SAE Aerospace
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AEROSPACE RECOMMENDED PRACTICE

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Aerospace – Test Methodology for Electrohydrostatic Actuators

RATIONALE

The test methodologies applicable to Electrohydrostatic Actuators (EHAs) require considerations unique to EHAs for certain requirements and tests, as compared to electrohydraulic servoactuators. This ARP discusses such tests specific to EHAs, and recommends test methodologies unique to EHAs

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1. SCOPE

This document provides an overview of the tests and issues related to testing that are unique to Electrohydrostatic Actuators (EHAs). An EHA incorporates a linear or rotary hydraulic actuator and a variable speed, reversible electric servomotor driving a fixed displacement hydraulic pump for actuator control, and associated power drive electronics. The tests and issues documented are not necessarily all-inclusive. This document discusses both, the tests applicable to EHAs and the test methodologies to accomplish the test objectives.

This document also lists tests that are not unique to EHAs, but are still applicable to EHAs. In these instances a discussion of such tests is not contained in this document, and as applicable, the reader may reference ARP1281 (Actuators: Aircraft Flight Controls, Power Operated, Hydraulic, General Specification For), which addresses test issues applicable to electrohydraulic flight control servoactuators.

In the discussion of the tests and test methodologies contained in this document, numerical definition or specification of the test parameters to be imposed or measured is not included. These definitions or specifications should be developed to conform to the requirements of the applicable EHA technical specification document, considering the usual influencing factors such as instrumentation accuracy, test temperature, etc.

1.1 Purpose

The purpose of this document is to facilitate the generation of test specifications, plans and procedures for EHAs (and EHA mode operation of Electric Backup Hydraulic Actuators (EBHAs), covering Integration, Acceptance and Qualification testing.

1.2 Field of Application

This document focuses on EHA issues irrespective of the application of the EHA – whether military or commercial. It shall be the user's responsibility to ensure that particular qualification or certification requirements, or applicable specifications, standards or regulations for the intended application are satisfied by the EHA design, and the tests and test methods that are developed.

2. REFERENCES

2.1 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.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

ARP1281 Actuators: Aircraft Flight Controls, Power Operated, Hydraulic, General Specification For

ARP1383 Impulse Testing of Aerospace Hydraulic Actuators, Valves, Pressure Containers, and Similar Fluid System Components

ARP4386 Terminology and Definitions for Aerospace Fluid Power, Actuation and Control Technologies

ARP5007 Development Process - Aerospace Fly-By-Wire Actuation System

AS4941 Aerospace - General Requirements for Commercial Aircraft Hydraulic Components