17.4.7 試驗前量測</u> <u>3.17.4.7.1 為確保人偶坐姿與位置再現性，於完成人偶放置及位置調整程序後，人偶與車輛內部須進行詳細 3D 靜態量測。</u> <u>圖 4：試驗前量測</u> (請參考末頁圖表) <u>3.17.4.7.2 除上述量測外，應於實體測試前測量下表 WorldSID 百分之五 0 成年男性人偶之位置。將相關位置及 CAE 人偶初始姿勢及位置進行比較。三次元量測儀(Coordinate measuring machine，CMM)所需合適原點（如門鎖）應由車輛業者宣告。詳細資訊參見 3.17.12。</u> (請參考末頁圖表)	
5 PHOTOGRAPHIC RECORD 5.1 Insufficient high speed or still photography could result in the data not being accepted by the Euro NCAP Secretariat. 5.2 From 2024 onwards, the relevant test number, supplied by the Euro NCAP Secretariat, must be placed physically on the sled, visible in all videos and referenced in all data files e.g. .mme. 5.3 It is essential that the onboard cameras are attached to the sled in a way that minimises relative motion during the test. 5.4 Sufficient lighting must also be provided to ensure that the maximum head excursion can be clearly seen on the high-speed film. 5.5 High speed film 5.5.1 High speed film, 1000fps minimum, is required for both tests. The	<u>3.17.5 影像紀錄</u> <u>3.17.5.1 若高速攝影或靜態影像並不完整，則 TNCAP 執行機構可不接受此資料。</u> <u>3.17.5.2 TNCAP 執行機構所提供之相關測試編號必須貼在台車上，且所有影片中皆清晰可見，並於所有數據檔案（例如 .mme 檔）中引用。</u> <u>3.17.5.3 車載攝影機應與台車妥善連接，將試驗時產生相對運動降至最低。</u> <u>3.17.5.4 必須有充足照明，以確保高速攝影畫面能清晰捕捉頭部最大偏移量。</u> <u>3.17.5.5 高速攝影</u> <u>3.17.5.5.1 兩個試驗之高速攝影至少具有 1000fps，並應使用下</u>	

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following specification shall be used: ● Format: MP4 or AVI. ● Codec: H.264, Data/Bit rate: 2 Mbps. ● Resolution: Native camera resolutions. ● Frame rate: 1000 fps. ● Must include burnt in timers 5.5.2 Sled mounted high speed cameras shall be used to record the whole of the relevant scene. 5.5.3 The minimum number of cameras required for each test is five. 5.5.4 Two cameras must be positioned either side of the zone in which the head excursion is anticipated. For example, if the excursion is expected in the orange zone, cameras 2 & 3 will be the minimum required, camera 6 would be placed on the orange line. 5.5.5 Where the camera positions are overlapping, the highest priority regarding camera positioning should be given to camera 1, but camera 2 is still required. (請參考末頁圖表) 5.6 Still photography 5.6.1 Pre and post-test still photography is required to clearly show the sled set-up and BIW construction. Still photographs should show the fixings of the body in white to the sled, in particular the steering column, facia/tunnel mounting and the appropriate body reinforcements before and after the series of tests. (請參考末頁圖表)	<u>列規格：</u> <u>(1)格式：MP4 或 AVI。</u> <u>(2)解碼器：H.264，資料/位元傳輸率: 2 Mbps。</u> <u>(3)解析度：攝影機本身之解析度。</u> <u>(4)幀率：1000 fps。</u> <u>(5)應包含燒錄時間碼。</u> <u>3.17.5.5.2 裝設於台車之高速攝影機應記錄所有相關畫面。</u> <u>3.17.5.5.3 每個試驗至少需要五台攝影機。</u> <u>3.17.5.5.4 兩台攝影機必須架設於頭部偏移預期區域之兩側。</u> <u>例如，若頭部偏移預期落在橘色區域，則至少裝置 2 號攝影機與 3 號攝影機，而 6 號攝影機架設於橘線。</u> <u>3.17.5.5.5 在攝影機位置重疊之情況下，應優先考架設 1 號攝影機，但 2 號攝影機仍須架設。</u> <u>(請參考末頁圖表)</u> <u>3.17.5.6 靜態影像</u> <u>3.17.5.6.1 試驗前與試驗後之靜態影像須能清楚顯示台车架設與車體結構。靜態影像應顯示一系列試驗前與試驗後車體與台車間之固定點，特別是轉向機柱、儀表板/中控台支架以及適當之車身強化。</u> <u>(請參考末頁圖表)</u>	
6 DATA PROCESSING AND REPORTING	<u>3.17.6.數據處理及提報</u>	

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6.1 Data processing 6.1.1 Data processing and assessment criteria calculation shall be supplied to Euro NCAP in ISO-MME format in accordance with Technical Bulletin 021. 6.2 Reporting 6.2.1 The key deliverables will be as follows: - Summary dossier - Reference pulse data in ISO MME format, as detailed in Section 4.1 - BIW & test set-up data, as detailed in Section 4 - H-point and head CoG measurement and comparison with full scale test - Restraint system time to fire and comparison with full scale test - All sensor outputs in ISO MME format - All sensor curves plotted in a single PDF file (sled and ATD) - High speed film (min. 1000fps) Section 5.5 - Photos, as detailed in Section 5.6 -All excursion line measurements relative to vehicle centreline (in Y axis) -Details of peak intrusion measurement location and photograph -Folder and file structure as follows: /Vehicle/ AE-MDB/ Channel/ Document/ Report/ Movie/	<u>3.17.6.1 數據處理</u> <u>3.17.6.1.1 數據處理與評等標準計算應依 Euro NCAP 技術通報 TB 021，以 ISO-MME 格式提交予 TNCAP。</u> <u>3.17.6.2 提報</u> <u>3.17.6.2.1 提交資料應符合下列要求：</u> <u>(1)摘要檔案。</u> <u>(2)參考脈衝資料以 ISO MME 格式呈現（詳見 3.17.4.1）。</u> <u>(3)車體與試驗設定資料（詳見 3.17.4）。</u> <u>(4)H 點及頭部重心測量以及與實車測試之比較。</u> <u>(5)束縛系統之觸發時間及與實車測試之比較。</u> <u>(6)所有感測器輸出以 ISO MME 格式呈現。</u> <u>(7)所有感測器曲線繪製於單一 PDF 檔案內（台車及 ATD）。</u> <u>(8)高速攝影（至少 1000fps）（詳見 3.17.5.5）。</u> <u>(9)照片（詳見 3.17.5.6）。</u> <u>(10)相對於車輛中線（Y 軸）之所有偏移線量測值。</u> <u>(11)最大侵入量測位置及照片之詳細資訊。</u> <u>(12)資料夾與檔案結構如下：</u> <u>/車輛/</u> <u>側方撞擊/</u> <u>頻道/</u> <u>文件/</u> <u>報告/</u> <u>影片/</u>	

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Photos/ Pole/ Channel/ Document/ Report/ Movie/ Photos/ Reference pulses AE-MDB/ Channel/ Document/ Reference pulses Pole/ Channel/ Document/	照片/ 側方立柱撞擊/ 頻道/ 文件/ 報告/ 影片/ 照片/ 側方撞擊參考脈衝/ 頻道/ 文件/ 側方立柱撞擊參考脈衝/ 頻道/ 文件/	
7 FAR SIDE OCCUPANT ASSESSMENTS 7.1 Scoring The points available for far side impact assessments in the final vehicle assessment is a total of 4 points, which will be combined with the full-scale AE-MDB (2 points) and pole impact (2 points) scores. The far side score will be scaled down from the individual scores of the two far side sled tests, which offer a maximum of 12 points per test. 7.2 Head excursion The peak head excursion in both sled tests will be established using the onboard cameras. The maximum amount of points available per body region in each test is dependent upon the amount of excursion observed and what specific far side impact countermeasures the vehicle is equipped	3.17.7 遠端側方模擬碰撞評等 3.17.7.1 分數 遠端側方模擬碰撞評等之分數於最終車輛評等為 4 分，包含完整側方撞擊試驗（2 分）與側方立柱撞擊試驗（2 分）。遠端側方模擬碰撞分數係從兩個遠端台車試驗之得分（各試驗滿分為 12 分）按比例調整調降而得。 3.17.7.2 頭部偏移 兩個台車試驗之頭部最大偏移量，將使用車載攝影機之結果判定。各個試驗中，每個身體部位之最高得分將受測得之偏移量、以及該車輛配備之特定遠端側方碰撞保護性對策所影響。當頭部偏移超出綠色區域，則其他身體部位之得分會隨	

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with. Where the head excursion is outside the green zone, the number of points available for each body region will be reduced according to which zone the peak head excursion occurs, see Figure 5. A sliding scale is not applicable to head excursion. 7.2.1 Head excursion assessment zones Figure 5: Head excursion zones (請參考末頁圖表) 7.2.2 Scoring for vehicles with far side countermeasure The maximum available points for each body region are dependent upon the amount of head excursion. The individual body region scores are presented in the table below. (請參考末頁圖表) 7.2.3 Scoring for vehicles without far side countermeasure The maximum available point for each body region is dependent upon the amount of head excursion. The individual body region scores are presented in the table below. (請參考末頁圖表) 7.3 Criteria and limit values The basic assessment criteria used for both impact scenarios are summarised below. The assessments are divided into four individual body regions, the head, neck, chest & abdomen and pelvis & lumbar spine. Where multiple criteria exist for an individual body region, the lowest scoring parameter is used to determine the performance of that region.	著頭部最大偏移量所到區域而減少，如圖 5。浮動計算法不適用於頭部偏移量。 3.17.7.2.1 頭部偏移評等區域 圖 5：頭部偏移區域 (請參考末頁圖表) 3.17.7.2.2 具備遠端側方碰撞保護性對策之車輛評分方式 每個身體部位之最高得分將受頭部偏移量所影響，各部位得分如下表所示： (請參考末頁圖表) 3.17.7.2.3 未具備遠端側方碰撞保護性對策之車輛評分方式 每個身體部位之最高得分將受頭部偏移量所影響，各部位得分如下表所示： (請參考末頁圖表) 3.17.7.3 標準與限制值 下述為兩個撞擊情境之基本評等標準。本項評等分為四個身體部位區域：頭部、頸部、胸部與腹部、骨盆與腰椎。若單一身體區域使用多重標準，則該區域性能判定將使用最低分之參數。	

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For dummy injury criteria, a sliding scale system of points scoring has been used to calculate points for each measured criterion. This involves two limits for each parameter, a more demanding limit (higher performance), below which a maximum score, as listed in the tables above, is obtained and a less demanding limit (lower performance), beyond which no points are scored. Where a value falls between the two limits, the score is calculated by linear interpolation. For both impact scenarios, capping is applied to the head, chest and abdomen. Where the dummy capping limit is exceeded, the score for the test in which this occurs will be 0 points. 7.3.1 Dummy criteria (請參考末頁圖表) 7.3.1.1 Monitoring criteria Head rotational acceleration shall be measured, but calculation of advanced brain injuryHead rotational velocity measurement is required along with calculation of DAMAGE and reporting of the results is required in the spreadsheet. 7.4 Modifiers 7.4.1 Pelvis and Lumbar loads Limiting excursion by transmitting excessive loads through the pelvis and lumbar area may pose a risk of injury to occupants. A -4 point modifier is applied to the dummy score for each test in which any of the limits listed below are exceeded. (請參考末頁圖表)	<u>人偶傷害標準將以浮動計算法計算每項量測標準之分數，包括每一參數之兩限制值（如下表所示）：其中一個為較高性能限制值（較高性能），低於該限制值可獲得最高分；以及另一個較不嚴格限制值（較低性能），超出該限制值則無法得分。若數值介於兩者之間，則以線性插值計算分數。</u> <u>兩個撞擊情境試驗之底線限制適用於頭部、胸部與腹部，若超過限制值，則該試驗將給予 0 分。</u> <u>3.17.7.3.1 人偶標準</u> (請參考末頁圖表) <u>3.17.7.3.1.1 監測階段標準</u> <u>應測量頭部旋轉加速度，惟須計算進階腦損傷頭部旋轉速度測量值以及腦部損傷，並於得分表內填寫結果。</u> <u>3.17.7.4 扣分</u> <u>3.17.7.4.1 骨盆與腰椎負載</u> <u>藉由將多餘負載轉移至骨盆與腰椎以限制偏移量，會增加乘員傷害風險。於每個試驗中，若超出下列任一限制值，則人偶分數將被扣 4 分。</u> (請參考末頁圖表)	

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7.4.2 Occupant to occupant protection	<u>3.17.7.4.2 乘員間保護</u>	
7.4.2.1 Where a vehicle is equipped with a far side countermeasure that is designed to limit head excursion but cannot provide meaningful head protection in occupant interaction (as defined in 7.4.2.2 below), the final far side score (max 4 points) will be reduced by 1 point.	<u>3.17.7.4.2.1 若車輛配備用以限制頭部偏移之遠端側方碰撞保護性對策，惟無法提供乘員間相互影響有效之頭部保護（如 3.17.7.4.2.2），則遠端側方碰撞試驗總分（滿分 4 分）應扣 1 分。</u>	
7.4.2.2 Where a vehicle is equipped with a countermeasure that is specifically designed to provide additional protection from occupant interaction, its efficacy will need to be demonstrated in the official Euro NCAP pole impact test with the use of two mid-sized WorldSIDs.	<u>3.17.7.4.2.2 車輛配備用以限制頭部偏移之遠端側方碰撞保護性對策，能否提供乘員間相互影響之額外保護，須於正式 TNCAP 側方立柱撞擊試驗中，使用兩個中等尺寸之 WorldSID 人偶證明。</u>	
a) Where the OEM can show that the presence of the passenger in the dual occupancy pole test will influence the results of the nearside driver, the OEM may sponsor an additional single occupant pole test. The results will instead be used to rate the near-side pole impact performance. More details of the dual occupancy test are provided in the Euro NCAP Oblique Pole Impact Testing Protocol.	<u>(1)若車輛業者可證明雙乘員於側方立柱撞擊試驗中，乘客會影響近端駕駛之結果，則車輛業者可自費執行額外單一乘員之側方立柱撞擊試驗，其結果將用以評等近端側方立柱撞擊試驗之性能。乘員間保護測試之詳細資訊參見「側方立柱撞擊測試規章」。</u>	
b) Where, in the dual occupancy pole test, there is interaction between either dummy head and the adjacent occupant (7.4.2.3) and/or the protection offered is not symmetric (7.4.2.4), and/or the protection zone is not met(7.4.2.5), the final far side score (max 4 points) will be reduced by 1 point.	<u>(2)若側方立柱撞擊測試乘員間保護中，出現人偶頭部與相鄰乘員之相互影響（3.17.7.4.2.3）、及/或所提供之保護並不對稱（3.17.7.4.2.4）、及/或無法滿足保護區域之要求（3.17.7.4.2.5），則遠端側方模擬碰撞試驗總分（滿分 4 分）應扣 1 分。</u>	
7.4.2.3 The heads of both the driver and passenger dummies will be evaluated. Upper neck and shoulder forces for both dummies must be reported. Interaction will be determined from the high-speed film with either evidence of direct contact or where the head lower performance limits (HIC & 3ms) are exceeded. Any direct contact between the far side	<u>3.17.7.4.2.3 駕駛與乘客人偶之頭部皆應評估，兩人偶之上頸部與肩部受力皆須記錄於試驗資料。相互影響將依高速攝影判定是否有直接接觸、或是否超過頭部較低性能極限值（HIC 與 3ms）進行判定。無論是否超過 3.17.7.3.1 所列之限制值，遠端乘員頭部與近端乘員任何部位之直接接觸皆納</u>	

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occupant's head and any part of the nearside occupant will be assessed regardless of whether the limits in 7.3.1 have been exceeded or not. For example, if an inflatable countermeasure allows the far side occupant's head to contact the driver, the peak resultant acceleration trace and/or the high-speed film will be used to identify head contact. 7.4.2.4 Countermeasures must offer equivalent levels of protection in dual occupancy scenarios regardless of which side of the vehicle is impacted. Where a countermeasure is asymmetric, the OEM must provide evidence to show that it provides protection when impacted on both sides. For example, with a second dual occupancy test impacting the passenger side of the vehicle or numerical simulations. Both seats shall be set to that of the AE-MDB test. 7.4.2.5 A countermeasure against occupant interaction must be able to protect a range of occupant sizes in different seating positions. Regardless of which dual occupancy test is performed, the coverage zone must be demonstrated in the zone defined as follows: Protection must be provided in a rounded rectangular area between the passenger head CoG in the dual occupancy pole test position and forwards up to the driver pole impact test position plus an additional 82mm border front and rear (half head diameter). In the vertical direction, the zone is 120mm upwards and downwards of the CoG (Figure 6). The following shall be noted: a) Where countermeasures utilise inflatable systems, the protection zone is measured on a flattened countermeasure using the passenger's head paint mark on the countermeasure from the dual occupancy pole impact test. This will be evaluated during the vehicle inspection.	<u>入評等。例如：若充氣對策導致遠端乘員之頭部與駕駛發生接觸，則依據合成加速度軌跡峰值及/或高速攝影畫面判定是否發生頭部接觸。</u> <u>3.17.7.4.2.4 無論車輛撞擊側為何，雙乘員情境中之保護性對策須提供同等之保護等級。若為非對稱保護性對策，則車輛業者必須提供兩側撞擊時之保護性佐證。例如：第二次雙乘員之車輛乘客側撞擊試驗或數值模擬。兩座椅配置皆應等同側方撞擊試驗中之配置。</u> <u>3.17.7.4.2.5 避免乘員間相互影響之保護性對策須能保護不同體型、不同坐姿之乘員。無論任一雙乘員試驗，保護區域皆應涵蓋下列範圍：圓角矩形保護區域之水平方向從雙乘員立柱試驗中乘客頭部重心位置，延伸至駕駛立柱撞擊試驗中頭部重心位置，前後額外加上 82mm（頭部直徑之一半）；垂直方向為頭部重心上下 120mm（如圖 6）。應特別注意下列事項：</u> <u>(1)若保護性對策使用充氣系統，保護區域之量測係依據雙乘員立柱撞擊試驗中未充氣時，乘客頭部顏料標記之位置。此量測應於車輛查驗時進行評估。</u>	

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b) It may be necessary to measure the coverage area using an inflated airbag. For example, using a flattened airbag may not be suitable if the shape/orientation of the inflated area cannot be flattened. This will be evaluated during the vehicle inspection. c) In some cases, the countermeasure may offer protection in the requested zone without fully or partially covering the protection zone. In this case, the robustness of occupant to occupant interaction avoidance in the requested protection zone must be clearly demonstrated to Euro NCAP by the manufacturer. This must be done with in house, full scale test data from an equivalent occupant to occupant pole test where the passenger seat is in the same position as that of the driver. A different test set-up may be necessary to show that the systems works for different statures within the protection zone, e.g. a higher or lower seat position. Figure 6: Protection zone (請參考末頁圖表)	<u>(2)可能須使用充氣後之空氣囊以測量覆蓋區域。例如，未充氣空氣囊可能不適合用於充氣區域之形狀/方向。此量測應於車輛查驗時進行評估。</u> <u>(3)有時保護性對策可能無法完全或部分覆蓋保護區域，在此情況下，車輛業者須向 TNCAP 充分證明規定之保護區域內，避免乘員間相互影響之保護性對策足夠穩健。這需要於廠內等效乘員與乘員立柱試驗之完整試驗資料來進行，試驗時乘客座須調整至與駕駛座一致。可能需要使用不同之試驗設置，證明此系統對保護區域內不同體型之乘員依然有效，例如調高或調低座椅位置。</u> <u>圖 6：頭部保護區域</u> <u>(請參考末頁圖表)</u>	
Appendix I To determine the excursion lines the following method is to be followed. In this method the following definitions are used: Intrusion area (請參考末頁圖表及圖示) Maximum inboard intrusion The maximum inboard point is determined within the intrusion area, the method to find this point is described as follows. There is no compulsory	<u>3.17.8 決定偏移線</u> <u>依照下列方式決定偏移線，此方式所使用之定義如下：</u> <u>(1)侵入區域</u> <u>(請參考末頁圖表)</u> <u>(2)最大內側侵入</u> <u>最大內側侵入點係於侵入區域內，依照下列步驟找出此點位置。最大內側侵入點之量測並無強制程序，可使用 3D 掃描、</u>	

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procedure how to measure the maximum inboard point. It is acceptable to use 3D scan, 3D arm or a tape measure. In most cases the armrest will be the most inboard part. Therefore, the measurement will be taken from the most inboard surface of the armrest. At waistline level, if this is the most inboard area, the inner door trim/cover is ignored. The point is defined as the most inboard metal part of the door structure +50mm inboard (see example below.) (請參考末頁圖表)	<u>3D 量測手臂、捲尺量測。</u> <u>多數狀況下，車門扶手為最內側零件，所以應測量扶手最內側表面。</u> <u>若此為車門腰線處最內側區域，則車門內飾板/飾蓋可被忽略。</u> <u>最大內側侵入點應以車門結構中最內側金屬零件朝內 +50mm 為準（如下圖範例）。</u> <u>(請參考末頁圖表)</u>	
Appendix II The pulse performed on the sled facility should be close to or more severe as the pulse defined in Section 4.1.3, Ax sled. All references to ‘sled pulse’ refer to the acceleration measured at the B-pillar on the body-in-white. To validate this point, the following process should be used: • Change the orientation to have body-in-white B-pillar pulse and vehicle pulse in globally positive values • Calculate by integration the Delta V (DV1(t)) from vehicle pulse, setting the initial velocity to 0 • Calculate by integration the Delta V (DV2(t)) from sled test(BIW), setting the initial velocity to 0 • Calculate the difference $DV(t) = DV1(t) - DV2(t)$ • Calculate by integration of DV1(t) the X displacement from vehicle, setting the initial value to 0 • Calculate by integration of DV2(t) the X displacement from sled test(BIW), setting the initial value to 0 • Calculate the difference $DX(t) = DX1(t) - DX2(t)$	<u>3.17.9 台車脈衝</u> <u>3.17.9.1 對台車設備施加之脈衝應接近或超過 3.17.4.1.3 所定義之試驗脈衝 $A_{台車-X}$。所有提及台車脈衝皆指在車體 B 柱測得之加速度。使用以下方式計算施加之脈衝是否有效：</u> <u>(1)調整方向，使車體 B 柱脈衝及車輛碰撞脈衝皆為正值。</u> <u>(2)設定初始速度為 0，從車輛碰撞脈衝 DV(DV1(t))，由積分計算 Delta V。</u> <u>(3)設定初始速度為 0，從台車試驗 DV(DV2(t))，由積分計算 Delta V。</u> <u>(4)計算 DV1 與 DV2 的差，$DV(t) = DV1(t) - DV2(t)$</u> <u>(5)對 DV1(t)進行積分，計算車輛碰撞脈衝 DX1(t)起的位移量 X，並將初始值設定為 0。</u> <u>(6)對 DV2 進行積分，計算台車試驗 DX2(t)起的位移量 X，並將初始值設定為 0。</u> <u>(7)計算 DX1(t)與 DX2(t)的差，$DX(t) = DX1(t) - DX2(t)$。</u> <u>(8)計算 120 ms 時的 DX。</u>	

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- Calculate DX at 120 ms Requirement #1: - If all the DV(t) values up to 120 ms are in the zone as shown below, requirement #1 is OK – check requirement #2 - If some DV(t) values up to 120 ms are outside the zone, requirement #1 is not OK →sled test (BIW) is less severe than the vehicle test pulse and cannot be accepted (請參考末頁圖表) →sled test (BIW) is more severe than the test pulse and cannot be accepted (請參考末頁圖表) Requirement #2: - If $DX_{(120ms)}$ value at 120 ms is negative, requirement #2 is OK →sled test is accepted - If $DX_{(120ms)}$ value at 120 ms is positive, requirement #2 is not OK →sled test cannot be accepted (請參考末頁圖表)	<u>3.17.9.2 條件 1：</u> <u>(1)檢查試驗從開始至 120 ms 之區間，DV(t)值是否皆落在下圖合格區內，若是，則符合條件 1，請接著檢查條件 2。</u> <u>(2)若在此區間內，有部分 DV(t)值落在合格區外，則不符合條件 1。</u> <u>下圖代表台車試驗使用之脈衝較實車試驗脈衝輕，故不接受此台車試驗。</u> (請參考末頁圖表) <u>下圖代表台車試驗使用之脈衝較實車試驗脈衝重，故不接受此台車試驗。</u> (請參考末頁圖表) <u>3.17.9.3 條件 2：</u> <u>(1)若 120 ms 時的 $DX_{(120ms)}$ 值為負值，則符合條件 2。代表可接受此台車試驗。</u> <u>(2)若 120 ms 時的 $DX_{(120ms)}$ 值為正值，則不符合條件 2。代表不接受此台車試驗。</u> (請參考末頁圖表)	
Appendix III Seat mounted arm rests (請參考末頁圖表) Centre console and tunnel mounted (請參考末頁圖表)	<u>3.17.10 扶手及置物盒設置</u> <u>3.17.10.1 安裝於座椅之扶手</u> (請參考頁末圖示) <u>3.17.10.2 安裝於中控台或通道之扶手或置物盒</u> (請參考頁末圖示)	

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Appendix IV (請參考末頁圖表)	3.17.11 執行本項試驗之所有頻道 (請參考頁末表格)	
Appendix V (請參考末頁圖表)	3.17.12 試驗前各項量測示意圖 (請參考頁末圖示)	

(Euro NCAP 原文)

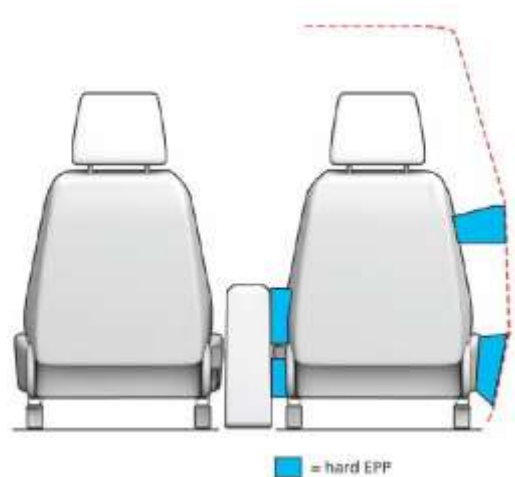


Figure 1: Seat spacers viewed from rear

(TNCAP 條文草案)

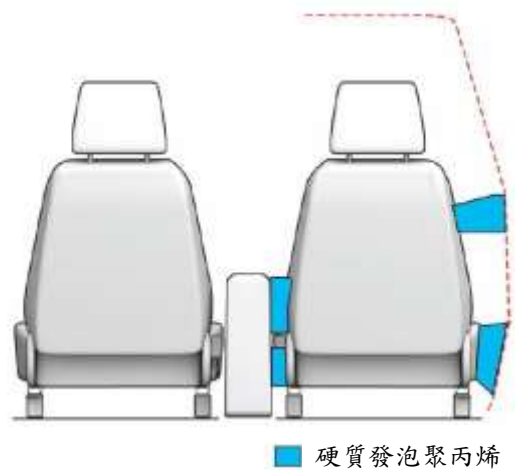


圖1：從後方視角觀看座椅墊塊

(Euro NCAP原文)

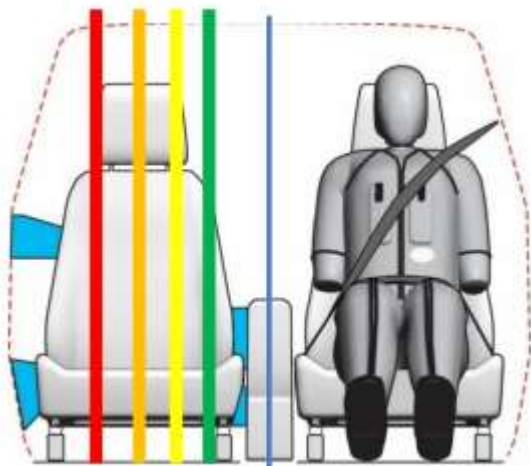


Figure 2: Vehicle markings

(TNCAP 條文草案)

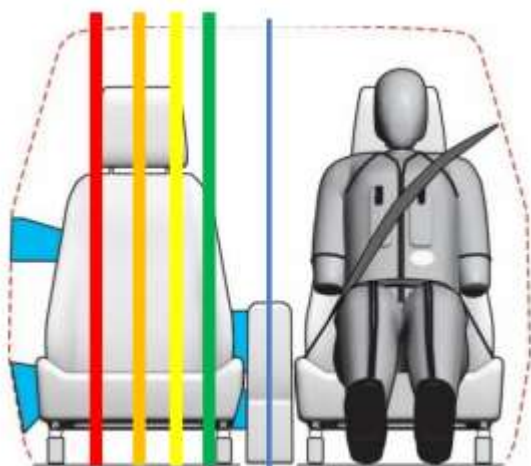
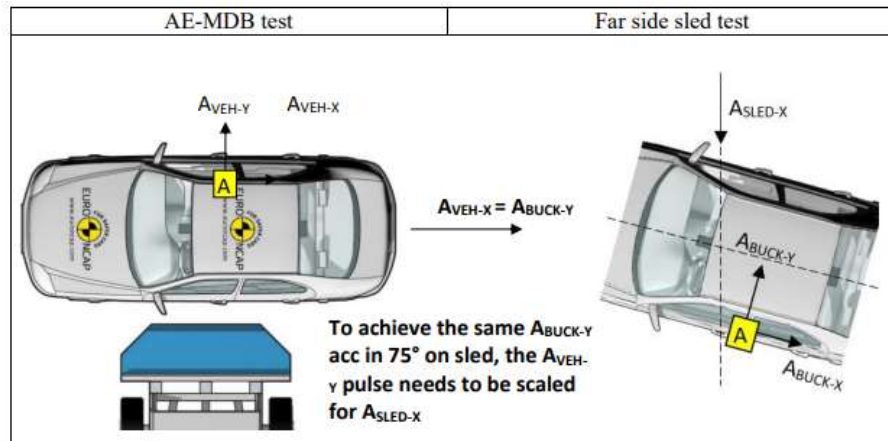


