

**Vehicle Research and Test Center
Eval of ATD THOR50M Shoulder Evaluation
THOR-50M**

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Summary Report

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**Prepared For
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SECTION 1
PURPOSE AND SUMMARY FOR THOR-50M

The purpose of the testing is: (1) Evaluate THOR Shoulder design in Frontal Impacts (2) Evaluate THOR Shoulder design in 20°Oblique Impacts.

SUMMARY

A THOR-50M (serial number 015) was secured in the right front occupant position (position 3 or P3). The THOR-50M was instrumented with head, spine (upper, middle and lower), and pelvis triaxial accelerometers, upper/lower neck, thoracic spine, ASIS, tibia and Femur force and moment load cells; acetabulum force load cells, knee displacement potentiometers and thorax and abdomen IRTRACC voltages. During this test series the dummy was restrained with a 3-point seatbelt and airbags.

Section 2 contains the driver's side 20° buck views of the dummy. Section 3 contains the driver's side 0° buck views of the dummy. Section 4 contains the dummy certification information.

SECTION 2
PASSENGER SIDE 20° BUCK TEST SUMMARY

TEST DUMMY INFORMATION

Description	Position # 3
ATD Type/Serial No.	THOR-50M/015
Restraint System	3-Point Seatbelt
Shoulder	Original (SD3) or Alternate (NHTSA)

CAMERA POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin	mm	0.00	0.00	0.00
N5 Passenger Shoulder	mm	-681.98	-1052.49	-534.81
Passenger Side	mm	338.78	728.47	-83.48
Passenger Oblique	mm	1069.44	734.30	-89.51
N1 Center	mm	-677.39	-721.72	-531.83

DUMMY POSITIONING

THOR50M 015 – Alternate (NHTSA) – 20° Degrees

TRC Test Number: S201013-1

VRTC Test Number: FRT_ALTSHLD_01



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	-0.053	-0.119	0.161
RHDCG	mm	-13.455	-338.619	-483.927
Right EAM	mm	-5.678	-343.121	-458.195
LHDCG	mm	-10.283	-492.666	-485.185
Left EAM	mm	-3.123	-488.586	-457.897
NS	mm	82.111	-415.049	-493.100
Right IOF	mm	79.257	-383.395	-456.188
Left IOF	mm	80.418	-446.938	-456.331
TN	mm	83.264	-415.035	-456.637
TC	mm	76.753	-414.991	-357.113
C1	mm	111.991	-415.461	-233.024
SHT1	mm	-27.811	-214.099	-255.999
SHT2	mm	56.474	-218.071	-232.527
E1	mm	137.408	-139.834	27.022
P1	mm	123.930	-140.816	139.402
H-Point	mm	199.367	-179.196	168.207
OK	mm	618.863	-238.827	87.929
IK	mm	625.070	-474.805	79.430
OA	mm	945.991	-241.304	351.868
IA	mm	942.862	-448.814	353.701
OH	mm	937.166	-291.784	489.036
IH	mm	921.204	-478.432	493.614
OP	mm	-211.805	-320.152	-337.210

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

HW	mm	761.096	-412.778	-493.725
Shoulder Belt Top	mm	103.902	-414.388	-251.769
Shoulder Belt Bottom	mm	145.687	-413.427	-180.044
Lap Belt Top	mm	261.452	-413.925	18.495
Lap Belt Bottom	mm	282.362	-413.821	62.093

