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(R) Helicopter Health and Usage Monitoring System Accelerometer Interface Specification

RATIONALE

This document defines interface requirements for accelerometers and associated interfacing electronics for use in a helicopter Health and Usage Monitoring System (HUMS). The purpose is to standardize the accelerometer-to-electronics interface with the intent of increasing interchangeability among HUMS sensors/systems and reducing the cost of HUMS accelerometers as the result of economy of scale. Additionally, the goal is to provide a set of high level requirements for HUMS accelerometers for system designers and integrators.

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1. SCOPE

Accelerometers are transducers, or sensors, that convert acceleration into an electrical signal that can be used for airframe, drive, and propulsion system vibration monitoring and analysis within vehicle health and usage monitoring systems.

This document defines interface requirements for accelerometers and associated interfacing electronics for use in a helicopter Health and Usage Monitoring System (HUMS). The purpose is to standardize the accelerometer-to-electronics interface with the intent of increasing interchangeability among HUMS sensors/systems and reducing the cost of HUMS accelerometers. Although this interface was specified with an internally amplified piezoelectric accelerometer in mind for Airframe and Drive Train accelerometers, this does not preclude the use of piezoelectric accelerometer with remote charge amplifier or any other sensor technology that meets the requirements given in this specification.

This SAE HUMS Accelerometer Interface Specification includes the minimal interface and performance requirements for commonality. Compliance with this Interface Specifications can be referenced in more comprehensive procurement and device specifications.

1.1 Classification

Accelerometers used in current HUMS fall into three distinct categories, they are:

a. Airframe accelerometers (generally used for rotor track and balance performance),

b. Drive train accelerometers, and

c. Engine accelerometers.

This document is divided into three sections in recognition of this common industry classification.

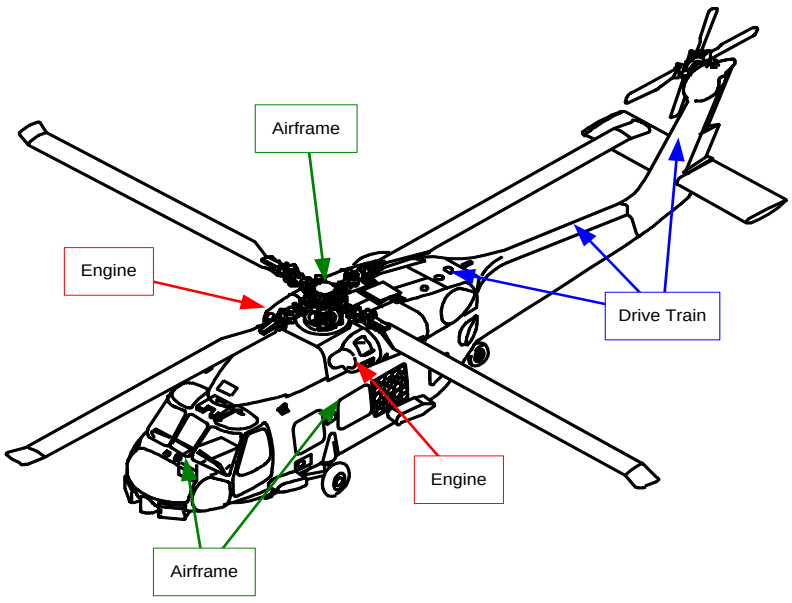

Figure 1 – Example of accelerometers location

1.2 Specification Terminology

The terms "shall" and "should" within this specification observe the following rules:

a. The word "shall" expresses a mandatory requirement of the specification.

b. The word "should" expresses a recommendation or advice on implementing the specification or actions expected of users of the system.