圖2：車輛標記

(Euro NCAP 原文)

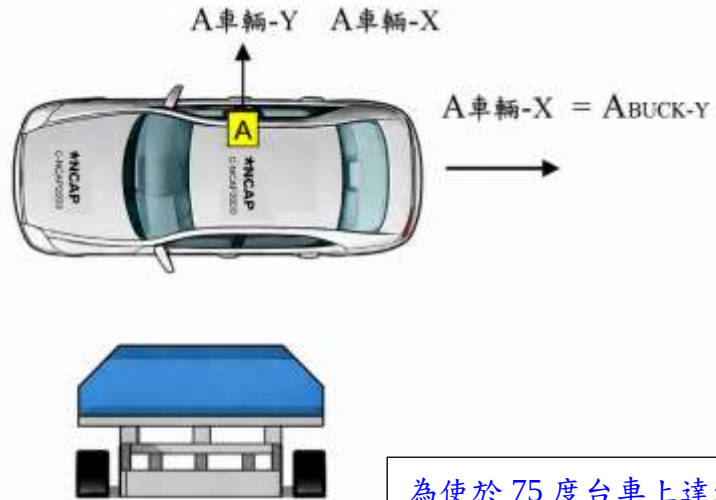
4.1.3



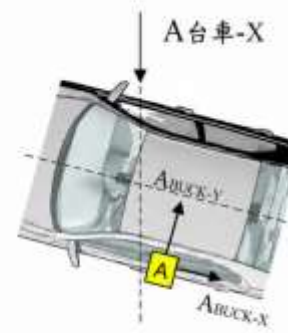
(TNCAP 條文草案)

3.17.4.1.3

側方撞擊試驗



遠端側方模擬碰撞試驗



為使於 75 度台車上達到相同加速度
 A_{BUCK-Y} ， $A_{車輛-Y}$ 脈衝須按比例調整
為 $A_{台車-X}$ 。

(Euro NCAP原文)

4.2.9

Location	Parameter	Minimum amplitude	Channel count
Head	Linear acceleration, Ax, Ay, Az	250g	3
	Angular velocity, ω_x , ω_y , ω_z	4000deg/sec	3
Upper neck	Forces and moments Fx, Fy, Fz, Mx, My, Mz	5kN, 300Nm	6
Lower neck*	Forces and moments Fx, Fy, Fz, Mx, My, Mz	5kN, 300Nm	6
Shoulder – Joint	Forces, Fx, Fy, Fz	8kN	3
Shoulder – Rib	Displacement & rotation	100mm	2
Thorax - Upper rib	Displacement & rotation	100mm	2
Thorax - Mid rib	Displacement & rotation	100mm	2
Thorax - Lower rib	Displacement & rotation	100mm	2
Thoracic temperature	Temperature	30°C	1
Abdomen - Upper rib	Displacement & rotation	100mm	2
Abdomen - Lower rib	Displacement & rotation	100mm	2
Spine - T12	Acceleration, Ax, Ay, Az	200g	3
	Forces Fx, Fy, Fz	5kN	3
	Moments, Mx, My, Mz	300Nm	3
Pelvis	Acceleration, Ax, Ay, Az	200g	3
	Pubic force	5kN	1
Total dummy channels			47

(TNCAP 條文草案)

3.17.4.2.9

<u>位置</u>	<u>參數</u>	<u>最低振幅</u>	<u>頻道數量</u>
<u>頭部</u>	<u>線性加速度, A_x、A_y、A_z</u>	<u>250g</u>	<u>3</u>
	<u>角速度, ω_x、ω_y、ω_z</u>	<u>4000 度/秒</u>	<u>3</u>
<u>上頸部</u>	<u>力與力矩</u>	<u>5kN, 300Nm</u>	<u>6</u>
	<u>F_x、F_y、F_z, M_x、M_y、M_z</u>		
<u>下頸部*</u>	<u>力與力矩</u>	<u>5kN, 300Nm</u>	<u>6</u>
	<u>F_x、F_y、F_z, M_x、M_y、M_z</u>		
<u>肩部－關節</u>	<u>力, F_x、F_y、F_z</u>	<u>8kN</u>	<u>3</u>
<u>肩部－肋骨</u>	<u>位移及旋轉</u>	<u>100mm</u>	<u>2</u>
<u>胸部－上肋骨</u>	<u>位移及旋轉</u>	<u>100mm</u>	<u>2</u>
<u>胸部－中肋骨</u>	<u>位移及旋轉</u>	<u>100mm</u>	<u>2</u>
<u>胸部－下肋骨</u>	<u>位移及旋轉</u>	<u>100mm</u>	<u>2</u>
<u>胸部溫度</u>	<u>溫度</u>	<u>30°C</u>	<u>1</u>
<u>腹部－上肋骨</u>	<u>位移及旋轉</u>	<u>100mm</u>	<u>2</u>
<u>腹部－下肋骨</u>	<u>位移及旋轉</u>	<u>100mm</u>	<u>2</u>
<u>脊椎- T12</u>	<u>加速度, A_x、A_y、A_z</u>	<u>200g</u>	<u>3</u>
	<u>力, F_x、F_y、F_z</u>	<u>5kN</u>	<u>3</u>
	<u>力矩, M_x、M_y、M_z</u>	<u>300Nm</u>	<u>3</u>
<u>骨盆</u>	<u>加速度, A_x、A_y、A_z</u>	<u>200g</u>	<u>3</u>
	<u>恥骨力</u>	<u>5kN</u>	<u>1</u>
	<u>人偶頻道總數</u>		<u>47</u>

(Euro NCAP原文)

4.3

Location	Parameter	Minimum Amplitude	No of channels
B-Pillar non-struck side (BIW coordinates)	Accelerations, A_x , A_y	150g	2
Sled	Accelerations, A_x	150g	1
Driver Seatbelt Shoulder and Lap* Sections	Force, $F_{diagonal}$, F_{lap}	16kN	2
Total vehicle channels			5

* Care must be taken to position the lap belt transducer outboard of the dummy so that it does not interfere with the dummy/interior during the impact.

(TNCAP條文草案)

3.17.4.3

<u>位置</u>	<u>參數</u>	<u>最低振幅</u>	<u>頻道數量</u>
<u>非撞擊側 B 柱 (車體座標)</u>	<u>加速度, A_x、A_y</u>	<u>150g</u>	<u>2</u>
<u>台車</u>	<u>加速度, A_x</u>	<u>150g</u>	<u>1</u>
<u>駕駛安全帶之肩部及腰部*</u>	<u>力, $F_{diagonal}$、F_{lap}</u>	<u>16kN</u>	<u>2</u>
<u>車輛頻道總數</u>			<u>5</u>

備註：*須小心地將腰部安全帶感測器置放於人偶外側，確保衝擊過程中不會干擾人偶/內飾板。

(Euro NCAP原文)



Figure 3: Dummy head painting

(TNCAP條文草案)



圖3：人偶頭部塗色

(Euro NCAP原文)

4.7.1

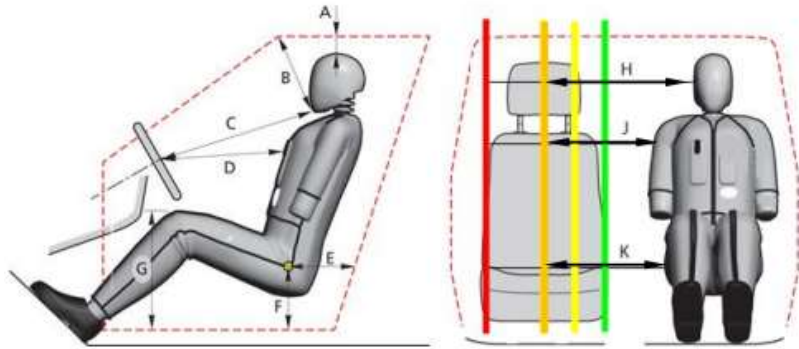


Figure 4: Pre-test measurements

Driver measurements	
A	Not required
B	Chin/windscreen joint
C	Chin/centre of the steering
D*	Thorax strap/centre of the steering wheel
E	Hip-joint point/inside opening of the door (horizontal), manikin and dummy
F	Hip-joint point/inside opening of the door (vertical), manikin and dummy
G	Knee/floor covering (vertical)
H	Head to seat centreline
J	Shoulder to seat centreline
K	Hip-joint point to seat centreline

* Horizontal distance from steering wheel centre

(TNCAP 條文草案)

3.17.4.7.1

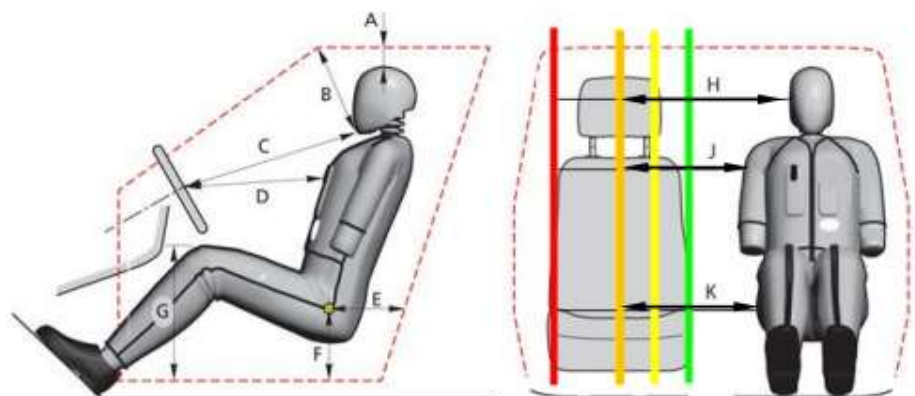


圖4：試驗前量測

駕駛量測值	
<u>A</u>	無需求
<u>B</u>	下巴至擋風玻璃接合點(Windscreen joint)
<u>C</u>	下巴至方向盤中心
<u>D*</u>	對角式織帶至方向盤中心
<u>E</u>	髖關節點至門檻(Inside opening of the door)（水平） 人體模型與人偶
<u>F</u>	髖關節點至門檻（垂直） 人體模型與人偶
<u>G</u>	膝部至地板表面材(Floor covering)（垂直）
<u>H</u>	頭部至座椅中線
<u>J</u>	肩部至座椅中線
<u>K</u>	髖關節點至座椅中線

備註：*與方向盤中心之水平距離

(Euro NCAP原文)

4.7.2

Measurement location		Coordinates		
Head CoG	Head skin outboard marking	X	Y	Z
Head	Tilt angle sensor	ID		
Neck bracket	Corner front	X	Y	Z
Neck bracket	Corner rear	X	Y	Z
Shoulder	Screw centre	X	Y	Z
Arm	Tip of foam centre	X	Y	Z
Arm	Upper arm angle	ID		
Thorax	Tilt angle sensor	ID		
H-point		X	Y	Z
Pelvis	Tilt angle sensor	ID		
Femur	Centreline of clevis	X	Y	Z
Femur	Angle	ID		
Knee	Joint screw centre	X	Y	Z
Ankle	Screw centre	X	Y	Z
Head restraint	Hole	X	Y	Z
Seatback	Angle (OEM location)	ID		
Seatbelt	Upper belt edge at dummy centreline	X	Y	Z

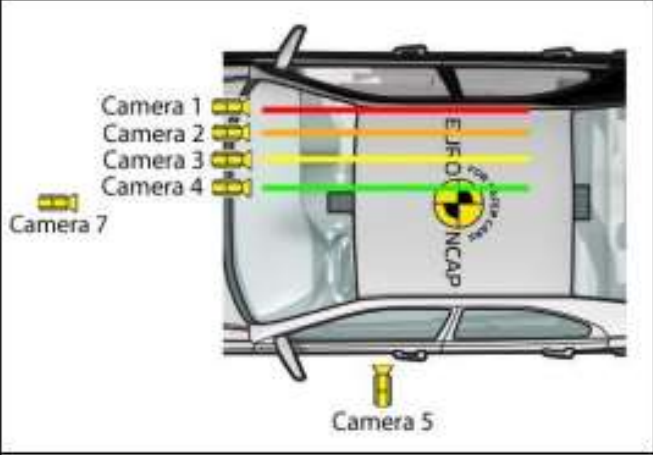
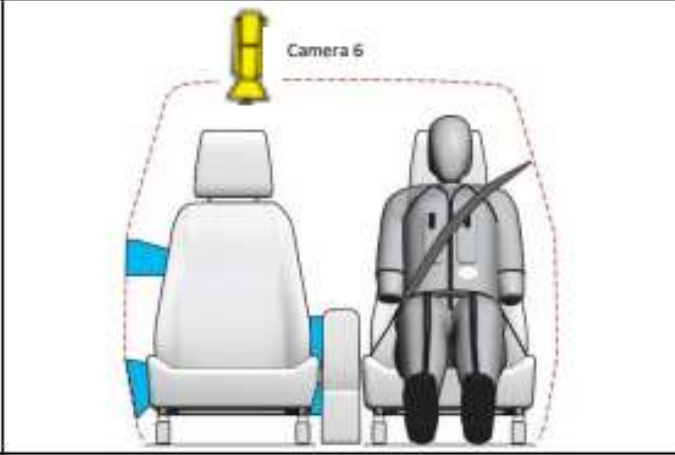
(TNCAP條文草案)

3.17.4.7.2

<u>量測位置</u>		<u>座標</u>		
<u>頭部重心(CoG)</u>	<u>頭部皮膚外側標記</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>頭部</u>	<u>傾斜角度感測器</u>	<u>1D</u>		
<u>人偶頸套(Neck bracket)</u>	<u>前端(Corner front)</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>人偶頸套</u>	<u>後端(Corner rear)</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>肩部</u>	<u>螺絲中心</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>手臂</u>	<u>泡棉中心頂端(Tip of foam centre)</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>手臂</u>	<u>上臂角度</u>	<u>1D</u>		
<u>胸腔</u>	<u>傾斜角度感測器</u>	<u>1D</u>		
<u>H 點</u>		<u>X</u>	<u>Y</u>	<u>Z</u>
<u>骨盆</u>	<u>傾斜角度感測器</u>	<u>1D</u>		
<u>股骨</u>	<u>膝關節中心線</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>股骨</u>	<u>角度</u>	<u>1D</u>		
<u>膝部</u>	<u>連接螺絲中心</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>腳踝</u>	<u>螺絲中心</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>頭枕</u>	<u>枕桿孔(Hole)</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>椅背</u>	<u>角度 (車輛業者宣告位置)</u>	<u>1D</u>		
<u>安全帶</u>	<u>人偶中心線處之對角式安全帶邊緣(Upper belt edge at dummy Centerline)</u>	<u>X</u>	<u>Y</u>	<u>Z</u>

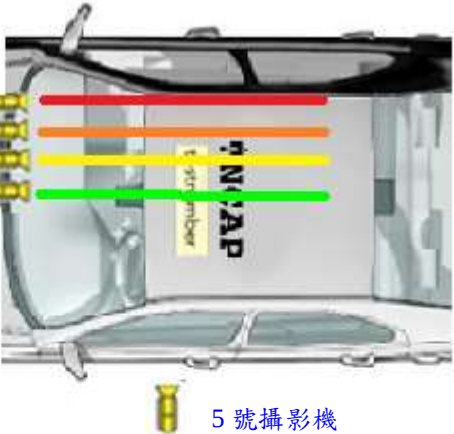
(Euro NCAP 原文)

5.5.5

 The diagram shows the interior of a vehicle with a crash test dummy seated in the driver's position. Seven camera locations are indicated: Camera 1 (red line), Camera 2 (orange line), Camera 3 (yellow line), and Camera 4 (green line) are all positioned at the front of the vehicle, pointing towards the dashboard and windshield. Camera 5 is located on the side, pointing at the driver's head and upper body. Camera 7 is located on the left side of the vehicle, pointing towards the driver's head. A Euro NCAP logo is visible on the dashboard.	 The diagram shows the rear of the vehicle with a crash test dummy seated in the driver's position. Camera 6 is located directly behind the vehicle, pointing forward at the rear of the dummy. Camera 7 is located further back, pointing forward at the rear of the vehicle, parallel to the centerline.
<u>Onboard camera views:</u> 1. Front, red line 2. Front, orange line 3. Front, yellow line 4. Front, green line 5. Side, driver pre-test pelvis to head 6. Plan, most outboard head excursion line	<u>Offboard camera views:</u> 7. Front, parallel to vehicle centreline

(TNCAP條文草案)

3.17.5.5.5

1 號攝影機 2 號攝影機 3 號攝影機 4 號攝影機 7 號攝影機  5 號攝影機	 6 號攝影機
<u>車載攝影機視圖：</u> <u>1. 前方，紅線</u> <u>2. 前方，橘線</u> <u>3. 前方，黃線</u> <u>4. 前方，綠線</u> <u>5. 側面，試驗前駕駛骨盆至頭部間</u> <u>6. 俯視，最外側之頭部偏移線</u>	<u>車外攝影機視圖</u> <u>7. 前方，與車輛中線平行</u>

Euro NCAP 原文

Camera: 1



Description:

Front view centred to intrusion limit and parallel to vehicle centreline.

Frame width: Outboard edge of A-pillar to far side seat centreline.

Frame height: Front edge of roof to seat base.

TNCAP 條文草案

1 號攝影機



說明：

前方視角：對準侵入線，與車輛中線平行。

畫面寬度：A 柱外緣至遠端座椅中線。

畫面高度：車頂前緣至座椅底座。

Euro NCAP原文

Camera: 2



Description:

Front view centred to seat centreline, parallel to vehicle centreline.

Frame width: Outboard edge of A-pillar to far side B-pillar.

Frame height: Front edge of roof to seat base.

TNCAP條文草案

2 號攝影機



說明：

前方視角：對準座位中線，與車輛中線平行。

畫面寬度：A 柱外緣至遠端 B 柱。

畫面高度：車頂前緣至座椅底座。

Euro NCAP原文

Camera: 3



Description:

Front view centred to yellow line, parallel to vehicle centreline.
Frame width: Outboard edge of A-pillar to far side B-pillar
Frame height: Front edge of roof to seat base.

TNCAP條文草案

3 號攝影機



說明：

前方視角：對準黃線，與車輛中線平行。

畫面寬度：A 柱外緣至遠端 B 柱

畫面高度：車頂前緣至座椅底座。

Euro NCAP原文

Camera: 4



Description:

Front view centred to green line, parallel to vehicle centreline.
Frame width: Outboard edge of B-pillar to far side B-pillar.
Frame height: Front edge of roof to seat base.

TNCAP條文草案

4 號攝影機



說明：

前方視角：對準綠線，與車輛中線平行。

畫面寬度：B 柱外緣至遠端 B 柱。

畫面高度：車頂前緣至座椅底座。

Euro NCAP原文

Camera: 5



Description:

Side view of driver centred to middle of door aperture, door waist height.

Frame width: Facia to rear of seat back

Frame height: Head to pelvis.

TNCAP條文草案

5 號攝影機



說明：

駕駛側方視角：對準門框中心、車門腰線高度。

畫面寬度：儀表板至椅背後緣。

畫面高度：頭部至骨盆。

Euro NCAP原文

Camera: 6



Description:

Frame width: Facia to rear of seat back

Frame height: Far side seat centreline to B-pillar.

TNCAP條文草案

6 號攝影機



說明：

畫面寬度：中控台至椅背後緣。

畫面高度：遠端座椅中線至 B 柱。

Euro NCAP 原文

Camera: 7



Description:

Front, parallel to vehicle centreline.

Frame width: Full width of BIW.

Frame height: Full height of BIW.

TNCAP 條文草案

7 號攝影機



說明：

前方視角：與車輛中線平行。

畫面寬度：車體全寬。

畫面高度：車體全高。

(Euro NCAP原文)

5.6.1

No.	Pre	Post	View
1	●	●	Top view of full BIW
2	●	●	Front view of full BIW
3	●	●	Rear view of full BIW
4	●	●	Side view of full BIW
5	●	●	Driver's side view of BIW at 45 ° to front
6	●	●	Passenger's side view of BIW at 45 ° to front
7	●	●	Side view of driver from outside
8	●	●	Side view of driver from inside (including paint)
9	●	●	Front view of driver
10	●	●	Rear view of spacers in position
After dummy removal:			
11		●	Paint transfer to centre console
12		●	Paint transfer to passenger's side door/airbags (if applicable)

(TNCAP條文草案)

3.17.5.6.1

<u>編號</u>	<u>試驗前</u>	<u>試驗後</u>	<u>畫面</u>
<u>1</u>	<u>●</u>	<u>●</u>	<u>整個車體頂部視角</u>
<u>2</u>	<u>●</u>	<u>●</u>	<u>整個車體前視角</u>
<u>3</u>	<u>●</u>	<u>●</u>	<u>整個車體後視角</u>
<u>4</u>	<u>●</u>	<u>●</u>	<u>整個車體側視角</u>
<u>5</u>	<u>●</u>	<u>●</u>	<u>車體前方45度角之駕駛側視角</u>
<u>6</u>	<u>●</u>	<u>●</u>	<u>車體前方45度角之乘客側視角</u>
<u>7</u>	<u>●</u>	<u>●</u>	<u>車外拍攝駕駛側視角</u>
<u>8</u>	<u>●</u>	<u>●</u>	<u>車內拍攝駕駛側視角(包含塗色)</u>
<u>9</u>	<u>●</u>	<u>●</u>	<u>駕駛前視角</u>
<u>10</u>	<u>●</u>	<u>●</u>	<u>墊塊後視角</u>
<u>人偶移除後</u>			
<u>11</u>		<u>●</u>	<u>中控台塗料</u>
<u>12</u>		<u>●</u>	<u>乘客側車門/空氣囊(依實際狀況)塗料</u>

(Euro NCAP原文)

7.2.1

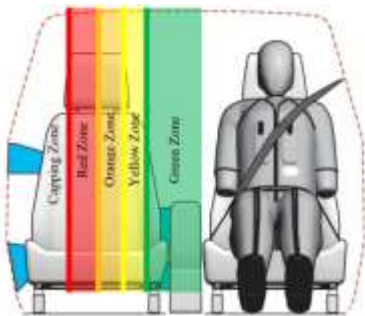
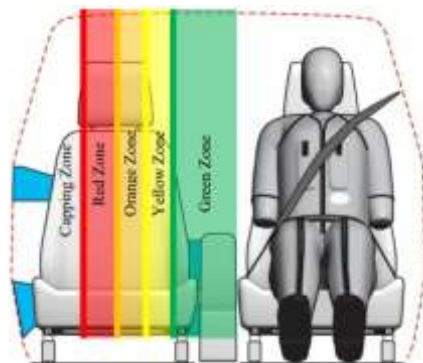


Figure 5: Head excursion zones

(TNCAP條文草案)

[3.17.7.2.1](#)



[圖5：頭部偏移區域](#)

(Euro NCAP原文)

7.2.2

Head Excursion						
	Capping Zone*	Red Zone**		Orange Zone	Yellow Zone	Green Zone
		≤125mm	>125m			
Head Score	0.000	0.000	2.000	3.000	4.000	4.000
Neck Score	0.000	4.000	4.000	3.000	4.000	4.000
Chest Score	0.000	0.000	0.000	3.000	4.000	4.000
Max Dummy Score	0.000	4.000	6.000	9.000	12.000	12.000

* In case of head excursion in the Capping Zone, both far side tests are capped.

** With the head excursion in the Red Zone, the maximum head score is depending on whether the red excursion line is >125mm outboard of the orange excursion line or not. Where the head excursion is in the red zone, the vehicle is equipped with a countermeasure and the red excursion line is >125 mm outboard of the orange line, then the excursion shall be coloured brown instead of red.

(TNCAP條文草案)

3.17.7.2.2

頭部偏移量						
	限制區域 ¹	紅色區域 ²		橘色區域	黃色區域	綠色區域
		≤125mm	>125m			
頭部分數	0.000	0.000	2.000	3.000	4.000	4.000
頸部分數	0.000	4.000	4.000	3.000	4.000	4.000
胸部分數	0.000	0.000	0.000	3.000	4.000	4.000
人偶最高得分	0.000	4.000	6.000	9.000	12.000	12.000

備註：1.若任一臺車試驗發生頭部偏移進入限制區域，則遠端側方模擬碰撞試驗給予0分。

2.若頭部偏移進入紅色區域，則頭部最高分數將取決於紅色偏移線與橘色偏移線之距離是否超過125mm。當頭部偏移進入紅色區域，車輛配備遠端側方碰撞保護性對策，且紅色偏移線於橘色偏移線外側大於125mm，則偏移情形應以棕色替代紅色。

(Euro NCAP原文)

7.2.3

Head Excursion					
	Capping Zone*	Red Zone	Orange Zone	Yellow Zone	Green Zone
Head Score	0.000	0.000	1.000	2.000	4.000
Neck Score	0.000	1.000	1.000	2.000	4.000
Chest Score	0.000	0.000	1.000	2.000	4.000
Max Dummy Score	0.000	1.000	3.000	6.000	12.000

* In case of head excursion in the Capping Zone, both far side tests are capped.

(TNCAP條文草案)

3.17.7.2.3

<u>頭部偏移量</u>					
	<u>限制區域¹</u>	<u>紅色區域</u>	<u>橘色區域</u>	<u>黃色區域</u>	<u>綠色區域</u>
<u>頭部分數</u>	<u>0.000</u>	<u>0.000</u>	<u>1.000</u>	<u>2.000</u>	<u>4.000</u>
<u>頸部分數</u>	<u>0.000</u>	<u>1.000</u>	<u>1.000</u>	<u>2.000</u>	<u>4.000</u>
<u>胸部分數</u>	<u>0.000</u>	<u>0.000</u>	<u>1.000</u>	<u>2.000</u>	<u>4.000</u>
<u>人偶最高得分</u>	<u>0.000</u>	<u>1.000</u>	<u>3.000</u>	<u>6.000</u>	<u>12.000</u>

備註：1.若任一台車試驗發生頭部偏移進入限制區域，則遠端側方模擬碰撞試驗給予0分。

(Euro NCAP原文)

7.3.1

	Criteria	Performance limits		
		Higher	Lower	Capping
Head	HIC ₁₅ (with direct contact)	500	700	700
	Resultant 3ms acceleration	72g	80g	80g
	*DAMAGE		[0.42]	
Upper Neck	Tension F _z		3.74kN	
	Lateral flexion M _x OC	162Nm	248Nm	
	Extension negative M _y OC		50Nm	
Lower Neck	Tension F _z		3.74kN	
	Lateral flexion M _x (base of neck)	162Nm	248Nm	
	Extension neg. M _y (base of neck)		100Nm	
Chest & Abdomen	Chest lateral compression	28mm	50mm	50mm
	Abdomen lateral compression	47mm	65mm	65mm

* Monitoring for 2024-2025

A hard contact is assumed if the peak resultant head acceleration exceeds 80g or if there is other evidence of hard contact.