DUMMY INJURY

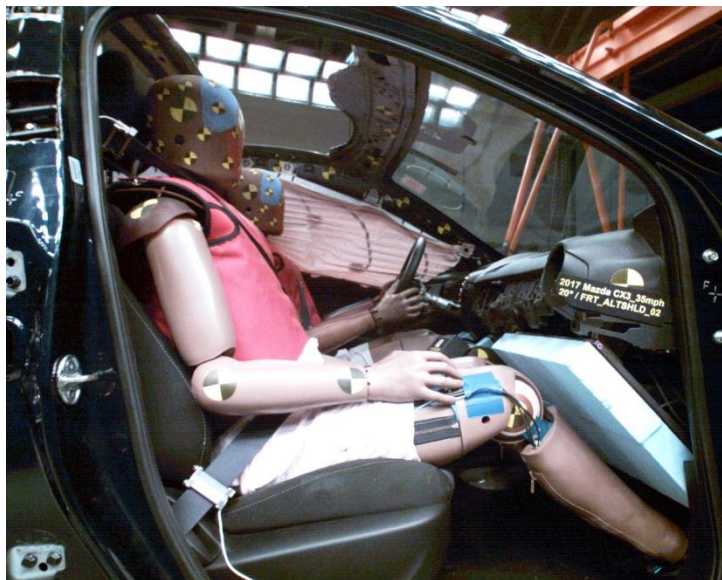
HIC (36 ms)	580
HIC (15 ms)	328
BriC	0.88
NIJ Max	0.49
Chest Deflection (mm)	36.8
Abdomen Deflection (mm)	44.7
Acetabulum Force (N)	3779.4
Femur Force (N)	-6747.3

DUMMY POSITIONING

THOR50M 015 – Alternate (NHTSA) – 20° Degrees

TRC Test Number: S201022-1

VRTC Test Number: FRT_ALTSHLD_02



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	-0.108	-0.121	0.159
RHDCG	mm	-10.399	-336.677	-486.248
Right EAM	mm	-3.347	-341.211	-460.274
LHDCG	mm	-7.478	-489.985	-488.015
Left EAM	mm	-1.668	-485.946	-460.970
NS	mm	84.378	-412.949	-495.382
Right IOF	mm	80.728	-381.539	-457.236
Left IOF	mm	81.822	-444.818	-458.154
TN	mm	85.209	-412.489	-457.692
TC	mm	77.128	-413.329	-358.542
C1	mm	112.725	-411.831	-238.624
SHT1	mm	-22.319	-208.541	-260.687
SHT2	mm	62.722	-215.611	-234.444
E1	mm	133.366	-133.481	26.299
P1	mm	125.096	-136.042	137.680
H-Point	mm	200.472	-174.294	168.046
OK	mm	616.312	-229.603	91.993
IK	mm	623.942	-468.847	88.065
OA	mm	946.015	-247.808	351.622
IA	mm	950.904	-449.501	353.387
OH	mm	938.987	-286.085	489.468
IH	mm	924.139	-484.150	491.375
OP	mm	-214.755	-316.111	-340.716

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

HW	mm	759.465	-411.944	-495.558
Shoulder Belt Top	mm	101.266	-413.474	-252.963
Shoulder Belt Bottom	mm	140.817	-413.220	-184.736
Lap Belt Top	mm	265.036	-413.447	21.238
Lap Belt Bottom	mm	285.411	-414.312	62.429

DUMMY INJURY

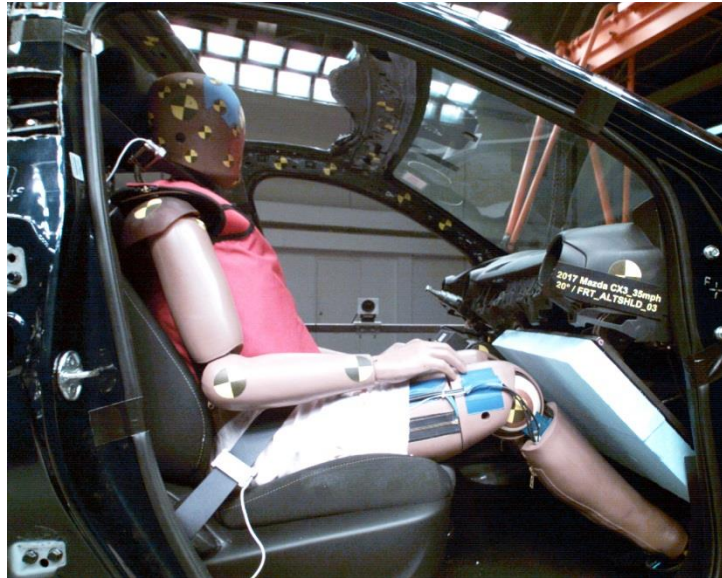
HIC (36 ms)	575
HIC (15 ms)	319
BriC	0.79
NIJ Max	0.48
Chest Deflection (mm)	36.4
Abdomen Deflection (mm)	44.2
Acetabulum Force (N)	3478.4
Femur Force (N)	-6902.9

