

## **STATEMENT OF ISSUE**

CS 23.562 requires dynamic seat testing as well as compliance with the lumbar load criteria. The limit for the lumbar load is defined under (c)(7) *The compression load measured between the pelvis and the lumbar spine of the ATD may not exceed 680 kg (1 500 lb).*

The value is based on an ATD weight of 77 kg (170 lb).

## **BACKGROUND**

The aircraft affected is a small two-seater aircraft for training purpose. The two pilot seats are located behind each other (trainee in the forward seat and instructor in the rear seat). The aircraft shall be certified in *Normal* and *Acrobatic* category. The aircraft is equipped with two ejection seats defined as primary escape means for the crew.

Dynamic tests have been conducted with the ejection seats and ATDs dressed in pilot suits including helmets. Dummies have been uploaded to weights beyond the 77 kg value. Due to the ejection seat design and intended function vertical stroke of the seats to compensate for high lumbar loads cannot be provided and thus the results exceeded the 680 kg limit.

## **ELOS**

If full compliance with the requirements of CS 23.562 cannot be met due the design of the seats or their installation constraints, an investigation about possible mitigation of injuries shall be conducted.

While the installation of ejection seats as primary emergency escape means already avoid occupancy of the aircraft in the majority of crash cases, occupancy of the aircraft cannot be avoided in all possible cases. The paragraph 23.562 (e) allows for:

*(e) An alternate approach that achieves an equivalent, or greater, level of occupant protection to that required by this paragraph may be used if substantiated on a rational basis.*

The alternate approach shall take the use of the aircraft (training purpose, not fare-paying passengers), the primary function of the ejection seats, the availability range of the ejection seats (0/0), aircraft dispatch limitations, etc. into account.

EASA acknowledges the applicant's position to replace CS 25.562(c)(7) compliance by an alternative approach as described in CS 25.562 (e). The test criteria under which data for compliance finding is generated (CS25.562(c)(1) and CS 25.562 (d)) assumes that the aircraft, when being in a configuration for landing or after take-off, has no pitch and roll applied.

EASA is prepared to accept demonstration of occupant protection required by CS 25.562 (c)(7) by an alternative approach when the applicant can show:

- That the ejection seat(s) are usable for a flight configuration as described above for
  - Flight at and after take-off
  - Flight before and at landing
- That the use of the ejection seat(s) in TTOL flight scenario are included in the AFM section for Emergency Procedures
- By showing that the use of the ejection seats provide for an adequate level of occupant protection when compared with the conditions in a vertical crash scenario.
- Limiting the range of occupants by excluding passengers.