

**ILLUSTRATIONS TO PRESENTATION
FOR THE INTERNATIONAL FIRE & CABIN
SAFETY CONFERENCE**

FKP “GkNIPAS”

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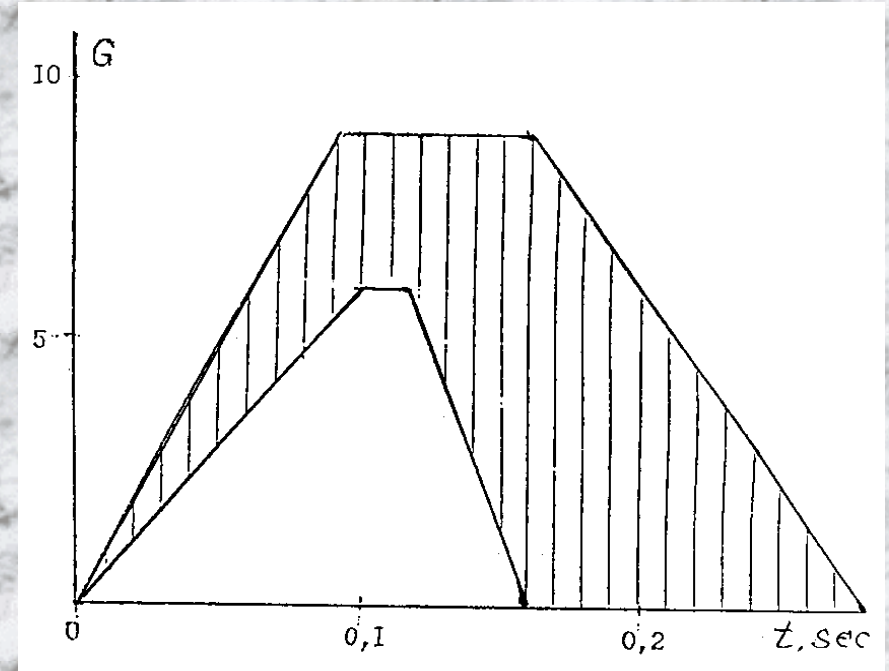
***DEVELOPMENT AND MAKING OF AND
ACCELERATION SLED FACILITY FOR
AIRCRAFT SEAT DYNAMIC TESTS***

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Seat system dynamic test procedures as a means of compliance with NLGS-3 5.11.2.2.

Test main conditions (1987):

- Structural test, horizontal impact.
- $G_{p_{cg}} \leq 9.0$ in c.g. of seat-dummy system (acc. to 4.3.1.1.)
- $G_{p_s} \approx 6.0-9.0$ on the sled (based on $G_{p_{cg}} = f(G_{p_s})$).
- ATD simplified anthropometric dummy/Hybrid II
- $W_{ATD} = 80$ kg for pas. and fl/att. seats, and
- $W_{ATD} = 90$ kg for crew seats (acc. to 5.11.2.2).



Required pulse shape ($G_{p_{cg}}$)