DUMMY POSITIONING

THOR50M 015 – Alternate (NHTSA) – 20° Degrees

TRC Test Number: S201027-1

VRTC Test Number: FRT_ALTSHLD_03



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	-0.070	-0.091	0.209
RHDCG	mm	-10.494	-340.323	-482.302
Right EAM	mm	-3.571	-344.826	-456.040
LHDCG	mm	-9.345	-493.059	-483.626
Left EAM	mm	-3.729	-488.764	-456.094
NS	mm	83.900	-416.324	-490.563
Right IOF	mm	80.498	-384.663	-452.989
Left IOF	mm	80.614	-448.625	-453.432
TN	mm	84.890	-416.328	-453.891
TC	mm	76.083	-416.315	-354.522
C1	mm	115.594	-414.901	-228.269
SHT1	mm	-21.834	-212.612	-253.480
SHT2	mm	62.620	-221.249	-230.545
E1	mm	137.844	-137.796	31.015
P1	mm	121.452	-141.816	141.006
H-Point	mm	197.768	-179.809	169.683
OK	mm	616.271	-231.059	91.972
IK	mm	627.049	-467.929	85.003
OA	mm	942.895	-246.734	350.750
IA	mm	946.151	-456.954	355.516
OH	mm	935.190	-288.241	490.558
IH	mm	921.491	-483.036	494.262
OP	mm	-213.116	-319.146	-339.245

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

HW	mm	766.774	-415.455	-490.570
Shoulder Belt Top	mm	98.601	-414.523	-251.551
Shoulder Belt Bottom	mm	149.708	-415.180	-189.998
Lap Belt Top	mm	266.101	-414.549	23.732
Lap Belt Bottom	mm	284.199	-415.472	66.192

DUMMY INJURY

HIC (36 ms)	472
HIC (15 ms)	302
BriC	1.31
NIJ Max	0.49
Chest Deflection (mm)	42.2
Abdomen Deflection (mm)	41.8
Acetabulum Force (N)	5271.6
Femur Force (N)	-8288.1

DUMMY POSITIONING

THOR50M 015 – Original (SD3) – 20° Degrees

TRC Test Number: S201105-1

VRTC Test Number: FRT_ALTSHLD_04



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	-0.289	0.089	0.195
RHDCG	mm	-20.957	-342.505	-483.641
Right EAM	mm	-12.682	-347.165	-457.419
LHDCG	mm	-16.974	-495.967	-486.958
Left EAM	mm	-9.320	-491.877	-459.508
NS	mm	75.022	-417.246	-496.575
Right IOF	mm	72.371	-385.851	-458.620
Left IOF	mm	73.987	-449.614	-460.386
TN	mm	76.930	-417.487	-459.733
TC	mm	72.986	-418.872	-360.756
C1	mm	107.149	-419.423	-240.605
SHT1	mm	-24.650	-215.896	-252.000
SHT2	mm	58.129	-221.804	-230.235
E1	mm	141.677	-141.106	23.652
P1	mm	123.470	-144.818	138.443
H-Point	mm	199.210	-182.748	168.401
OK	mm	618.237	-234.845	85.144
IK	mm	627.024	-468.515	82.787
OA	mm	939.886	-235.603	357.273
IA	mm	944.234	-456.959	360.708
OH	mm	931.710	-283.591	496.987

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

IH	mm	930.193	-473.052	500.596
OP	mm	-221.726	-333.341	-337.977
HW	mm	759.585	-417.725	-496.240
Shoulder Belt Top	mm	100.593	-418.779	-251.345
Shoulder Belt Bottom	mm	144.600	-418.621	-183.792
Lap Belt Top	mm	265.763	-417.559	17.414
Lap Belt Bottom	mm	289.006	-417.678	57.199

DUMMY INJURY

HIC (36 ms)	608
HIC (15 ms)	320
BrlC	1.63
NIJ Max	0.63
Chest Deflection (mm)	44.5
Abdomen Deflection (mm)	42.4
Acetabulum Force (N)	4459.3
Femur Force (N)	-8288.1

