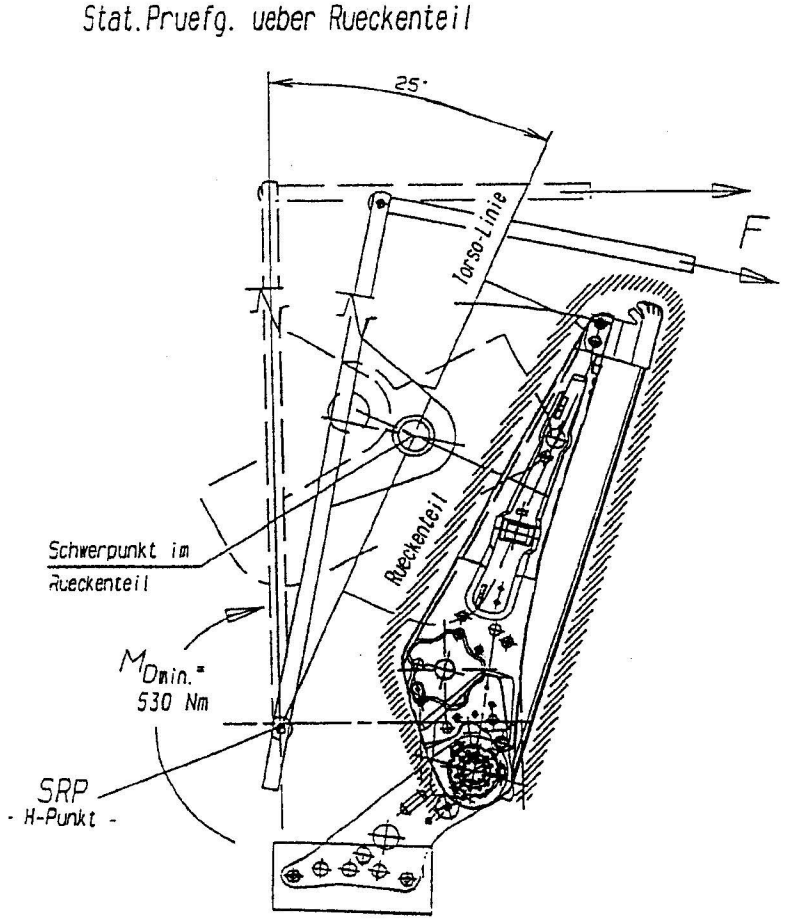
Mercedes-Benz Complete Seat System
Test Procedure

3. Static Stability Tests | **Version 2 Status 02/97**

Number **3.3.1**	Test piece **Driver's seat backrest assy**	Page No. 1 of 1 page

Test	**Torque around H point**	
Test structure	complete driver's seat backrest stationary-mounted (see sketch)	
Seat position	**Cushion**	**Backrest** 95% man
Load	Apply load to driver's seat backrest around H point with a torque of 530 Nm that is applied via the back of the standard dummy according to SAE J 826.	



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Only internal MB requirements which exceed the legal requirements are listed here (see Chapter 2).

Test conditions for safety parts manufactured from materials with climatically-dependent characteristics must be project-specifically coordinated with the responsible MB specialist department.

The nominal dynamic stability test values are oriented towards the results from tests on the complete vehicle.

A new test piece may be used for each test, unless this is expressly ruled out in the corresponding test procedure.

Mercedes-Benz Complete Seat System
Test Procedure

4. Dynamic Stybility Tests | Version 1 Status 02/96

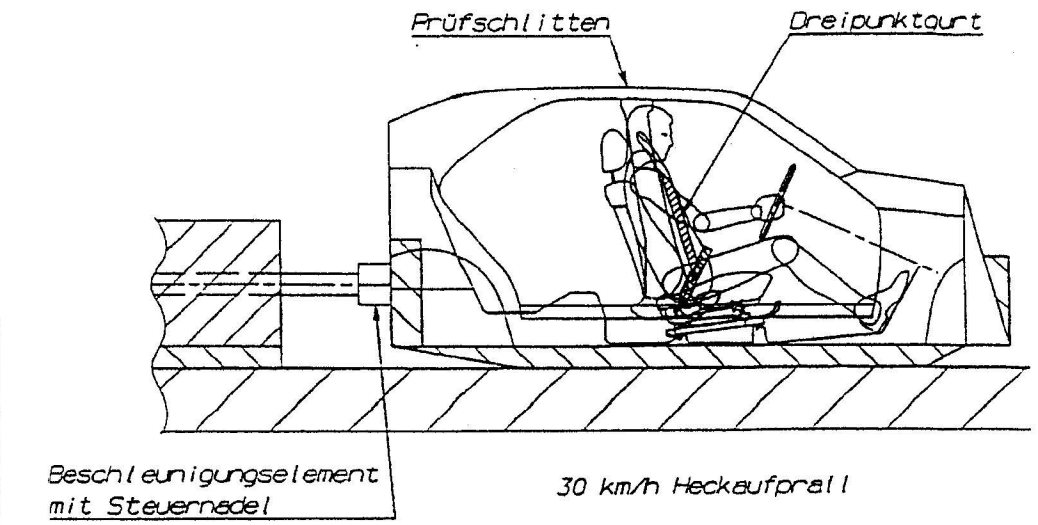
Number	4.2.1	Test piece	Complete seat, driver's and rear, electrically/manually-adjustable	Page No. 1 of 2 pages

