AE3212-II SVV Structures Assignment Aircraft Allocation & Data

This document is part of the SVV Structures assignment 2021. It contains the allocation of aircraft type to each project group. More importantly, it contains the required data for the aircraft types that are considered in the AE3212-II SVV structures assignment. The values provided in this document correspond to the variables which are illustrated in figures 1 to 5 of the structures assignment document.

Group Aircraft Allocation

Each project group is allocated one of four aircraft types:

- Airbus A320
- Bombardier CRJ700
- Dornier Do 228
- Fokker 100

The allocation of aircraft type to each group is given in table 1. Groups must use the aircraft type allocated to them for the SVV structures assignment.

Table 1: group aircraft allocation

Group	Aircraft	Group	Aircraft	Group	Aircraft	Group	Aircraft
A01	A320	A18	CRJ700	A35	Do 228	A52	F100
A02	CRJ700	A19	Do 228	A36	F100	A53	A320
A03	Do 228	A20	F100	A37	A320	A54	CRJ700
A04	F100	A21	A320	A38	CRJ700	A55	Do 228
A05	A320	A22	CRJ700	A39	Do 228	A56	F100
A06	CRJ700	A23	Do 228	A40	F100	A57	A320
A07	Do 228	A24	F100	A41	A320	A58	CRJ700
A08	F100	A25	A320	A42	CRJ700	A59	Do 228
A09	A320	A26	CRJ700	A43	Do 228	A60	F100
A10	CRJ700	A27	Do 228	A44	F100	A61	A320
A11	Do 228	A28	F100	A45	A320	A62	CRJ700
A12	F100	A29	A320	A46	CRJ700	A63	Do 228
A13	A320	A30	CRJ700	A47	Do 228	A64	F100
A14	CRJ700	A31	Do 228	A48	F100	A65	A320
A15	Do 228	A32	F100	A49	A320	A66	CRJ700
A16	F100	A33	A320	A50	CRJ700	A67	Do 228
A17	A320	A34	CRJ700	A51	Do 228	A68	F100

Airbus A320

Data Airbus A320 (Please refer to the drawings)

Property	Symbol	Value	Unit
Chord length aileron	C_a	0.547	m
Span of the aileron	l_a	2.771	m
x-location of hinge 1	x_1	0.153	m
x-location of hinge 2	x_2	1.281	m
x-location of hinge 3	x_3	2.681	m
Distance between actuator 1 and 2	x_a	28.0	cm
Aileron height	h	22.5	cm
Skin thickness	t_{sk}	1.1	mm
Spar thickness	t_{sp}	2.9	mm
Thickness of stiffener	t_{st}	1.2	mm
Height of stiffener	h_{st}	1.5	cm
Width of stiffener	w_{st}	2.0	cm
Number of stiffeners (equally spaced along the periphery of the cross-section)	n_{st}	17	-
Vertical displacement hinge 1	d_1	1.103	cm
Vertical displacement hinge 3	d_3	1.642	cm
Maximum upward deflection	θ	26	deg
Load in actuator 2	P	91.7	kN

Boeing 737

Data Boeing 737 (Refer to the drawings)

Property	Symbol	Value	Unit
Chord length aileron	C_a	0.605	m
Span of the aileron	l_a	2.661	m
x-location of hinge 1	x_1	0.172	m
x-location of hinge 2	x_2	1.211	m
x-location of hinge 3	x_3	2.591	m
Distance between actuator 1 and 2	x_a	35.0	cm
Aileron height	h	20.5	cm
Skin thickness	t_{sk}	1.1	mm
Spar thickness	t_{sp}	2.8	mm
Thickness of stiffener	t_{st}	1.2	mm
Height of stiffener	h_{st}	1.6	cm
Width of stiffener	w_{st}	1.9	cm
Number of stiffeners (equally spaced along the periphery of the cross-section)	n_{st}	15	-
Vertical displacement hinge 1	d_1	1.154	cm
Vertical displacement hinge 3	d_3	1.840	cm
Maximum upward deflection	θ	28	deg
Load in actuator 2	P	97.4	kN

Bombardier CRJ 700

Data Bombardier CRJ700 (Refer to the drawings)

Property	Symbol	Value	Unit
Chord length aileron	C_a	0.484	m
Span of the aileron	l_a	1.691	m
x-location of hinge 1	x_1	0.149	m
x-location of hinge 2	x_2	0.554	m
x-location of hinge 3	x_3	1.541	m
Distance between actuator 1 and 2	x_a	27.2	cm
Aileron height	h	17.3	cm
Skin thickness	t_{sk}	1.1	mm
Spar thickness	t_{sp}	2.5	mm
Thickness of stiffener	t_{st}	1.2	mm
Height of stiffener	h_{st}	1.4	cm
Width of stiffener	w_{st}	1.8	cm
Number of stiffeners (equally spaced along the periphery of the cross-section)	n_{st}	13	-
Vertical displacement hinge 1	d_1	0.681	cm
Vertical displacement hinge 3	d_3	2.030	cm
Maximum upward deflection	θ	26	deg
Load in actuator 2	P	37.9	kN

Dornier Do 228

Data Dornier Do 228 (Refer to the drawings)

Property	Symbol	Value	Unit
Chord length aileron	C_a	0.515	m
Span of the aileron	l_a	2.691	m
x-location of hinge 1	x_1	0.174	m
x-location of hinge 2	x_2	1.051	m
x-location of hinge 3	x_3	2.512	m
Distance between actuator 1 and 2	x_a	30.0	cm
Aileron height	h	24.8	cm
Skin thickness	t_{sk}	1.1	mm
Spar thickness	t_{sp}	2.2	mm
Thickness of stiffener	t_{st}	1.2	mm
Height of stiffener	h_{st}	1.5	cm
Width of stiffener	w_{st}	3.0	cm
Number of stiffeners (equally spaced along the periphery of the cross-section)	n_{st}	11	-
Vertical displacement hinge 1	d_1	1.034	cm
Vertical displacement hinge 3	d_3	2.066	cm
Maximum upward deflection	θ	25	deg
Load in actuator 2	P	20.6	kN

Fokker 100

Data Fokker 100 (Refer to the drawings)

Property	Symbol	Value	Unit
Chord length aileron	C_a	0.505	m
Span of the aileron	l_a	1.611	m
x-location of hinge 1	x_1	0.125	m
x-location of hinge 2	x_2	0.498	m
x-location of hinge 3	x_3	1.494	m
Distance between actuator 1 and 2	x_a	24.5	cm
Aileron height	h	16.1	cm
Skin thickness	t_{sk}	1.1	mm
Spar thickness	t_{sp}	2.4	mm
Thickness of stiffener	t_{st}	1.2	mm
Height of stiffener	h_{st}	1.3	cm
Width of stiffener	w_{st}	1.7	cm
Number of stiffeners (equally spaced along the periphery of the cross-section)	n_{st}	11	-
Vertical displacement hinge 1	d_1	0.389	cm
Vertical displacement hinge 3	d_3	1.245	cm
Maximum upward deflection	θ	30	deg
Load in actuator 2	P	49.2	kN