DUMMY POSITIONING

THOR50M 015 – Original (SD3) – 20° Degrees

TRC Test Number: S201110-1

VRTC Test Number: FRT_ALTSHLD_05



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	-0.076	-0.475	0.691
RHDCG	mm	-17.738	-344.410	-484.005
Right EAM	mm	-9.201	-349.670	-457.971
LHDCG	mm	-14.247	-497.633	-488.767
Left EAM	mm	-8.316	-493.639	-461.413
NS	mm	77.523	-419.683	-497.366
Right IOF	mm	75.410	-388.691	-459.106
Left IOF	mm	76.628	-452.413	-461.332
TN	mm	80.195	-420.154	-461.048
TC	mm	75.572	-422.447	-361.620
C1	mm	111.782	-419.535	-240.072
SHT1	mm	-26.694	-215.824	-251.811
SHT2	mm	56.116	-218.873	-228.704
E1	mm	138.109	-143.504	25.589
P1	mm	123.271	-146.585	136.962
H-Point	mm	199.596	-183.943	165.587
OK	mm	618.004	-227.639	87.675
IK	mm	627.677	-476.758	80.542
OA	mm	934.801	-243.365	359.755
IA	mm	939.046	-462.911	367.416
OH	mm	930.373	-276.968	500.433

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

IH	mm	929.952	-480.427	502.937
OP	mm	-215.526	-336.515	-337.489
HW	mm	758.147	-415.434	-496.401
Shoulder Belt Top	mm	101.658	-418.757	-250.738
Shoulder Belt Bottom	mm	147.867	-418.311	-180.037
Lap Belt Top	mm	265.591	-418.898	16.735
Lap Belt Bottom	mm	285.926	-419.126	59.721

DUMMY INJURY

HIC (36 ms)	523
HIC (15 ms)	355
BrlC	1.17
NIJ Max	0.58
Chest Deflection (mm)	43.1
Abdomen Deflection (mm)	44.5
Acetabulum Force (N)	3518.1
Femur Force (N)	-6706.3

DUMMY POSITIONING

THOR50M 015 – Original (SD3) – 20° Degrees

TRC Test Number: S201117-1

VRTC Test Number: FRT_ALTSHLD_06



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	-0.345	0.150	0.195
RHDCG	mm	-21.266	-338.312	-488.739
Right EAM	mm	-12.902	-343.333	-462.921
LHDCG	mm	-20.572	-491.402	-492.358
Left EAM	mm	-13.678	-487.493	-465.449
NS	mm	73.272	-414.698	-501.976
Right IOF	mm	70.688	-383.550	-463.466
Left IOF	mm	71.141	-447.621	-465.073
TN	mm	74.671	-414.836	-465.055
TC	mm	70.455	-416.501	-365.882
C1	mm	103.995	-415.454	-245.746
SHT1	mm	-26.099	-207.212	-257.935
SHT2	mm	55.886	-212.143	-234.809
E1	mm	138.031	-138.222	20.611
P1	mm	129.092	-138.532	130.468
H-Point	mm	203.010	-178.929	160.637
OK	mm	617.208	-233.458	87.586
IK	mm	621.573	-469.761	87.693
OA	mm	933.452	-238.934	363.933
IA	mm	943.564	-450.908	358.052
OH	mm	929.337	-277.416	502.647

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

IH	mm	928.954	-475.839	497.766
OP	mm	-222.330	-334.425	-338.486
HW	mm	752.686	-414.831	-500.003
Shoulder Belt Top	mm	102.592	-415.788	-250.413
Shoulder Belt Bottom	mm	140.233	-415.034	-183.221
Lap Belt Top	mm	259.908	-415.685	17.666
Lap Belt Bottom	mm	280.804	-414.979	57.963

DUMMY INJURY

HIC (36 ms)	532
HIC (15 ms)	322
BrlC	1.24
NIJ Max	0.53
Chest Deflection (mm)	36.7
Abdomen Deflection (mm)	42.6
Acetabulum Force (N)	3896.1
Femur Force (N)	-7714.9

SECTION 3
PASSENGER SIDE 0° BUCK TEST SUMMARY

TEST DUMMY INFORMATION

Description	Position # 3
ATD Type/Serial No.	THOR-50M/015
Restraint System	3-Point Seatbelt
Shoulder	Original (SD3) or Alternate (NHTSA)

