OX-XOS Test Loading

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Test loading achieved 'FAR 23 -------given loading standard

Following aeroplane parts tested:

- Wing
- Frame (body)
- Altitude control and rudder
- Sideware control and rudder
- Ailerons
- Steering lines
- Landing gear
- Engine mounts

1. Wings

Ability Classification

$N_1 = 6$
$N_2 = -3$
$W = 400$ kg
$S = 11.15$ m^2

→ Positive test loading = 215.4 kg/m^2
Negative test loading = 107.7 kg/m^2

Point difference in direction is straight forward division. To compensate carrying and steering suface loading impact as follows.

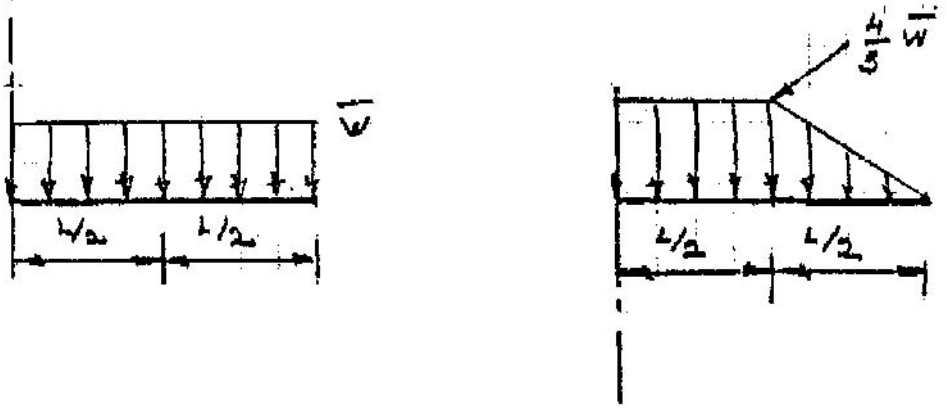
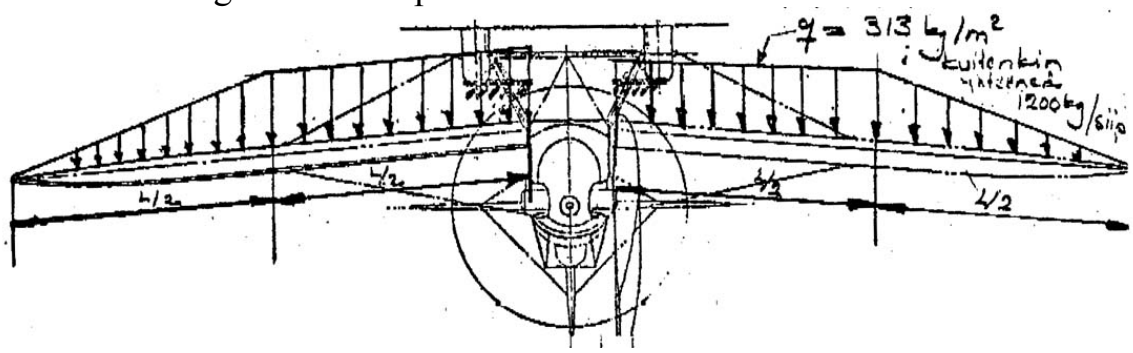


Figure 1

1.1 Wings positive loading achieved by sand bags while plane is suspended on its back. Wings being horizontal, supported from landing gear pipe strut ends. Between wheels and from altitude steering connection points



(Figure 2)

1.2 Wings negative loading achieved when plane is resting freely on its landing gear. Base line being horizontal when frame and landing gear is loaded. Loading points

g = 156.5 kg/m (Divided as in Figure 2)
giving a total of 600 kg/wing

2. Frame

Lifting and steering surface loading is achieved while they are connected to frame. Therefore frame fixing brackets are also loading giving shared partial loading.

Rear frame bending moment. Y axis (wing direction) is tied with wing positive loading together. Therefore rear frame gives N 360 kgm.

Vertical support reaction. Frame bending moment occurs when side tail fin and stabilzer loading. Plane being on its side.