(TNCAP條文草案)

3.17.7.3.1

	標準	性能限制值		
		較高性能	較低性能	底線限制
頭部	<u>HIC₁₅ (直接接觸)</u>	<u>500</u>	<u>700</u>	<u>700</u>
	<u>3ms合成加速度</u>	<u>72g</u>	<u>80g</u>	<u>80g</u>
	<u>腦部損傷-傷害</u>		<u>[0.42]</u>	

	<u>標準</u>	<u>性能限制值</u>		
		<u>較高性能</u>	<u>較低性能</u>	<u>底線限制</u>
	<u>¹(Brain Injury - DAMAGE)</u>			
<u>上頸部</u>	<u>張力F_z</u>		<u>3.74kN</u>	
	<u>橫向彎曲M_xOC</u>	<u>162Nm</u>	<u>248Nm</u>	
	<u>反向拉伸M_yOC</u>		<u>50Nm</u>	
<u>下頸部</u>	<u>張力F_z</u>		<u>3.74kN</u>	
	<u>橫向彎曲M_x(<u>頸底</u>)</u>	<u>162Nm</u>	<u>248Nm</u>	
	<u>反向拉伸M_y(<u>頸底</u>)</u>		<u>100Nm</u>	
<u>胸部與腹部</u>	<u>胸部橫向壓縮量</u>	<u>28mm</u>	<u>50mm</u>	<u>50mm</u>
	<u>腹部橫向壓縮量</u>	<u>47mm</u>	<u>65mm</u>	<u>65mm</u>

備註：1.監控

2.若頭部合成加速度峰值超過80g，或有其他硬碰撞證據，則判定為頭部硬碰撞。

(Euro NCAP原文)

7.4.1

	Criteria	Performance limits	
Pelvis & Lumbar	Pubic symphysis	2.8kN	-4 points
	Lumbar Fy	2.0kN	
	Lumbar Fz	3.50kN	
	Lumbar Mx	120Nm	

(TNCAP條文草案)

3.17.7.4.1

	<u>標準</u>	<u>性能限制值</u>	
<u>骨盆與腰 椎</u>	<u>恥骨聯合力</u>	<u>2.8kN</u>	<u>扣4分</u>
	<u>腰椎F_y</u>	<u>2.0kN</u>	
	<u>腰椎F_z</u>	<u>3.50kN</u>	
	<u>腰椎M_x</u>	<u>120Nm</u>	

(Euro NCAP原文)

7.2.4.2.5

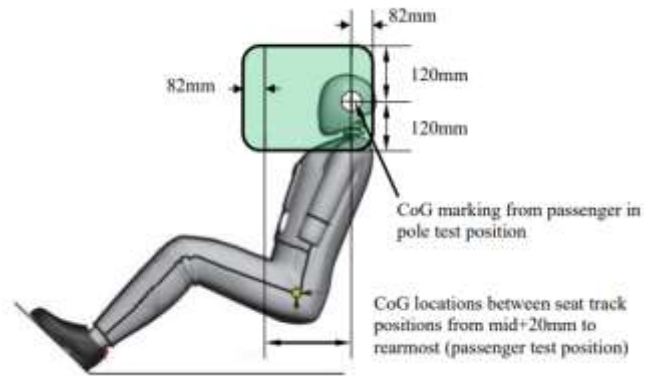
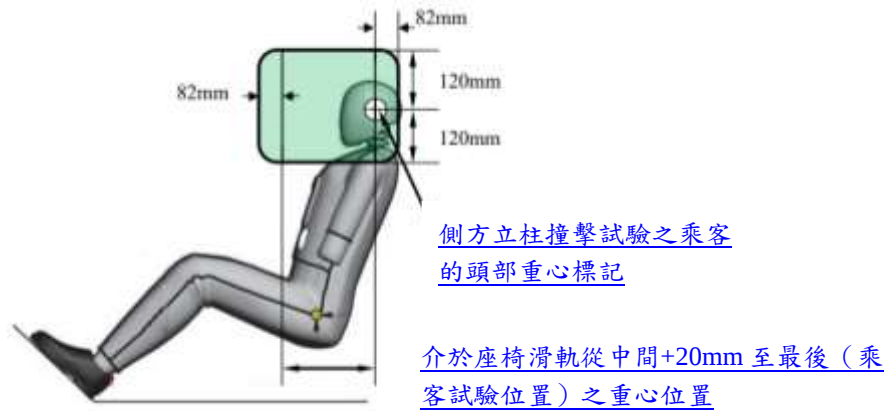


Figure 6: Protection zone

(TNCAP條文草案)

[3.17.7.2.4.2.5](#)



[圖6：頭部保護區域](#)

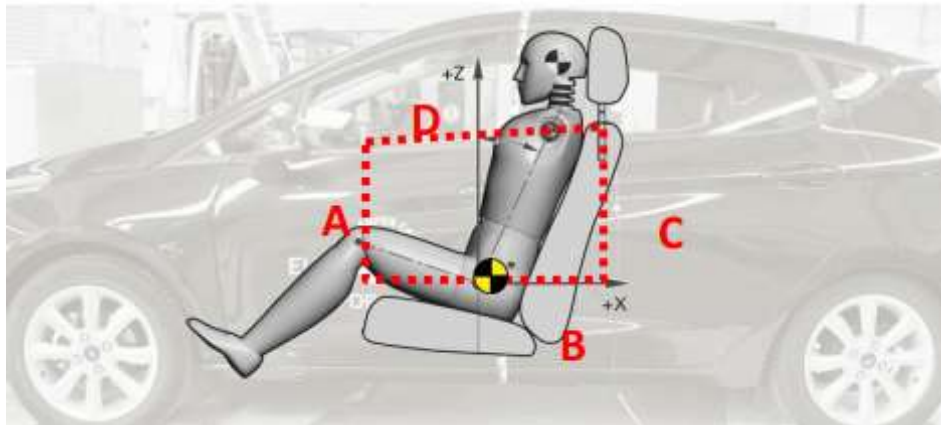
Euro NCAP原文

Appendix I

Intrusion area

The intrusion area is the external area limited by the following lines:

Line	Description
A	Vertical line at x-position 700mm forward of the R-point
B	Horizontal line at z-position of R-point
C	Vertical line at x-position at the back of headrest stems
D	Door waist line



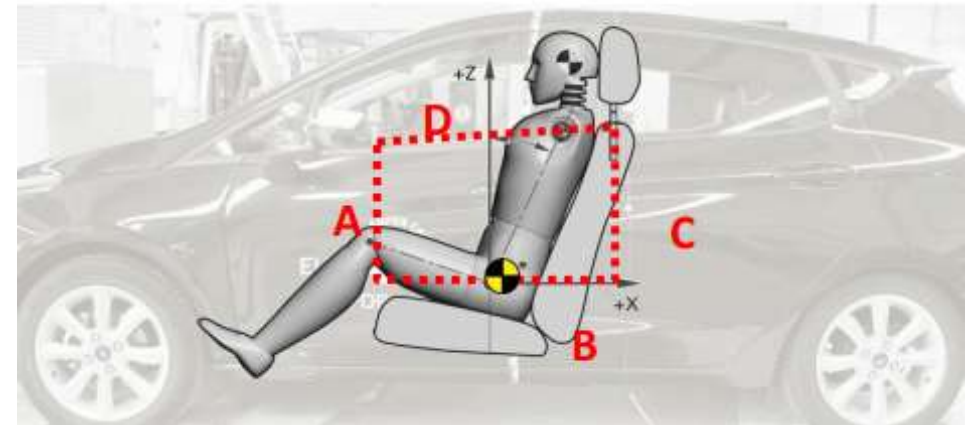
TNCAP條文草案

3.17.8

侵入區域

侵入區域為下列線段所界定之外表面積：

線段	說明
A	R點X座標前方700mm之垂直線
B	R點Z座標之水平線
C	頭枕根部後方X座標之垂直線
D	車門腰線



Euro NCAP原文

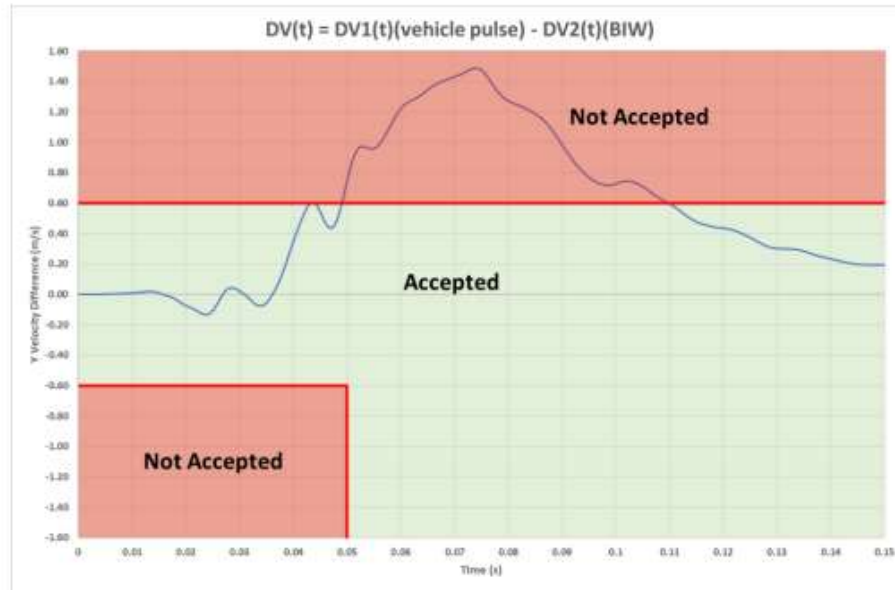


TNCAP條文草案



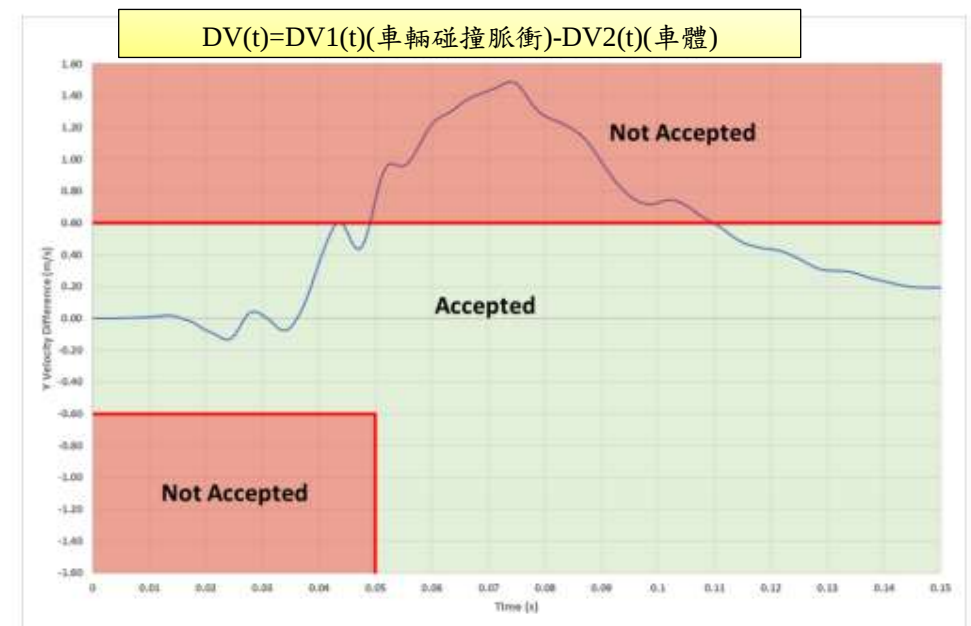
Appendix II

Requirement #1:



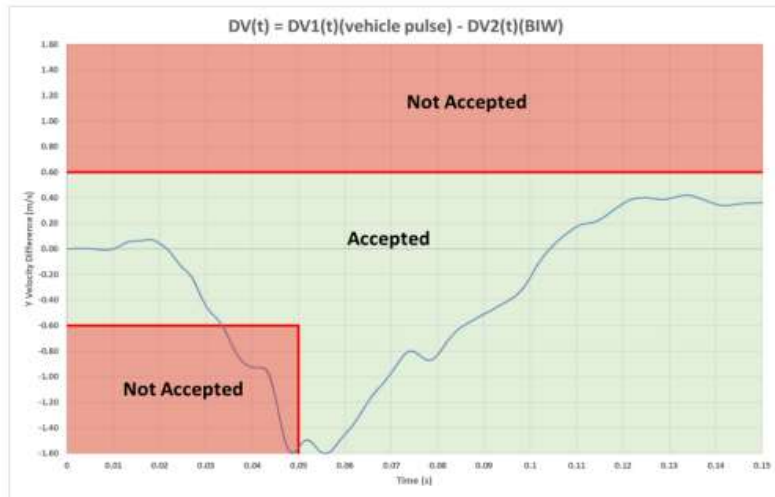
[3.17.9.](#)

[3.17.9.2 條件1：](#)



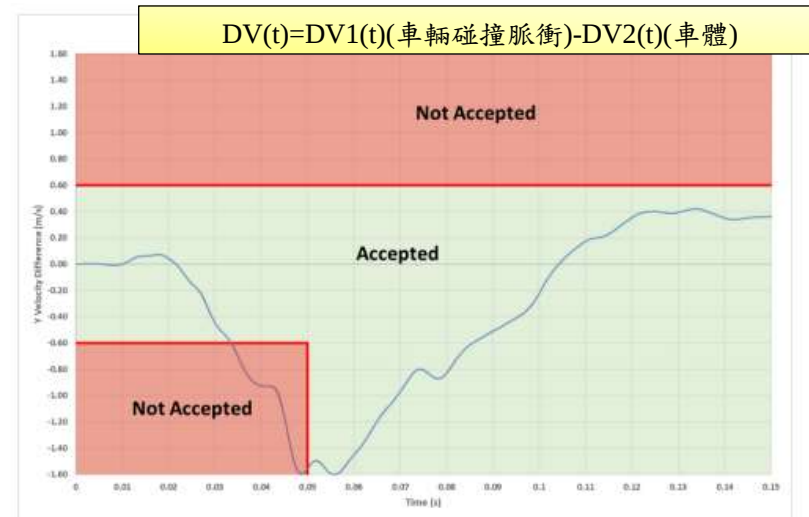
Euro NCAP原文

Requirement #1:



TNCAP條文草案

[3.17.9.2 條件1：](#)



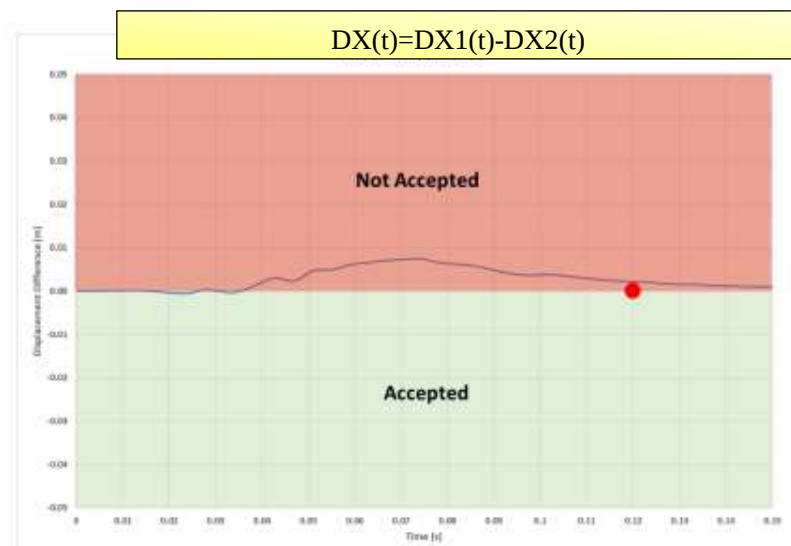
Euro NCAP原文

Requirement #2:

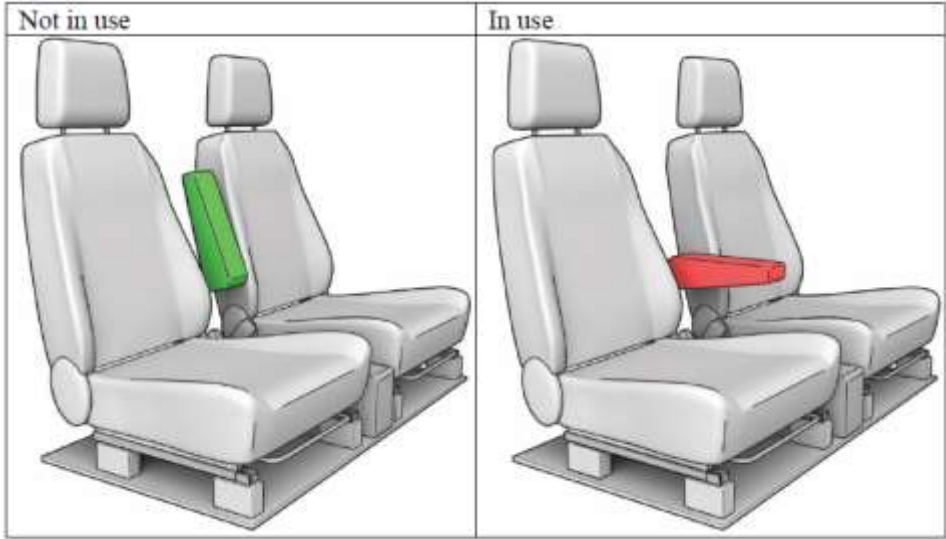


TNCAP條文草案

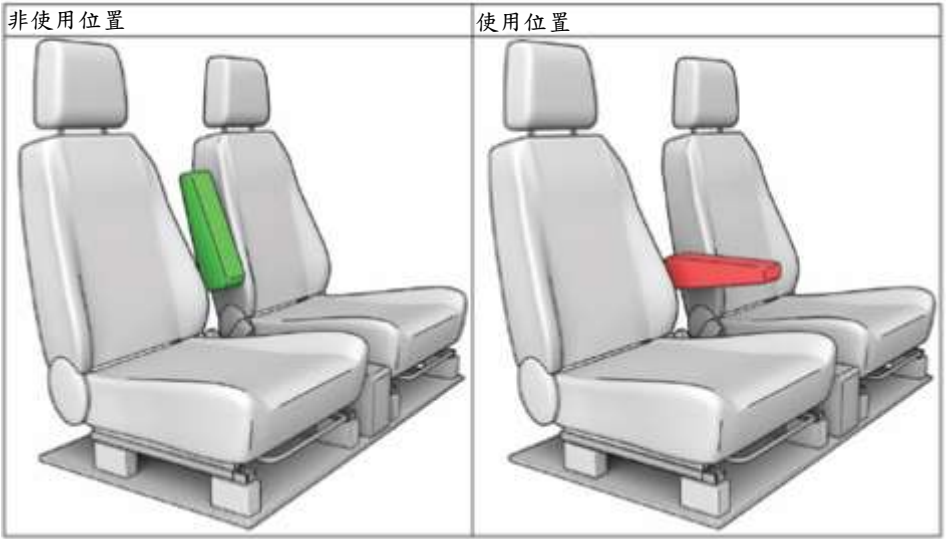
[3.17.9.3 條件2：](#)



Appendix III
Seat mounted arm rests

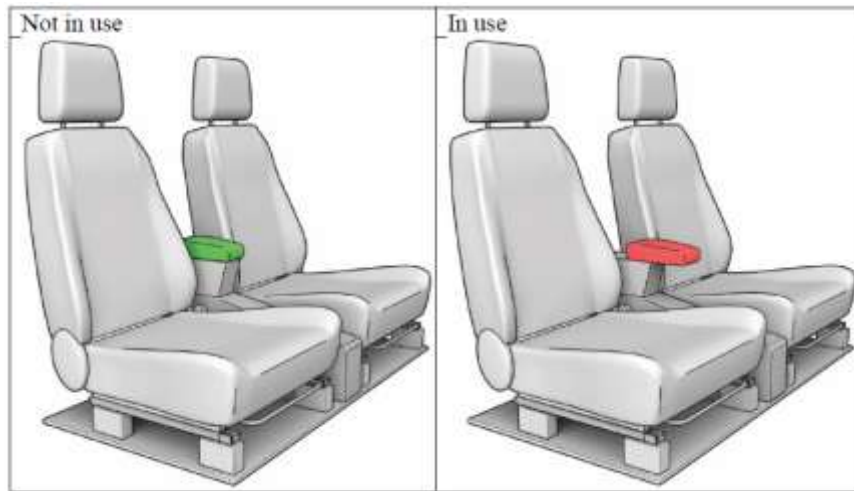


[3.17.10](#)
[3.17.10.1 安裝於座椅之扶手](#)



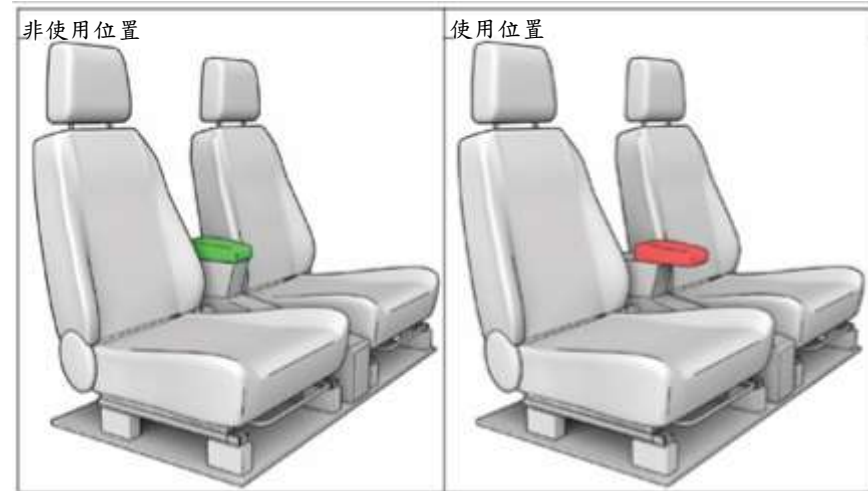
Euro NCAP原文

Centre console and tunnel mounted

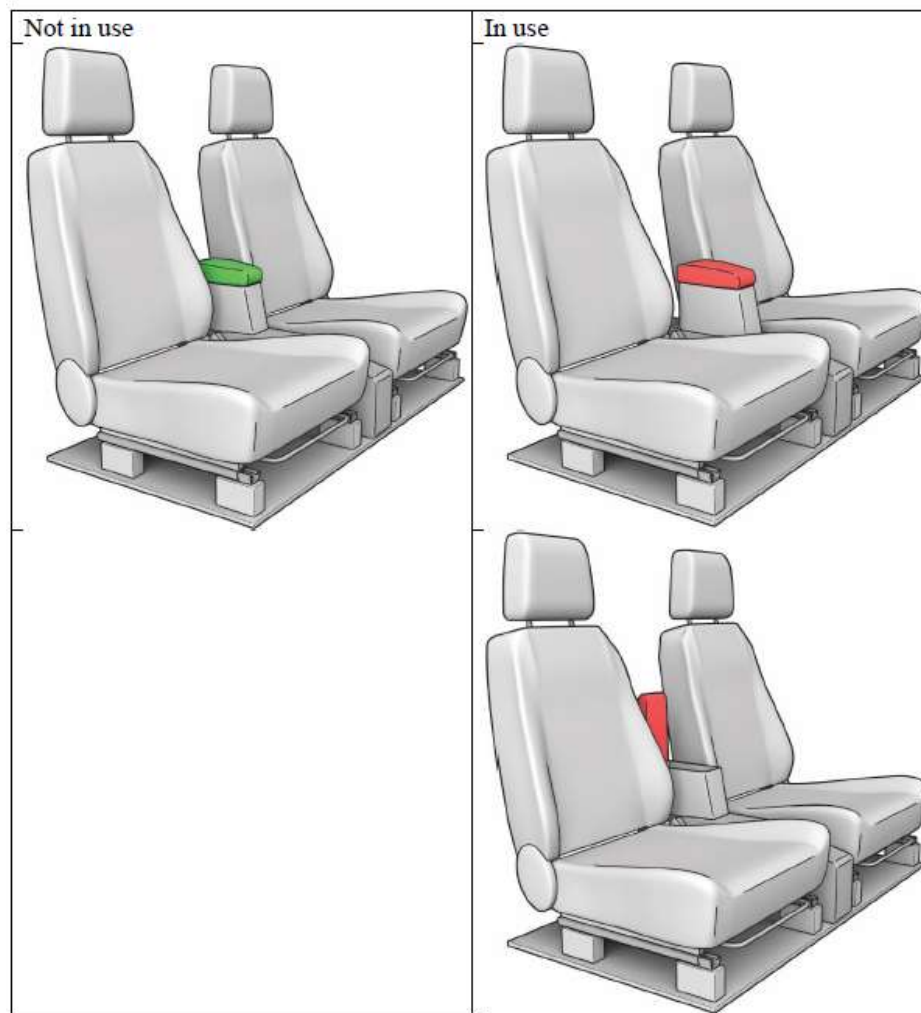


TNCAP條文草案

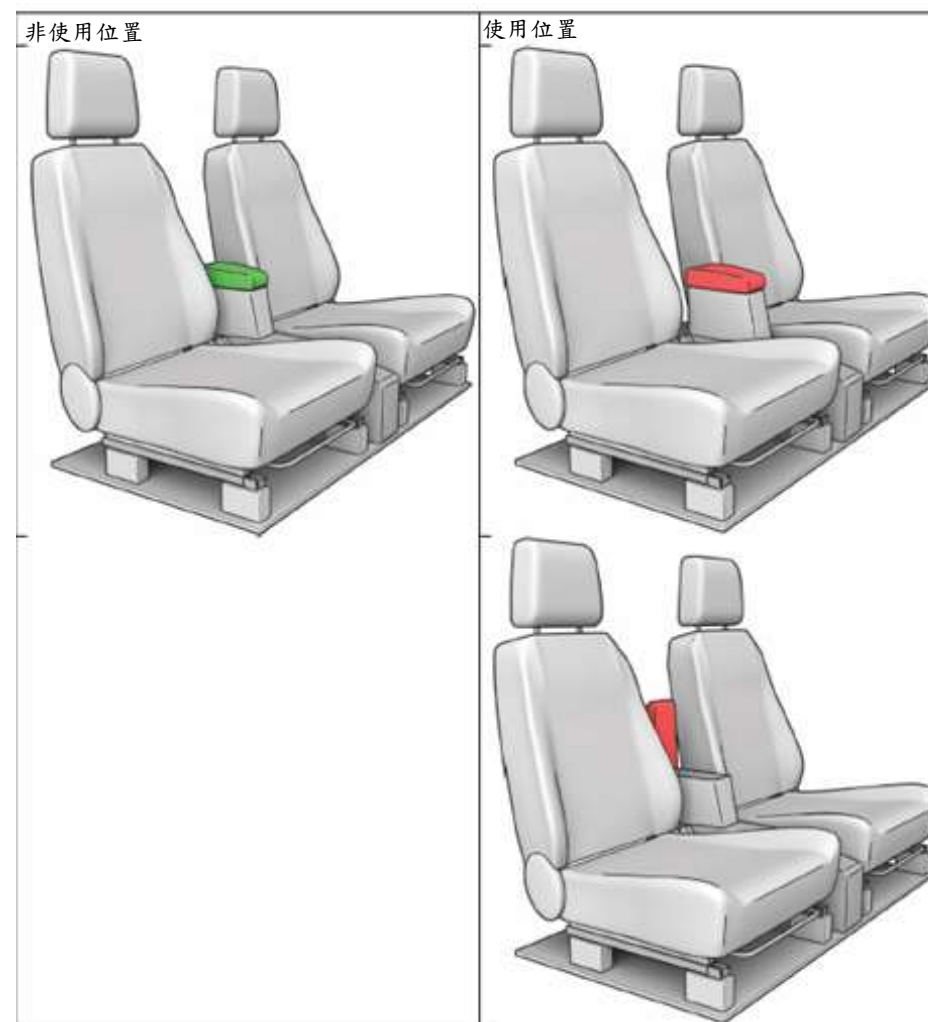
[3.17.10.2 安裝於中控台或通道之扶手或置物盒](#)

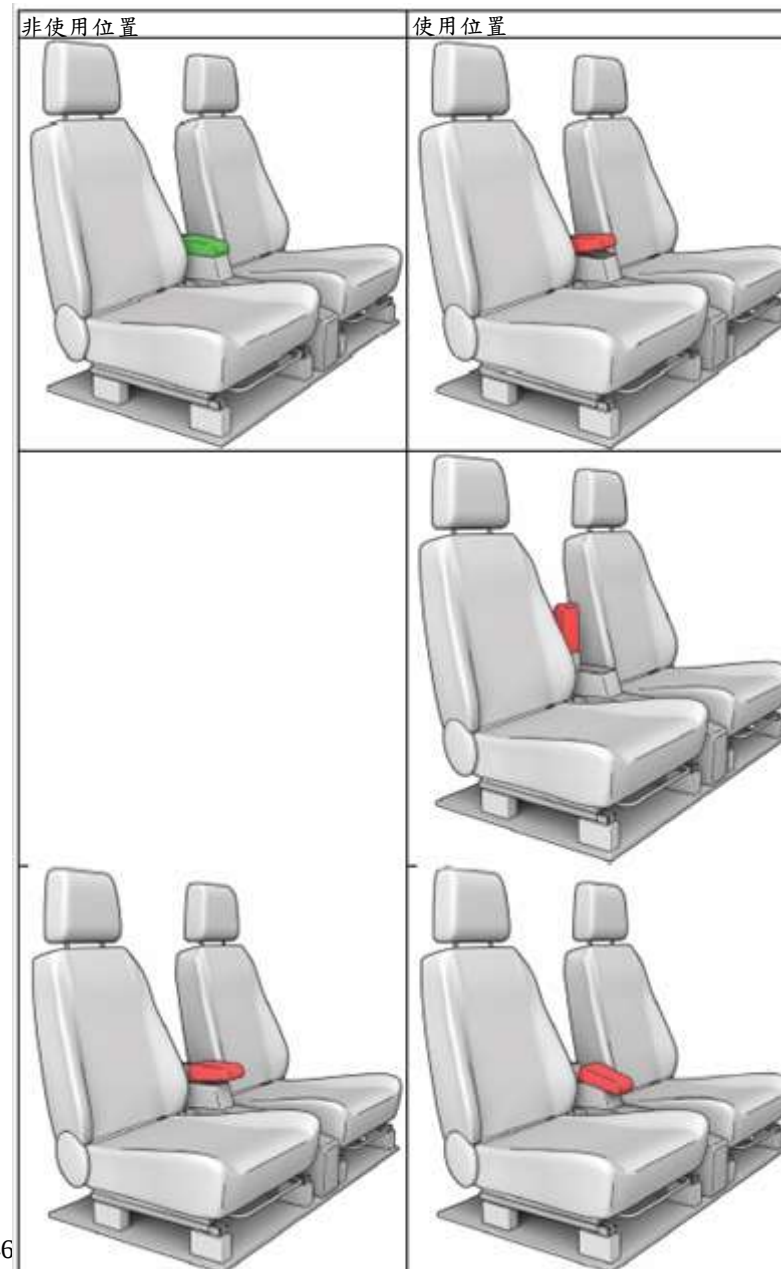
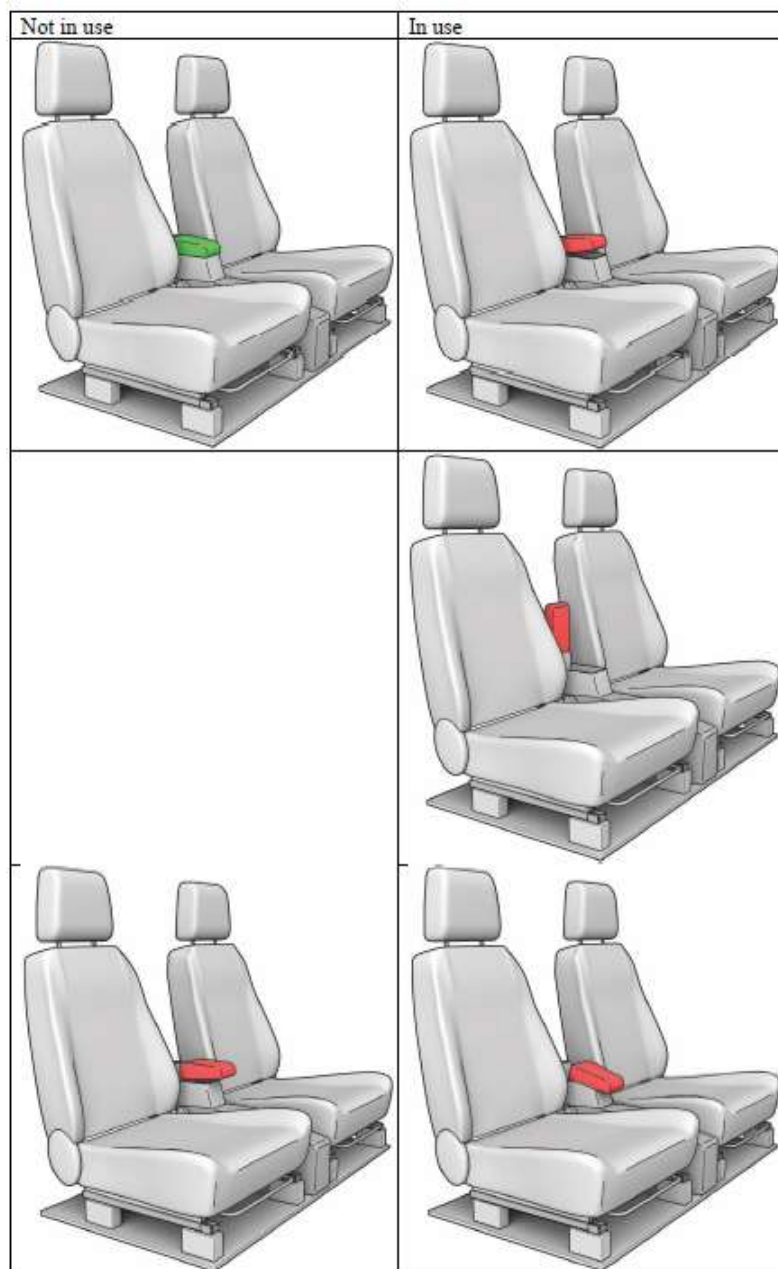