CAMERA POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin	mm	0.00	0.00	0.00
N5 Passenger Shoulder	mm	-681.98	-1052.49	-534.81
Passenger Side	mm	338.78	728.47	-83.48
Passenger Oblique	mm	1069.44	734.30	-89.51
N1 Center	mm	-677.39	-721.72	-531.83

DUMMY POSITIONING

THOR50M 015 – Original (SD3) – 0° Degrees

TRC Test Number: S201123-1

VRTC Test Number: FRT_ALTSHLD_07



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	-0.476	0.155	0.193
RHDCG	mm	-24.439	-347.836	-487.559
Right EAM	mm	-15.801	-352.473	-461.504
LHDCG	mm	-18.487	-500.581	-492.731
Left EAM	mm	-11.472	-496.719	-465.455
NS	mm	72.494	-420.214	-502.441
Right IOF	mm	69.441	-389.007	-464.192
Left IOF	mm	70.868	-453.056	-465.777
TN	mm	74.795	-421.122	-465.609
TC	mm	71.688	-422.623	-366.134
C1	mm	108.585	-421.633	-245.281
SHT1	mm	-20.116	-215.299	-254.867
SHT2	mm	63.386	-221.023	-230.147
E1	mm	142.523	-140.401	21.403
P1	mm	125.326	-151.307	132.396
H-Point	mm	201.829	-186.483	160.095
OK	mm	618.966	-233.611	86.859
IK	mm	628.720	-469.304	77.463
OA	mm	935.769	-239.799	362.008
IA	mm	941.387	-460.761	359.740
OH	mm	932.206	-285.888	501.529
IH	mm	927.417	-480.299	498.700
OP	mm	-223.084	-343.271	-338.386

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

HW	mm	747.226	-420.452	-501.781
Shoulder Belt Top	mm	101.047	-420.909	-256.094
Shoulder Belt Bottom	mm	142.777	-420.937	-185.570
Lap Belt Top	mm	265.593	-420.366	15.075
Lap Belt Bottom	mm	286.671	-420.391	54.932

DUMMY INJURY

HIC (36 ms)	757
HIC (15 ms)	449
BrlC	0.86
NIJ Max	0.47
Chest Deflection (mm)	48.3
Abdomen Deflection (mm)	41.3
Acetabulum Force (N)	3288.6
Femur Force (N)	-6065.9

DUMMY POSITIONING

THOR50M 015 – Original (SD3) – 0° Degrees

TRC Test Number: S201201-1

VRTC Test Number: FRT_ALTSHLD_08



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	0.010	0.135	0.012
RHDCG	mm	-20.281	-340.489	-488.912
Right EAM	mm	-11.775	-345.270	-462.563
LHDCG	mm	-22.492	-493.598	-490.903
Left EAM	mm	-16.262	-489.807	-463.612
NS	mm	73.201	-419.610	-499.236
Right IOF	mm	70.963	-388.047	-461.999
Left IOF	mm	69.256	-452.121	-462.836
TN	mm	74.117	-419.236	-462.764
TC	mm	67.955	-420.463	-363.275
C1	mm	102.796	-422.105	-240.342
SHT1	mm	-17.549	-207.308	-261.141
SHT2	mm	65.352	-215.172	-235.393
E1	mm	141.491	-139.493	20.250
P1	mm	127.472	-140.583	137.264
H-Point	mm	201.980	-181.154	165.475
OK	mm	614.109	-228.491	93.451
IK	mm	620.589	-468.599	90.345
OA	mm	933.659	-234.958	362.953
IA	mm	938.609	-463.801	362.378
OH	mm	931.508	-281.092	502.634
IH	mm	922.727	-481.522	502.666
OP	mm	-225.399	-343.375	-340.312

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

HW	mm	754.102	-420.808	-498.392
Shoulder Belt Top	mm	92.217	-420.658	-252.423
Shoulder Belt Bottom	mm	136.091	-421.524	-183.685
Lap Belt Top	mm	259.680	-420.340	20.231
Lap Belt Bottom	mm	282.586	-420.009	58.441

DUMMY INJURY

HIC (36 ms)	800
HIC (15 ms)	501
BriC	1.06
NIJ Max	0.51
Chest Deflection (mm)	44.0
Abdomen Deflection (mm)	38.4
Acetabulum Force (N)	3392.1
Femur Force (N)	-6916.1