Figure 1

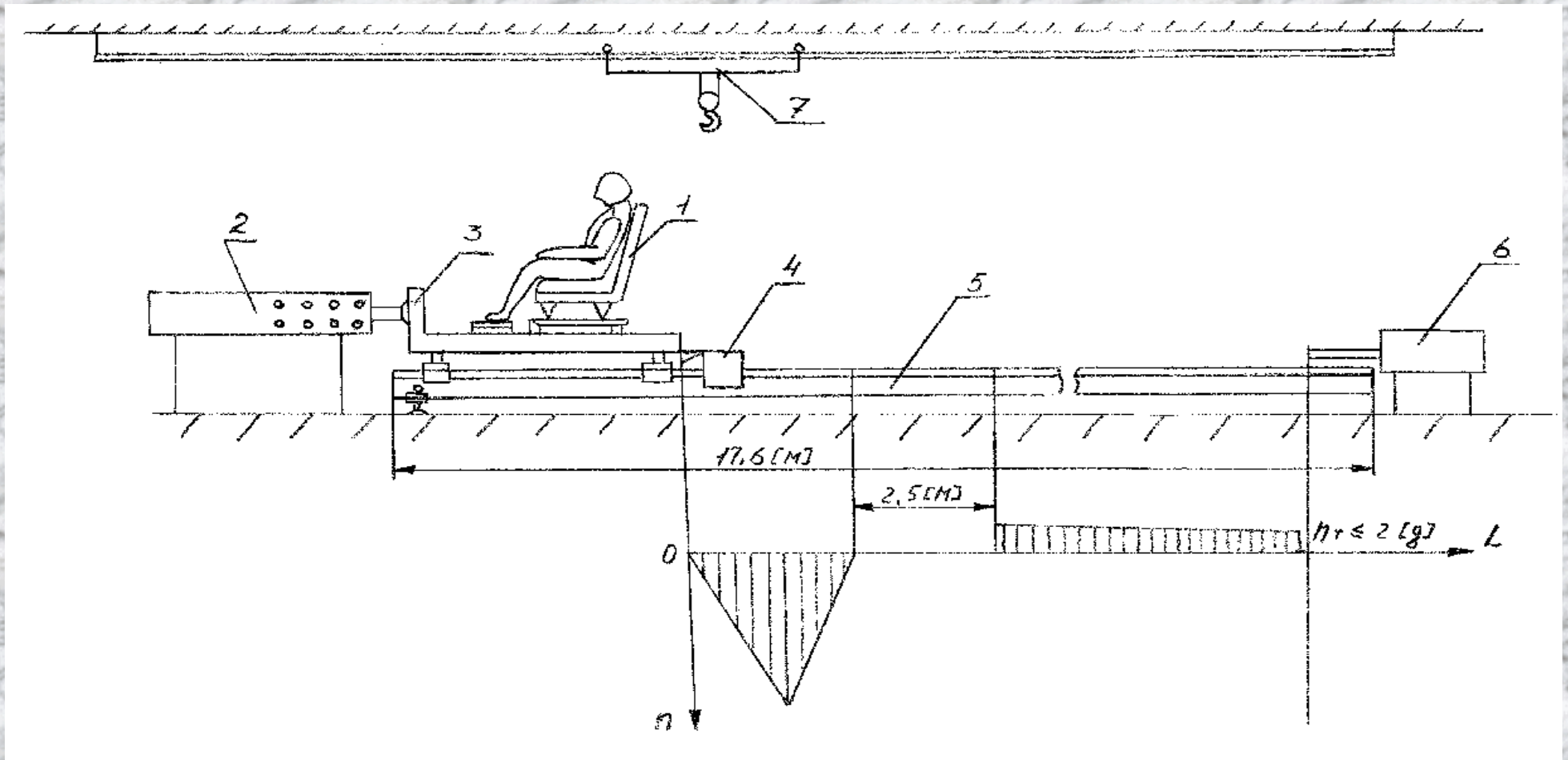


Figure 2. Schematic Test Facility and G's Diagram.

1 – Seat with test fixtures; 2 – Accelerator; 3 – Sled; 4 – Decelerator; 5 – Rail Guides;
 6 – Emergency Braking Device; 7 – Hoisting Device.

