**Summary of Deflections from Fully Assembled
EC Structure Finite Element Model**

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Introduction

The purpose of this note is to summarize the deflections in the fully assembled EC OH and MH module arrays as calculated by a superelement finite element model. These results are for the case where the OH modules are fully connected at four locations on the inner radius and four locations on the outer radius. Both the OH and MH modules are modeled as skins and endplates (and in the case of OH, internal structural plates) only. The OH module has a skin thickness of 1/16 th in.

Fig. 1 shows the fully assembled model and the coordinate system used to express deflections. The deflections at the inner and outer radius at both the front (nearest the collision center) and the back of the module assemblies are given in Tables I-IV. A summary of the deflections is given in Figs. 2-4.

Table I. Deflections at Front of OH Assembly

Theta	Inner Radius			Outer Radius		
	UX	UY	UZ	UX	UY	UZ
0.0	0.0	-.029	.007	0.0	-.019	-.007
22.5	-.002	-.026	.007	-.003	-.015	-.007
45.0	<.001	-.018	.007	-.002	-.003	-.004
67.5	-.007	-.012	.015	.007	.003	.005
90.0	.007	-.011	.039	.005	.001	.042
112.5	.006	-.010	.050	.007	-.002	.064
135	.006	-.010	.070	.012	-.007	.064
157.5	-.001	-.021	.086	.001	-.022	.083
180.0	0.0	-.024	.083	0.0	-.021	.089

Table II. Deflections at Back of OH Arch

Theta	Inner Radius			Outer Radius		
	UX	UY	UZ	UX	UY	UZ
0.0	0.0	-.063	.011	0.0	-.047	-.011
22.5	-.006	-.060	.012	-.005	-.041	-.011
45.0	-.006	-.050	.016	-.005	-.027	-.007
67.5	-.002	-.041	.025	-.004	-.040	-.007
90.0	.008	-.036	.040	.007	-.024	.041
112.5	.008	-.034	.056	.008	-.026	.061
135	.005	-.031	.072	.010	-.029	.068
157.5	<.001	-.039	.085	.002	-.040	.083
180.0	0.0	-.041	.084	0.0	-.037	.090

Table III. Deflections at Front of MH Assembly

Theta	Inner Radius			Outer Radius		
	UX	UY	UZ	UX	UY	UZ
0.0	0.0	-.032	.003	0.0	-.032	-.040
11.25	.002	-.031	0.0	.003	-.032	-.030
33.75	.006	-.033	<.001	.007	-.035	-.017
56.25	.007	-.037	.005	.010	-.038	-.006
78.75	.005	-.039	.012	.004	-.044	.009
101.25	.002	-.042	.021	.001	-.045	.024
123.75	<.001	-.045	.028	<.001	-.045	.039
146.25	<.001	-.048	.034	.001	-.047	.050
168.75	<.001	-.049	.038	<.001	-.048	.056
180.00	0.0	-.049	.038	0.0	-.049	.056

Table IV. Deflections at Back of MH Assembly

Theta	Inner Radius			Outer Radius		
	UX	UY	UZ	UX	UY	UZ
0.0	0.0	-.07	-.005	0.0	-.070	.034
11.25	.002	-.066	-.006	.003	-.070	-.020
33.75	.006	-.069	-.003	.008	-.070	-.014
56.25	.006	-.074	.004	.010	-.074	-.003
78.75	.005	-.076	.012	.004	-.080	.009
101.25	.002	-.079	.020	.001	-.081	.024
123.75	.006	-.082	.030	<.001	-.081	.037
146.25	<.001	-.084	.036	.001	-.083	.047
168.75	<.001	-.085	.039	<.001	-.084	.053
180.00	0.0	-.085	.040	0.0	-.085	.054

ANSYS 4.2B
JUL 17 1987
7:57:00
PLOT NO. 1
POST1 ELEMENTS

ORIG SCALING
ZV=1
DIST=97.9
XF=-44.5
ZF=-36.1

Fig 1. Back View of Module
Assembly
(looking toward collision
center)

ANSYS 4.2B
JUL 17 1987
7:57:31
PLOT NO. 2
POST1 DISPL.
STEP=1
ITER=10

ORIG SCALING
ZV=1
DIST=97.9
XF=-44.5
ZF=-36.1
SECTION
DMAX=
DSCA=116

Fig2. Deflections of Assembly

1 FULL ASSEMBLY, 1/16 TH SKIN OH, FULLY CONNECTED

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ANSYS)2B
 JUL 17 1987
 8:01:33
 PLOT NO. 6
 POST1 DISPL.
 STEP=1
 ITER=10

ORIG SCALING
 ZV=1
 DIST=97.9
 XF=-44.5
 ZF=-36.1
 HIDDEN
 DMAX= . . .
 DSCA=155

Fig 3. OH Back View

1 OH DEFLECTION

ANSYS 4.2B
JUL 17 1987
7:58:45
PLOT NO. 3
POST1 DISPL.
STEP=1
ITER=10

ORIG SCALING
XV=1
DIST=97.9
XF=-44.5
ZF=-36.1
HIDDEN
DMAX=
DSCA=155

Fig.4.
Side View of OH

1 MH DEFLECTION

ANSYS 2B
JUL 17 1987
8:00:42
PLOT NO. 5
POST1 DISPL.
STEP=1
ITER=10

ORIG SCALING
ZV=1
DIST=68.2
XF=-30.4
ZF=-28.9
HIDDEN
DMAX= 0.845
DSCA=80.8

Fig.5 MH Back View