DUMMY POSITIONING

THOR50M 015 – Original (SD3) – 0° Degrees

TRC Test Number: S201203-1

VRTC Test Number: FRT_ALTSHLD_09



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	-0.056	-0.238	0.370
RHDCG	mm	-26.207	-343.259	-484.044
Right EAM	mm	-17.816	-348.132	-458.306
LHDCG	mm	-25.541	-495.959	-485.758
Left EAM	mm	-17.936	-491.753	-458.636
NS	mm	68.165	-419.380	-496.747
Right IOF	mm	66.080	-387.698	-459.012
Left IOF	mm	66.536	-451.504	-459.559
TN	mm	70.124	-420.057	-460.511
TC	mm	66.748	-419.952	-361.035
C1	mm	102.111	-421.315	-235.452
SHT1	mm	-21.766	-206.842	-256.163
SHT2	mm	62.099	-213.589	-231.123
E1	mm	136.309	-142.805	27.605
P1	mm	126.014	-140.298	138.245
H-Point	mm	201.700	-180.234	164.837
OK	mm	615.804	-231.295	89.483
IK	mm	624.399	-465.703	85.380
OA	mm	931.260	-237.769	364.478
IA	mm	940.076	-461.871	360.204
OH	mm	934.150	-277.869	504.892
IH	mm	933.311	-480.571	500.156
OP	mm	-225.785	-341.518	-339.573

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

HW	mm	756.526	-419.063	-496.600
Shoulder Belt Top	mm	87.762	-419.429	-256.144
Shoulder Belt Bottom	mm	131.178	-420.282	-189.887
Lap Belt Top	mm	259.547	-418.829	21.497
Lap Belt Bottom	mm	280.341	-419.698	62.100

DUMMY INJURY

HIC (36 ms)	732
HIC (15 ms)	493
BriC	1.09
NIJ Max	0.49
Chest Deflection (mm)	43.1
Abdomen Deflection (mm)	41.3
Acetabulum Force (N)	3219.5
Femur Force (N)	-6270.0

DUMMY POSITIONING

THOR50M 015 – Alternate (NHTSA) – 0° Degrees

TRC Test Number: S201208-1

VRTC Test Number: FRT_ALTSHLD_10



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	0.047	0.011	0.146
RHDCG	mm	-25.255	-348.236	-483.573
Right EAM	mm	-17.421	-352.468	-457.381
LHDCG	mm	-23.952	-500.791	-483.723
Left EAM	mm	-16.583	-496.973	-457.325
NS	mm	70.211	-422.761	-494.141
Right IOF	mm	67.391	-391.139	-457.034
Left IOF	mm	68.590	-454.509	-457.160
TN	mm	71.890	-422.179	-457.331
TC	mm	66.964	-422.531	-358.656
C1	mm	101.366	-421.727	-237.340
SHT1	mm	-26.095	-216.351	-253.259
SHT2	mm	56.933	-221.967	-232.746
E1	mm	145.317	-138.255	23.424
P1	mm	117.014	-148.499	141.577
H-Point	mm	195.248	-183.734	165.948
OK	mm	618.272	-233.543	93.269
IK	mm	630.718	-461.275	87.629
OA	mm	939.703	-230.842	365.716
IA	mm	943.749	-450.287	368.402
OH	mm	931.401	-276.873	505.269
IH	mm	922.973	-468.265	505.396
OP	mm	-224.847	-339.184	-339.639

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

HW	mm	763.783	-422.527	-493.653
Shoulder Belt Top	mm	91.363	-420.869	-250.378
Shoulder Belt Bottom	mm	133.336	-421.015	-184.799
Lap Belt Top	mm	260.246	-420.263	16.412
Lap Belt Bottom	mm	281.589	-421.013	59.053

DUMMY INJURY

HIC (36 ms)	744
HIC (15 ms)	512
BriC	0.94
NIJ Max	0.51
Chest Deflection (mm)	38.5
Abdomen Deflection (mm)	39.0
Acetabulum Force (N)	3033.2
Femur Force (N)	-5857.1

