STATIC TEST REPORT No. 1000

Element	Storch HS Jabiru engine mount
Purpose	Limit load structure resistance
Method	Static load
Instruments	meter
According to	LTF UL section S 361

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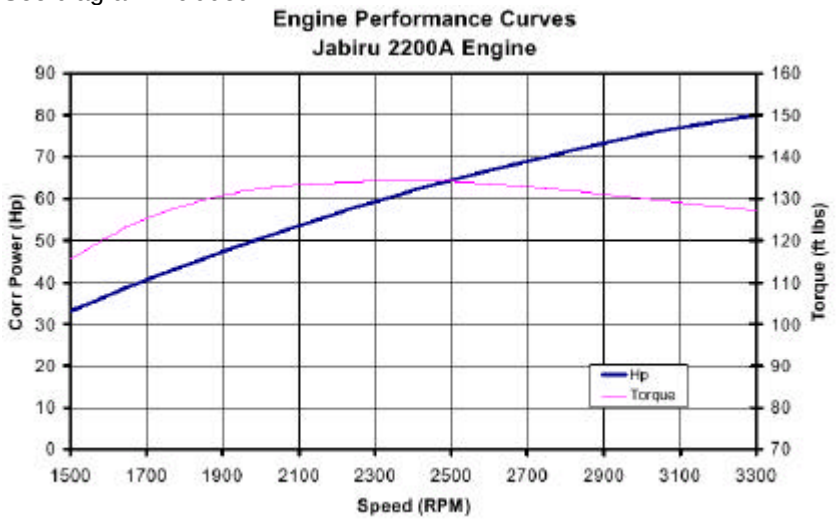
Witness	Mr. Brian Franken
Date:	15/12/2003

CONDITION A:

According to LTF-UL 361 we compute the loads acting on engine mount. From Jabiru 2200 "Technical Data" we have the followings:

Max. Power: 80 hp (at 3300 RPM)
Direct shaft no reduction
Weight: 66 Kg (Engine+ accessories+ propeller+ engine mount)

According to LTF-UL361 (a) we have:
$T_{Tor\text{-}max}$=(Max. available Power/?) being:
Max. available Power = (80 hp)(? prop)= (80)(.9) = 72 hp = 52.92 KW
? = 3300 RPM = 345.57 rad/sec
Then the max. torque is:
$T_{Tor\text{-}max}$ = (52920 / 345.57) = 153.14 Nm (torque is applied 1 mt side of c.g.)
From Jabiru engine 2200 instruction manual, torque diagram, we obtain higher value of $T_{Tor\text{-}max}$ = 173 Nm (torque is applied 1 mt side of c.g.)
See diagram included:



The vertical (downward) limit load from flight condition (n_l =4) (safety factor = 1.5) , is:

P_w= (.75)W(n_l) * (S.F.) = (.75)(66)(4) (1.5) = 297 Kg)

CONDITION B:

According to LTF-UL 361(b) we have:

Assuming that the max continuos power is max power (80 hp), from the Jabiru engine "Technical Data" we found corresponding speed of 3300 RPM.

Then the limit engine torque is:

T_{Tor}= (Max available power/?)(f)

Being:

Max available power = (80 hp)(? prop) = (80)(.9)= 72 hp = 52.92 kw

?= 3300 RPM =345.57 rad/sec

f= factor from table of LTF UL 361 f = 2 (four stroke, four cylinder)

we have:

T_{TOR}= (52920/345.57)(2)= 306.27 Nm

From Jabiru engine 2200 instruction manual, torque diagram, we obtain higher value of $T_{Tor-max}$ = 173 Nm (torque is applied 1 mt side of c.g.)

The vertical (downward) limit load from flight condition (n_l =4) (safety factor = 1.5) is:

P_w= W(n_l) (S.F.) =(66)(4)(1.5) = 396 Kg (LIMIT)

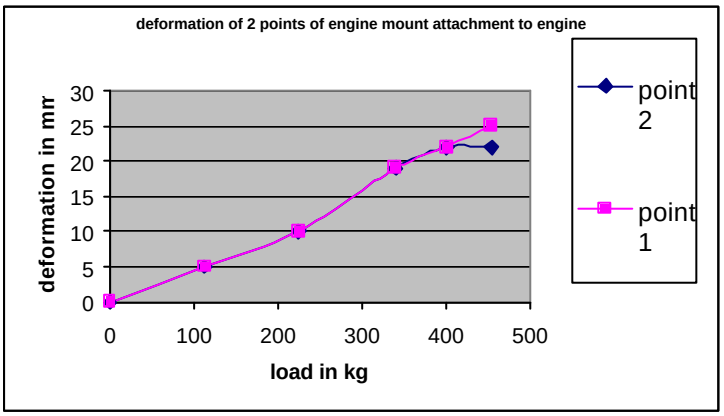
Note: The engine torque values considered here, are on conservative side for at least the two following topics:

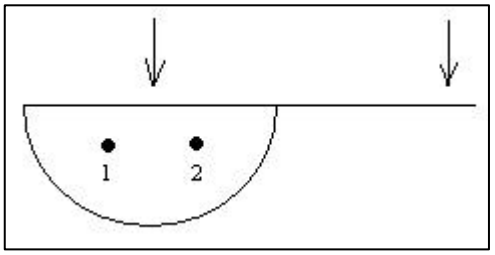
1. The real propeller efficiency value is surely lower then 0.9
2. The engine power curves used refer to tests bench with throttle valves completely open.

TEST PROCEDURE

The test was done putting 13 sand bags of 30 kg each over the engine mount for the vertical load and 2 sand bags of 27 and 27 kg each at 1 meter aside from the C.G. position using a bar.

To be sure of the test, we followed a linear increase of load, shown in the following table:





See attached photos:

Fig.1

Fig.2

Conclusions

In this test the safety margins of all items have a positive value, so the structure is strong enough to bear critical flight condition for the ultra light category.

Signature of responsible person: :
Mr. Aldo Cattano