Euro NCAP原文

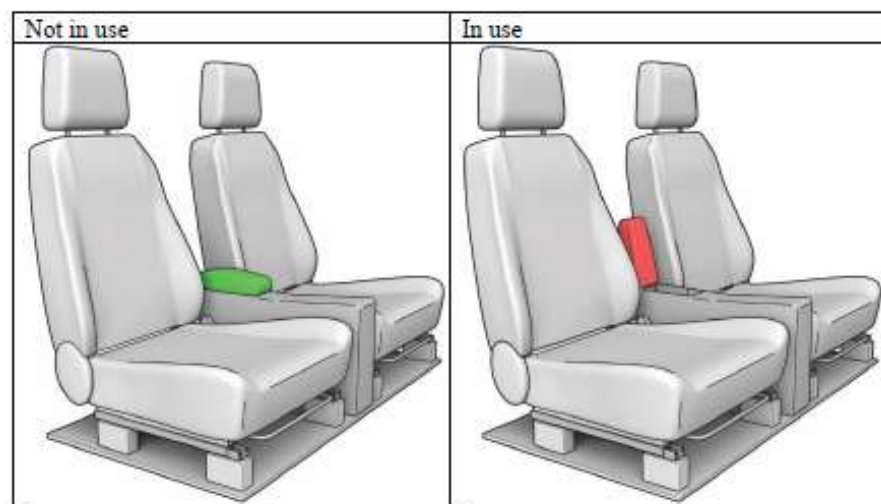


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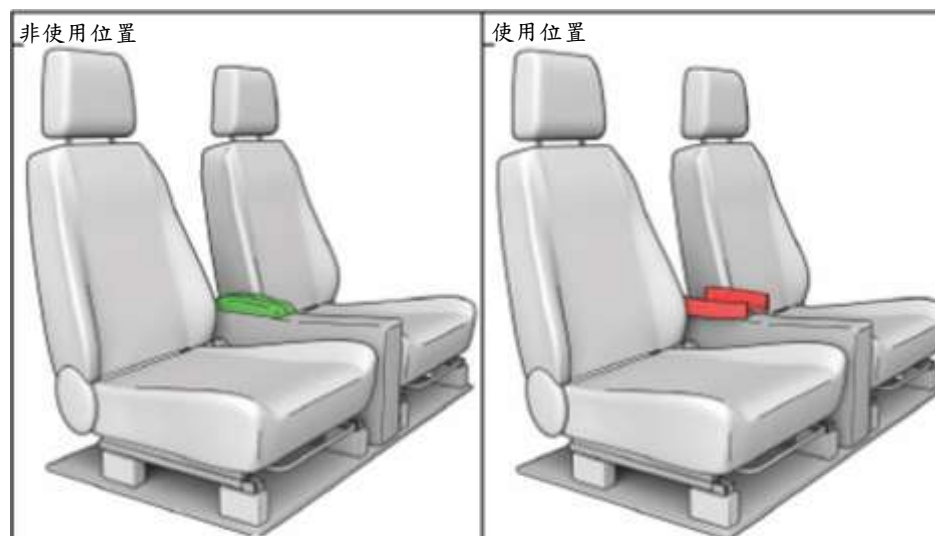
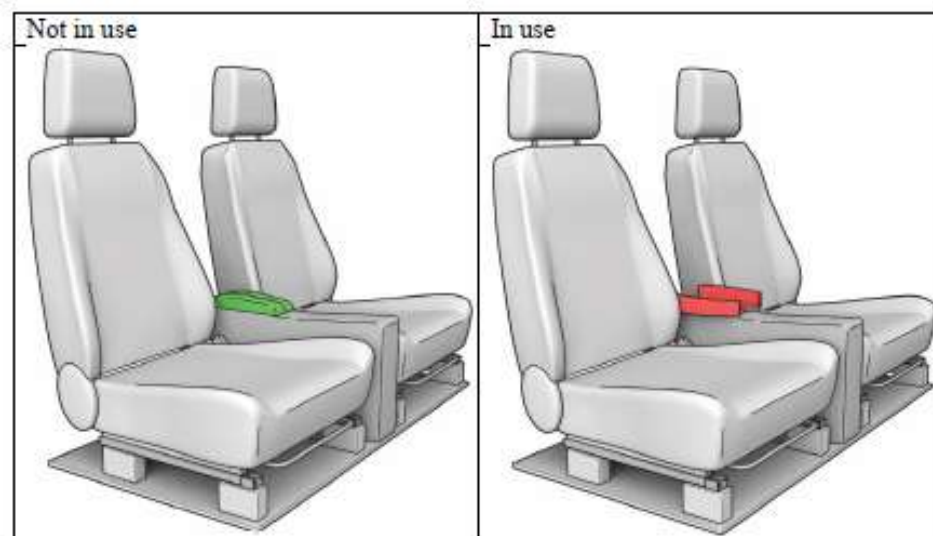
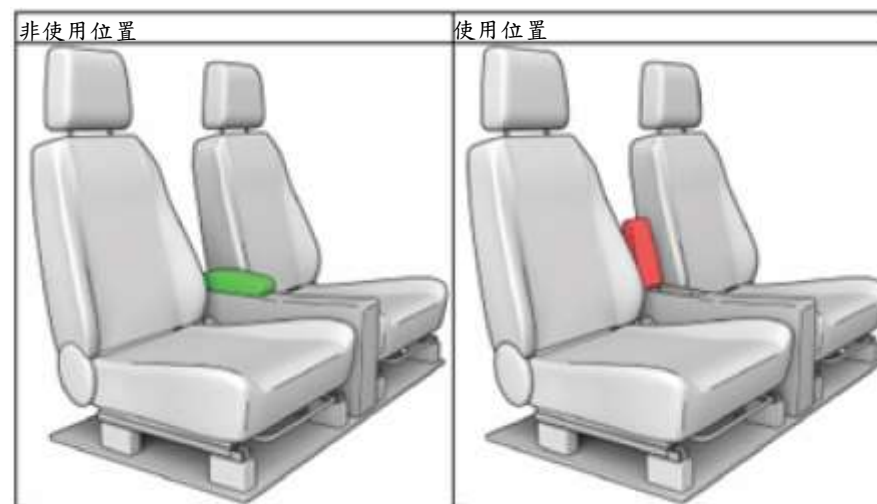




Euro NCAP原文



TNCAP條文草案



(Euro NCAP 原文)

Appendix IV

Location	Parameter	Axis	ISO Code
Head CoG	Angular velocities	x	1?HEAD0000WSAVX0
		y	1?HEAD0000WSAVY0
		z	1?HEAD0000WSAVZ0
	Accelerations	x	1?HEAD0000WSACX0
		y	1?HEAD0000WSACY0
		z	1?HEAD0000WSACZ0
Upper neck	Forces	x	1?NECKUP00WSFOX0
		y	1?NECKUP00WSFOY0
		z	1?NECKUP00WSFOZ0
	Moments	x	1?NECKUP00WSMOX0
		y	1?NECKUP00WSMOY0
		z	1?NECKUP00WSMOZ0
Lower neck	Forces	x	1?NECKLO00WSFOX0
		y	1?NECKLO00WSFOY0
		z	1?NECKLO00WSFOZ0
	Moments	x	1?NECKUP00WSMOX0
		y	1?NECKUP00WSMOY0
		z	1?NECKUP00WSMOZ0
Spine – T4	Accelerations	x	1?THSP0400WSACX0
		y	1?THSP0400WSACY0
		z	1?THSP0400WSACZ0
Spine – T12	Accelerations	x	1?THSP1200WSACX0

Location	Parameter	Axis	ISO Code
		y	1?THSP1200WSACY0
		z	1?THSP1200WSACZ0
Lumbar spine	Forces	x	1?LUSP0000WSFOX0
		y	1?LUSP0000WSFOY0
		z	1?LUSP0000WSFOZ0
	Moments	x	1?LUSP0000WSMOX0
		y	1?LUSP0000WSMOY0
		z	1?LUSP0000WSMOZ0
Shoulder joint	Forces	x	1?SHLD??00WSFOX0
		y	1?SHLD??00WSFOY0
		z	1?SHLD??00WSFOZ0
Shoulder – rib	Displacement	1D	1?SHRI??00WSDC00
	Angular displacement		1?SHRI??00WSAN00
Thorax - Upper rib	Displacement	1D	1?TRRI??01WSDC00
	Angular displacement		1?TRRI??01WSAN00
Thorax - Mid rib	Displacement	1D	1?TRRI??02WSDC00
	Angular displacement		1?TRRI??02WSAN00
Thorax - Lower rib	Displacement	1D	1?TRRI??03WSDC00
	Angular displacement		1?TRRI??03WSAN00
Abdomen –	Displacement	1D	1?ABRI??01WSDC00

Location	Parameter	Axis	ISO Code
Upper rib	Angular displacement		1?ABRI??01WSAN00
Abdomen – Lower rib	Displacement	1D	1?ABRI??02WSDC00
	Angular displacement		1?ABRI??02WSAN00
Pelvis	Accelerations	x	1?PELV000000ACX0
		y	1?PELV000000ACY0
		z	1?PELV000000ACZ0
Pubic Symphysis	Force	y	1?PUBC0000WSFOY0
B-Pillar (non-struck side)	Accelerations	x	1?BPILLO0000ACX0
		y	1?BPILLO0000ACY0
		z	1?BPILLO0000ACZ0
Lap Belt (B6)	Force	y	1?SEBE0003B6FO00
Shoulder Belt (B3)	Force	y	1?SEBE0003B3FO00
CALCULATED CHANNELS			
Shoulder – rib	Displacement corrected		1?SHRI??00WSDS00
Thorax - Upper rib	Displacement corrected		1?TRRI??01WSDS00
Thorax - Mid rib	Displacement corrected		1?TRRI??02WSDS00
Thorax -	Displacement		1?TRRI??03WSDS00

Location	Parameter	Axis	ISO Code
Lower rib	corrected		
Abdomen – Upper rib	Displacement corrected		1?ABRI??01WSDS00
Abdomen – Lower rib	Displacement corrected		1?ABRI??02WSDS00
B-Pillar (non- struck side)	Calculated global velocities	x	1?BPILLO0000VEX0
		y	1?BPILLO0000VEY0
		z	1?BPILLO0000VEZ0
Total number of required channels:		63	

(TNCAP 條文草案)

3.17.11 執行本項試驗之所有頻道

<u>位置</u>	<u>參數</u>	<u>軸</u>	<u>ISO code</u>
<u>頭部重心</u>	<u>角速度</u>	<u>x</u>	<u>1?HEAD0000WSAVX0</u>
		<u>y</u>	<u>1?HEAD0000WSAVY0</u>
		<u>z</u>	<u>1?HEAD0000WSAVZ0</u>
	<u>加速度</u>	<u>x</u>	<u>1?HEAD0000WSACX0</u>
		<u>y</u>	<u>1?HEAD0000WSACY0</u>
		<u>z</u>	<u>1?HEAD0000WSACZ0</u>
<u>上頸部</u>	<u>力</u>	<u>x</u>	<u>1?NECKUP00WSFOX0</u>
		<u>y</u>	<u>1?NECKUP00WSFOY0</u>
		<u>z</u>	<u>1?NECKUP00WSFOZ0</u>

<u>位置</u>	<u>參數</u>	<u>軸</u>	<u>ISO code</u>
	<u>力矩</u>	<u>x</u>	<u>1?NECKUP00WSMOX0</u>
		<u>y</u>	<u>1?NECKUP00WSMOY0</u>
		<u>z</u>	<u>1?NECKUP00WSMOZ0</u>
<u>下頸部</u>	<u>力</u>	<u>x</u>	<u>1?NECKLO00WSFOX0</u>
		<u>y</u>	<u>1?NECKLO00WSFOY0</u>
		<u>z</u>	<u>1?NECKLO00WSFOZ0</u>
	<u>力矩</u>	<u>x</u>	<u>1?NECKUP00WSMOX0</u>
		<u>y</u>	<u>1?NECKUP00WSMOY0</u>
		<u>z</u>	<u>1?NECKUP00WSMOZ0</u>
<u>脊椎-T4</u>	<u>加速度</u>	<u>x</u>	<u>1?THSP0400WSACX0</u>
		<u>y</u>	<u>1?THSP0400WSACY0</u>
		<u>z</u>	<u>1?THSP0400WSACZ0</u>
<u>脊椎-T12</u>	<u>加速度</u>	<u>x</u>	<u>1?THSP1200WSACX0</u>
		<u>y</u>	<u>1?THSP1200WSACY0</u>
		<u>z</u>	<u>1?THSP1200WSACZ0</u>
<u>腰部脊椎</u> (Lumbar spine)	<u>力</u>	<u>x</u>	<u>1?LUSP0000WSFOX0</u>
		<u>y</u>	<u>1?LUSP0000WSFOY0</u>
		<u>z</u>	<u>1?LUSP0000WSFOZ0</u>
	<u>力矩</u>	<u>x</u>	<u>1?LUSP0000WSMOX0</u>
		<u>y</u>	<u>1?LUSP0000WSMOY0</u>
		<u>z</u>	<u>1?LUSP0000WSMOZ0</u>
<u>肩部關節</u> (Shoulder joint)	<u>力</u>	<u>x</u>	<u>1?SHLD??00WSFOX0</u>
		<u>y</u>	<u>1?SHLD??00WSFOY0</u>
		<u>z</u>	<u>1?SHLD??00WSFOZ0</u>

<u>位置</u>	<u>參數</u>	<u>軸</u>	<u>ISO code</u>
<u>肩部-肋骨</u>	<u>位移</u>	<u>1D</u>	<u>1?SHRI??00WSDC00</u>
	<u>角位移</u>		<u>1?SHRI??00WSAN00</u>
<u>胸-上肋骨</u>	<u>位移</u>	<u>1D</u>	<u>1?TRRI??01WSDC00</u>
	<u>角位移</u>		<u>1?TRRI??01WSAN00</u>
<u>胸-中肋骨</u>	<u>位移</u>	<u>1D</u>	<u>1?TRRI??02WSDC00</u>
	<u>角位移</u>		<u>1?TRRI??02WSAN00</u>
<u>胸-下肋骨</u>	<u>位移</u>	<u>1D</u>	<u>1?TRRI??03WSDC00</u>
	<u>角位移</u>		<u>1?TRRI??03WSAN00</u>
<u>腹部-上肋骨</u>	<u>位移</u>	<u>1D</u>	<u>1?ABRI??01WSDC00</u>
	<u>角位移</u>		<u>1?ABRI??01WSAN00</u>
<u>腹部-下肋骨</u>	<u>位移</u>	<u>1D</u>	<u>1?ABRI??02WSDC00</u>
	<u>角位移</u>		<u>1?ABRI??02WSAN00</u>
<u>骨盆</u>	<u>加速度</u>	<u>x</u>	<u>1?PELV000000ACX0</u>
		<u>y</u>	<u>1?PELV000000ACY0</u>
		<u>z</u>	<u>1?PELV000000ACZ0</u>
<u>恥骨聯合</u>	<u>力</u>	<u>y</u>	<u>1?PUBC0000WSFOY0</u>
<u>B 柱</u> (非撞擊側)	<u>加速度</u>	<u>x</u>	<u>1?BPILLO0000ACX0</u>
		<u>y</u>	<u>1?BPILLO0000ACY0</u>
		<u>z</u>	<u>1?BPILLO0000ACZ0</u>
<u>腰部安全帶</u> (B6)	<u>力</u>	<u>y</u>	<u>1?SEBE0003B6FO00</u>
<u>肩部安全帶</u> (B3)	<u>力</u>	<u>y</u>	<u>1?SEBE0003B3FO00</u>

<u>位置</u>	<u>參數</u>	<u>軸</u>	<u>ISO code</u>
<u>計算頻道數量</u>			
<u>肩部-肋骨</u>	<u>位移修正</u>		<u>1?SHRI??00WSDS00</u>
<u>胸部-上肋骨</u>	<u>位移修正</u>		<u>1?TRRI??01WSDS00</u>
<u>胸部-中肋骨</u>	<u>位移修正</u>		<u>1?TRRI??02WSDS00</u>
<u>胸部-下肋骨</u>	<u>位移修正</u>		<u>1?TRRI??03WSDS00</u>
<u>腹部-上肋骨</u>	<u>位移修正</u>		<u>1?ABRI??01WSDS00</u>
<u>腹部-下肋骨</u>	<u>位移修正</u>		<u>1?ABRI??02WSDS00</u>
<u>B 柱</u> <u>(非撞擊側)</u>	<u>計算之全域</u>	<u>x</u>	<u>1?BPILLO0000VEX0</u>
	<u>速 度</u>	<u>y</u>	<u>1?BPILLO0000VEY0</u>
	<u>(Calculated</u> <u>global</u> <u>velocities)</u>	<u>z</u>	<u>1?BPILLO0000VEZ0</u>
<u>頻道總數</u>		<u>63</u>	

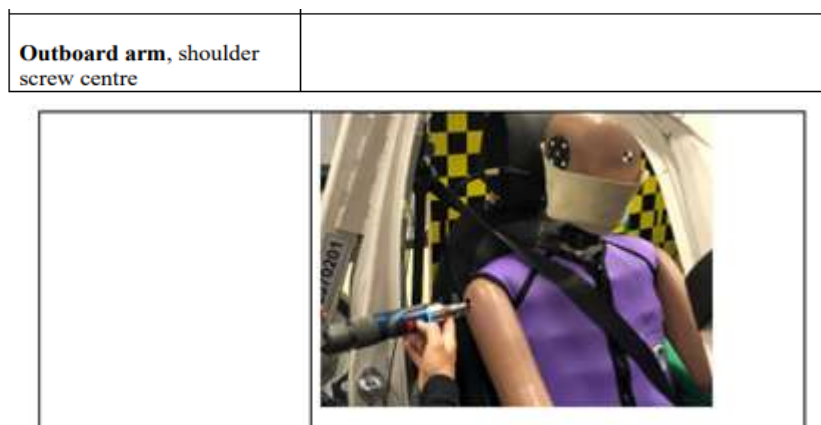
Euro NCAP原文
Appendix V

Description Head CoG, Outboard head skin marking	
Neck bracket, rearmost, outboard corner of the bracket	
Neck bracket, foremost, outboard corner of bracket	

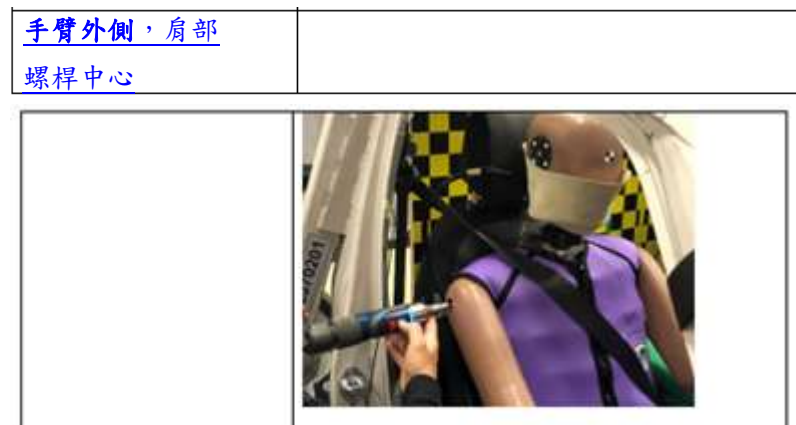
TNCAP條文草案
3.17.12 試驗前各項量測示意圖

說明 <u>頭部重心，外側頭部皮膚標記</u>	
<u>頸部支撐座，最後端，支撐座外側邊緣</u>	
<u>頸部支撐座，最前端，支撐座外側邊緣</u>	

Euro NCAP原文
Appendix V



TNCAP條文草案
[3.17.12 試驗前各項量測示意圖](#)



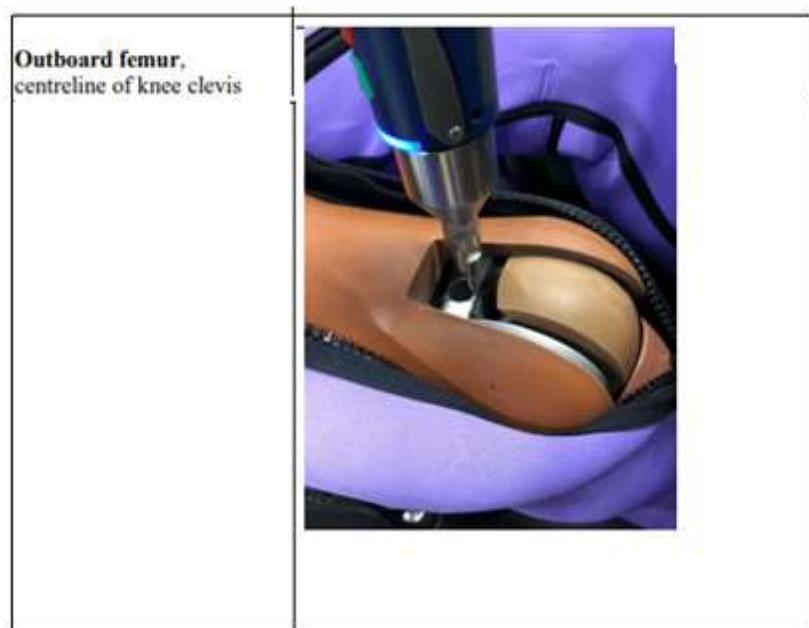
Euro NCAP原文
Appendix V

Outboard arm, tip of arm foam centre	
Outboard arm angle, place a straight edge along the length of the arm	

TNCAP條文草案
3.17.12 試驗前各項量測示意圖

<u>手臂外側，手臂尖端 端泡棉中心</u>	
<u>手臂外側角度，沿 手臂長方向放置</u>	

Euro NCAP原文
Appendix V



TNCAP條文草案
[3.17.12 試驗前各項量測示意圖](#)



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Outboard knee, knee joint/bolt centre	
Outboard femur, angle, place a short length inclinometer on the femur centreline	
	

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<u>膝關節外側，膝部 接頭/螺栓中心</u>	
<u>股骨外側，角度， 將長度較短傾斜計放 置於股骨中線</u>	
	

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Outboard ankle, centre of bolt	
Outboard head restraint tube, most outboard part of the tube where it meets the seatback.	
Diagonal seatbelt	

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外側腳踝，螺栓中心	
頭枕桿外側，枕桿最外側與椅背接觸處	
對角式安全帶	

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3.18 虛擬遠端側方模擬碰撞試驗規章

Euro NCAP Virtual Far Side Simulation & Assessment Protocol Version 1.0

Technical Bulletin TB043-1 Qualification Procedure for Virtual Dummy Models Part 1: WorldSID AM50 Version 1.0

Technical Bulletin TB021 Data format and Injury Criteria Calculation Version 4.1

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1 INTERODUCTION This document summarises the Euro NCAP Virtual Testing Crashworthiness (VTC), procedure applied to far-side impact. The aim of the procedure is to add more robustness to the evaluation of far-side protection through the deployment of additional, virtual CAE simulations. These simulations are based on load case variations of the Euro NCAP far-side sled procedure defined in the Euro NCAP Far Side Occupant Test & Assessment protocol. In this procedure, the vehicle manufacturer carries out the physical sled tests and the virtual simulations, and both sets of results are used by Euro NCAP to score the performance. The qualification procedures of the WorldSID model, used throughout this procedure, are included in Technical Bulletin TB043-1. 1.1 Definitions Throughout this protocol the following terms are used (listed in alphabetical order): AC – Assessment criteria, as defined in the Euro NCAP Euro NCAP FAR SIDE OCCUPANT TEST & ASSESSMENT PROCEDURE. AC_{Limit} – Assessment criteria performance limits. dAC – The difference in ratio between the simulations and physical tests. rAC – The ratio between the derived assessment criteria and assessment criteria limits. This ratio can be for the simulations rAC_{sim} and for the physical tests rAC_{test}.	3.18.1 簡介 本文件概述適用於遠端模擬側方碰撞之 TNCAP 虛擬試驗碰撞性能 (VTC) 程序。該程序旨在透過額外的虛擬 CAE 模擬，增強遠端側方碰撞保護評等之穩健性。相關模擬係基於「遠端側方模擬碰撞試驗規章」所定義之虛擬遠端台車試驗程序，並進行多種負載案例變化。在此程序中，車輛業者須執行實體台車試驗及虛擬模擬，TNCAP 將同時採用此兩組結果進行性能評分。本程序中所使用之 WorldSID 模型，其資格認定程序詳見 Euro NCAP 技術通報 TB043-1。 3.18.1.1 名詞釋義 3.18.1.1.1 評等標準(Assessment criteria, AC)：係指依照「遠端側方模擬碰撞試驗規章」所定義之評等標準。 3.18.1.1.2 AC_{Limit}：評等標準之性能限制。 3.18.1.1.3 dAC：模擬與實際試驗結果之間的比例差異。 3.18.1.1.4 rAC：推導出評等標準與評等標準限制之間的比例。此比例可以適用於模擬 (rAC_{sim}) 及實際試驗 (rAC_{test})。 3.18.1.1.5 碰撞時間零點(Crash Time Zero(t₀))：係指碰撞開始	