DUMMY POSITIONING

THOR50M 015 – Alternate (NHTSA) – 0° Degrees

TRC Test Number: S201209-1

VRTC Test Number: FRT_ALTSHLD_11



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	0.259	0.430	-0.430
RHDCG	mm	-25.773	-344.040	-482.748
Right EAM	mm	-17.202	-348.739	-456.620
LHDCG	mm	-24.143	-496.734	-485.065
Left EAM	mm	-17.056	-492.546	-458.059
NS	mm	68.741	-420.310	-494.779
Right IOF	mm	66.414	-388.285	-456.236
Left IOF	mm	66.904	-453.099	-457.725
TN	mm	70.445	-421.056	-457.606
TC	mm	65.370	-421.448	-357.912
C1	mm	96.111	-420.851	-239.928
SHT1	mm	-25.076	-213.863	-254.596
SHT2	mm	59.053	-223.670	-233.385
E1	mm	143.381	-143.446	24.734
P1	mm	120.218	-142.833	135.916
H-Point	mm	198.444	-177.534	160.540
OK	mm	620.430	-228.734	90.414
IK	mm	633.810	-461.171	84.352
OA	mm	936.145	-235.050	365.378
IA	mm	947.691	-462.180	364.864
OH	mm	939.378	-283.689	504.197
IH	mm	929.219	-481.627	501.447
OP	mm	-225.262	-342.841	-341.635

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

HW	mm	766.643	-420.389	-492.789
Shoulder Belt Top	mm	88.658	-421.241	-251.651
Shoulder Belt Bottom	mm	133.178	-420.885	-188.032
Lap Belt Top	mm	266.130	-419.918	18.252
Lap Belt Bottom	mm	285.794	-420.092	59.402

DUMMY INJURY

HIC (36 ms)	631
HIC (15 ms)	417
BriC	0.90
NIJ Max	0.51
Chest Deflection (mm)	37.1
Abdomen Deflection (mm)	37.4
Acetabulum Force (N)	3047.2
Femur Force (N)	-6011.1

DUMMY POSITIONING

THOR50M 015 – Alternate (NHTSA) – 0° Degrees

TRC Test Number: S201210-1

VRTC Test Number: FRT_ALTSHLD_12



DUMMY POSITIONING FARO MEASUREMENTS

Description	Units	X	Y	Z
Origin-post	mm	-0.070	0.212	0.010
RHDCG	mm	-25.687	-342.113	-482.035
Right EAM	mm	-17.682	-346.857	-455.523
LHDCG	mm	-20.654	-495.131	-483.910
Left EAM	mm	-14.342	-491.066	-457.011
NS	mm	70.302	-416.382	-494.674
Right IOF	mm	67.470	-384.942	-456.390
Left IOF	mm	69.178	-449.143	-457.732
TN	mm	72.119	-415.691	-457.133
TC	mm	67.867	-418.369	-358.491
C1	mm	99.844	-416.307	-241.300
SHT1	mm	-27.787	-212.231	-251.123
SHT2	mm	56.728	-217.121	-228.637
E1	mm	145.510	-138.321	26.673
P1	mm	116.467	-143.175	138.078
H-Point	mm	194.844	-177.522	164.064
OK	mm	619.547	-230.565	90.282
IK	mm	633.596	-462.754	87.544
OA	mm	940.627	-230.978	364.900
IA	mm	948.427	-462.113	366.421
OH	mm	928.548	-277.480	505.486
IH	mm	938.731	-477.319	501.854
OP	mm	-223.961	-339.592	-337.640

DUMMY POSITIONING FARO MEASUREMENTS, CONTINUED

HW	mm	764.142	-416.958	-492.616
Shoulder Belt Top	mm	89.108	-418.904	-252.937
Shoulder Belt Bottom	mm	134.642	-417.912	-187.625
Lap Belt Top	mm	264.069	-417.245	16.865
Lap Belt Bottom	mm	284.917	-417.418	56.777

DUMMY INJURY

HIC (36 ms)	790
HIC (15 ms)	481
BriC	0.88
NIJ Max	0.50
Chest Deflection (mm)	42.2
Abdomen Deflection (mm)	42.0
Acetabulum Force (N)	3069.8
Femur Force (N)	-5559.7

SECTION 4

DUMMY CALIBRATION DATA