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APPROVED P. PERDAN	04/18/12	CLASSIFICATION OF CHARACTERISTICS, SPECIFICATION FOR
CONTRACT NO.		
APPROVAL		

SIZE	CAGE CODE	
A	**72429**	**SP436125**
REVISION LEVEL **A**		SHEET **1 OF 7**

REVISION HISTORY

Revision	Date	Change Summary.
-	10/31/06	Released per A/R 4120.
A	07/18/24	Updated to align with AS9145 requirements. Changed the SFI references to Eaton. Added Section 4. NOTES. Added Revision History page.

1. SCOPE

This specification establishes the classification of key characteristics to be used with drawings of all AAR products manufactured by Eaton.

2. APPLICABLE DOCUMENTS

The following documents form a part of this procedure to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposals shall apply. When a specific document issue is indicated below, references to the document in subsequent sections of this procedure shall consist of the basic document number without repetition of the pertinent issue designation.

2.1 Government Documents

There are none.

2.2 Non-Government Documents

STANDARD

SAE Aerospace

AS9100 (Latest)	Quality Management Systems –Requirements for Aviation, Space and Defense Organizations
AS9145	Requirements for Advanced Product Quality Planning and Production Part Approval Process

OTHER PUBLICATIONS

American Society of Mechanical Engineers (ASME)

Y14.100 (Latest)	Engineering Drawing Practices

Eaton

ESP-714.01	Control of Critical Safety Items and Critical Application Items – Work Instructions

(Copies of specifications, standards, drawings, and publications required by suppliers shall be obtained by the supplier, except Eaton-controlled documents, which will be furnished by Eaton. If a supplier is unable to obtain any document listed herein, he should immediately contact Eaton for assistance.)

3. REQUIREMENTS

3.1 Definitions

Key, Major, and critical characteristics are used to identify and classify those features which, from the perspective of customer satisfaction, have the most probable effect on the fit, performance, producibility, or service life of a completed part or of a subassembly of a finished product. Major Characteristics define a legacy approach to characteristic definition. Major characteristics are not to be used for new design. Key

characteristics are defined using a design failure mode and effects analysis process and shall be used for new design. See AS9100 and AS9145 for terms and definitions not specified herein.

The selection of characteristics shall be the responsibility of Eaton. Characteristics shall be classified by one of the following definitions:

Critical Characteristic	A characteristic which, through judgment and experience, indicates that if not maintained in accordance with drawing specifications, would cause an unsafe condition; or a characteristic which is essential to the function of the end product.
Major Characteristic (not for new design)	Any dimension, tolerance, finish, or material; any installation, assembly, manufacturing, or inspection process; or any other characteristic which, if not in conformance with drawing specifications, would affect fit, form, or function of the end item.
Key Characteristic	Key characteristics should be established using a Design Failure Mode and Effects Analysis process. Key characteristics are an attribute or feature (dimension, tolerance, finish, material, installation, assembly, manufacturing, or inspection process) or any other characteristic which, if not in conformance with drawing specifications, would affect fit, form, function, performance, service life, or producibility of end item, that requires specific action for the purpose of controlling variation.
Minor Characteristic	Characteristics other than critical or major which, if not maintained in accordance with drawing specifications, would not reduce the suitability of the product and would have no adverse effect on safety. Such characteristics may be important for correct assembly, but do not impact function.
Critical Safety Characteristics (Ref: ASME Y14.100-2017)	Any feature, such as tolerance, finish, material composition, manufacturing, assembly, or inspection process or product that, if nonconforming or missing, could cause the failure or malfunction of the critical safety item.
Critical Safety Item (CSI) (Ref: ASME Y14.100-2017)	A part, assembly, installation, or production system with one or more critical characteristics that, if not conforming to the design data or quality requirements, would result in an unsafe condition.

3.2 Responsibilities

The Integrated Product Team (IPT) shall be responsible for assigning characteristics per the definitions contained herein. Eaton shall determine the appropriate characteristics to use on Eaton product drawings.

When it is desirable to impose these requirements on existing designs, an IPT will be established and the entire product or major assembly shall be reviewed for critical or major characteristics, which will be added by Change Request. This IPT shall consist, at a minimum, of personnel from Design Engineering, Manufacturing Engineering, and Quality Engineering.