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Crash Time Zero (t_0) – The time when crash is starting. Far Side Sled Test Protocol - Euro NCAP FAR SIDE OCCUPANT TEST & ASSESSMENT PROCEDURE v2.4. ISO Scores – As validation criteria, ISO scores are calculated according to the implementation of the python script ‘Objective Rating Metric for non-ambiguous signals according to ISO/TS 18571’ available at https://openvt.eu/validationmetrics/ISO18571, which is based on ISO TS 185711.¹ ¹An updated version of ISO TS 18571 is currently posted for vote by ISO. As soon as the new version of the standard is released, the reference to the latest ISO 18571 document will be added after reconfirming verification of the tool using the latest validation dataset. Qualified WSID Model – The CAE model of a WorldSID (mid-sized male World Side Impact Dummy, ISO 15830), which fulfils all qualification criteria defined in Technical Bulletin 043-1 and can therefore be used for validation of the vehicle environment as well as for the virtual test cases. S_i – Individual axis sensor score. S_{Sensor} – Individual sensor ISO score. Simulation Data – Prescribed outputs from simulations of the virtual far side tests in the prescribed format according to Section 5. Test Data – Measurement data and documentation from sled tests according to the Euro NCAP FAR SIDE OCCUPANT TEST & ASSESSMENT PROCEDURE and TB 021. Validation – The process of determining the degree to which a model represents the real world in the context of its intended use. The model	<u>之時間。</u> <u>3.18.1.1.6 遠端台車試驗規章(Far side sled test protocol)：係指「遠端側方模擬碰撞試驗規章」。</u> <u>3.18.1.1.7 ISO 得分(ISO Score)：作為驗證標準，ISO 分數係依據 python 腳本「Objective Rating Metric for non-ambiguous signals according to ISO/TS 18571」計算得出。該腳本可於 https://openvt.eu/validation-metrics/ISO18571 獲取，其以 ISO/TS 18571:2024 為基礎。</u> <u>3.18.1.1.8 符合資格之 WSID Model(Qualified WSID model)：係指符合 Euro NCAP 技術通報 TB043-1 所有資格認定標準之 WorldSID（中等男性側方碰撞人偶，ISO 15830）CAE 模型，可用於車輛環境驗證及虛擬測試案例。</u> <u>3.18.1.1.9 S_i：係指單軸向之感測器得分。</u> <u>3.18.1.1.10 S_{Sensor}：係指單一感測器之 ISO 得分。</u> <u>3.18.1.1.11 模擬資料(Simulation Data)：依照 3.18.5 格式所規定之虛擬遠端側方碰撞試驗模擬輸出。</u> <u>3.18.1.1.12 測試數據(Test Data)：依照「遠端側方模擬碰撞試驗規章」及 Euro NCAP 技術通報 TB021 收集之台車試驗量測數據及文件。</u> <u>3.18.1.1.13 驗證(Validation)：係指確定模型在其預期用途背景下與現實世界符合程度之過程。藉由將模型響應與基準事實(Ground-truth)進行比較，測試模型之預測能力。</u>	

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response is compared to a ground-truth. The model's prediction capabilities are tested. Validation Load case – Load cases for which simulations and tests are available and can be therefore compared to validate the virtual vehicle model. Vehicle Manufacturer (VM) – Vehicle/car manufacturer, or supplier, contractor/consultant performing simulations for the virtual assessment. Vehicle Simulation Model – A virtual model of the vehicle and/or body in white on a sled, which has been calibrated (parameters have been optimised to reach a target response (reference) defined) and validated by the VM beforehand. This happens based on material and component tests as well as observations from sled tests. It covers the model of the sled, the vehicle structure, seat and restraint systems. Virtual Testing (VT) Load case – Robustness load cases that are simulated to assess the specific car, where no hardware sled test data is available. VTC Server – Virtual Testing Crashworthiness Web Application to upload, process and review the provided data and store it on the Euro NCAP Server. It is accessible by VMs through the link https://vtc.euroncap.com and can be accessed with the user account used for data upload on the Euro NCAP data exchange server. W_i – Weighting factors. WSID Model – The CAE model of a WorldSID (World Side Impact Dummy) dummy. 1.2 Overall Process	3.18.1.1.14 驗證負載案例(Validation load case)：係指同時具備模擬與測試，可用於驗證虛擬車輛模型之負載案例。 3.18.1.1.15 車輛業者(Vehicle manufacturer, VM)：係指汽車製造廠，或執行虛擬評估模擬之供應商、承包商/顧問。 3.18.1.1.16 車輛模擬模型(Vehicle simulation model)：係指於台車上車輛及/或車體之虛擬模型，該模型由車輛業者預先校準（優化參數以達成目標響應）及驗證。此過程基於材料與組件測試以及台車測試之觀察，其涵蓋台車模型、車輛結構、座椅及束縛系統。 3.18.1.1.17 虛擬測試負載案例(Virtual testing (VT) load case)：用於評等特定車輛穩健性之負載案例，無需實體台車之試驗數據。 3.18.1.1.18 虛擬試驗碰撞性能伺服器(VTC Server)：係指虛擬試驗碰撞性能網頁應用程式，用於上傳、處理及審核所提供之數據，並將其存儲於 TNCAP 伺服器。車輛業者可透過連結(待建立後更新)進行存取，並使用數據交換伺服器之帳戶登入。 3.18.1.1.19 W_i：權重因子。 3.18.1.1.20 WSID 模型：WorldSID（側方碰撞人偶）之 CAE 模型。 3.18.1.2 整體流程	

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1.2.1 The overall procedure for the virtual far side occupant assessment is outlined in Figure 1, with further explanation on the individual steps as follows: Figure 1: Overview of VTC Process (請參考末頁圖示) - Step 1 – The VM is free to use whichever WorldSID simulation model is used for virtual assessment. However, to gain trust in the WorldSID simulation model(s) used, Euro NCAP has prescribed certain qualification requirements that models must meet for virtual testing. These model acceptance requirements are specified in Euro NCAP Technical Bulletin TB 043-1. - Step 2 – Simulations of the predefined simulation matrix consisting of two far-side validation load cases and additional virtual testing load cases are to be performed by the VM with their vehicle simulation models and the qualified WorldSID model. The results are to be shared with Euro NCAP in the prescribed format via the VTC server² no less than two weeks before the physical sled tests. The datasets must include all specified information and fulfil the specified quality criteria. When the simulation data is approved, a unique far side test reference number will be provided to the vehicle manufacturer by Euro NCAP. - Step 3 – After step 2 is completed, physical sled tests of the two validation load cases are to be performed in accordance with the current Far Side Sled Test Protocol. Test results shall be submitted to Euro NCAP via the VTC server in the prescribed format. A	<u>3.18.1.2.1 虛擬遠端側方模擬碰撞乘員保護評等之整體程序概述如圖 1 所示，各步驟詳細說明如下：</u> <u>圖 1：VTC 流程概覽</u> (請參考末頁圖示) <u>(1)步驟一：車輛業者得自由選擇用於虛擬評等之 WorldSID 模擬模型。然而，為建立對使用之 WorldSID 模擬模型之信任，TNCAP 規定虛擬試驗用之模型必須符合資格要求，相關模型接受標準詳參 Euro NCAP 技術通報 TB 043-1。</u> <u>(2)步驟二：車輛業者須使用車輛模擬模型及合格之 WorldSID 模型，執行預定模擬矩陣中（包含兩個遠端驗證負載案例及額外之虛擬測試負載案例）。模擬結果須於實體台車測試前至少兩週，依照規定之格式透過 VTC 伺服器提交予 TNCAP。數據集必須包含所有指定資訊並符合指定之品質標準。模擬數據經同意後，TNCAP 將提供車輛業者唯一之遠端側方模擬碰撞試驗參考編號。</u> <u>(3)步驟三 - 完成步驟二後，依照「遠端側方模擬碰撞試驗規章」於交通部指定 TNCAP 檢測機構執行兩個驗證負載情境之實體台車試驗。試驗結果應以規定格式透過 VTC 伺服器提交予 TNCAP。TNCAP 執行機構所提供唯一遠端側方模擬</u>	

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unique far side reference number, to be supplied by the Euro NCAP Secretariat, must be placed physical on the sled and visible all videos and referenced in the .mme file. ²vtc.euroncap.com - Step 4 – Euro NCAP makes a comparison of the hardware sled test results and simulation-based predictions to validate the VM’s virtual model of the vehicle environment (including seat, seatbelt, airbag, centre console). In doing so, Euro NCAP can establish the necessary confidence in the VM model, without physically requiring access to the model. - Step 5 – If the validation results of step 4 are sufficient, i.e. hardware and simulation results closely match, this step (5) can be skipped. If the validation results are not sufficient, the VM must provide evidence showing this was caused by the specific hardware test conditions, deviating from simulation parameters. The simulations of the two standard validation load cases may be repeated with adjustments to only the prescribed boundary conditions from the sled tests. Note: Within the monitoring phase, two trials will be allowed according to the specification in Section 7. If validation criteria are still not fulfilled after boundary condition adjustment, the results submitted in step 2 will not be considered for the assessment, otherwise step 6 follows. - Step 6 – The results from the virtual testing load cases submitted in step 2 are considered for the vehicle rating.	<u>碰撞試驗參考編號必須實際放置於台車上，且所有影片中清晰可見，並於.mme 檔案中引用。</u> <u>(待建立連結後更新)</u> <u>(4)步驟四 – TNCAP 將比較實體台車試驗結果與基於模擬之預測結果，以驗證車輛業者之車輛環境虛擬模型(包括座椅、安全帶、空氣囊、中控台)。透過此程序，TNCAP 無須取得該模型之實際檔案情況下，可對車輛業者模型建立必要信任。</u> <u>(5)步驟五 – 若步驟四驗證結果足夠充分，即實體試驗與模擬結果高度吻合，則可跳過本步驟。若驗證結果不充分，則車輛業者必須提供證據證明此差異係由特定實體試驗條件偏離模擬參數所造成。允許兩個標準驗證負載情境之重新進行模擬，惟僅限於根據台車試驗調整規定之邊界條件。</u> <u>允許根據 3.18.7 之規範進行兩次嘗試。若在調整邊界條件後仍無法滿足驗證標準，則步驟二所提交之結果將不予納入評等，否則進入步驟六。</u> <u>(6)步驟六 – 步驟二所提交之虛擬測試負載情境結果，將納入車輛安全評等。</u>	

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1.3 General Requirements 1.3.1 Throughout this process, the exact same vehicle and dummy models shall be used. This specifically applies to: • All control settings (time step, mass scaling, etc.), • Material cards (including fracture mode), • Contact cards including all settings, • Constraints, • Airbag Models, • Seatbelt Models (including pretensioner and load limiter), • Output definitions (IDs and coordinate systems used for outputs), • Geometries and represented components. 1.3.2 This requirement does not apply to parameters that need to be adjusted to define the different load cases. For example, node coordinates can be adjusted for replicating different positions of the dummy relative to the seat, the seatbelt and the seat relative to the car as well as the initial seat cushion deformations and load curves have to be adjusted to simulate the different loading scenarios. 1.3.3 Furthermore, it is important that all simulations are performed with consistent settings. This applies to: • Solver-Version and Processing Type, • Solver-Precision (Single, Double Precision), • Time-step settings (relating to initial and dynamic mass scaling),	<u>3.18.1.3 一般規定</u> <u>3.18.1.3.1 在整個過程中，必須使用完全相同之車輛模型及人偶模型。此特別適用於：</u> <u>(1)所有控制設置（例如時間步長、質量縮放等）。</u> <u>(2)材料卡片（包括破裂模式）。</u> <u>(3)接觸卡片及其所有設置。</u> <u>(4)限制條件。</u> <u>(5)空氣囊模型。</u> <u>(6)安全帶模型（包括預負載裝置及負載限制器）。</u> <u>(7)輸出定義（輸出所使用之 ID 及座標系統）。</u> <u>(8)幾何形狀及代表之組件。</u> <u>3.18.1.3.2 此規定不適用於為定義不同負載情境而須調整之參數。例如，為了模擬不同之負載情境，可調整節點座標以複製人偶相對於座椅、安全帶，以及座椅相對於車輛之不同位置，亦包含座墊初始變形及負載曲線。</u> <u>3.18.1.3.3 另所有模擬必須使用一致的設定執行，此適用於：</u> <u>(1)解算器版本及處理類型。</u> <u>(2)解算器精度（單精度或雙精度）。</u> <u>(3)時間步長設定（涉及初始和動態質量縮放）。</u>	

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- Contact settings (especially between occupant and vehicle simulation model), - Control settings (which ensure also equal distribution of the model on the CPUs). 1.3.4 Ideally, all simulations shall be performed on the same computer system and with the same number of CPUs. - If the cluster architecture does not allow simulations to be performed with a consistent number of CPUs and/or on the same computer system and/or, equal distribution of the model on the CPUs, a report demonstrating the scatter shall be provide to with the Euro NCAP Secretariat. Within this report, the exact same simulation shall be repeated twice and resulting curves of all signals specified in Table 5 shall be overlayed for comparison.	<u>(4)接觸設定（特別是乘員與車輛模擬模型間之接觸）。</u> <u>(5)控制設置（確保模型於 CPU 上之均勻分佈）。</u> <u>3.18.1.3.4 理想情況下，所有模擬應在相同電腦系統並使用相同數量之 CPU 執行。</u> <u>(1)若叢集架構(Cluster architecture)無法維持一致 CPU 數量及/或相同電腦系統執行模擬，及/或無法在 CPU 上均勻分配模型，則必須向 TNCAP 執行機構提交一份證明偏差(Scatter)之報告。該報告中必須重複進行兩次完全相同的模擬，並將表 5 中指定之所有訊號曲線進行疊圖比對。</u>	
2. WORLDSID SIMULATION MODEL 2.1 Requirements 2.1.1 The WorldSID model (WSID) used in this procedure must be qualified beforehand to ensure that it behaves consistently when compared to its physical counterparts. The qualification of the WSID models must be performed according to the specifications in Euro NCAP Technical Bulletin TB 043-1. 2.1.2 Documentation on the WSID qualification shall be uploaded together with the simulation results to the VTC server. The VM is responsible for ensuring that all requested dummy outputs are available with: - A sampling frequency of at least 10 kHz, - The coordinate systems according to SAE J1733_201811 with the	<u>3.18.2 WORLDSID 模擬模型</u> <u>3.18.2.1 要求</u> <u>3.18.2.1.1 在此程序所使用之 WorldSID 模型（WSID）必須預先通過資格認定，確保其與實體對應人偶具有一致之表現。WSID 模型之資格認定須依照 Euro NCAP 技術通報 TB 043-1 規範執行。</u> <u>3.18.2.1.2 WSID 資格認定之文件應與模擬結果一同上傳至 VTC 伺服器。車輛業者須確保所有要求之人偶輸出皆符合下列條件：</u> <u>(1)採樣頻率至少為 10 kHz；</u> <u>(2)座標系統須符合 SAE J1733_201811 的規範，且感測器方向</u>	

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correct orientation of the sensors. 2.1.3 The compression of shoulder, thorax and abdominal ribs must be converted to the lateral displacement (DS) according to TB 021 to be comparable with the hardware dummy. The channels DC (sensor length) and AN (sensor rotation) for the ribs can be shared, but only DS (lateral displacement) will be considered for the assessment criteria and ISO Score calculation.	<u>正確。</u> <u>3.18.2.1.3 肩部、胸部及腹部肋骨之壓縮量須依照 Euro NCAP 技術通報 TB 021 轉換為側向位移 (DS)，以便與實體人偶進行比對。肋骨之 DC (感測器長度) 及 AN (感測器旋轉) 頻道可以共享，惟僅側向位移 (DS) 將用於納入評估標準及 ISO 分數之計算。</u>	
3. VEHICLE SIMULATION MODEL 3.1 Requirements 3.1.1 The vehicle model is to be calibrated in advance and the VM must have confidence that the model is ready to predict occupant response in Euro NCAP far side test cases. 3.1.2 No modifications of the vehicle models are allowed during the virtual testing procedure and all settings are to remain constant. 3.1.3 This does not apply to boundary conditions, such as the initial position of the seat or dummy, initial seat deformation, belt routing and load curves describing the sled acceleration, especially if validation simulations need to be rerun, see Section 7.	<u>3.18.3. 車輛模擬模型</u> <u>3.18.3.1 要求</u> <u>3.18.3.1.1 車輛模型必須預先進行校準，且車輛業者必須確保該模型已具備預測 TNCAP 遠端模擬碰撞試驗案例中乘員反應之能力。</u> <u>3.18.3.1.2 虛擬測試過程中，不允許對車輛模型進行任何修改，且所有設定必須保持一致。</u> <u>3.18.3.1.3 此要求不適用於邊界條件，例如座椅或人偶之初始位置、座椅初始變形、安全帶圍繞以及描述台車加速度之負載曲線，特別是在需要重新執行驗證模擬之情況（參見 3.18.7）。</u>	
4. SIMULATION SETUP 4.1 Simulation Time 4.1.1 All simulations need to be run until the maximum head excursion in y-direction is reached with an additional time margin of +20%. Equation 1 below must be fulfilled for all simulations. <u>Equation 1</u> <i>simulation time > time of max. y head excursion*1.2</i>	<u>3.18.4. 模擬設定</u> <u>3.18.4.1 模擬時長</u> <u>3.18.4.1.1 所有模擬須運行至頭部於 y 軸方向達最大偏移之後，並額外增加 20%之時間裕量。所有模擬必須滿足下列公式：</u> <u>公式 1：</u> <u>模擬時長 > 頭部 y 軸方向最大偏移時間 × 1.2</u>	

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4.1.1.1 No data before t0 needs to be shared. If it is shared, the time offset needs to be specified in all channel files as “Time of first sample”. 4.2 Global Coordinate System 4.2.1 The global coordinate system to be used is as follows: • x-direction is facing rearwards, • z-direction is facing upwards (according to ECE/TRANS/WP.29/78/Rev.6 Annex 1-Appendix 2). 4.2.2 The vehicle centreline always defines the x-z plane. A clearly identifiable reference point to define the y-z and x-y plane must be selected by the VM. The same origin shall be used in the simulations and the tests. 4.3 Dummy Positioning inside the Vehicle 4.3.1 The qualified WSID simulation model is to be positioned in the vehicle environment in line with the Far Side Sled Test Protocol. 4.3.2 The tables below (Table 1 and Table 2) detail measurements that have to be provided as part of the uploaded data for each validation load case together with the test data. For the tests, the measurements on the outboard side of the dummy are sufficient (as it may be difficult to reach the inboard side of the dummy). Table 1: Documentation of initial position of the WSID in simulations and sled tests. (請參考末頁圖表) Table 2: Documentation of seat and belt adjustment in simulations and sled test.	<u>3.18.4.1.1.1 無須分享 t₀ 之前的數據。若提交資料包含 t₀ 之前數據，則必須在所有頻道檔案中明確指定時間偏移，並註明為「首個樣本時間」。</u> <u>3.18.4.2 全域座標系統</u> <u>3.18.4.2.1 所使用之全域座標系統如下：</u> <u>(1) x 軸方向指向車輛後方，</u> <u>(2) z 軸方向指向上方（依據 ECE/TRANS/WP.29/78/Rev.6 Annex 1-Appendix 2）。</u> <u>3.18.4.2.2 車輛中心線始終定義 x-z 平面。車輛業者必須選擇一個清晰可識別之參考點定義 y-z 平面及 x-y 平面。模擬與試驗應使用相同之原點。</u> <u>3.18.4.3 車內人偶定位</u> <u>3.18.4.3.1 合格之 WSID 模擬模型應依照「遠端側方模擬碰撞試驗規章」定位於車輛環境中。</u> <u>3.18.4.3.2 表 1 及表 2 詳列每個驗證負載情境提交測試數據時，必須一併提供之量測值。對於實體台車測試，僅需提供人偶外側之量測值即可（考量人偶內側可能難以進行量測）。</u> <u>表 1：記錄模擬與台車試驗中 WSID 之初始位置</u> <u>(請參考末頁圖表)</u> <u>表 2：記錄模擬與台車試驗中座椅及安全帶之調整</u> <u>(請參考末頁圖表)</u>	

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(請參考末頁圖表) - The measures shall be taken in the global vehicle coordinate system and must be as close as possible between simulation and test (target values from simulations must be available and provided to test engineers to adjust the positions as close as possible within the specifications of the Far Side Sled Test Protocol). - The method by which the seatback angle is measured must be documented and the method must be consistent between test and simulation. Table 2 must also be provided for all virtual load cases as part of the submitted simulation data. - For the seatbelt routing, the point of intersection on the sternum with the upper edge of the shoulder belt is to be measured. - The dummy shall be settled in the seat, so that no non-physical spring-back occurs at the simulation start (see quality criterion on initial displacement of H-Point specified in section 6.1)³ ³ It is recommended to apply gravity and achieve realistic contact forces. ³ It is recommended to apply gravity and achieve realistic contact forces. 4.4 Load Cases 4.4.1 The two load cases shown in Table 3 related to the hardware test specified in the FarSide Sled Test Protocol are used for validation of the vehicle model (as described in section 6.3). Hardware test and simulation data according to Section 5 needs to be provided for these load cases. Table 3: Validation load cases. (請參考末頁圖表)	<u>(1)所有量測必須於全域車輛座標系統中進行，且模擬與試驗之間的數值須儘可能接近（模擬得出之目標值必須提供給測試工程師，以便於「遠端側方模擬碰撞試驗規章」規範內將位置調整至最接近模擬狀態）。</u> <u>(2)測量椅背角度之方法必須記錄，且確保試驗與模擬間之方法必須一致。對於所有虛擬負載案例，亦須提供表 2 作為提交模擬數據之一部分。</u> <u>(3)對於安全帶圍繞，必須測量肩帶上緣與胸骨之交點位置。</u> <u>(4)人偶必須穩定安置於座椅上，確保模擬開始時不會出現非物理性之反彈（參見 3.18.6.1 關於 H 點初始位移之品質標準）。建議施加重力，以獲得符合實際之接觸力。</u> <u>3.18.4.4 負載案例</u> <u>3.18.4.4.1 表 3 所列之兩個負載案例與「遠端側方模擬碰撞試驗規章」之實體試驗相關，並用於車輛模型之驗證（如 3.18.6.3 所述）。針對這些負載案例，必須依照 3.18.5 規定提供硬體測試及模擬數據。</u> <u>表 3：驗證負載案例</u> <u>（請參考末頁圖表）</u>	

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4.4.2 The virtual testing load cases are specified in Table 4. Only simulation data must be provided for these load cases. Crash pulses, orientations and seat positions are to be adjusted. Please take note of the following: - The crash pulses and red lines (as described in the Far Side Sled Test Protocol) for Pole and AE-MDB must be set by the VM based on in-house information. After the official Euro NCAP Pole and AE-MDB crash tests have been performed, Euro NCAP will check if the distance between red line to vehicle centreline deviates more than 100 mm between VM internal data and Euro NCAP crash tests, and if the pulse used in the sled tests (derived from internal pulse) is not fulfilling the pulse check. - If this is the case, additional information will be requested by Euro NCAP. To vary the impact angle, the x- and y-acceleration signals shall be applied/converted according to impact angles for the respective load cases. The vehicle model must not be rotated around the z-axis to represent the different impact angles as this would lead to incorrect calculation of head excursion. - Firing times of active restraints must be consistent between simulations and tests and fulfil the criterion defined in the Far Side Sled Test Protocol for both pulses. - The uppermost position (z-high) is determined by the following procedure: - Firstly, the seat must be positioned into the reference position according to the AE-MDB protocol (adjust seatback angle, lateral	<u>3.18.4.4.2 虛擬測試負載案例詳列於表 4。這些負載案例僅需提供模擬數據。碰撞脈衝、方向及座椅位置必須進行調整。注意下列事項：</u> <u>3.18.4.4.2.1 車輛業者必須依照內部數據設定側方立柱撞擊與側方撞擊之碰撞脈衝及紅線（如遠端側方模擬碰撞試驗規章所述）。TNCAP 執行正式側方立柱撞擊與側方撞擊試驗後，將檢查車輛業者內部數據與 TNCAP 試驗數據之間紅線至車輛中心線之距離偏差是否超過 100mm，以及台車試驗所使用之脈衝（由內部脈衝導出）是否未通過脈衝檢查。</u> <u>3.18.4.4.2.2 若發生此情況，TNCAP 將要求提供額外資訊。為了改變撞擊角度，必須根據各負載案例之撞擊角度施加/轉換 x 軸及 y 軸加速度訊號。禁止將車輛模型繞 z 軸旋轉代表不同之撞擊角度，因為這會導致頭部偏移量之計算錯誤。</u> <u>3.18.4.4.2.3 主動束縛系統之觸發時間於模擬與試驗之間必須保持一致，也符合「遠端側方模擬碰撞試驗規章」中兩種脈衝所定義之標準。</u> <u>3.18.4.4.2.4 依照下列程序決定最高位置（z-high）：</u> <u>(1)首先，依照「側方撞擊試驗規章」將座椅調整至參考位置（調整椅背角度、橫向位置等）。</u>	

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position, etc.). – After this, the seat must be positioned to the uppermost vertical position from that position. – If this causes contact between the WSID head and roof, the seat position should be lowered as little as possible to avoid initial contact between the head and the roof. – If the vertical adjustment causes implausible seatback angles (e.g. outside of the design limits of the WSID, in a position where the head level cannot be oriented according to the far side protocol anymore), the seatback angle shall be adjusted to the seatback angle in the reference position or the closest notch. – If initial contact occurs between the steering wheel (column) and the WSID, the steering wheel column shall be slightly adjusted, just to avoid the initial contact with the WSID. – If this adjustment is still not sufficient, the seat can be adjusted laterally (x position) as little as possible to avoid initial contact between steering wheel (column) and WSID. – The resulting position needs to be documented in Table 2. • The passenger seat position is adjusted according to the Far Side Sled Test Protocol and not changed in-between the load cases. Table 4: Virtual Testing Load cases. (請參考末頁圖表)	<u>(2)接著，將座椅從該位置調整至最高垂直位置。</u> <u>(3)若導致 WSID 頭部與車頂接觸，則應盡可能微調降低座椅，避免初始接觸。</u> <u>(4)若垂直調整導致不合理之椅背角度（例如超出 WSID 設計限制，使頭部無法依照「遠端側方模擬碰撞試驗規章」定位），則應將椅背角度調整至參考位置之角度或最接近的段位。</u> <u>(5)若 WSID 與方向盤（轉向機柱）初始接觸，則應微調方向盤轉向機柱以避免接觸。</u> <u>(6)若仍無法解決，則可微調座椅橫向位置（x 方向），避免方向盤（轉向機柱）與 WSID 接觸。</u> <u>(7)最終位置必須記錄於表 2。</u> <u>3.18.4.4.2.5 乘客座椅位置應依照「遠端側方模擬碰撞試驗規章」進行調整，且在各負載案例之間不得更改。</u> <u>表 4：虛擬測試負載案例</u> <u>（請參考末頁圖表）</u>	
5. SIMULATION DATA 5.1 Requirements	<u>3.18.5 模擬數據</u> <u>3.18.5.1 要求</u>	

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5.1.1 All simulation results must be uploaded in the prescribed format to the Euro NCAP VTC server⁴.Data that are not provided in the correct format, are provided incomplete or that is not with the stated time window, will be rejected.	<u>3.18.5.1.1 所有模擬結果必須依照規定格式上傳至 TNCAP VTC 伺服器。若數據格式不正確、內容不完整或未在指定時間內提交，則拒絕接受。</u>	
⁴vtc.euroncap.com		
5.1.2 The following files are requested for each assessment: • PDF file – including the documentation of the dummy qualification (TB 043) • Any additional documentation required to explain deviations. • After the physical sled tests are performed, a report on the initial positions according to 4.3.2 must be uploaded for the two validation load cases (Table 3).	<u>3.18.5.1.2 每次評估必須提供下列文件：</u> <u>(1)PDF 檔案 – 包括人偶資格認定之文件（Euro NCAP 技術通報 TB 043）；</u> <u>(2)任何解釋偏差之額外文件；</u> <u>(3)於實體台車試驗後，依照 3.18.4.3.2 規定上傳兩個驗證負載情境之初始位置報告（表 3）。</u>	
5.2 Required Simulation Results per Load Case	<u>3.18.5.2 每個負載情境所需之模擬結果</u>	
5.2.1 Videos of the animated simulation results, meeting the following requirements: • Animations need to be analysed with an output interval of 2 ms or less. • Videos are accepted with the following specification: – Format: .mp4 or .avi – Codec: H.264 – Frame rate: 10 frames per second – File size: 1-10 MB Note: the resolution/frame size shall be maximised within the file	<u>3.18.5.2.1 動畫模擬結果之影片，必須符合下列要求：</u> <u>3.18.5.2.1.1 動畫需以不超過 2 毫秒之輸出間隔進行分析。</u> <u>3.18.5.2.1.2 接受之影片格式：</u> <u>(1)格式：.mp4 或.avi；</u> <u>(2)編解碼器：H.264；</u> <u>(3)幀率：10 幀/秒；</u> <u>(4)文件大小：1 至 10MB。在檔案大小限制內，盡可能最大化解析度/影片尺寸。</u>	

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size limit. - Six videos need to be prepared per load case, as illustrated in Figure 2. Figure 2: Video views for animated simulation results. (請參考末頁圖表) - The coronal cutting plane for the section cut must be normal to the x-axis and cut through the dummy pelvis and the sternum as shown in Figure 2. The aim is to have a detailed view of the lumbar spine kinematics. - The cross-section cut shall be fixed relative to the dummy and move with the dummy throughout the simulation. - The videos must be recorded from t=0 to “simulation time” according to Equation1. The timestamp must be clearly visible in all videos. The videos have to be named according to the load case, as shown in Table 3 and Table 4 and the view name in Figure 2. For example, for FS_Pole_75_x-ref_z-ref_50M_Sim_1, the six videos are named as follows: - FS_Pole_75_x-ref_z-ref_50M_Sim_1_side - FS_Pole_75_x-ref_z-ref_50M_Sim_1_front - FS_Pole_75_x-ref_z-ref_50M_Sim_1_front_centre - FS_Pole_75_x-ref_z-ref_50M_Sim_1_front_belt - FS_Pole_75_x-ref_z-ref_50M_Sim_1_top - FS_Pole_75_x-ref_z-ref_50M_Sim_1_X-section - All videos shall be shared as one .zip folder (no specific naming of the .zip file required).	3.18.5.2.1.3 每個負載情境必須準備 6 個影片，如圖 2 所示。 圖 2：動畫模擬結果之影片視角 (請參考末頁圖表) (1)剖面切割之冠狀切割平面必須垂直於 x 軸，並如圖 2 所示穿過人偶骨盆及胸骨。此視角旨在提供腰椎運動學之詳細觀察。 (2)橫切面切割應相對於人偶固定，並在整個模擬過程中隨人偶移動。 3.18.5.2.1.4 影片必須從 t=0 記錄至「模擬時長」(依據公式 1)。所有影片中須清楚顯示時間戳。影片必須依照表 3 及表 4 之負載案例及圖 2 之視角命名，例如： 1. FS Pole 75 x-ref z-ref 50M Sim 1 side 2. FS Pole 75 x-ref z-ref 50M Sim 1 front 3. FS Pole 75 x-ref z-ref 50M Sim 1 front centre 4. FS Pole 75 x-ref z-ref 50M Sim 1 front belt 5. FS Pole 75 x-ref z-ref 50M Sim 1 top 6. FS Pole 75 x-ref z-ref 50M Sim 1 X-section 3.18.5.2.1.5 所有影片應需壓縮為一個.zip 文件（無需特定命名.zip 檔）。	