Test	**MB rear impact**

Seat structure	Complete seat, upholstered	
Seat position	**Cushion** Most unfavorable position	**Backrest** Most unfavorable position between 5% woman and 95% man
Load	**Occupancy** Driver's seats: One Hybrid III 95 % dummy each (50 % dummy for all test positions ≤ 5 % woman position) Rear seats divided: 1/3 - section: 1 x Hybrid III 95 % dummy 2/3 - section: 2 x Hybrid III 50 % dummies Rear seats undivided: right: 1 x Hybrid III 95 % dummy center, left: 2 x Hybrid III 50 % dummies If the spatial conditions in the rear do not permit 1 x 95 %, 2 x 50 % dummy occupancy, one 50% dummy must be used for each seat. If the spatial conditions are even more restricted, a 5 % H III dummy is to be used on an outer seat, in front of the larger backrest section in the case of an **asymmetrically** divided backrest. At the very least, seats with belt integration must always be occupied with a 50 % dummy.	
Test procedure	Rear impact on accident simulation system 180°	
Acceleration	Type-specific value according to characteristic vehicle line according to the impact of a rigid impact carriage (1814 kg) with 100 % overlapping, adjusted to conditions in reinforced body of accident simulation system. (if not yet available, coordination with MB specialist department).	
Amplitude course	See above	
Restraint system	Type-specific belt system without force limitation, without airbag (in the case of belt height-adjustment, the return point must be adjusted to the size and position of the dummy)	

Number	4.2.1	Test piece	Complete seat, driver's and rear, electrically/manually-adjustable	Page No. 2 of 2 pages
Test	MB rear impact			

Sketch of the test structure



Permissible result

The seat must remain in the position which has been set.

In the case of backrest-integrated belt systems, the upper return point must remain in the map according to FMVSS 210 and ECE-R14 Appendix 3.

No parts of the seat system or their anchorage may fail or come loose.

No components may break apart, slight deformation and tears are permissible. In the event of deformation, no sharp edges or corners must occur.
The passengers must not slide out of the seats.

At most, the dummy may be inclined 20° to the rear (plastic deformation of backrest inclination).

Head acceleration must not exceed 70 g over 3 ms.

Comparison of existing Mercedes-Benz and Chrysler Corporation complete seat system test procedures

Mercedes-Benz	Chrysler Corporation
Static load tests	
Static front and rear seat and belt anchorage	
3.1.1 and 3.1.2 20g at c.g. of seat **ECE R-17 6.3.1** 13.6 KN on pelvic belt (3057lb) (**ECE R-14 6.4** requires) 13.6 KN on shoulder belt (3057lb) (13.5KN (3035lb)) <2 sec to max force Hold for 10 sec, then increase to failure	PF-8401 2.3.4 20g at c.g. of seat **FMVSS 207** 13.34 KN on pelvic belt (3000lb) **FMVSS 210** 13.34 KN on shoulder belt (3000lb)**FMVSS 210** <30 sec to max force Hold for 10 sec, then increase by 20% and hold for 10 sec, then increase to failure.
Rearward loading of seat back	
3.2.1 Complete frame asy 2250Nm about recliner pivot Max set 20º 3.3.1 Trimmed backframe asy 530Nm about H-point through SAE J826 backform **ECE R-17 6.2.1** Max set 10º	PF-8401 2.3.3 Complete frame asy 465Nm about H-point applied 279mm above H Max deflection 61mm at top of seat back Max set 15.2mm at top of seat back PF-8401 2.3.8 Complete frame asy 447.4Nm about H-point applied at top of back frame No structural failure
Forward loading of seat back	
3.2.1 Complete frame asy 1500 Nm about recliner pivot Max set 20º	PF-8401 2.3.7 24 x seat back mass applied through cg of seat back
Vertical loading of cushion frame	
	PF-8401 2.3.1 890N (200lb) at each occupant position Max deflection 4.1mm (0.16in)(60%), 2.03mm (0.08in)(40% & bkt) Max set 0.89mm (0.035in) (60%), 0.51mm (0.02in)(40% & bucket) 1.78KN (356lb) at each occupant position – No structural failure.
Torsional rigidity of cushion frame	
	PF-8401 2.3.2 Fixed at one track, 667N(150lb) load on opposite sid Max deflection 12.7mm (0.5in) Max set 4.8mm (0.19in)
Head restraint rearward strength	
3.2.3 1000N (225lb) – No structural failure Max deflection 102 mm (4.016in) **ECE R-17 5.11**	PF-8401 2.3.11 1068N (240lb) – No structural failure Max deflection 81.3 mm (3.2in)

