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Superseding ARP5475

Abuse Load Testing for In-Seat Deployable Video Systems

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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1. SCOPE:

This SAE Aerospace Recommended Practice (ARP) provides guidelines for abuse load testing of a deployable Individual Video System (IVS).

The abuse load testing defined in this ARP is intended to only address the evaluation of the deployable IVS regarding stowage of the system and injurious projections/protrusions as a result of passenger interaction with the video system. Other aspects of the video system design or qualification may require additional testing or analysis and are outside the scope of this ARP.

This ARP is not intended to address customer satisfaction or reliability aspects of individual designs.

1.1 Purpose:

The deployable IVS includes, for the purpose of this ARP, all video system components from the monitor to the interface at the primary seat structure. It should be shown that the system meets the performance criteria of Section 4 after being subjected to the forces defined in 3.2. This can be demonstrated by the test procedure described in this ARP or by similarity analysis to a system previously shown to comply with this ARP.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AS8049A Performance Standard for Seats in Civil Rotorcraft and Transport Aircraft and General Aviation Aircraft

2.2 FAA Publications:

Available from the Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591.

14 CFR 25.601 General

14 CFR 25.785 Seats, berths, safety belts, and harnesses

14 CFR 25.789 Retention of items of mass in passenger and crew compartments and galleys

3. STATIC TEST PROCEDURES:

3.1 Test Setup:

The test article may be electrically non-functional but should include components such as the video arm, monitor and shrouds. It may be necessary to include the electronic wiring if there is a possibility that the wiring would influence the testing or the restowage of the system. (Note: If the system is designed to separate from the seat and be stowed in another location, the wiring should be installed during the test.) The test article should be tested using a fixture that simulates the production installation in the airplane.

3.2 Loading Conditions:

A minimum load of 200 lb (see Note 1) shall be applied for at least 3 s without failure or until one of the deflection, damage or separation conditions of 3.4 (b), (c), or (d) occurs. The load should be applied approximately 2 in below the upper edge of the monitor except for downward loading. For downward loading the load should be applied approximately 2 in from the edge most distant from the IVS attachment. If a large deflection is likely, the test setup should anticipate the deflection and accommodate continued loading of the test article through the range of deflection. Loading should remain in the direction required by the test throughout the deflection, although the relative angle of the load to the loading surface may change as the IVS deflects (see Note 2).

3.3 Test Selection:

The load cases shown in Figure 1 should be considered for testing. The load shall be applied to the unstowed IVS in a manner that will load the IVS assembly (see Note 3). This may not be a typical viewing position. Rotation of the monitor or arm should be taken into account when determining the loading conditions. That is, it may be necessary to rotate the monitor or arm to a position to which the test load can be applied. Inability of the IVS to carry load in any particular direction, because of the operational design of the IVS, is sufficient cause to exclude loading in that direction.

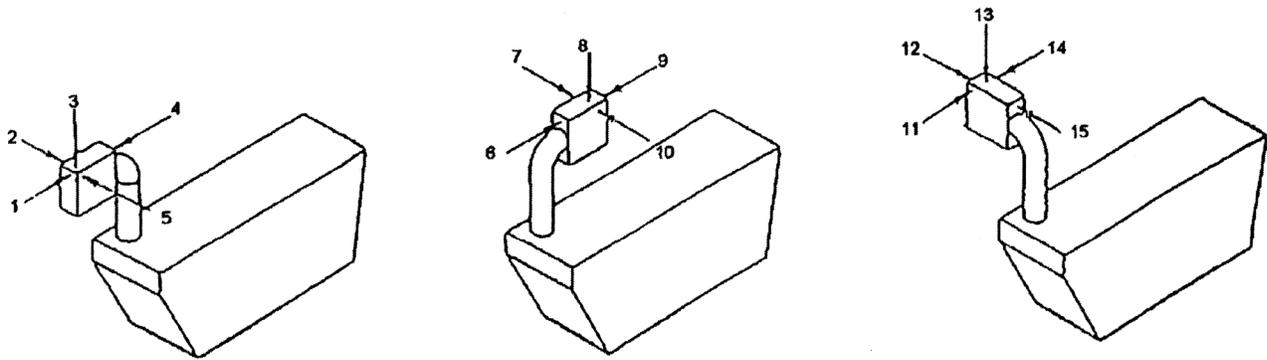


FIGURE 1 - Sample IVS in Possible Deployed Orientations

3.4 Test Completion:

The test load shall be applied to the monitor in each of the directions specified in 3.3 until one of the following conditions is satisfied:

- a. A 200 lb load is applied (see Note 1) and is maintained for at least 3 s.
- b. The system reaches a point of deflection beyond its deployed and stable position such that the application of additional load is no longer meaningful considering the load case, the design of the system, and the direction of the applied load.
- c. The deployable IVS is structurally damaged (see Note 4) at a load of 200 lb (see Note 1) or less to a point that it no longer carries load. If a portion of the IVS remains such that the application of additional load is meaningful the load application point shall be relocated to the remaining portion of the IVS and the test continued.
- d. The deployable IVS separates (see Note 4) from the seat at a load of 200 lb or less.

4. PERFORMANCE CRITERIA

- a. The IVS shall be stowable (see Note 5) and restrainable (see Note 6) after the completion of each test. Alternatively the IVS shall be removable and stowable elsewhere. None of these actions shall require the use of hand tools or force greater than 35 lb. Any wiring shall be easily disconnected to remove broken parts. The wiring connectors shall be readily accessible.
- b. Broken or separated parts shall not result in projections or protrusions injurious to an airplane occupant.
- c. All parts remaining attached to the seat after the test shall be stowable (see Note 5) and restrainable (see Note 6).