

# Work instruction

## JSF Critical Characteristics (CTE/CTM)

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## REVISION STATUS

The latest version of this document may be confirmed by viewing the Fokker Landing gear (FLG) website at: <http://www.fokkerlandinggear.com/Suppliers>

Questions regarding this document should be directed to the FLG procurement department.

| Date       | Issue | Definition / reason   | Concerned: page / paragraph    |
|------------|-------|---|--------------------------------|
| 22-01-2014 | 06    | <ul style="list-style-type: none"> <li>• Changed to new FLG lay-out</li> <li>• Added TOC</li> <li>• Added Scope</li> <li>• Changed overall lay-out</li> </ul> | All<br>Page 2<br>Page 3<br>All |
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## SCOPE

Unit: Suppliers  
 Program: F-35 program  
 Source: SPA-Q-30.2K, JSF contract procedure  
 2ZZP00006, General specification for control of F-35 air vehicle critical parts

## PURPOSE OF THE WORK INSTRUCTION

In the JSF program Critical Characteristics (CTE/CTM) are used. Critical Characteristics are intended to assure that an unsafe condition will not exist when the item conforms to the engineering requirements and to alert those in the production of the importance of this feature in assuring safety. CTE/CTM's lay down the influence of the variations of the features of a material or part on product fit, performance, service life, or manufacturability. This instruction provides valuable informations for all suppliers regarding FLG requirements on CTE/CTM characteristics.

## RESPONSIBILITY

Supplier Quality Assurance (SQA)

## DESCRIPTION OF THE WORK INSTRUCTION

### 1. Identification on the drawing

#### 1.1 Classification of the CTE/CTM characteristic

##### 1.1.1 Safety critical

An equipment part that contributes to a safety critical function, and whose failure alone results in the loss of the air vehicle, major system damage (greater than \$1,000,000), death, severe injury or occupational illness, or severe environmental damage.

##### 1.1.2 Durability critical:

An equipment part which failure alone, or frequent failure amongst many air vehicles, would generate major economic impact on air system performance by: a) requiring costly maintenance, part repair, and/or replacement to assure continued performance, or b) causing the air vehicle(s) to be down for extended periods of time for repair.

##### 1.1.3 Expendable:

Other / Expendable part includes all components of a system not classified as safety critical, mission critical, or durability critical. The failure of these components could be handled during routine maintenance and would not impact mission, safety, or operational readiness.

## 1.2 Accountability

- 1.2.1 All CTE/CTM Characteristics are mentioned on the drawing and should be accounted for on the measurement report

## 2. Handling of CTE/CTM Characteristics

### 2.1 Measurement

For all parts ordered by the purchase order a 100% inspection or measurement of the CTE/CTM Characteristics are required, without any exceptions. All measurements or inspections of CTE/CTM Characteristics shall be recorded<sup>1</sup> on a measuring report (see appendix 1 for an example).

### 2.2 Implementation

CTE/CTM Characteristics shall be implemented in the manufacturing planning, listing how the CTE/CTM Characteristics shall be measured, the frequency of measuring and the method how the results shall be recorded. Manufacturing plans for Safety Critical parts shall always be approved by Fokker Landing Gear B.V.

### 2.3 Submittal

Manufacturers shall submit the measuring reports together with the products. Measuring reports shall provide traceability to the manufactured (serialized) part. In case of measurement or inspection of non-serialized parts it is allowed to record all measurements or inspections on one report, without a link to each specific single part. A reference to the batch number / lot number is sufficient in this case.

## 3. Reporting

### 3.1 Marking

The term "Safety critical" and "Durability Critical" shall be specified and placed in a prominent place on all below mentioned documents, including electronic documents. Marking of parts shall be done as specified on the drawing.

### 3.2 Applicable documents

- MPS
- Technique sheets
- Purchase orders
- Certificates of conformance (CofC)
- CTE/CTM report
- FAIR's

## 4. Concepts and Definitions

### 4.1 Definition

A Critical Characteristic is any feature throughout the life cycle of a part, subassembly or system, such as dimension, tolerance, finish, material or assembly, manufacturing, inspection process or operation that if nonconforming, missing or degraded may cause the failure or malfunction of this item. Furthermore it are those selected geometrical, material properties, functional and/or cosmetic features, which are measurable, whose variation control is necessary in meeting Customer requirements and enhancing Customer satisfaction.

## ANNEXES

Annex 1 Example CTE report / list

<sup>1</sup> Recorded means:

- In case of an inspection: OK or ACCEPTED is allowed to be recorded
- In case of a measurement: record the measured actual value

**ABBREVIATION**

CTE Critical To Engineering  
CTM Critical To Manufacturing  
MPS Manufacturing Planning Sheet

**ANNEX 1**

**SAMPLE CTE REPORT / LIST**

|              |            |            |                |            |          |
|--------------|------------|------------|----------------|------------|----------|
| Partnumber : | Drawing Nr | Revision   | Drawing rev.   | FLG order: | Ordernr. |
| Part name :  | Title      | Serial nr. | Serial / batch | Date :     | Date     |

Optional fields in case supplier prefers to add supplier internal numbers

| CTE | B/P zone | Requirement (imperial)                       | Measured (imperial) | Accept | Remarks                      |
|-----|----------|--|---------------------|--------|------------------------------|
| 1   | 1C1      | Ø1,0±0,01                                    | Ø1,005              | Y      |                              |
| 2   | 1D6      | Ø1,5±0,1                                     | Ø1,75               | N      | Add NCR number               |
| 3   | 2A3      | 0,5625-24UNJEF-3A                            | N/A                 | Y      | Measured with go-no go gauge |
| 4   | -        | Check paint coverage                         | N/A                 | Y      | Visual check                 |
| 5   | 1G6      | 45HRc min                                    | 47-48-47 HRc        | Y      | Mean value > 45HRc           |
| 6   | 1A3      | Do not break edge, remove burr (3 locations) | N/A                 | Y      | Visual check                 |
|     | 1C4      |  |                     | Y      | Visual check                 |
|     | 1D2      |  |                     | Y      | Visual check                 |

Supplier Quality name and signature:

- Examples of measurements / inspections stated on drawings are:
  - Check hardness → report actual values of all measurements
  - Check dimension → report actual value
  - Check Strength → report actual value
  - Check presence of → OK or ACCEPTED.
- The CTE list of several parts may be combined; in that case a clear link shall be present between serial number and measurement, like adding a column serial nr to the table.
- In case of an accept “NO” reference to the FLG NCR/Concession number is required.
- In case no value can be noted, note N/A and add clarification in remarks column.
- In case a CTE is applicable to multiple locations all locations need to be addressed in the CTE list. Multiple CTE Characteristics in the same B/P zone must all be separately recorded on the measuring report.
- Imperial dimensions are leading; therefore the CTE list should contain at least the imperial values. The addition of extra columns with metric values is permitted for information.