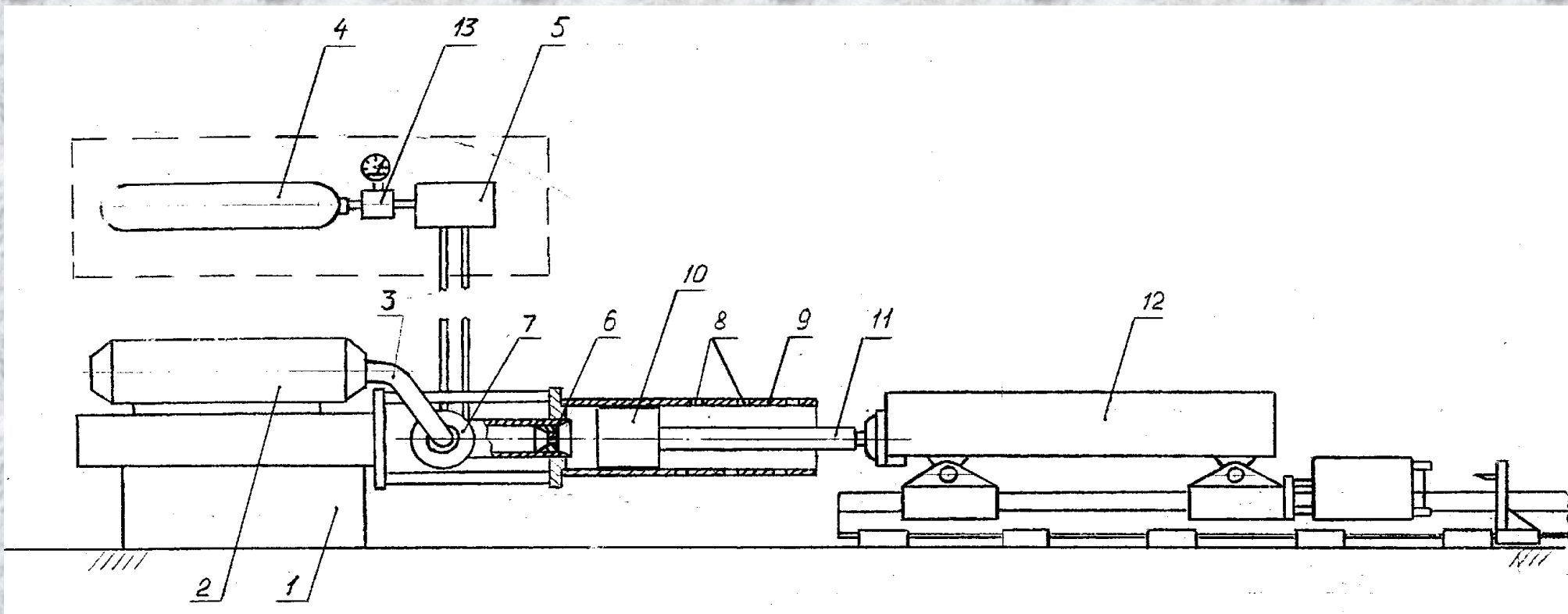
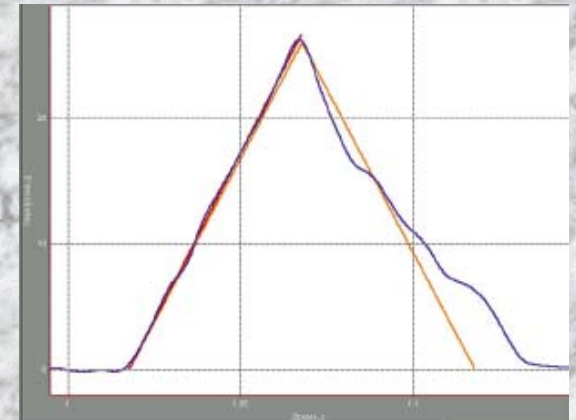
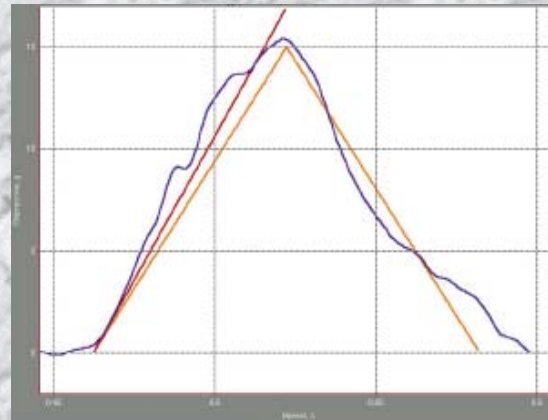
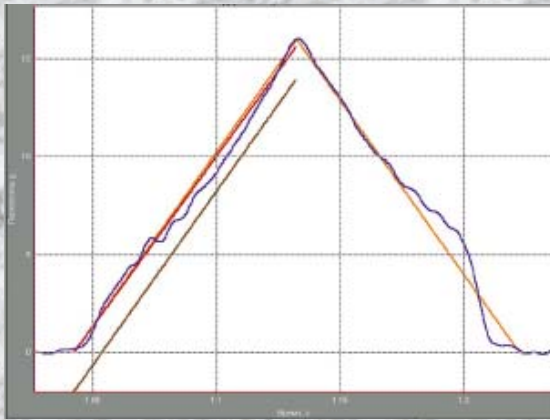