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5.2.2 Zipped ISO MME Files with .mme, .chn and all requested channels.	3.18.5.2.2 壓縮之 ISO MME 檔案，包括.mme、.chn 及所有要求之頻道。	
5.2.3 Each load case shall be put into a separate folder. The test and simulation name shall be according to Table 4. e.g. FS_Pole_75_x-ref_z-ref_50M_Sim_1.	3.18.5.2.3 每個負載案例應分別存放於個別資料夾，試驗與模擬名稱應依照表 4 之規定，例如：FS_Pole_75_x-ref_z-ref_50M_Sim_1。	
5.3 Content of ISO MME Files	3.18.5.3 ISO MME 檔案內容	
5.3.1 All outputs must be provided with an output frequency of 10 kHz and no additional filtering shall be applied ⁵ on the raw data.	3.18.5.3.1 所有輸出必須以 10kHz 之頻率提供，且不得對原始數據進行額外濾波處理。	
⁵ In LS-Dyna IACCOP has to be set to 1 to get meaningful accelerations. If accelerations are still very noisy, it is recommended to derive accelerations from velocities.	在 LS-Dyna 軟體中，IACCOP 必須設定為 1，才能獲得有意義之加速度。若加速度仍存在過高雜訊，建議改由速度推導加速度。	
5.3.2 Orientation of coordinate systems: - All “Global coordinates” (x, y, z location) have to be in the global coordinate system according to Section 4.2, while all forces, moments, displacements, velocities and accelerations have to be in a local coordinate system according to SAE J1733. - If polarity is not correct in the simulations, it needs to be rectified before uploading the MME files.	3.18.5.3.2 座標系方向： (1)所有「全域座標」(x,y,z 位置)必須依照 3.18.4.2 之全域座標系統；所有力、力矩、位移、速度及加速度必須依照 SAE J1733 之局部座標系統； (2)若模擬中極性(Polarity)不正確，則於上傳 MME 檔案前必須進行修正。	
5.3.3 The units of the outputs must be checked by the VM and must be provided in each channel file. They shall be in SI units. If not, the VTC server app will scale them to SI units before filtering.	3.18.5.3.3 車輛業者必須檢查輸出之單位，並在每個頻道檔案中提供。輸出數據應採用 SI 單位制，若非 SI 單位，則 VTC 伺服器應用程式在濾波前將其縮放轉換為 SI 單位。	
5.3.4 All channels must be named according to the ISO MME channel codes listed in the APPENDIX I. The position of the dummy (either posn 1 or	3.18.5.3.4 所有頻道必須依照 3.18.9 所列之 ISO MME 頻道代碼進行命名。在所有遠端側方模擬碰撞數據集中，人偶之位	

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posn 3) within all far side data sets and the related ISO MME codes have to be consistent between physical sled tests and simulations. 5.3.5 All channels listed in the table below are to be provided. If any channel is missing (except airbag-related channels, if no airbag is present), the data upload will be automatically rejected from the VTC server. Table 5: Required output channels for each simulation load case. (請參考末頁圖表) 5.3.6 The minimum content of the .mme file shall be in accordance with APPENDIX I, and Section 1.3 has to be provided for each simulation load case. Where this is not the case, the simulation results will not be accepted. Further lines can be added but will be not interpreted by the server. The name of the subtype of the test has to be according to Table 3 and Table 4. Otherwise, the simulation and test will not be correctly matched, and the dossier will be incomplete. 5.3.7 In each channel (e.g. .001 file) the header according to APPENDIX I, Section 1.3 must be included.	<u>置 (位置 1 或位置 3) 及相關 ISO MME 代碼, 必須在實體台車試驗與模擬之間保持一致。</u> <u>3.18.5.3.5 必須提供下表所列之所有頻道。若缺少任何頻道(若無空氣囊, 則空氣囊相關頻道除外), VTC 伺服器將自動拒絕該次數據上傳。</u> <u>表 5: 每個模擬負載情境所需輸出頻道 (請參考末頁圖表)。</u> <u>3.18.5.3.6 mme 檔案之最低內容應符合 3.18.9 之規定, 每個模擬負載情境必須提供 3.18.1.3 之相關內容。若未符合此要求, 則模擬結果將不被接受。可以添加額外行數, 但伺服器不會解析這些額外數據。測試子類型名稱必須符合表 3 及表 4 之規定, 否則模擬與試驗將無法正確匹配, 導致資料不完整。</u> <u>3.18.5.3.7 每個頻道(例如.001 檔案)之標頭必須符合 3.18.9.1.3 之規定。</u>	
6. QUALIFICATION OF SIMULATION SETUPS 6.1 Simulation Set-up 6.1.1 The simulation set-ups are only accepted for virtual testing if all quality criteria and validation criteria for all load cases are fulfilled. If any of them fails, the simulation dossier will not be accepted. The quality criteria are calculated automatically on the VTC server as soon as the data is uploaded. A preview is provided to the user and the upload needs to be confirmed by the user after checking the preview.	<u>3.18.6 模擬設置之資格</u> <u>3.18.6.1 模擬設置</u> <u>3.18.6.1.1 僅當所有負載案例之品質標準及驗證標準皆滿足時, 模擬設置才被接受用於虛擬測試。若任一項未通過, 則模擬資料將不被接受。品質標準將於數據上傳至 VTC 伺服器後自動計算, 並向使用者提供預覽, 使用者確認後完成上傳。</u>	

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6.1.2 Quality Criteria - Max. Hourglass Energy of full setup must be < 10% of max. internal energy. - Max. Hourglass Energy of all WSID components must be < 10% of max. internal energy of WSID. - Max. mass added due to mass scaling to the total model is less than 5 % of the total model mass at the beginning of the run. - Less than 10 mm H-point z-displacement recorded in first 5 ms of the simulation (5ms after t0). - The simulation time needs to exceed time of maximum head y displacement + 20% (Equation 1).	<u>3.18.6.1.2 品質標準</u> <u>(1)全設置之沙漏能量必須小於最大內能的 10%。</u> <u>(2)所有 WSID 組件之沙漏能量必須小於 WSID 最大內能的 10%。</u> <u>(3)總模型因質量縮放而增加之總質量必須小於總模型初始質量的 5%。</u> <u>(4)模擬開始後的前 5 毫秒內 (t₀ + 5ms)，H 點 z 軸方向位移必須小於 10mm。</u> <u>(5)模擬時長必須超過頭部最大 y 軸方向位移時間的+20% (公式 1)。</u>	
6.1.3 The following parameters are monitored and therefore calculated on the VTC server, but currently no criteria are defined: - Hourglass energy / internal energy at time of max. y head excursion for setup, dummy, sled and seat. - Max. added mass (Dummy, seat, sled).	<u>3.18.6.1.3 下列參數於 VTC 伺服器上進行監控及計算，目前尚未定義標準：</u> <u>(1)頭部最大 y 軸方向偏移時，針對設定、人偶、台車及座椅之沙漏能量/內能。</u> <u>(2)最大增加質量 (人偶、座椅、台車)。</u>	
6.2 Sled Testing	<u>3.18.6.2 台車試驗</u>	
6.2.1 After all simulation load cases are shared and all quality criteria are fulfilled, the physical far side sled tests can be performed. - The tests and documentation shall be in line with the Far Side Sled Test Protocol using original vehicle components. - Please make sure the data are correct, especially in terms of naming of the load cases, channel codes, polarity of the sensors.	<u>3.18.6.2.1 在所有模擬負載案例上傳且符合所有品質標準後，可執行實體遠端側方模擬碰撞之台車試驗。</u> <u>(1)試驗及文件應使用符合「遠端側方模擬碰撞試驗規章」之原廠車輛零組件。</u> <u>(2)請務必確保數據正確，特別是負載案例命名、頻道代碼及感測器之極性。</u>	
6.2.2 The complete data sets, prepared according to TB 021 (Data format and Injury Criteria Calculation v4.0.2), must be uploaded to the VTC	<u>3.18.6.2.2 完整數據集必須依照 Euro NCAP 技術通報 TB 021 (數據格式及傷害標準計算) 準備並上傳至 VTC 伺服器。</u>	

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server. All channels shall be unfiltered (only Butterworth pre-filtering done within data acquisition is allowed). 6.2.3 All injury criteria are processed automatically based on the provided raw data according to TB 021. If any offset of the channels is needed for the correct calculation (e.g. for rib sensor rotation to calculate corrected lateral thoracic or abdominal displacement) this has to be done prior to the data upload. 6.2.4 All curves of the simulation data and the test data are processed according to the steps described in APPENDIX I, Section 2 automatically on the VTC server as soon as they are uploaded. 6.3 Validation Criteria 6.3.1 Validation criteria 1 (ISO Scores) and 2 (Injury Criteria) must be fulfilled for both load cases. 6.3.2 The ISO scores of all channels listed in Table 6⁸ are calculated⁸An overview of all calculated scores S_i is presented on the VTC server interface. The VM must confirm that the plausibility of each sensor was checked to rectify any major issues (e.g. wrong polarity or unit errors in test or simulation data). ⁸ The ISO score implementation used on the VTC server is publicly available https://openvt.eu/validation-metrics/ISO18571 6.3.3 For all sensor locations where more than one axis is measured, weighting factors w_i are calculated for each axis based on the maximum amplitude of the axis in the sled tests according to Equation 2: <u>Equation 2</u>	<u>所有頻道應為未濾波狀態（僅允許數據擷取系統內部之 Butterworth 預濾波）。</u> <u>3.18.6.2.3 所有傷害標準將根據所提交原始數據，依照 Euro NCAP 技術通報 TB 021 進行自動化處理，若為了正確計算而需要對頻道進行任何偏移校正（例如為了計算修正後胸部或腹部側向位移而進行之肋骨感測器旋轉校正），則必須在上傳前完成。</u> <u>3.18.6.2.4 一旦上傳，模擬及試驗數據之所有曲線將於 VTC 伺服器上依照 3.18.9.2 所述之步驟自動處理。</u> <u>3.18.6.3 驗證標準</u> <u>3.18.6.3.1 兩個負載案例皆需同時符合驗證標準 1（ISO 分數）及驗證標準 2（傷害標準）。</u> <u>3.18.6.3.2 將計算表 6 列出之所有頻道之 ISO 分數，所有計算得出之分數 S_i 概覽結果將展示於 VTC 伺服器界面。車輛業者必須確認已檢查每個感測器之合理性並修正任何主要問題（例如試驗或模擬數據中之極性或單位錯誤）。</u> <u>VTC 伺服器上所使用之 ISO 分數實作為公開的，網址 https://openvt.eu/validation-metrics/ISO18571</u> <u>3.18.6.3.3 對於測量軸數超過一軸之感測器位置，根據台車試驗中最大振幅依照公式 2 計算權重因子（w_i）。</u> <u>公式 2</u>	

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$w_i = \frac{\max(Channel_{test_i})}{\max(Channel_{test_x}) + \max(Channel_{test_y}) + \max(Channel_{test_z})} \text{ with } i = X, Y, Z$ Table 6: List of channels for which ISO scores are calculated/summarised per sensor location (請參考末頁圖表) 6.3.4 The weighting factors are then used to summarise the individual ISO scores for each axis S_i of one sensor to one score per sensor (S_{sensor}) according to Equation 3 Equation 3 $S_{\text{Sensor}} = \sum_i w_i * S_i \text{ with } i = X, Y, Z$ 6.3.5 For those sensors which are marked as mandatory in Table 6, the calculated Sensor Score must exceed 0.5 to fulfil Validation Criterion 1. Validation Criterion 1 (ISO Scores): $S_{\text{sensor}} > 0.5$. 6.3.6 Currently, the scores for all other Sensors are only monitored and have no consequence on the acceptance of the data and the scoring.⁹ ⁹ From 2026 onwards the other sensors will become also mandatory when the resultant value exceeds a threshold which will be defined during the monitoring phase. 6.3.7 All assessment criteria (AC) specified in the Far Side Sled Test Protocol are calculated and compared between simulations and tests. Table 7: List of analysed assessment criteria and lower performance limits applied to decide for which of the assessment criteria the validation criterion must be fulfilled.	$w_i = \frac{\max(Channel_{test_i})}{\max(Channel_{test_x}) + \max(Channel_{test_y}) + \max(Channel_{test_z})} \text{ with } i = X, Y, Z$ 表 6：每個感測器位置計算/彙總 ISO 分數之頻道列表 (請參考末頁圖表)。 3.18.6.3.4 權重因子將用於彙總各軸之獨立 ISO 分數 (S_i)，依照公式 3 計算為每個感測器之單一分數 (S_{sensor})，。 <u>公式 3</u> $S_{\text{Sensor}} = \sum_i w_i * S_i \text{ with } i = X, Y, Z$ 3.18.6.3.5 對於表 6 中標記為強制之感測器，其計算得感測器分數必須超過 0.5 以符合驗證標準 1。 <u>驗證標準 1 (ISO 分數): $S_{\text{sensor}} > 0.5$</u> 3.18.6.3.6 目前所有其他感測器之分數僅供監控，對數據接收及評分暫無影響。 3.18.6.3.7 依照「遠端側方模擬碰撞試驗規章」計算所有指定之評等標準 (AC)，並比較模擬與試驗數據。 表 7：列出評等標準及其較低性能限制值，判定哪些評等標準必須符合驗證標準	

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(請參考末頁圖表) 6.3.8 The ratio (γ_{AC}) between the derived assessment criteria AC_{test} and the AC_{limits} shown in Table 7 is calculated as defined in Equation 4 for each criterion and for simulations and tests. The limits in the table are in line with the lower performance limits of the Far Side Sled Test Protocol. Equation 4 $r_{AC_{test}} = \frac{AC_{test}}{AC_{limit}}$ $r_{AC_{sim}} = \frac{AC_{sim}}{AC_{limit}}$ 6.3.9 For any assessment criteria where the ratio γ_{AC} according to 6.3.8 exceeds 50%. I.e. the AC calculated from the sled test data exceeds 50% of the limit specified in Table 7, the difference in ratios between simulations and tests is calculated as defined in Equation 5. Equation 5 $\text{if } r_{AC_{Test}} \geq 50\%$ $d_{AC} = r_{AC_{Test}} - r_{AC_{Sim}} $ 6.3.10 These deviations between the ratios must be < 30% for each considered (based on the condition specified in 6.3.9) assessment criteria to fulfil the validation criterion 2. Validation Criterion 2 (Assessment Criteria): $d_{AC} < 30\%$ ¹⁰ This threshold is defined for the monitoring phase only and is planned to	(請參考末頁圖表) <u>3.18.6.3.8 對於每個標準，應針對模擬與試驗分別計算其衍生評等標準 AC_{test} 與表 7 所列之 AC_{limit} 之間的比例(γ_{AC})，如公式 4。表中限制值與「遠端側方模擬碰撞試驗規章」之較低性能限制值相同。</u> <u>公式 4</u> $r_{AC_{test}} = \frac{AC_{test}}{AC_{limit}}$ $r_{AC_{sim}} = \frac{AC_{sim}}{AC_{limit}}$ <u>3.18.6.3.9 對於任何依照 3.18.6.3.8 計算之比例 γ_{AC} 超過 50% 之評等標準，即台車試驗數據算得 AC 超過表 7 規定之限制值的 50%，則應計算模擬與試驗之間的比例差異，如公式 5。</u> <u>公式 5</u> $\text{if } r_{AC_{Test}} \geq 50\%$ $d_{AC} = r_{AC_{Test}} - r_{AC_{Sim}} $ <u>3.18.6.3.10 對於每個考慮（根據 3.18.6.3.9 指定條件）之評等標準，其比例之間的偏差必須<30%，以滿足驗證標準 2。</u> <u>驗證標準 2（評等標準）：$d_{AC} < 30\%$</u>	

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be reduced by 2026		
7. RERUN SIMULATIONS WITH ADJUSTED BOUNDARY CONDITIONS 7.1 Procedure 7.1.1 If the qualification of the simulation model was not successful after uploading the tests data (not all validation criteria were fulfilled), Euro NCAP will give permission for the VM to re-run simulations and re-upload simulation data of the two validation load cases. In this case, the VM can adjust only the following parameters to be closer in line with the laboratory tests: - Initial position of the dummy (node coordinates), - Initial seat deflection (node coordinates of the seat covering foam, wire mesh etc.), - Initial belt positions (node coordinates of seatbelt including buckle), - Load curve describing the crash pulse. 7.1.2 During the monitoring phase, the VM also has the possibility to upload a third set of simulation results of the two validation load cases with further changes. The changes shall be clearly documented and motivated in a report. Only changes that cover unexpected deviations between the test setup and simulations will be accepted. Other changes, which are not related to boundary conditions and/or initial condition deviations between simulations and tests (e.g. material properties, element formulations) will not be accepted. Evidence from the test setup must be provided to justify any change.	<u>3.18.7 調整邊界條件後重新執行模擬</u> <u>3.18.7.1 程序</u> <u>3.18.7.1.1 上傳測試數據後，若模擬模型之資格認定未成功（即未滿足所有驗證標準），TNCAP 允許車輛業者重新執行模擬，並重新上傳兩個驗證負載案例之模擬數據。在此情況下，車輛業者僅能調整下列參數，使模擬結果更接近實驗室測試：</u> <u>(1)人偶之初始位置（節點座標）。</u> <u>(2)座椅之初始變形（座椅包覆泡棉、金屬網等節點座標）。</u> <u>(3)安全帶之初始位置（包括安全帶帶扣節點座標）。</u> <u>(4)描述碰撞脈衝之負載曲線。</u> <u>3.18.7.1.2 監控階段，車輛業者可針對兩個驗證負載案例上傳第三組包含進一步變更之模擬結果。所有變更須於報告中清楚記錄並提出合理解釋。僅接受針對測試設置與模擬之間非預期偏差進行變更。其他與邊界條件及/或初始條件無關之變更（例如材料特性、元素公式）將不被接受。任何變更皆須提供測試設置之證據，以證明任何變更之合理性。</u>	
8. VIRTUAL FAR SIDE OCCUPANT ASSESSMENTS	<u>3.18.8 虛擬遠端側方模擬碰撞之乘員評等</u>	

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8.1 Scoring Scheme 8.1.1 The scoring scheme within the monitoring phase is summarised in Table 8 below, the final scoring in Table 9. 8.1.2 If the validation criteria are still not met for the third upload, or no or incomplete simulation data is provided, the virtual assessment will be considered as failed and the scores from the hardware far side sled tests (before possible modifiers are applied) will be halved. 8.1.3 If the validation criteria and all quality criteria for the provided complete simulation load cases are fulfilled, the full scores of the hardware far side sled tests will be included in the rating. - During the monitoring phase, the exact assessment criteria values (i.e. injury criteria and head excursions) predicted in the virtual testing load cases are not considered. The total far side sled score is based only on the hardware far side sled result. - After the monitoring phase, the scoring of the virtual load cases will be aligned with the sled tests and based on the criteria and performance limits. All virtual load cases will be equally considered with 1/3 pt maximum for each of the 6 load cases coming from virtual testing for the final score. The total far side sled score is based on the hardware sled result and the sum of virtual results. Table 8: Scoring for far side assessment based on sled tests and provided virtual testing results during monitoring phase (2024-2025). (請參考末頁圖表) Table 9: Scoring for far side assessment based on sled tests and provided	<u>3.18.8.1 評等方式</u> <u>3.18.8.1.1 監控階段之評等方式彙整於表 8。</u> <u>3.18.8.1.2 若第三次上傳後仍未符合驗證標準，或未提供模擬數據、提供不完整模擬數據，則虛擬遠端側方模擬碰撞評等將視為失敗，且實體遠端側方模擬碰撞之台車試驗分數（在適用可能之扣分前）將被減半。</u> <u>3.18.8.1.3 若提供之完整模擬負載案例符合所有驗證標準及品質標準，則實體遠端側方模擬碰撞之台車試驗總分數將納入評分。</u> <u>(1)現階段虛擬測試負載案例所預測之具體評估標準值（如傷害標準及頭部偏位）不予計分。遠端側方模擬碰撞總分僅採計遠端側方模擬碰撞之實體台車試驗結果。</u> <u>(2)未來虛擬負載案例之評分將與台車試驗相同，並基於標準與性能限制值。虛擬測試之六個負載案例平均配分，每個負載案例最高可獲得 1/3 分。遠端側方模擬碰撞總分為實體台車試驗結果與虛擬結果總和之加總。</u> <u>表 8：現階段基於台車試驗與虛擬測試結果之遠端側方模擬碰撞評分</u> <u>(請參考末頁圖表)</u>	

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virtual testing results in assessment phase after monitoring phase (2026) (請參考末頁圖表)		
APPENDIX I: OUTPUT DEFINITIONS & PROCESSING ON VTC SERVER 1 REQUIREMENTS FOR CHANNEL OUTPUT FORMATS 1.1 Channel Codes The following ISO MME Channel codes for the simulation outputs must be used. Otherwise, the VTC server will not allow you to upload the simulation files or misinterpret the provided results. The placeholders indicated with “?” must match the position of the driver seat (left or right) and must be consistent between tests and simulations. Table 10: required channels and corresponding ISO Codes for all virtual tests (請參考末頁圖表) Table 11: Placeholder definitions for left and right-hand drive vehicles for far side tests on driver’s side. (請參考末頁圖表) Tests can either performed on left- or right-hand drive vehicles, independent of the nomination. However, it must be consistent between simulations and lab tests, if left or right-hand drive vehicles are used throughout the procedure (no mix is allowed). 1.2 Header Requirements for .MME FILE Below is an example for a .mme file. The lines with examples must be filled in. The rest may remain empty (but needs to be in the file). Table 12: Content of .mme file.	3.18.9 輸出定義及 VTC 伺服器處理 3.18.9.1 頻道輸出格式要求 3.18.9.1.1 頻道代碼 必須使用下列模擬輸出之 ISO MME 頻道代碼。否則，VTC 伺服器將不允許所上傳模擬檔案，或錯誤解讀所提供之結果。代碼中以「？」標示的佔位符必須與駕駛座位置（左側或右側）一致，並且於試驗及模擬之間必須保持一致。 表 9：所有虛擬測試所需頻道及對應之 ISO 代碼（請參考末頁圖表） 表 10：左駕與右駕車輛於遠端側方碰撞試驗之佔位符定義（請參考末頁圖表） 無論指定案例為何，測試可於左駕或右駕車輛上進行。惟整個程序中，無論使用左駕或右駕車輛，模擬與實驗室試驗之間必須保持一致（不允許混用）。 3.18.9.1.2 .MME 檔案之標頭要求 下述為.mme 檔案之範例，範例中提及行數內容必須填寫，其餘行數可保持空白（但仍須保留在檔案中）。 表 11：.mme 檔案內容	

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(請參考末頁圖表) 1.3 Header requirements for each channel file Below an example of a header for any channel files (e.g. .001, .100 file is given). Only the lines with examples must be filled in. The rest can remain empty. If the simulation results include a settling phase before t0, the “time of first sample” has to be included (e.g. -0.2 for a 200 ms settling phase). Test object number : 1 Name of the channel : e.g. Head x acceleration Laboratory channel code : Customer channel code : Channel code : e.g. 11HEAD0000WSACX0 Unit : e.g. m/(s*s) Reference system : Pre-filter type : Cut off frequency : Channel amplitude class : Sampling interval : 1E-4 Bit resolution : Time of first sample : e.g. 0 Number of samples : e.g. 6200	<u>(請參考末頁圖表)</u> <u>3.18.9.1.3 每個頻道檔案之標頭要求</u> <u>下述為任一頻道檔案 (例如.001 或.100 檔案) 之標頭範例。僅需填寫範例中行數內容，其餘行數可保持空白。若模擬結果於 t₀ 前包含穩定階段(Settling phase)，則必須包括「首個樣本時間」(例如 200 ms 之穩定階段時間填寫-0.2)。</u> <u>(1)測試物件編號：1</u> <u>(2)頻道名稱：例如 Head x acceleration</u> <u>(3)實驗室頻道代碼：</u> <u>(4)客戶頻道代碼：</u> <u>(5)頻道代碼：例如 11HEAD0000WSACX0</u> <u>(6)單位：例如 m/(s*s)</u> <u>(7)參考系統：</u> <u>(8)預濾波器類型：</u> <u>(9)截止頻率：</u> <u>(10)頻道幅度類別：</u> <u>(11)採樣間隔：1E-4</u> <u>(12)位元解析度：</u> <u>(13)首個樣本時間：例如 0</u> <u>(14)樣本數量：例如 6200</u>	
2 DATA PROCESSING Read “sampling interval” from the individual channel file and resample data to 10 kHz if needed (if 20 kHz are uploaded, every second value is used)¹²	<u>3.18.9.2 數據處理</u> <u>(1)讀取每個頻道檔案中之「採樣間隔」，並依實際需求將數據重新採樣為 10 kHz (若上傳為 20 kHz，則使用每隔一個的值)。</u>	

Euro NCAP 原文	修訂 TNCAP 條文草案(第三版)	說明
¹²The sampling rate shall be reviewed based on the results received in the monitoring phase. The downsampling is performed as the reference data from ISO is available at 10 kHz and therefore the ISO tool can be only validated for this sample rate for now - Filter all Channels with filter class according to TB 021. For the unspecified channels in TB 021 (e.g. energies or displacement, no filtering is applied). - Time of first sample“ (t_0_MME) and sampling interval is read in from channel file. - If not included, t_0_MME is set to 0. - If filled in: t_0_MME= „Time of first sample“ / “sampling interval“ - Remove data before t_0_MME - Calculate time of maximum y head excursion - Remove data after maximum y head excursion + 20% of time - store "t_end_calc" After test data has been uploaded: - Calculate ISO scores for all channels, which are listed in Section 6.3.2, Table 6. - Calculate weighting factors for all sensors where more than one axis is measured. - Summarise the individual channels of one sensor to S_{sensor} - All injury criteria specified in the Far Side Sled Test Protocol are calculated according to TB 021. - The head displacement of the test data is calculated from the	<u>採樣率將根據監控階段之結果進行審核。目前執行降採樣是因為 ISO 參考數據係以 10 kHz 提供，因此 ISO 工具目前僅能針對此採樣率進行驗證。</u> <u>(2)依照 Euro NCAP 技術通報 TB 021 之濾波等級對所有頻道進行濾波。對於 TB 021 未指定之頻道（例如能量或位移），則不施加濾波。</u> <u>(3)從頻道檔案中讀取「首個樣本時間(t_0_MME)」及「採樣間隔」：</u> <u>(A)若未填寫，則將 t_0_MME 設為 0；</u> <u>(B)若有填寫，則 t_0_MME = 「首個樣本時間」/「採樣間隔」。</u> <u>(4)移除 t_0_MME 之前的數據。</u> <u>(5)計算頭部 y 方向最大偏移之時間。</u> <u>(6)移除最大 y 位移時間+20%之後的數據，並儲存此為 "t_end_calc"。</u> <u>在測試數據上傳後：</u> <u>(1)計算 3.18.6.3.2 表 6 所列之所有通道 ISO 分數。</u> <u>(2)針對所有測量軸數超過一軸之感測器計算權重因子。</u> <u>(3)將感測器之所有通道匯總為單一感測器(S_{sensor})。</u> <u>(4)依照 Euro NCAP 技術通報 TB 021 計算「遠端側方模擬碰撞試驗規章」中指定之所有傷害標準。</u> <u>(5)測試數據之頭部偏移係由頭部重心測得之加速度與角速度</u>	

Euro NCAP 原文	修訂 TNCAP 條文草案(第三版)	說明
measured accelerations and rotational velocities of the head CoG. To consider the distance between the head CoG, an offset of 80 mm is added for the max. head excursion calculation for the simulations and the tests. All data is used as provided and rounded only at the very last steps. A minimum of 8 digits has to be provided for each channel.	<u>計算而得。為考慮頭部重心之的距離，在計算模擬與測試之最大頭部偏移量，需額外增加 80 mm 之偏移量。</u> <u>所有數據按原始提供進行處理，僅在最後步驟進行四捨五入。每個頻道數據至少提供 8 位有效數字。</u>	

(Euro NCAP原文)