While Eaton shall have overall responsibility to identify critical and major characteristics, subcontractors shall be responsible for the quality, conformity, and integrity of parts supplied to Eaton. For Vendor Item Drawings, the subcontractor shall be responsible for identifying characteristics as appropriate.

3.3 Guidelines for Selection of Characteristics

Characteristics shall be selected based upon the specific function of the part or subassembly. Determining factors shall be the product's fit, performance, service life and manufacturability. Critical and major characteristics shall be identified on the appropriate drawing. If characteristics are not identified as critical, major, or key, they shall be considered minor and shall not be identified on the drawing.

3.3.1 Mechanical Parts

The following list of potential critical or major characteristics is not intended to be all-inclusive. Eaton and the subcontractor shall consider dimensional, functional, process, and other features when selecting characteristics.

- Dimensional features:
    - Bearing journal diameters
    - Pilot diameters
    - Press fit diameters in structural lugs
    - Seal ride surfaces
    - Valve seat diameters

- Functional features:
    - Balance data/shaft concentricity
    - Presence of lubrication holes not readily obvious
    - Features affecting end item interchangeability
    - Valve geometric tolerancing

- Processing features:
    - Heat treat surface temper
    - Surface treatments
    - Surface finish
    - Structural adhesive bonding
    - Oxygen Cleanliness
    - Deburring

3.3.2 Electrical/electronic Parts or Systems

The following list of potential critical or major characteristics is not intended to be all-inclusive. Eaton and the subcontractor shall consider dimensional, functional, process, and other features when selecting characteristics.

- Relay or power contact device
    - Operate and release time
    - Contact transfer time
    - Contact voltage drop at full load
    - Coil pull-in voltage

- Electronic power supply
    - Output voltage over load range
    - Output voltage over range of input voltage
    - Output voltage over control range
    - Output waveform/ripple
    - Input current waveform
    - Efficiency
    - Output of monitoring circuits
    - Case grounding resistance

- Lamp/lighted panel
    - Output light intensity at specific power conditions
    - Output light intensity over control range
    - Output light chromaticity or spectral power density
    - Output light spatial distribution
    - Lighting contrast ratio and uniformity

- Amplifier
    - Transfer characteristics including gain and phase margins
    - Bandwidth at specified signal amplitude
    - Dynamic range
    - Efficiency/power dissipation

- Circuit breaker or power controller
    - Time to trip at specified load currents
    - Response to control inputs (mechanical or electrical)
    - Output of status indications (if applicable)
    - Off-state output indications (if applicable)
    - Off-state output voltage (if applicable)

3.4 Critical Characteristic Drawing Note

Critical characteristics shall be identified on the Engineering Drawing by a note symbol. The accompanying note shall read, "Critical Characteristic per SP436125."

3.5 Critical Safety Item Drawing

Critical safety item drawing shall be identified by adding “Critical Safety Item” to drawing name box.

3.5 Major Characteristic Drawing Note

Major characteristics shall be identified on the Engineering Drawing by a note symbol. The accompanying note shall read, "Major Characteristic per SP436125."

3.6 Minor Characteristic Drawing Note

If critical or major characteristics are not required on the Engineering Drawing, a note shall be added that reads, "Characteristics have been deemed Minor per SP436125."

3.7 Key Characteristic Drawing Note

Key characteristics shall be identified on the Engineering Drawing by a note symbol. The accompanying note shall read, "Key Characteristic per SP436125."

3.8 Note Symbols

When more than one feature is attached to a leader line, the note symbol shall be located to the left or right of each feature, note, geometric characteristic, etc., which has been identified as major or critical. Note symbols for single features shall be located within the proximity of the feature.

3.9 Critical Safety Item (CSI).

Critical safety items shall be identified on the engineering drawing by symbol(s) per Y14.100. A critical characteristic note symbol shall be assigned to identify CSI status. For CSI control, risk management and design engineering responsibility, refer to ESP-714.01.

4. NOTES

Changes to this document shall be made using the applicable practices described in ST1637815.