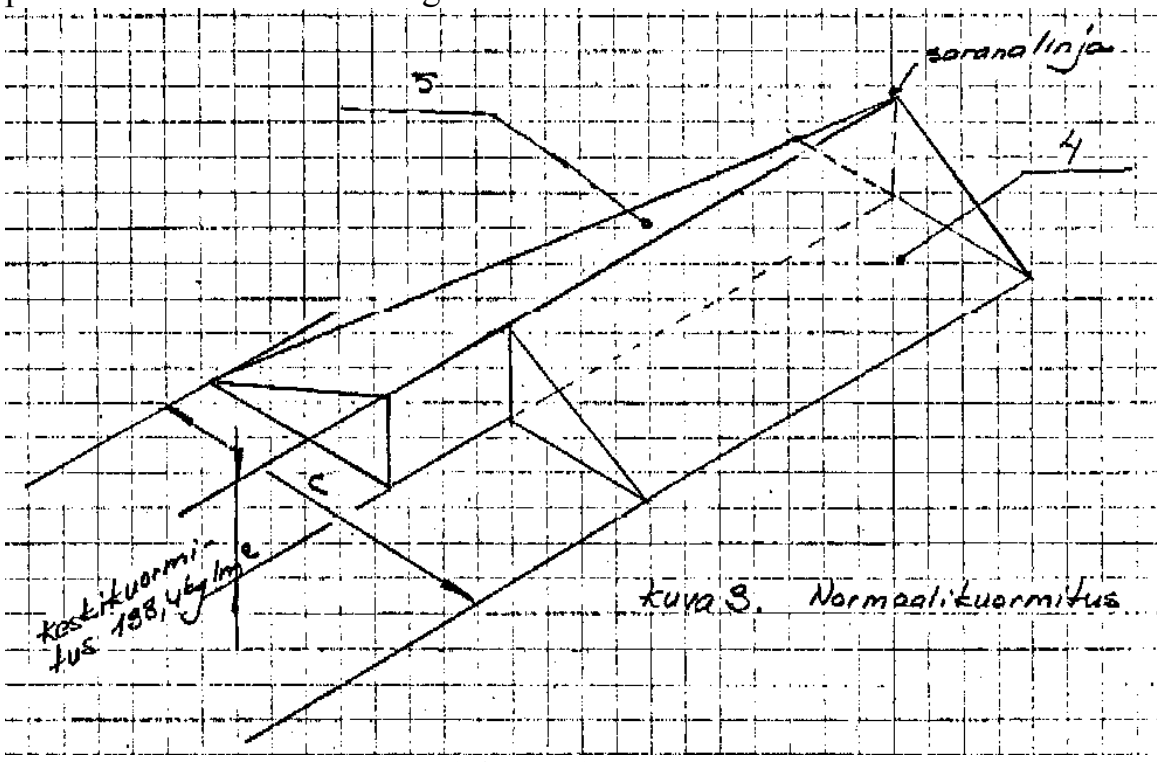
3. Altitude Control & Rudder

Altitude control & rudder test loading using three loading points. Loaded on both sides

1. Normal loading
2. Wing gust loading
3. Assymetrical wing gust loading.

3.1 Normal Loading

Plane is supported from underside like occasion 1.1. Loading from above. Plane's rear frame is supported by pipe lifting connection point. Planes base line being horizontal



(Figure 3)

Partial loading 4	= 27.7 kg => Hinge 4.1 kg
Partial loading 5	= 57.4 kg
Total loading	= 85.1 kg