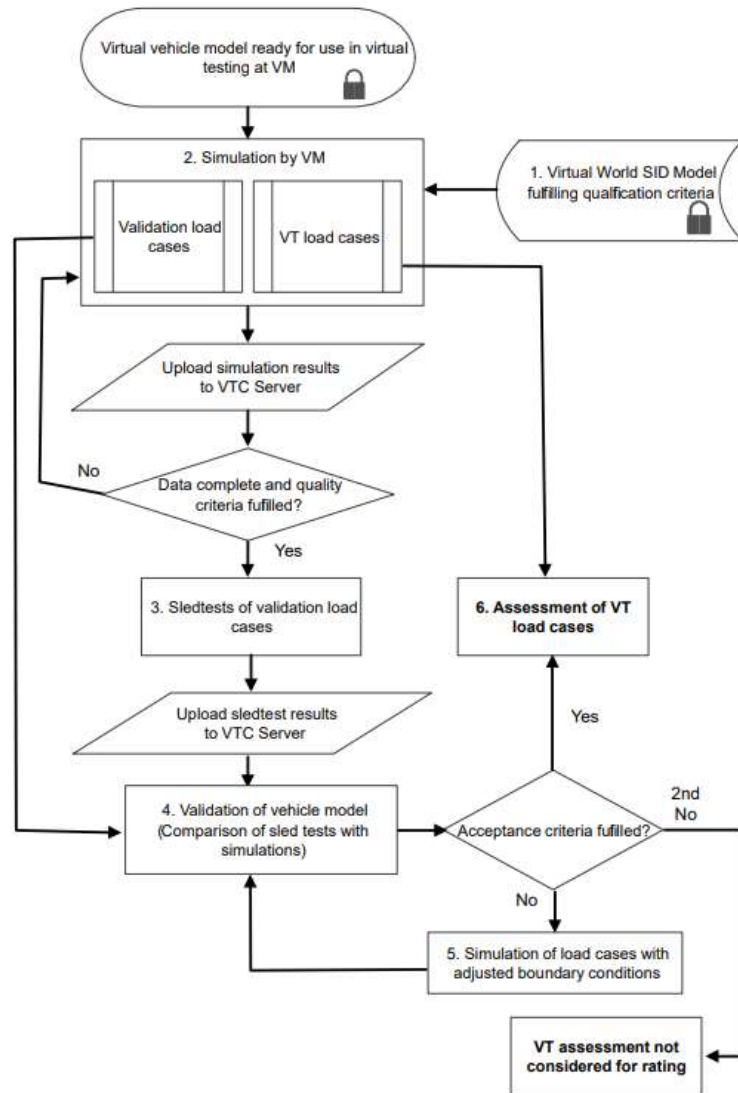


Figure 1: Overview of VTC Process

(TNCAP 條文草案)

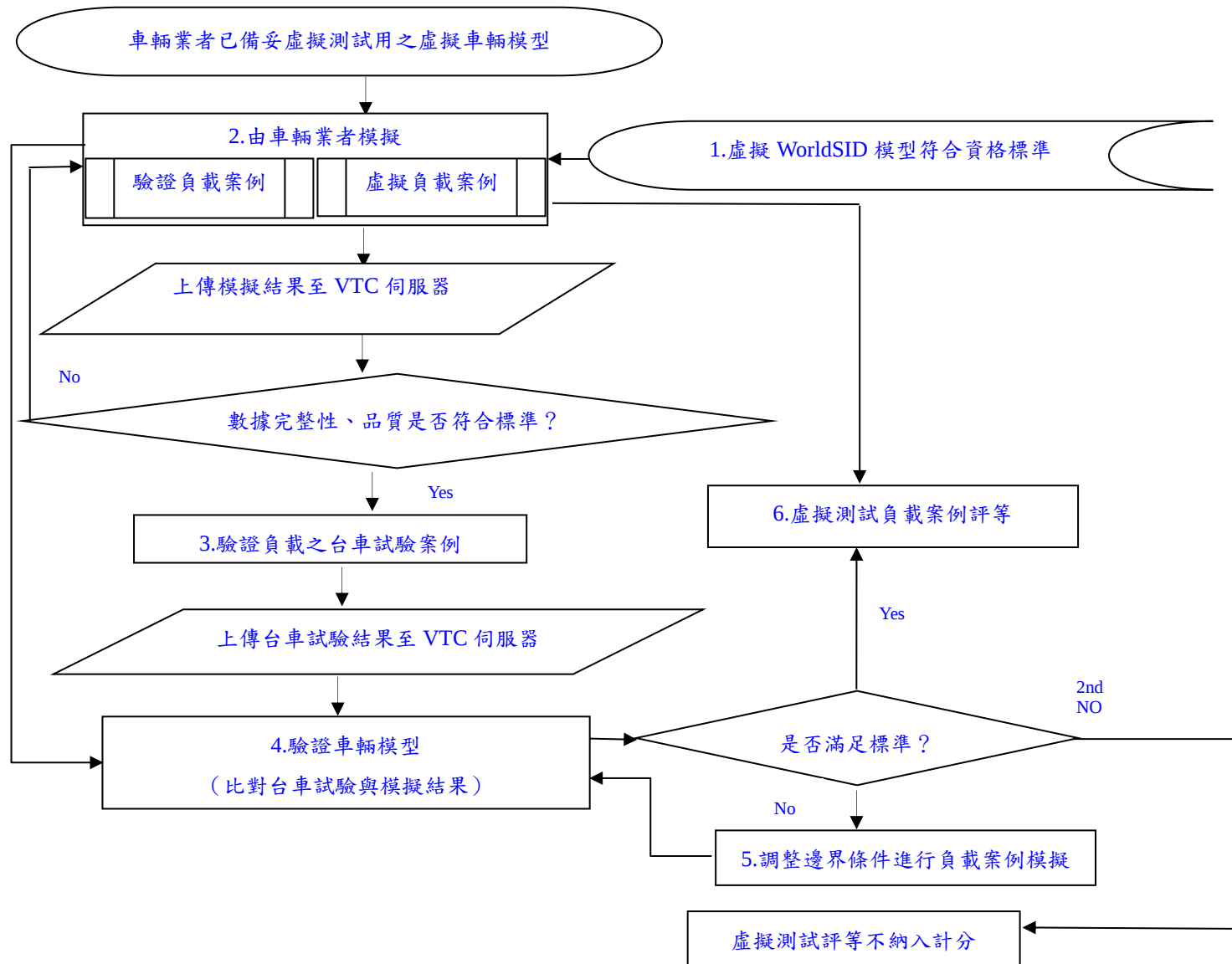


圖1：VTC流程概覽

(Euro NCAP原文)

Table 1: Documentation of initial position of the WSID in simulations and sled tests.

	Simulation Models						Lab Sled Tests		
	Left			Right			Non-Struck Side		
Head CoG	X	Y	Z	X	Y	Z	X	Y	Z
Shoulder crew									
Arm tip									
H-Point									
Knee									
Ankle									

	Simulation Models			Lab Sled tests		
Neck bracket edge front	X	Y	Z	X	Y	Z
Neck bracket edge rear						
Head tilt angle						
Chest tilt angle						
Pelvic tilt angle						
Femur tilt angle						

(TNCAP 條文草案)

表1：記錄模擬與台車試驗中WSID之初始位置。

	<u>模擬模型</u>						<u>實驗室台車試驗</u>		
	<u>左側</u>			<u>右側</u>			<u>非撞擊側</u>		
	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>頭部重心</u>									
<u>肩部螺絲</u>									
<u>手臂末端</u>									
<u>H點</u>									
<u>膝部</u>									
<u>腳踝</u>									

	<u>模擬模型</u>			<u>實驗室台車試驗</u>		
	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>頸部支架前緣</u>						
<u>頸部支架後緣</u>						
<u>頭部傾斜角度</u>						
<u>胸部傾斜角度</u>						
<u>骨盆傾斜角度</u>						
<u>股骨傾斜角度</u>						

(Euro NCAP原文)

Table 2: Documentation of seat and belt adjustment in simulations and sled test.

	Simulation Models						Lab Sled test					
	Left			Right			Left			Right		
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
Headrest stay hole												
Striker hole												
Seatback angle												
Seatbelt routing (measured on sternum)												

(TNCAP 條文草案)

表2：記錄模擬與台車試驗中座椅及安全帶之調整。

	<u>模擬模型</u>						<u>實驗室台車試驗</u>					
	<u>左側</u>			<u>右側</u>			<u>左側</u>			<u>右側</u>		
	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>X</u>	<u>Y</u>	<u>Z</u>
<u>頭枕支撐孔</u>												
<u>車門扣鎖孔</u>												
<u>椅背角度</u>												
<u>安全帶圍繞（於胸骨上測量）</u>												

(Euro NCAP原文)

Table 3: Validation load cases.

Pulse	Impact angle	Seat position x	Seat position z	Subtype of the test	Virtual Testing reference ID for Hardware Tests	Virtual Testing reference ID for Simulations
Pole	75°	x-ref	z-ref	Pole 75 °	FS_Pole_75_x-ref_z-ref_50M_Test_1	FS_Pole_75_x-ref_z-ref_50M_Sim_1 - FS_Pole_75_x-ref_z-ref_50M_Sim_3
AE-MDB	75°	x-ref	z-ref	AE-MDB 75°	FS_AEMDB_75_x-ref_z-ref_50M_Test_1	FS_AEMDB_75_x-ref_z-ref_50M_Sim_1 - FS_AEMDB_75_x-ref_z-ref_50M_Sim_3

(TNCAP 條文草案)

表3：驗證負載案例

<u>脈衝</u>	<u>撞擊角度</u>	<u>座椅位置</u> <u>X</u>	<u>座椅位置</u> <u>Z</u>	<u>測試子類型</u>	<u>實體試驗之虛擬測試參考ID</u>	<u>模擬之虛擬測試參考ID</u>
<u>側方立柱撞擊(Pole)</u>	<u>75°</u>	<u>x-ref</u>	<u>z-ref</u>	<u>Pole 75度</u>	<u>FS Pole 75 x-ref z-ref 50M Test 1</u>	<u>FS Pole 75 x-ref z-ref 50M Sim 1</u> = <u>FS Pole 75 x-ref z-ref 50M Sim 3</u>

<u>脈衝</u>	<u>撞擊角度</u>	<u>座椅位置</u> <u>X</u>	<u>座椅位置</u> <u>Z</u>	<u>測試子類型</u>	<u>實體試驗之虛擬測試參考ID</u>	<u>模擬之虛擬測試參考ID</u>
<u>側方撞擊</u> <u>(AE-MDB)</u>	<u>75°</u>	<u>x-ref</u>	<u>z-ref</u>	<u>AE-MDB 75</u> <u>度</u>	<u>FS_AEMDB_75_x-</u> <u>ref_z-ref_50M_Test</u>	<u>FS_AEMDB_75_x</u> <u>-ref_z-ref_50M_Sim_1</u> <u>=</u> <u>FS_AEMDB_75_x</u> <u>-ref_z-ref_50M_Sim_3</u>

(Euro NCAP原文)

Table 4: Virtual Testing Load cases.

Pulse	Impact angle	Seat position x	Seat position x	Subtype of the test	Virtual Testing reference ID for Simulations:
Pole	75°	x-ref@z-high	Z- high	Pole 75 degree(Z- high)	FS_Pole_75_x-ref_z-high_50M_Sim_1
Pole	90°	x-ref	z-ref	Pole 90 degree	FS_Pole_90_x-ref_z-ref_50M_Sim_1
AE-MDB	60°	x-ref	z-ref	AE-MDB 60 degree	FS_AEMDB_60_x-ref_z-ref_50M_S
AE-MDB	75°	x-ref@z-high	z-high	AE-MDB 75 degree (z-high)	FS_AEMDB_75_x-ref_z-high_50M_Sim_1
AE-MDB	90°	x-ref	z-ref	AE-MDB 90 degree	FS_AEMDB_90_x-ref_z-ref_50M_Sim
AE-MDB	90°	x-ref@z-high	z-high	AE-MDB 90 degree (z-high)	FS_AEMDB_90_x-ref_z-high_50M_Sim_1

(TNCAP 條文草案)

表4：虛擬測試負載案例

<u>脈衝</u>	<u>撞擊角度</u>	<u>座椅位置X</u>	<u>座椅位置Z</u>	<u>測試子類型</u>	<u>模擬之虛擬測試參考 ID：</u>
<u>側方立柱 撞擊</u>	<u>75°</u>	<u>x-ref@z- high</u>	<u>Z- high</u>	<u>Pole 75度 (Z- high)</u>	<u>FS_Pole_75_x-ref_z- high_50M_Sim_1</u>
<u>側方立柱 撞擊</u>	<u>90°</u>	<u>x-ref</u>	<u>z-ref</u>	<u>Pole 90度</u>	<u>FS_Pole_90_x-ref_z- ref_50M_Sim_1</u>
<u>側方撞擊</u>	<u>60°</u>	<u>x-ref</u>	<u>z-ref</u>	<u>AE-MDB 60度</u>	<u>FS_AEMDB_60_x-ref_z- ref_50M_S</u>
<u>側方撞擊</u>	<u>75°</u>	<u>x-ref@z- high</u>	<u>z-high</u>	<u>AE-MDB 75 度 (z-high)</u>	<u>FS_AEMDB_75_x-ref_z- high_50M_Sim_1</u>
<u>側方撞擊</u>	<u>90°</u>	<u>x-ref</u>	<u>z-ref</u>	<u>AE-MDB 90 度</u>	<u>FS_AEMDB_90_x-ref_z- ref_50M_Sim</u>
<u>側方撞擊</u>	<u>90°</u>	<u>x-ref@z- high</u>	<u>z-high</u>	<u>AE-MDB 90 度(z-high)</u>	<u>FS_AEMDB_90_x-ref_z- high_50M_Sim_1</u>

(Euro NCAP 原文)

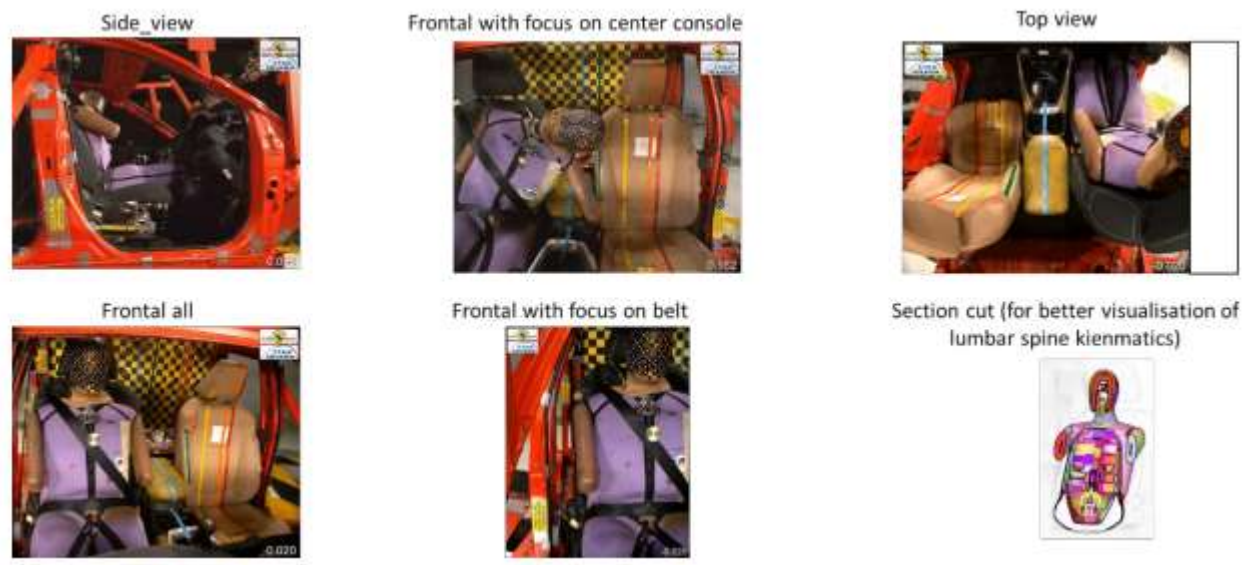


Figure 2: Video views for animated simulation results.

(TNCAP 條文草案)

側方視角



前方全部



前方聚焦於中控台



前方聚焦於安全帶



上方視角



剖面圖(為觀察腰椎旋轉運動學)



圖2：動畫模擬結果之影片視角

(Euro NCAP原文)

Table 5: Required output channels for each simulation load case.

Location	Parameter	Axis
Head CoG accelerometer	Global coordinates	x, y, z
	Angular velocities	x, y, z
	Velocities	x, y, z
	Accelerations	x, y, z
Upper neck loadcell	Forces	x, y, z
	Moments	x, y, z
Upper neck loadcell	Forces	x, y, z
	Moments	x, y, z
Spine – T4 accelerometer	Global coordinates	x, y, z
	Accelerations	x, y, z
	Velocities	x, y, z
Spine – T12 accelerometer	Global coordinates	x, y, z
	Accelerations	x, y, z
	Velocities	x, y, z
Lumbar spine loadcell	Forces	x, y, z
	Moments	x, y, z
Shoulder joint	Forces	x, y, z
Shoulder – rib facing centre console	lateral displacement	1D
Thorax - Upper rib facing centre console	lateral displacement	1D
Thorax - Mid rib facing centre console	lateral displacement	1D
Thorax - Lower rib facing centre console	lateral displacement	1D
Abdomen – Upper rib facing centre console	lateral displacement	1D

Location	Parameter	Axis
Abdomen – Lower rib facing centre console	lateral displacement	1D
Pelvis accelerometer	Global coordinates	x, y, z
	Velocities	x, y, z
	Accelerations	x, y, z
Pubic Symphysis Loadcell	Force	1D
B-Pillar (non-struck side)	Global coordinates	x, y, z
	Global velocities	x, y, z
	Acceleration	x, y, z
Lap Belt (B6)	Forc	1D
Shoulder Belt (B3)	Forc	1D
Contact Dummy – Centre Console	Forc	x, y, z
Contact Dummy – Seat	Forc	x, y, z
Contact Dummy – Seatbelt	Forc	x, y, z
Contact Dummy – Airbag ⁶	Forc	x, y, z
Total Setup	Global Kinetic Energy	-
	Global Internal Energy	-
	Global Hourglass Energy	-
	Global External Work	-
	Total Energy	-
	Added Mass (absolute)	-
Dummy	Kinetic Energy	-
	Internal Energy	-
	Hourglass Energy	-
	Added Mass (absolute)	-

Location	Parameter	Axis
Driver Seat	Kinetic Energy	-
	Internal Energy	-
	Hourglass Energy	-
	Added Mass (absolute)	-
Sled ⁷	Kinetic Energy	-
	Internal Energy	-
	Hourglass Energy	-
	Added Mass (absolute)	-
Centre Console	Kinetic Energy	
	Internal Energy	
	Hourglass Energy	
	Added Mass (absolute)	
Airbag ⁶	Kinetic Energy	
	Internal Energy	
	Hourglass Energy	
	Added Mass (absolute)	
Total number of requested channels:	115	

⁶ If present. Otherwise, these channels do not have to be shared.

⁷ The vehicle environment (if present, model of the sled + Body in white without the seat, centre console and airbag)

(TNCAP 條文草案)

表5：每個模擬負載情境所需輸出頻道。

<u>位置</u>	<u>參數</u>	<u>軸</u>
<u>頭部重心加速度計</u>	<u>全域座標系統</u>	<u>x, y, z</u>
	<u>角速度</u>	<u>x, y, z</u>
	<u>速度</u>	<u>x, y, z</u>
	<u>加速度</u>	<u>x, y, z</u>
<u>上頸部荷重計</u>	<u>力</u>	<u>x, y, z</u>
	<u>力矩</u>	<u>x, y, z</u>
<u>下頸部荷重計</u>	<u>力</u>	<u>x, y, z</u>
	<u>力矩</u>	<u>x, y, z</u>
<u>脊柱 - T4 加速度計</u>	<u>全域座標系統</u>	<u>x, y, z</u>
	<u>加速度</u>	<u>x, y, z</u>
	<u>速度</u>	<u>x, y, z</u>
<u>脊柱 - T12 加速度計</u>	<u>全域座標系統</u>	<u>x, y, z</u>
	<u>加速度</u>	<u>x, y, z</u>
	<u>速度</u>	<u>x, y, z</u>
<u>腰椎荷重計</u>	<u>力</u>	<u>x, y, z</u>
	<u>力矩</u>	<u>x, y, z</u>
<u>肩部關節</u>	<u>力</u>	<u>x, y, z</u>
<u>肩部-面向中控台肋骨</u>	<u>側向位移</u>	<u>1D</u>
<u>胸部 - 面向中控台之上肋骨</u>	<u>側向位移</u>	<u>1D</u>
<u>胸部 - 面向中控台之中肋骨</u>	<u>側向位移</u>	<u>1D</u>
<u>胸部 - 面向中控台之下肋骨</u>	<u>側向位移</u>	<u>1D</u>
<u>腹部 - 面向中控台之上肋骨</u>	<u>側向位移</u>	<u>1D</u>

<u>位置</u>	<u>參數</u>	<u>軸</u>
<u>腹部 - 面向中控台之下肋骨</u>	<u>側向位移</u>	<u>1D</u>
<u>骨盆加速度計</u>	<u>全域座標系統</u>	<u>x, y, z</u>
	<u>速度</u>	<u>x, y, z</u>
	<u>加速度</u>	<u>x, y, z</u>
<u>恥骨聯合荷重計</u>	<u>力</u>	<u>1D</u>
<u>B 柱（非撞擊側）</u>	<u>全域座標系統</u>	<u>x, y, z</u>
	<u>全域速度</u>	<u>x, y, z</u>
	<u>加速度</u>	<u>x, y, z</u>
<u>腰部安全帶（B6）</u>	<u>力</u>	<u>1D</u>
<u>肩部安全帶（B3）</u>	<u>力</u>	<u>1D</u>
<u>人偶接觸 - 中控台</u>	<u>力</u>	<u>x, y, z</u>
<u>人偶接觸 - 座椅</u>	<u>力</u>	<u>x, y, z</u>
<u>人偶接觸 - 安全帶</u>	<u>力</u>	<u>x, y, z</u>
<u>人偶接觸 - 空氣囊¹</u>	<u>力</u>	<u>x, y, z</u>
<u>總設置</u>	<u>全域動能</u>	<u>=</u>
	<u>全域內能</u>	<u>=</u>
	<u>全域沙漏能量(Hourglass Energy)</u>	<u>=</u>
	<u>全域外部功</u>	<u>=</u>
	<u>總能量</u>	<u>=</u>
	<u>新增質量（絕對值）</u>	<u>=</u>
<u>人偶</u>	<u>動能</u>	<u>=</u>
	<u>內能</u>	<u>=</u>
	<u>沙漏能量</u>	<u>=</u>

<u>位置</u>	<u>參數</u>	<u>軸</u>
	<u>新增質量（絕對值）</u>	=
<u>駕駛座</u>	<u>動能</u>	=
	<u>內能</u>	=
	<u>沙漏能量</u>	=
	<u>新增質量（絕對值）</u>	=
<u>台車²</u>	<u>動能</u>	=
	<u>內能</u>	=
	<u>沙漏能量</u>	=
	<u>新增質量（絕對值）</u>	=
<u>中控台</u>	<u>動能</u>	
	<u>內能</u>	
	<u>沙漏能量</u>	
	<u>新增質量（絕對值）</u>	
<u>空氣囊¹</u>	<u>動能</u>	
	<u>內能</u>	
	<u>沙漏能量</u>	
<u>頻道總數</u>		<u>115</u>

備註：1.若有配備空氣囊，則需提供。否則，無需分享相關頻道。

2.車輛環境（依實際狀況，係指台車模型與車體，不含座椅、中控台及空氣囊）

(Euro NCAP原文)

Table 6: List of channels for which ISO scores are calculated/summarised per sensor location.

Sensor	Axis	Mandatory in Monitoring Phase (2024-2025)
Head CoG Angular velocities	x, y, z	Yes
Head CoG Accelerations	x, y, z	No
Head CoG Accelerations derived from velocities (for simulations)	x, y, z	No
Upper neck Forces	x, y, z	No
Upper neck Moments	x, y, z	No
Lower neck Forces	x, y, z	No
Lower neck Moments	x, y, z	No
Spine – T4 Accelerations	x, y, z	Yes
Spine – T12 Accelerations	x, y, z	Yes
Pelvis accelerations	x, y, z	Yes
Lumbar spine loadcell Forces	x, y, z	No
Lumbar spine loadcell Moments	x, y, z	No
Shoulder joint Forces	x, y, z	No
Shoulder – rib Displacement (corrected)	1D	No
Thorax - Upper rib Displacement (corrected)	1D	No
Thorax - Mid rib Displacement (corrected)	1D	No
Thorax - Lower rib Displacement (corrected)	1D	No

Abdomen – Upper rib Displacement (corrected)	1D	No
Abdomen – Lower rib Displacement (corrected)	1D	No
Pubic Symphysis Loadcell Forces	1D	No
B-Pillar (non-struck side) Accelerations	x, y, z	Yes
Lap Belt (B6) Force	1D	No
Shoulder Belt (B3) Force	1D	Yes

(TNCAP 條文草案)

表6：每個感測器位置計算/匯總ISO分數之頻道列表

<u>感測器</u>	<u>軸</u>	<u>監控階段為必須項目</u>
<u>頭部重心角速度</u>	<u>x, y, z</u>	<u>是</u>
<u>頭部重心加速度</u>	<u>x, y, z</u>	<u>否</u>
<u>由速度推導出之頭部重心加速度</u>	<u>x, y, z</u>	<u>否</u>
<u>上頸部力</u>	<u>x, y, z</u>	<u>否</u>
<u>上頸部力矩</u>	<u>x, y, z</u>	<u>否</u>
<u>下頸部力</u>	<u>x, y, z</u>	<u>否</u>
<u>下頸部力矩</u>	<u>x, y, z</u>	<u>否</u>
<u>脊柱 T4 加速度</u>	<u>x, y, z</u>	<u>是</u>
<u>脊柱 T12 加速度</u>	<u>x, y, z</u>	<u>是</u>
<u>骨盆加速度</u>	<u>x, y, z</u>	<u>是</u>
<u>腰椎力傳感器</u>	<u>x, y, z</u>	<u>否</u>
<u>腰椎力矩傳感器</u>	<u>x, y, z</u>	<u>否</u>
<u>肩部關節力</u>	<u>x, y, z</u>	<u>否</u>

<u>感測器</u>	<u>軸</u>	<u>監控階段為必須項目</u>
<u>肩部-肋骨位移（校正後）</u>	<u>1D</u>	<u>否</u>
<u>胸部-上肋骨位移（校正後）</u>	<u>1D</u>	<u>否</u>
<u>胸部-中肋骨位移（校正後）</u>	<u>1D</u>	<u>否</u>
<u>胸部-下肋骨位移（校正後）</u>	<u>1D</u>	<u>否</u>
<u>腹部-上肋骨位移（校正後）</u>	<u>1D</u>	<u>否</u>
<u>腹部-下肋骨位移（校正後）</u>	<u>1D</u>	<u>否</u>
<u>恥骨聯合力傳感器</u>	<u>1D</u>	<u>否</u>
<u>B 柱（非撞擊側）加速度</u>	<u>x, y, z</u>	<u>是</u>
<u>腰部安全帶力（B6）</u>	<u>1D</u>	<u>否</u>
<u>肩部安全帶力（B3）</u>	<u>1D</u>	<u>是</u>

(Euro NCAP原文)

Table 7: List of analysed assessment criteria and lower performance limits applied to decide for which of the assessment criteria the validation criterion must be fulfilled.

Assessment criterion <i>AC</i>	Limit <i>AC_{limit}</i>
HIC15	700
a3ms	80g
Upper Neck Fz	3.74 kN
Upper Neck MxOC	248 Nm
Upper Neck MyOC	50 Nm
Lower Neck Fz	3.74 kN
Lower Neck Mx(base of neck)	248 Nm
Lower Neck My(base of neck)	Monitored only
Chest compression	50 mm
Abdomen compression	65 mm
Pubic Symphysis Force	2.8 kN
Lumbar Fy	2 kN
Lumbar Fz	3.5 kN
Lumbar Mx	120 Nm
Head excursion	Lateral distance between original head CoG and orange line – 80 mm

(TNCAP 條文草案)

表 7：列出評等標準及其較低性能限制值，判定哪些評等標準必須符合驗證標準

<u>評等標準</u>	<u>限制值</u>
<u>AC</u>	<u>AC_{limit}</u>
<u>HIC₁₅</u>	<u>700</u>
<u>a_{3ms}</u>	<u>80g</u>
<u>上頸部 F_z</u>	<u>3.74 kN</u>
<u>上頸部 M_xOC</u>	<u>248 Nm</u>
<u>上頸部 M_yOC</u>	<u>50 Nm</u>
<u>下頸部 F_z</u>	<u>3.74 kN</u>
<u>下頸部 M_x (頸部基座)</u>	<u>248 Nm</u>
<u>下頸部 M_y (頸部基座)</u>	<u>僅監控</u>
<u>胸部壓縮量</u>	<u>50 mm</u>
<u>腹部壓縮量</u>	<u>65 mm</u>
<u>恥骨聯合力</u>	<u>2.8 kN</u>
<u>腰椎 F_y</u>	<u>2 kN</u>
<u>腰椎 F_z</u>	<u>3.5 kN</u>
<u>腰椎 M_x</u>	<u>120 Nm</u>
<u>頭部偏移</u>	<u>原始頭部重心與橘線間之橫向距離 - 80 mm</u>

(Euro NCAP原文)

Table 8: Scoring for far side assessment based on sled tests and provided virtual testing results during monitoring phase (2024-2025).

