



STATICAL TEST REPORT No. 1020

Element	Storch HS Jabiru fuselage
Purpose	fuselage strength
According to	LTF UL 331
Date:	15/12/03
Supervisor	Aldo Cattano
Executor	M. Stafuzza, G. Stafuzza, D. delle Vedove, S. Franceschini
Witness	Mr. Brian Franken

As per LTF UL 331 fuselage is sustained on wing under 4 g and as per LTF UL 303 this factor has to be multiplied by 1.5 :

Load applied on engine mount= $66 \times 4 \text{ g} \times \text{S.F.} = 66 \times 4 \times 1.5 = 396 \text{ kg}$

The calculation of gust load factor is performed as follows (LTF UL 341):

$N = 1 + \frac{0.5 \cdot k \cdot \rho_0 \cdot U \cdot V \cdot a}{m \cdot g / S}$ where:

a = lift rise of the wing in the radian measure = 4.41

g = ground acceleration in $\text{m/s}^2 = 9.81$;

S = wing area in $\text{m}^2 = 41.1$;

l_m = middle wing chord in $\text{m} = 1.34$;

ρ_0 = air density at sea level = 1.225 kg/m^3 ;

m = airplane weight in $\text{kg} = 472.5$;

k = corrective factor = $0.88 \cdot m_i / (5.3 + m_i) = 0.6$ where $m_i = (2m/S) / (\rho_0 \cdot l_m \cdot a) = 11.35$ is the relative airplane-weight density;

For the following values of gust speed (U) and airspeed (V):

$V_c = 44.44 \text{ m/s}$, $V_d = 57.5 \text{ m/s}$;

$U_c = 15 \text{ m/s}$; $U_d = 7.5 \text{ m/s}$;

We obtain the values of gust load factor in the table:

positive n_c	3,679469
negative n_c	-1,67947
positive n_d	2,733282
negative n_d	-0,73328

Since the values of positive n_c and positive n_d are not larger than $n_2 = 4$ we use $n = 4$ as g load factor as in LTF UL 337

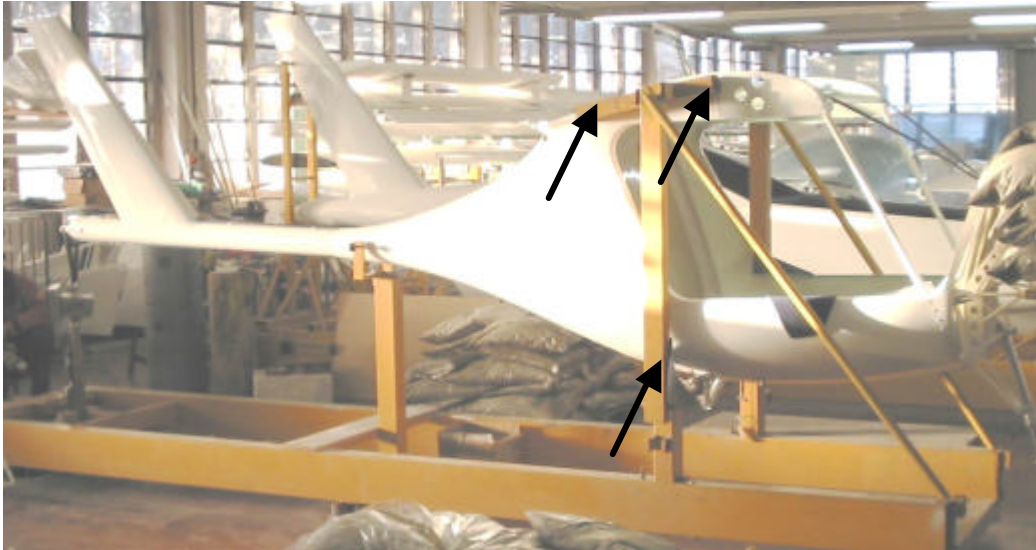
Load applied on pilots seats = Max. Pilots weight is: 170 kg (as shown in LTF UL23) $\times 4 \times 1.5 = 1020 \text{ kg}$

Stabilator load:

$L_{hk} = L_{max} * 1.5 = \max(L_a, L_d) * 1.5 = 145 * 1.5 = 217.5 \text{kg}$. where L_a and L_d are the maneuver speed and dive speed respectively. as shown in the table below:

description	unit	value	
Mtow	kg	472,5	daec
wing weight	kg	56	measured
airplane empty weight	kg	275	measured
max pilot weight	kg	170	daec
parachute weight	kg	15	measured
mtow - max pilot	kg	287,5	
fuel weight	kg	12,5	
load on semi wing	kg	202	
positive g-factor		4	
negative g-factor		2	
dust g-limit			
safety factor		1,5	
stabilator angle			
			corresponding C_L
max upward deflection		12	0,92
max downward deflection		17	1,36
1/3 max upward deflection		4,0	0,31
1/3 max downward deflection		5,7	0,45
ρ Air density at sea level.	$\text{kg} \cdot \text{sec}^2 / \text{m}^4$	0,125	
S Wing area.	m^2	1,715	measured
V_a	m/sec	38,3	daec
V_d	m/sec	57,5	daec
g gravity	m/s^2	9,81	
$L_a = 0,5 * C_L * V^2 * S * \rho$	kg	145	
$L_d = 0,5 * C_L * V^2 * S * \rho$	kg	110	
L_{max}	kg	145	

Load is applied on seats, parachute place, tail and engine mount.
 Fuselage is constrained at wing attachment points, as shown by arrows in picture:



Load applied with sand bag of 30 kg.:

Lhk=	13 * 30=	385 kg
Fengine=	14 * 30=	420 kg
Fpilots =	34 * 30 =	1020 kg

We left load for approximately 1 min.

We did not observe any abnormal deformation during the test and any permanent deformation after.

Result: **positive**

Signature of responsible person
Mr. Aldo Cattano