3.2 Wind Gust Loading

Plane supported as for 3.1

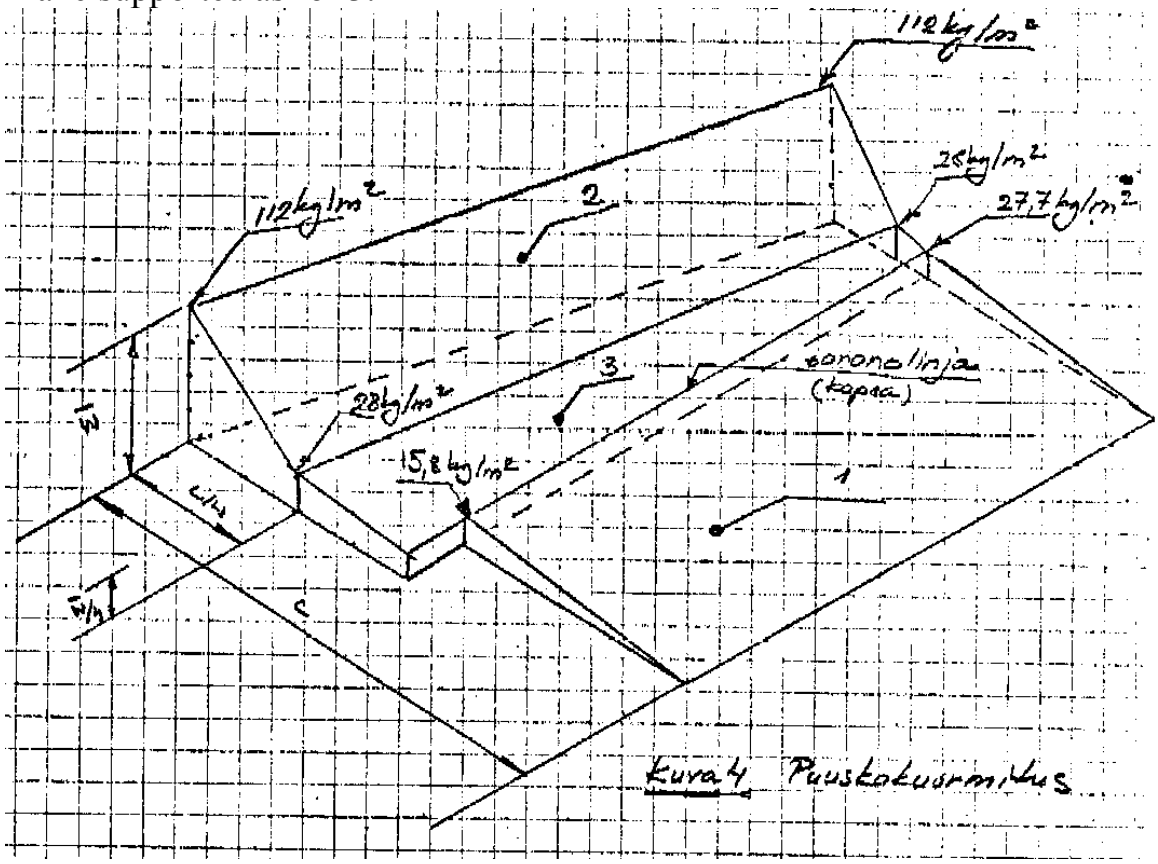


Figure 4

Partial loading 1	= 21.8 kg
Partial loading 2-3	= 101.7 kg
Total loading	= 123.5 kg

3.3 Assymetrical Wind Gust Loading

Altitude steering surface assymetrical loading achieved by removing 50% of load on upper steering surface on one side.

4. Sideward Steering Control and Rudder

Sideward steering surface is carried out for normal and wind gust loading only against side frame concern is symetry.
Plane is supported on its side on landing gear frame at the location of the rear arch.