	Max. scores from farside hardware sled tests based on performance limits (without penalty)	Scale Factor	Max. farside scores considered for rating
No simulation data is uploaded to VTC server	4	0.5	2
Uploaded data is incomplete or not accepted: • Not all quality criteria of simulations are fulfilled, • Not all requested load cases are uploaded	4	0.5	2
Validation criteria are not fulfilled for the validation load cases (even after boundary condition adjustment)	4	0.5	2
Data sets are complete and all validation criteria required for the monitoring phase are fulfilled for both validation load cases	4	1	4

(TNCAP 條文草案)

表 8：現階段基於台車試驗與虛擬測試結果之遠端側方模擬碰撞評分

	<u>基於性能限制之實體遠端碰撞台車 試驗最高分（無扣分）</u>	<u>比例因子</u>	<u>納入評等之最高分</u>
<u>未上傳模擬數據至 VTC 伺服器</u>	<u>4</u>	<u>0.5</u>	<u>2</u>
<u>上傳數據不完整或未被接受：</u> <u>模擬未滿足所有品質標準</u> <u>未上傳所有要求的負載案例</u>	<u>4</u>	<u>0.5</u>	<u>2</u>
<u>驗證負載案例之驗證標準未符合 （即使調整邊界條件）</u>	<u>4</u>	<u>0.5</u>	<u>2</u>
<u>數據集完整且兩個驗證負載案例 所需之所有驗證標準皆符合</u>	<u>4</u>	<u>1</u>	<u>4</u>

(Euro NCAP原文)

Table 10: required channels and corresponding ISO Codes for all virtual tests

Location	Parameter	Axis	ISO Code
Head CoG accelerometer	Global coordinates	x	1?HEAD0000WSDCX0
		y	1?HEAD0000WSDCY0
		z	1?HEAD0000WSDCZ0
	Angular velocities	x	1?HEAD0000WSAVX0
		y	1?HEAD0000WSAVY0
		z	1?HEAD0000WSAVZ0
	Accelerations	x	1?HEAD0000WSACX0
		y	1?HEAD0000WSACY0
		z	1?HEAD0000WSACZ0
	Velocities	x	1?HEAD0000WSVEX0
		y	1?HEAD0000WSVEY0
		z	1?HEAD0000WSVEZ0
Upper neck load cell	Forces	x	1?NECKUP00WSFOX0
		y	1?NECKUP00WSFOY0
		z	1?NECKUP00WSFOZ0
	Moments	x	1?NECKUP00WSMOX0
		y	1?NECKUP00WSMOY0
		z	1?NECKUP00WSMOZ0
Lower neck load cell	Forces	x	1?NECKLO00WSFOX0
		y	1?NECKLO00WSFOY0
		z	1?NECKLO00WSFOZ0
	Moments	x	1?NECKUP00WSMOX0

Location	Parameter	Axis	ISO Code
		y	1?NECKUP00WSMOY0
		z	1?NECKUP00WSMOZ0
Spine – T4 accelerometer	Global coordinates	x	1?THSP040000DCX0
		y	1?THSP040000DCY0
		z	1?THSP040000DCZ0
	Accelerations	x	1?THSP0400WSACX0
		y	1?THSP0400WSACY0
		z	1?THSP0400WSACZ0
	Velocities	x	1?THSP0400WSVEX0
		y	1?THSP0400WSVEY0
		z	1?THSP0400WSVEZ0
Spine – T12 accelerometer	Global coordinates	x	1?THSP120000DCX0
		y	1?THSP120000DCY0
		z	1?THSP120000DCZ0
	Accelerations	x	1?THSP1200WSACX0
		y	1?THSP1200WSACY0
		z	1?THSP1200WSACZ0
	Velocities	x	1?THSP1200WSVEX0
		y	1?THSP1200WSVEY0
		z	1?THSP1200WSVEZ0
Lumbar spine load cell	Forces	x	1?LUSP0000WSFOX0
		y	1?LUSP0000WSFOY0
		z	1?LUSP0000WSFOZ0
	Moments	x	1?LUSP0000WSMOX0

Location	Parameter	Axis	ISO Code
		y	1?LUSP0000WSMOY0
		z	1?LUSP0000WSMOZ0
Shoulder join	Forces	x	1?SHLD??00WSFOX0
		y	1?SHLD??00WSFOY0
		z	1?SHLD??00WSFOZ0
Shoulder – rib	Compression corrected	ID	1?SHRI??00WSDS00
Thorax - Upper rib	Compression corrected	ID	1?TRRI??01WSDS00
Thorax - Mid rib	Compression corrected	ID	1?TRRI??02WSDS00
Thorax - Lower rib	Compression corrected	ID	1?TRRI??03WSDS00
Abdomen – Upper rib	Compression corrected	ID	1?ABRI??01WSDS00
Abdomen – Lower rib	Compression corrected	ID	1?ABRI??02WSDS00
Pelvis accelerometer	Global coordinates	x	1?PELV0000WSDCX0
		y	1?PELV0000WSDCY0
		z	1?PELV0000WSDCZ0
	Accelerations	x	1?PELV0000WSACX0
		y	1?PELV0000WSACY0
		z	1?PELV0000WSACZ0
	Velocities	x	1?PELV0000WSVEX0
		y	1?PELV0000WSVEY0
		z	1?PELV0000WSVEZ0
Pubic Symphysis Loadcell	Force	y	1?PUBC0000WSFOY0
B-Pillar (non-struck side)	Global coordinates	x	1?BPILLO0000DCX0
		y	1?BPILLO0000DCY0
		z	1?BPILLO0000DCZ0

Location	Parameter	Axis	ISO Code
	Global velocities	x	1?BPILLO0000VEX0
		y	1?BPILLO0000VEY0
		z	1?BPILLO0000VEZ0
	Accelerations	x	1?BPILLO0000ACX0
		y	1?BPILLO0000ACY0
		z	1?BPILLO0000ACZ0
Lap Belt (B6)	Force	1D	1?SEBE0003B6FO00
Shoulder Belt (B3)	Force	1D	1?SEBE0003B3FO00
Contact Dummy – Centre Console	Force	x	1?CEC00000WSFOX0
		y	1?CEC00000WSFOY0
		z	1?CEC00000WSFOZ0
Contact Dummy – Seat	Force	x	1?SEAT0000WSFOX0
		y	1?SEAT0000WSFOY0
		z	1?SEAT0000WSFOZ0
Contact Dummy – Seatbelt	Force	x	1?SEBE0000WSFOX0
		y	1?SEBE0000WSFOY0
		z	1?SEBE0000WSFOZ0
Contact Dummy – Airbag ¹¹	Force	x	1?ARBG0000WSFOX0
		y	1?ARBG0000WSFOY0
		z	1?ARBG0000WSFOZ0
Total Setup	Global Kinetic Energy	-	00EKINSU0000EN00
	Global Internal Energy	-	00EINTSU0000EN00
	Global Hourglass Energy	-	00EHOUSU0000EN00

Location	Parameter	Axis	ISO Code
	Global External Work	-	00EXWOSU0000EN00
	Added Mass (absolute)	-	00MINCSU00000000
	Total Energy	-	00ETOTSU0000EN00
Dummy	Kinetic Energy	-	1?EKINSU00WSEN00
	Internal Energy	-	1?EINTSU00WSEN00
	Hourglass Energy	-	1?EHOUSU00WSEN00
	Added Mass (absolute)	-	1?MINCSU00WSMA00
Driver Seat	Kinetic Energy	-	1AEKINSU0000EN00
	Internal Energy	-	1AEINTSU0000EN00
	Hourglass Energy	-	1AEHOUSU0000EN00
	Added Mass (absolute)	-	1AMINCSU0000MA00
Sled ⁷	Kinetic Energy	-	S0EKINSU0000EN00
	Internal Energy	-	S0EINTSU0000EN00
	Hourglass Energy	-	S0EHOUSU0000EN00
	Added Mass (absolute)	-	S0MINCSU0000MA00
Centre Console	Kinetic Energy	-	10EKINSU0001EN00
	Internal Energy	-	10EINTSU0001EN00
	Hourglass Energy	-	10EHOUSU0001EN00
	Added Mass (absolute)	-	10MINCSU0001MA00
Airbag ⁶	Kinetic Energy	-	10EKINSU0002EN00
	Internal Energy	-	10EINTSU0002EN00
	Hourglass Energy	-	10EHOUSU0002EN00
Total number of requested channels:		115	

¹¹ If present. Otherwise, these channels do not have to be shared

(TNCAP 條文草案)

表 9：所有虛擬測試所需頻道及對應之 ISO 代碼

<u>位置</u>	<u>參數</u>	<u>軸</u>	<u>ISO Code</u>
<u>頭部重心加速度計</u>	<u>全域座標</u>	<u>x</u>	<u>1?HEAD0000WSDCX0</u>
		<u>y</u>	<u>1?HEAD0000WSDCY0</u>
		<u>z</u>	<u>1?HEAD0000WSDCZ0</u>
	<u>角速度</u>	<u>x</u>	<u>1?HEAD0000WSAVX0</u>
		<u>y</u>	<u>1?HEAD0000WSAVY0</u>
		<u>z</u>	<u>1?HEAD0000WSAVZ0</u>
	<u>加速度</u>	<u>x</u>	<u>1?HEAD0000WSACX0</u>
		<u>y</u>	<u>1?HEAD0000WSACY0</u>
		<u>z</u>	<u>1?HEAD0000WSACZ0</u>
	<u>速度</u>	<u>x</u>	<u>1?HEAD0000WSVEX0</u>
		<u>y</u>	<u>1?HEAD0000WSVEY0</u>
		<u>z</u>	<u>1?HEAD0000WSVEZ0</u>
<u>上頸部荷重計</u>	<u>力</u>	<u>x</u>	<u>1?NECKUP00WSFOX0</u>
		<u>y</u>	<u>1?NECKUP00WSFOY0</u>
		<u>z</u>	<u>1?NECKUP00WSFOZ0</u>
	<u>力矩</u>	<u>x</u>	<u>1?NECKUP00WSMOX0</u>
		<u>y</u>	<u>1?NECKUP00WSMOY0</u>
		<u>z</u>	<u>1?NECKUP00WSMOZ0</u>
<u>下頸部荷重計</u>	<u>力</u>	<u>x</u>	<u>1?NECKLO00WSFOX0</u>
		<u>y</u>	<u>1?NECKLO00WSFOY0</u>
		<u>z</u>	<u>1?NECKLO00WSFOZ0</u>
	<u>力矩</u>	<u>x</u>	<u>1?NECKUP00WSMOX0</u>

<u>位置</u>	<u>參數</u>	<u>軸</u>	<u>ISO Code</u>
		<u>y</u>	<u>1?NECKUP00WSMOY0</u>
		<u>z</u>	<u>1?NECKUP00WSMOZ0</u>
<u>脊柱 - T4 加速度計</u>	<u>全域座標</u>	<u>x</u>	<u>1?THSP040000DCX0</u>
		<u>y</u>	<u>1?THSP040000DCY0</u>
		<u>z</u>	<u>1?THSP040000DCZ0</u>
	<u>加速度</u>	<u>x</u>	<u>1?THSP0400WSACX0</u>
		<u>y</u>	<u>1?THSP0400WSACY0</u>
		<u>z</u>	<u>1?THSP0400WSACZ0</u>
	<u>速度</u>	<u>x</u>	<u>1?THSP0400WSVEX0</u>
		<u>y</u>	<u>1?THSP0400WSVEY0</u>
		<u>z</u>	<u>1?THSP0400WSVEZ0</u>
<u>脊柱 - T12 加速度計</u>	<u>全域座標</u>	<u>x</u>	<u>1?THSP120000DCX0</u>
		<u>y</u>	<u>1?THSP120000DCY0</u>
		<u>z</u>	<u>1?THSP120000DCZ0</u>
	<u>加速度</u>	<u>x</u>	<u>1?THSP1200WSACX0</u>
		<u>y</u>	<u>1?THSP1200WSACY0</u>
		<u>z</u>	<u>1?THSP1200WSACZ0</u>
	<u>速度</u>	<u>x</u>	<u>1?THSP1200WSVEX0</u>
		<u>y</u>	<u>1?THSP1200WSVEY0</u>
		<u>z</u>	<u>1?THSP1200WSVEZ0</u>
<u>腰椎荷重計</u>	<u>力</u>	<u>x</u>	<u>1?LUSP0000WSFOX0</u>
		<u>y</u>	<u>1?LUSP0000WSFOY0</u>
		<u>z</u>	<u>1?LUSP0000WSFOZ0</u>
	<u>力矩</u>	<u>x</u>	<u>1?LUSP0000WSMOX0</u>

<u>位置</u>	<u>參數</u>	<u>軸</u>	<u>ISO Code</u>
		<u>y</u>	<u>1?LUSP0000WSMOY0</u>
		<u>z</u>	<u>1?LUSP0000WSMOZ0</u>
<u>肩部關節</u>	<u>力</u>	<u>x</u>	<u>1?SHLD??00WSFOX0</u>
		<u>y</u>	<u>1?SHLD??00WSFOY0</u>
		<u>z</u>	<u>1?SHLD??00WSFOZ0</u>
<u>肩部-肋骨</u>	<u>壓縮校正</u>	<u>ID</u>	<u>1?SHRI??00WSDS00</u>
<u>胸部-上肋骨</u>	<u>壓縮校正</u>	<u>ID</u>	<u>1?TRRI??01WSDS00</u>
<u>胸部-中肋骨</u>	<u>壓縮校正</u>	<u>ID</u>	<u>1?TRRI??02WSDS00</u>
<u>胸部-下肋骨</u>	<u>壓縮校正</u>	<u>ID</u>	<u>1?TRRI??03WSDS00</u>
<u>腹部-上肋骨</u>	<u>壓縮校正</u>	<u>ID</u>	<u>1?ABRI??01WSDS00</u>
<u>腹部-下肋骨</u>	<u>壓縮校正</u>	<u>ID</u>	<u>1?ABRI??02WSDS00</u>
<u>骨盆加速度計</u>	<u>全域座標</u>	<u>x</u>	<u>1?PELV0000WSDCX0</u>
		<u>y</u>	<u>1?PELV0000WSDCY0</u>
		<u>z</u>	<u>1?PELV0000WSDCZ0</u>
	<u>加速度</u>	<u>x</u>	<u>1?PELV0000WSACX0</u>
		<u>y</u>	<u>1?PELV0000WSACY0</u>
		<u>z</u>	<u>1?PELV0000WSACZ0</u>
	<u>速度</u>	<u>x</u>	<u>1?PELV0000WSVEX0</u>
		<u>y</u>	<u>1?PELV0000WSVEY0</u>
		<u>z</u>	<u>1?PELV0000WSVEZ0</u>
<u>恥骨聯合荷重計</u>	<u>力</u>	<u>y</u>	<u>1?PUBC0000WSFOY0</u>
<u>B柱 (非撞擊側)</u>	<u>全域座標</u>	<u>x</u>	<u>1?BPILLO0000DCX0</u>
		<u>y</u>	<u>1?BPILLO0000DCY0</u>
		<u>z</u>	<u>1?BPILLO0000DCZ0</u>

<u>位置</u>	<u>參數</u>	<u>軸</u>	<u>ISO Code</u>
	<u>全域速度</u>	<u>x</u>	<u>1?BPILLO0000VEX0</u>
		<u>y</u>	<u>1?BPILLO0000VEY0</u>
		<u>z</u>	<u>1?BPILLO0000VEZ0</u>
	<u>加速度</u>	<u>x</u>	<u>1?BPILLO0000ACX0</u>
		<u>y</u>	<u>1?BPILLO0000ACY0</u>
		<u>z</u>	<u>1?BPILLO0000ACZ0</u>
<u>腰部安全帶(B6)</u>	<u>力</u>	<u>1D</u>	<u>1?SEBE0003B6FO00</u>
<u>肩部安全帶(B3)</u>	<u>力</u>	<u>1D</u>	<u>1?SEBE0003B3FO00</u>
<u>人偶接觸 - 中控台</u>	<u>力</u>	<u>x</u>	<u>1?CEC00000WSFOX0</u>
		<u>y</u>	<u>1?CEC00000WSFOY0</u>
		<u>z</u>	<u>1?CEC00000WSFOZ0</u>
<u>人偶接觸 - 座椅</u>	<u>力</u>	<u>x</u>	<u>1?SEAT0000WSFOX0</u>
		<u>y</u>	<u>1?SEAT0000WSFOY0</u>
		<u>z</u>	<u>1?SEAT0000WSFOZ0</u>
<u>人偶接觸 - 安全帶</u>	<u>力</u>	<u>x</u>	<u>1?SEBE0000WSFOX0</u>
		<u>y</u>	<u>1?SEBE0000WSFOY0</u>
		<u>z</u>	<u>1?SEBE0000WSFOZ0</u>
<u>人偶接觸 - 空氣囊¹</u>	<u>力</u>	<u>x</u>	<u>1?ARBG0000WSFOX0</u>
		<u>y</u>	<u>1?ARBG0000WSFOY0</u>
		<u>z</u>	<u>1?ARBG0000WSFOZ0</u>
<u>總設置</u>	<u>全域動能</u>	<u>-</u>	<u>00EKINSU0000EN00</u>
	<u>全域內能</u>	<u>-</u>	<u>00EINTSU0000EN00</u>
	<u>全域沙漏能量</u>	<u>-</u>	<u>00EHOUSU0000EN00</u>
	<u>全域外部功</u>	<u>-</u>	<u>00EXWOSU0000EN00</u>

<u>位置</u>	<u>參數</u>	<u>軸</u>	<u>ISO Code</u>
	<u>新增質量（絕對值）</u>	-	<u>00MINCSU00000000</u>
	<u>總能量</u>	-	<u>00ETOTSU0000EN00</u>
<u>人偶</u>	<u>動能</u>	-	<u>1?EKINSU00WSEN00</u>
	<u>內能</u>	-	<u>1?EINTSU00WSEN00</u>
	<u>沙漏能量</u>	-	<u>1?EHOUSU00WSEN00</u>
	<u>新增質量（絕對值）</u>	-	<u>1?MINCSU00WSMA00</u>
<u>台車</u>	<u>動能</u>	-	<u>新增質量（絕對值）</u>
	<u>內能</u>	-	<u>S0EINTSU0000EN00</u>
	<u>沙漏能量</u>	-	<u>S0EHOUSU0000EN00</u>
	<u>新增質量（絕對值）</u>	-	<u>S0MINCSU0000MA00</u>
<u>中控台</u>	<u>動能</u>	-	<u>10EKINSU0001EN00</u>
	<u>內能</u>	-	<u>10EINTSU0001EN00</u>
	<u>沙漏能量</u>	-	<u>10EHOUSU0001EN00</u>
	<u>新增質量（絕對值）</u>	-	<u>10MINCSU0001MA00</u>
<u>空氣囊</u>	<u>動能</u>	-	<u>10EKINSU0002EN00</u>
<u>空氣囊</u>	<u>內能</u>	-	<u>10EINTSU0002EN00</u>
<u>空氣囊</u>	<u>沙漏能量</u>	-	<u>10EHOUSU0002EN00</u>
<u>頻道總數</u>		<u>115</u>	

備註：1.若有人偶接觸空氣囊，則需提供。否則，無需分享相關頻道。

(Euro NCAP原文)

Table 11: Placeholder definitions for left and right-hand drive vehicles for far side tests on driver's side.

	Left-hand drive vehicle	Right-hand drive vehicle
2 nd for dummy sensors e.g. 1?HEAD0000WSDCX0	1 e.g. 11HEAD0000WSDCX0	3 e.g. 13HEAD0000WSDCX0
7 th and 8 th digit e.g. 1?SHRI??00WSDS00	RI e.g. 11SHRIRI00WSDS00	LE e.g. 13SHRILE00WSDS00
2 nd digit for B-Pillar accelerometer e.g. 1?BPILLO0000ACX0	4 e.g. 14BPILLO0000ACX0	6 e.g. 16BPILLO0000ACX0

(TNCAP 條文草案)

表 10：左駕與右駕車輛於遠端側方碰撞試驗之佔位符定義

	<u>左駕車輛</u>	<u>右駕車輛</u>
<u>人偶感測器第 2 位數</u> <u>例如 1?HEAD0000WSDCX0</u>	<u>1</u> <u>例如 11HEAD0000WSDCX0</u>	<u>3</u> <u>例如 13HEAD0000WSDCX0</u>
<u>第 7 及第 8 位數字</u> <u>例如 1?SHRI??00WSDS00</u>	<u>RI</u> <u>例如 11SHRIRI00WSDS00</u>	<u>LE</u> <u>例如 13SHRILE00WSDS00</u>
<u>B 柱加速度計第 2 位數字</u> <u>例如 1?BPILLO0000ACX0</u>	<u>4</u> <u>例如 14BPILLO0000ACX0</u>	<u>6</u> <u>例如 16BPILLO0000ACX0</u>

(Euro NCAP原文)

Table 12: Content of .mme file.

Item	Header	Remarks
Data format edition number	: 1.6	
Laboratory name	: <lab name>	
Customer name	: TNCAP	
Customer test ref. number	: <test number>	Full file name (Reference-ExtensionRun)
Customer project ref. number	: <test series number>	4 digits number
Title	: Euro NCAP <year of test>	
Timestamp	: <date> <time>	
Type of the test	: Side Impact	see table in TB 021
Subtype of the test	: <subtype of the test>	See Table 3 & 4 e.g. Pole 75 degree
Virtual Testing reference ID:	: <Virtual Testing reference ID>	Identifier according to Table 3&4 e.g. FS_Pole_75_x-ref_zref_50M_Test_1
Euro NCAP Validation Test Reference Number	: <FS reference number provided by Euro NCAP>	Only included in hardware tests used for validation of virtual tests. Empty for simulations.
Regulation	: <test protocol version>	
Date of the test	: <date>	Date of hardware test or when simulation was executed
Name of test object 1 :	: <make and model>	
Ref. number of test object 1	: <VIN number>	
Velocity test object 1 lon.	: <VUT longitudinal velocity>	Desired (scenario) velocity

Item	Header	Remarks
Velocity test object 1 lat	: <VUT lateral velocity>	Desired (scenario) velocity
Mass test object 1	: <VUT mass>	
Driver position object 1	: <1/3>	LHD=1, RHD=3
Impact side test object 1	: <LE, RI>	LHD=RI, RHD=LE
Type of data source	: <type>	Simulation or Hardware
Additional mandatory lines for Virtual Tests:		
Dummy Simulation Model Specification	: <dummy simulation model type> <name> <version> (<supplier>)	e.g. WSID 50 M v3.4.1. (Humanetics)
Reference to Dummy Model Qualification Documentation	: <name of pdf>.pdf	Document name e.g. WSIDv3_2022-11-03.pdf
Solver Name	: <FE software name>	e.g. LS-Dyna
Solver Version	: <FE software solver version>	e.g. ls-dyna_mpp_s_R9_3_1_x64_ centos65_ifort131_sse2_openmpi183
Solver Precision	: <Solver precision>	SP or DP
Platform Name	: <name of platform on which simulations have been run>	e.g. centos78_openmpi2.1.3
Number of CPUs	:<cores x CPUs>	e.g. 2x32
Time step setting	<min. time step size in seconds>	e.g. min. time step 1-e7 s
Contact Type between dummy and seat	:<contact documentation>	S2S SOFT2 nu=0.2
Contact Type between dummy and seatbelt	:<contact documentation>	S2S SOFT2 nu=0
Number of contacts used in the overall simulation setup	: <total number of contacts>	e.g. 10

Item	Header	Remarks
Number of elements	: <total number of contacts>	e.g. 20000
Mass of total setup (used for quality checks)	: <total mass in kg>	Fill in in kg e.g. 1500
Mass of dummy in kg	: <total mass in kg>	Fill in in kg e.g. 75
Mass of seat in kg	: <total mass in kg>	Fill in in kg e.g. 50
Mass of sled in kg	: <total mass in kg>	Fill in in kg e.g. 500
Mass of centre console in kg	: <total mass in kg>	Fill in in kg e.g. 500
Distance between head CoG and green line	: <distance in meters>	Fill in in meters e.g. 0.2.
Distance between head CoG and yellow line	: <distance in meters>	Fill in in meters e.g. 0.3.
Distance between head CoG and orange line	: <distance in meters>	Fill in in meters e.g. 0.4.
Distance between head CoG and red line	: <distance in meters>	Fill in in meters e.g. 0.5.

(TNCAP 條文草案)

表 11：.mme 檔案內容。

<u>項目</u>	<u>標頭</u>	<u>備註</u>
<u>資料格式版本編號</u>	<u>: 1.6</u>	
<u>實驗室名稱</u>	<u>: <實驗室名稱></u>	
<u>客戶名稱</u>	<u>: TNCAP</u>	
<u>客戶試驗參考編號</u>	<u>: <試驗編號></u>	<u>完整檔案名稱（參考-附檔名-運行）</u>
<u>客戶專案參考編號</u>	<u>: <試驗系列編號></u>	<u>四位數編號</u>

<u>項目</u>	<u>標頭</u>	<u>備註</u>
<u>標題</u>	<u>: TNCAP <試驗年份></u>	
<u>時間戳記</u>	<u>: <日期> <時間></u>	
<u>試驗類型</u>	<u>: 側方撞擊</u>	詳見 Euro NCAP 技術通報 TB 021 表格
<u>試驗子類型</u>	<u>: <試驗子類型></u>	例如 75 度立柱撞擊試驗 (參見表 3 及表 4)
<u>虛擬測試參考編號</u>	<u>: <虛擬測試參考編號></u>	依照表 3 及表 4 之識別符, 例如 FS Pole 75 x-ref z-ref 50M Test 1
<u>TNCAP 驗證試驗參考編號</u>	<u>: <TNCAP 所提供之 FS 參考編號></u>	僅包含在用於驗證虛擬測試之實體試驗中。模擬檔案留空
<u>規定</u>	<u>: <試驗規章版本></u>	
<u>試驗日期</u>	<u>: <日期></u>	實體試驗或模擬執行的日期
<u>試驗對象 1 名稱</u>	<u>: <廠牌及車型></u>	
<u>試驗對象 1 參考編號</u>	<u>: <車身號碼 (VIN) ></u>	
<u>試驗對象 1 縱向速度</u>	<u>: <受驗車輛縱向速度></u>	預期 (情境) 速度
<u>試驗對象 1 橫向速度</u>	<u>: <受驗車輛橫向速度></u>	預期 (情境) 速度
<u>試驗對象 1 質量</u>	<u>: <受驗車輛質量></u>	
<u>試驗對象 1 駕駛位置</u>	<u>: <1/3></u>	左駕=1, 右駕=3
<u>試驗對象 1 撞擊側</u>	<u>: <LE, RI></u>	左駕=RI, 右駕=LE
<u>數據來源類型</u>	<u>: <類型></u>	模擬或實體試驗
<u>虛擬測試之額外強制性資訊:</u>		
<u>人偶模擬模型規格</u>	<u>: <人偶模擬模型類型></u>	例如, WSID 50 M v3.4.1. (Humanetics)
<u>人偶模型驗證參考文件</u>	<u>: <文件名稱>.pdf</u>	例如 WSID-v3_2022-11-03.pdf。

<u>項目</u>	<u>標頭</u>	<u>備註</u>
<u>求解器名稱</u>	<u>:<有限元素軟體名稱></u>	<u>例如 LS-Dyna。</u>
<u>求解器版本</u>	<u>:<有限元素軟體求解器版本></u>	<u>例如 ls-dyna_mpp_s_R9_3_1_x64_centos65_ifort131_sse2_openmpi183</u>
<u>求解器精度</u>	<u>:<求解器精度></u>	<u>單精度 (SP) 或雙精度 (DP)</u>
<u>平台名稱</u>	<u>:<模擬運行之平台名稱></u>	<u>例如 centos78_openmpi2.1.3</u>
<u>CPU 數量</u>	<u>:<核心數量 x CPU 數量></u>	<u>例如 2x32</u>
<u>時間步長設定</u>	<u><最小時間步長 (單位：秒) ></u>	<u>例如最小時間步長 1-e7 秒</u>
<u>人偶與座椅之間的接觸類型</u>	<u><接觸文件></u>	<u>S2S SOFT2 nu=0.2</u>
<u>人偶與安全帶之間的接觸類型</u>	<u><接觸文件></u>	<u>S2S SOFT2 nu=0.</u>
<u>模擬設置中使用的總接觸數量</u>	<u><總接觸數量></u>	<u>例如 10</u>
<u>元件數量</u>	<u><總元件數量></u>	<u>例如 20000</u>
<u>總設置質量 (用於質量檢查)</u>	<u><總質量 (單位：公斤) ></u>	<u>單位為公斤，例如 1500</u>
<u>人偶質量 (公斤)</u>	<u><總質量 (單位：公斤) ></u>	<u>單位為公斤，例如 75</u>
<u>座椅質量 (公斤)</u>	<u><總質量 (單位：公斤) ></u>	<u>單位為公斤，例如 50</u>
<u>台車質量 (公斤)</u>	<u><總質量 (單位：公斤) ></u>	<u>單位為公斤，例如 500</u>
<u>中控台質量 (公斤)</u>	<u><總質量 (單位：公斤) ></u>	<u>單位為公斤，例如 500</u>
<u>頭部重心與綠線之距離</u>	<u><距離 (單位：公尺) ></u>	<u>單位為公尺，例如 0.2</u>
<u>頭部重心與黃線之距離</u>	<u><距離 (單位：公尺) ></u>	<u>單位為公尺，例如 0.3</u>
<u>頭部重心與橘線之距離</u>	<u><距離 (單位：公尺) ></u>	<u>單位為公尺，例如 0.4</u>
<u>頭部重心與紅線之距離</u>	<u><距離 (單位：公尺) ></u>	<u>單位為公尺，例如 0.5</u>