



U.S. Department
of Transportation
**Federal Aviation
Administration**

Memorandum

Subject: INFORMATION: Use of the Hybrid III
Anthropomorphic Test Dummy in Seat Dynamic Testing

Date: MAR -3 2000

From: Manager, Aircraft Engineering Division,
Aircraft Certification Service, AIR-100

Reply to
Attn. of:

To: SEE DISTRIBUTION

The purpose of this memorandum is to provide information on acceptable means to demonstrate compliance with §§ 23.562, 25.562, 27.562, and 29.562 of the FAR using the "Hybrid III" anthropomorphic test dummy (ATD), in lieu of the ATD specified in Federal Aviation Regulations.

The regulations for seat dynamic testing in parts 23, 25, 27 and 29 specify the ATD defined in 49 CFR part 572, subpart B, (known as the Hybrid II) or its equivalent. Subpart E of 49 CFR part 572 specifies an ATD known as the Hybrid III. The Civil Aeromedical Institute (CAMI) has been conducting research to determine whether the Hybrid III ATD is suitable for aviation dynamic testing, and is therefore equivalent to the Hybrid II. The resulting data indicate that there are differences between the Hybrid II and Hybrid III that must be accounted for, if the Hybrid III is to be used. The significant differences, from a certification standpoint, are in the lumbar spine region. In addition, there are some mass distribution adjustments that are necessary. There are also differences that give the Hybrid III a higher degree of biofidelity, and are considered enhancements over the Hybrid II.

CAMI has developed a means of modifying the Hybrid III to allow it to provide valid data for certification testing in accordance with the FARs. The modifications described in the Society of Automotive Engineers (SAE) Technical Paper 1999-01-1609 (attached) enable the Hybrid III ATD to be used in lieu of the Hybrid II ATD that is currently specified in the FARs. In order to maximize standardization, we believe that this guidance should apply to tests conducted under all relevant FARs, and not just those for specific category aircraft. We intend to also apply this guidance to TSO C127a.

Therefore, when modified in accordance with the SAE Technical Report 1999-01-1609, the Hybrid III ATD is considered equivalent to the Hybrid II ATD, and may be used for seat dynamic testing in all relevant FARs.

Any questions may be directed to Hal Jensen, AIR-120 202-267-8807.

James P. Brantley
fcr James Jones

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Manager, Small Airplane Directorate, ASW-100
Manager, Engine and Propeller Directorate, ANE-100
Manager, Rotorcraft Directorate, ASW-100
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