4.1 Normal loading

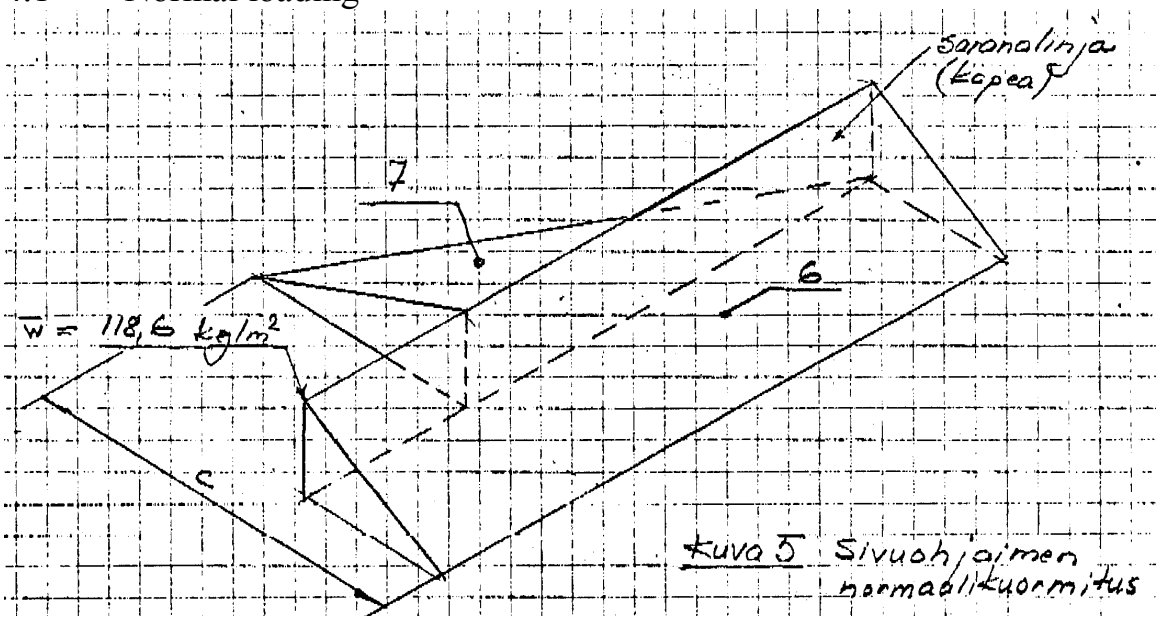


Figure 5

Partial loading 6	= 35.6 kg	=> Hinge 5.9 kg
Partial loading 7	= 19.9 kg	
Total loading	= 55.5 kg	