Figure 3. Schematic Accelerator

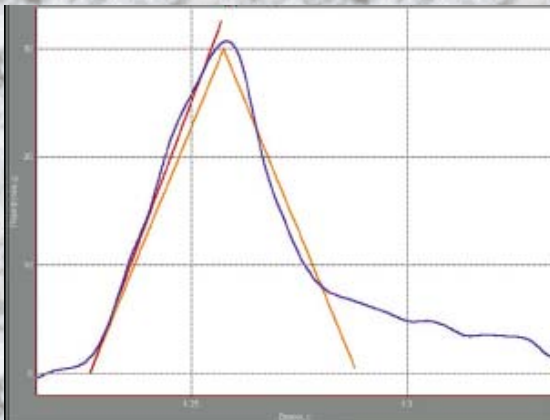
- 1 – Base, 2 – Receiver, 3 – Pipe Line, 4- Control Pneumatic System Air Vessel,
 5 – Electro-Pneumatic Valve (EPV), 6 – Throttling Device, 7 – Cut-off Valve,
 8 – Air Release Hole, 9 – Pneumatic Cylinder, 10 – Piston, 11 – Rod,
 12 – Test Sled, 13 – Pressure Regulator



Parameter	Required value FAR 23.562	Computed value	Allowable
Peak load, Gp	not less than 15.000	15.397	Yes
Time of G increase, tr	not more than 0.060 sec.	0.054	Yes
Change in velocity per period, tr	not less than 4.725 m/sec.	5.393	Yes
Change in forward longitudinal velocity	not less than 9.450 m/sec	9.993	Yes
Criterion 2G			Yes

Parameter	Required value FAR 25.562	Computed value	Allowable
Peak load, Gp	not less than 16.000	16.018	Yes
Time of G increase, tr	not more than 0.090 sec.	0.090	Yes
Change in velocity per period, tr	not less than 6.700 m/sec.	6.701	Yes
Change in forward longitudinal velocity	not less than 13.400 m/sec	14.016	Yes
Criterion 2G			Yes

Parameter	Required value FAR 23.562	Computed value	Allowable
Peak load, Gp	not less than 26.000	26.194	Yes
Time of G increase, tr	not more than 0.050 sec.	0.048	Yes
Change in velocity per period, tr	not less than 6.400m/sec.	6.592	Yes
Change in forward longitudinal velocity	not less than 12.800 m/sec	13.955	Yes
Criterion 2G			Yes



Parameter	Required value FAR 29.562	Computed value	Allowable
Peak load, Gp	not less than 30.000	30.672	Yes
Time of G increase of overload, tr	not more than 0.031 sec.	0.029	Yes
Change in velocity per period, tr	not less than 4.550 m/sec.	5.071	Yes
Change in forward longitudinal velocity	not less than 9.100 m/sec	10.406	Yes
Criterion 2G			Yes

Figure 4. Examples of the Impact Pulses Obtained



Figure 4. In-process Test Videogram

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