

**REPORT NUMBER: 5FEM-MGA-2001-021**

**35 MPH FRONTAL BARRIER IMPACT TEST**

**DaimlerChrysler Corporation  
2001 Dodge Durango MPV  
NHTSA NUMBER: M10316**

**PREPARED BY:  
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5000 WARREN ROAD  
BURLINGTON, WI 53105**



**April 2, 2001**

**FINAL REPORT**

**PREPARED FOR:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
OFFICE OF CRASHWORTHINESS STANDARDS  
400 SEVENTH STREET, SW, ROOM 5311  
WASHINGTON, D.C. 20590**

35 MPH FRONTAL BARRIER IMPACT TEST

Vehicle: 2001 Dodge Durango MPV

NHTSA No.: M10316

Test Date: April 2, 2001

Test Speed: 56.2 kph

Vehicle Test Weight:

Weight as Delivered: = 2155.5 kg

Weight as Tested: = 2442.1 kg

Injury Criteria:

ATD Position	HIC	Clip (g's)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)
Driver	837	59	28	1790	2022
Passenger	325	44	20	2659	3685

**DATA SHEET NO. 8  
HYBRID III ATD INJURY CRITERIA AND SENSOR DATA**

Test Vehicle: 2001/Dodge/Durango/MPV  
Test Program: 35 mph Frontal Barrier Impact

NHTSA No.: M10316  
Test Date: April 2, 2001

**HEAD PRIMARY PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	12.0	130	72.9	60	0.4	23	60.3	70
Head CG	Y	G's	33.3	128	63.8	67	1.0	60	10.5	70
Head CG	Z	G's	31.2	73	25.4	122	29.5	58	19.2	121
Head CG Resultant	N/A	G's	88.3	64			61.0	70		

**CHEST PRIMARY PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	50.9	119	61.6	70	3.9	178	44.2	65
Chest CG	Y	G's	16.4	72	8.0	58	3.1	128	7.8	77
Chest CG	Z	G's	25.0	64	32.4	118	17.6	59	20.3	124
Chest CG Resultant	N/A	G's	65.2	70			45.0	65		

**FEMUR PEAK FORCES**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	931	57	1790	79	125	28	2659	60
Right Femur	Z	Newtons	432	78	2022	58	372	105	3685	53

**SEAT BELT SENSOR PEAK VALUES**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Lap Belt Force	N/A	Newtons	3287	62			3777	56		
Shoulder Belt Force	N/A	Newtons	5222	66			4275	59		

**HEAD INJURY CRITERIA (HIC<sub>15</sub>)**

Location	Driver				Passenger			
	HIC	Avg G's	T <sup>1</sup>	T <sup>2</sup>	HIC	Avg G's	T <sup>1</sup>	T <sup>2</sup>
Head CG Primary	837	79.2	57.8	72.8	325	54.3	63.3	78.3

**CHEST CLIP (3MSEC)**

Location	Driver			Passenger		
	CLIP	T <sup>1</sup>	T <sup>2</sup>	CLIP	T <sup>1</sup>	T <sup>2</sup>
Chest CG Primary	58.8	67.7	70.7	44.0	63.7	66.8

**NECK INJURY CRITERIA**

Location	Driver	Passenger
N <sub>te</sub>	1.2	1.2
N <sub>tf</sub>	0.1	0.2
N <sub>ce</sub>	0.6	0.3
N <sub>cf</sub>	0.3	0.2

**DATA SHEET NO. 8...(continued)**  
**HYBRID III ATD INJURY CRITERIA AND SENSOR DATA**

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**PELVIC PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	7.8	138	59.6	66	5.5	139	67.1	51
Pelvis	Y	G's	9.0	53	8.5	67	9.4	29	6.8	86
Pelvis	Z	G's	16.1	66	24.7	108	5.6	56	19.9	111

**UPPER NECK PEAK FORCES AND MOMENTS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	423	128	922	73	233	113	823	62
Neck Force	Y	Newtons	398	121	188	157	190	72	91	134
Neck Force	Z	Newtons	2834	72	1211	129	2292	64	574	126
Neck Moment	X	N•m	29.6	171	19.2	58	2.9	101	14.4	55
Neck Moment	Y	N•m	10.2	121	53.3	73	23.9	161	60.2	62
Neck Moment	Z	N•m	35.4	83	0.1	19	5.6*	65*	1.5*	45*

\*Data not valid after 99 msec.

**FOOT PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	282.1	59	75.3	69	165.4	48	79.7	99
Left Foot Aft	Z	G's	56.4	68	21.1	60	65.3	98	66.0	48
Left Foot Fore	Z	G's	47.4	72	55.5	61	92.3	49	84.5	100
Right Foot Aft	X	G's	335.1	52	52.5	64	180.4	56	73.3	96
Right Foot Aft	Z	G's	55.0	83	42.2	47	*	*	*	*
Right Foot Fore	Z	G's	156.7	62	222.1	52	120.4	52	158.8	97

\* No Valid Data Collected

**UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Lower Moment	X	N•m	38.4	82	32.9	63	27.9	50	35.4	101
Left Lower Moment	Y	N•m	38.0	68	104.7	59	49.2	97	157.9	49
Left Lower Force	Z	Newtons	4774	60	225	118	3092	98	95	31
Left Upper Moment	X	N•m	18.9	101	72.6	68	26.3	49	18.1	142
Left Upper Moment	Y	N•m	10.8	131	170.5	60	12.0	137	171.9	49
Left Upper Force	Z	Newtons	3245	60	321	54	1926	49	205	115
Right Lower Moment	X	N•m	22.2	89	23.9	75	38.7	55	48.5	98
Right Lower Moment	Y	N•m	112.0	66	95.9	47	58.1	95	274.6	55
Right Lower Force	Z	Newtons	2873	51	294	47	3485	95	90	121
Right Upper Moment	X	N•m	18.4	137	43.2	75	37.6	54	14.6	79
Right Upper Moment	Y	N•m	15.2	131	150.8	52	7.4	137	165.0	54
Right Upper Force	Z	Newtons	3421	52	140	129	2311	95	155	116

**DATA SHEET NO. 8...(continued)**  
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**CHEST PEAK DISPLACEMENTS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	mm			27.9	69			20.3	62

**HEAD REDUNDANT PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	17.9	130	72.4	61	0.6	200	57.9	70
Head CG	Y	G's	35.1	127	60.5	65	5.5	70	7.6	80
Head CG	Z	G's	33.0	72	26.4	123	30.3	58	20.4	119
Head CG Resultant	N/A	G's	87.6	64			58.7	70		

**CHEST REDUNDANT PEAK ACCELERATIONS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	51.7	119	60.8	70	3.6	194	43.6	64
Chest CG	Y	G's	15.9	71	8.2	58	3.8	127	6.9	77
Chest CG	Z	G's	24.9	63	32.3	118	16.1	59	19.9	123
Chest CG Resultant	N/A	G's	64.6	70			44.3	64		

**REDUNDANT HEAD INJURY CRITERIA (HIC)**

Location	Driver				Passenger			
	HIC	Avg G's	T <sup>1</sup>	T <sup>2</sup>	HIC	Avg G's	T <sup>1</sup>	T <sup>2</sup>
Head CG Redundant	775	76.8	57.7	72.7	315	53.5	63.3	78.3

**REDUNDANT CHEST CLIP (3MSEC)**

Location	Driver			Passenger		
	CLIP	T <sup>1</sup>	T <sup>2</sup>	CLIP	T <sup>1</sup>	T <sup>2</sup>
Chest CG Redundant	57.2	68.0	71.1	43.2	63.2	66.3