4.2 Wind Gust Loading

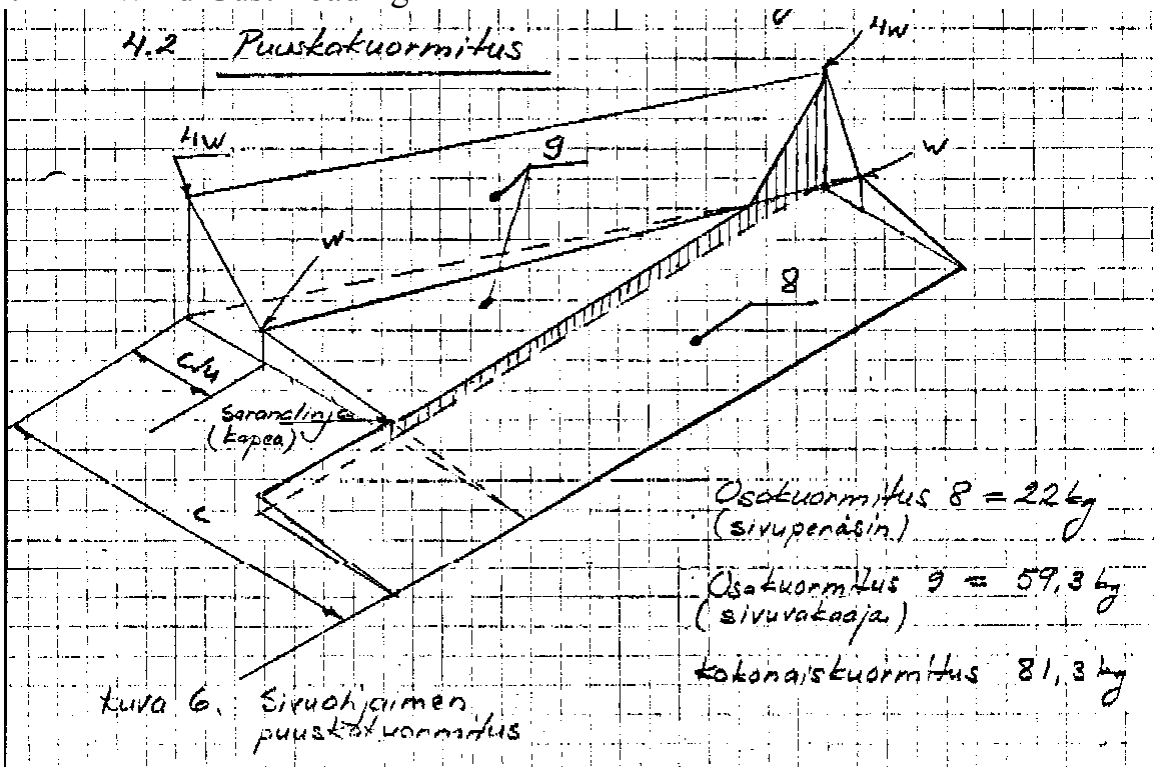


Figure 6

Partial loading 8 (Side Rudder)	= 22 kg
Partial loading 9 (Side Rudder)	= 59.3 kg
Total loading	= 81.3 kg

5. Aileron Loading

Aileron loading as for figure 7 on both sides

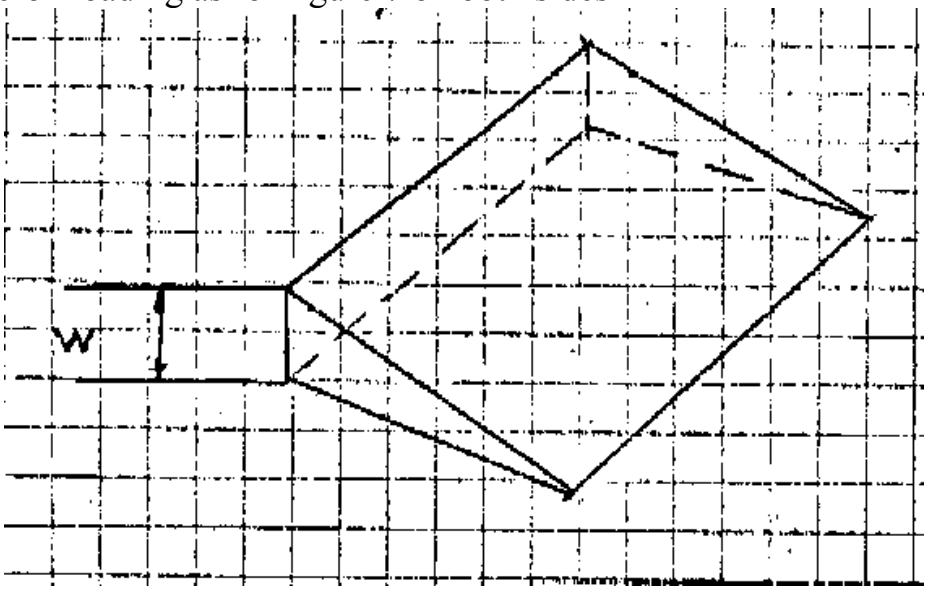


Figure 7

W - 100.3 kg/m^2

Loading = 25.5 kg
Hinges = 2.45 kg

6. Steering Lines

Side and altitude rudder lines loaded by increasing moving steering surfaces normal loading by 25% and locking it midway.

Only altitude steering is loaded both sides

Aileron line is loaded by operating joystick spring 18 kp:n force ailerons closed. The hinge moment is calculated when joystick force is less than permitted operator restriction (18 kp)

7. Landing Gear

Landing gear is loaded when wings negative loading test is carried out because plane is standing on its landing gear while being loaded for the test.

8. Engine Mounts

Engine mounts are test loaded by connecting to engine 22.5 kpm:n turning moment multiplies by two (4 ???) and 6 : n g in accelerated loading. Simultaneously 385 kg additional load placed on top of engine.

Sideways loading made when engine is on its side. Placing on top of motor 77 kg:n additional load (2 g).

9. Test Loading Practice and Documenting

9.1 Practice

Test loading as carried out in 'Salora Oyn' helicopter hangar or any suitable locations.

Test loading is done by sand bags or similar approved loads

9.2 Documentation

Test loads are entered in test loading log book which is divided into 1-9 equivalent tests

Load book - Enter loads - Note Deviation or changes - Note possible failure points plus other noticable events.