Transverse loading	
3.3.2 3.2.2	
Mercedes-Benz	**Chrysler Corporation**
Load floor load	
3.3.3 Distributed load 2.5 KN (562lb) Corner load 1.5 KN (337lb)on 100mm (3.94in)diameter No failure or loss of function. Maximum deviation of operating forces and torques 15%.	PF-8401 2.3.6 Distributed load 5.27 KN / m ^{2} (110lb/ft^2) Concentrated load 1.11 KN (250lb) on 102mm (4in) diameter No failure or loss of function
Climatic loading	
3.3.4 250N (56.2ln) load on folded rear seat at various climatic conditions. No permanent deformation or marking allowed on covers.	
Armrest loading	
3.4.1 800N (180lb) vertical load applied as far fwd as possible up to 250mm (9.84in) max from pivot Max deflection 60mm (2.36in) Max set 10mm (0.39in) 3.4.2 400N (90lb)side load applied as far fwd as possible up to 250mm (9.84in) max from pivot Max deflection N/S Max set 4mm (0.16in)	PF-8401 2.3.5 667N (150lb)vertical load applied 25mm (1in) from front of armature Max deflection 50.8mm (2in) Max set 7.6mm (0.3in) Increase load to 1001N (225lb)with no loss of structural integrity or function 356N (80lb) side load applied 25mm (1in) from front c armature Max deflection 50.8mm (2in) Max set 7.6mm(0.3in) Increase load to 534N (120lb) with no loss of structural integrity or function
Armrest cupholder	
150N (33.7lb) vertical load on front of ext. cupholder Max deflection 5mm @ 100N (0.2in @ 22.5lb) No structural failure @ 150N (33.7lb)	
Seat back assist strap	
	PF-8401 2.3.9 1112N (250lb) at center of strap No structural failure
Removable riser latch test	
	PF-8401 2.3.10 Latch handle effort must stay between 44.5 &133.4N (10-30lb)before and after 200 operating cycles
Rear seat back load (anti – theft)	
3.5.1 1000N (225lb) applied perpendicular to seat back by an 80mm (3.15in)diameter press in a test fixture No break	

Mercedes-Benz	Chrysler Corporation
Dynamic load tests	
Frontal Impact	
4.1.1 50Km/h (31mph) HYGE sled. Occupant protection 4.1.2 50Km/h (31mph) HYGE sled. Load retention 4.1.5 Ski bag asy 4.1.6 Fire extinguisher 4.1.7 Under seat storage	
Frontal Impact	
	PF-8401 2.4.2 Front head restraint – rear occupant impact
Rear Impact	
4.2.1 30Kph (18.6 mph) HYGE sled. Occupant protection 4.2.3 Armrest asy 4.2.4 Ski bag asy	
Harmonic vibration	
	PF-8401 2.4.1
Folded rear seat back impact	
4.4.1 & 4.4.2 20Kg (44.1lb)Iron weight 150mm (5.9in) dia. dropped 200mm (7.87in) No break, splintering.	
Acceleration tests	
	PF-8401 2.4.3

Mercedes-Benz	Chrysler Corporation
Durability tests	
Power tracks	
5.1.1, 5.2.1 & 5.3.1 15,000 cycles. Alternating full travel, then 5% short of full. Motor cooling for 3 seconds after 2 cycles Abrasive dust applied for last 5,000 cycles 80Kg (176.4lb) load Voltage not specified.	PF-8492 12 All functions full travel with 0.5 sec min stall on motor 13.5V 57Kg (125lb) load 300 cycles + 15.5V 136Kg (300lb) load 2400 cycles + 11V 136Kg (300lb) load 2400 cycles + 11V 57Kg (125lb) load 2400 cycles + 13.5V 136Kg (300lb)load till failure or for 15,000 cycles
Manual tracks	
5.1.2, 5.2.2 & 5.3.2 10,000 cycles. Alternating full travel, then 5% short of full. Abrasive dust applied for last 2,500 cycles 80Kg (176.4lb)load	PF-9335 2.2.1 136Kg (300lb) load 5,000 cycles with latch/unlatch after each sequence
Rearward load fatigue	
5.5.1 Complete seat frame with tracks mounted on fixture. Cycle between 120 and 240Nm (88.5-177lbft) about recliner pivot applied 220 mm (8.66in) above pivot at 6Hz. 900,000 cycles	PF-8401 2.2.2 Complete seat frames with and without tracks - mounted on fixtures. Cycle 307Nm about H-point applied 279mm above H point at 0.5Hz. (250lb @ 11in above H-point) 10,000 cycles
Forward load fatigue	
5.5.1 Complete seat frame with tracks mounted on fixture. Cycle between 120 and 240Nm (88.5-177lbft) about recliner pivot applied 220 mm (8.66in) above pivot at 6Hz. 100,000 cycles	