First Article Inspection (FAI) Report Guide

Supplier Guide SG-0181

Sector Director, Supplier Quality
Northrop Grumman Aeronautics Systems

12/17/2021

FAI Review Guide – Form 1

AS9102 Form 1

FORM 1 - PART NUMBER ACCOUNTABILITY

Sheet ___ of ___

1. Part Number:	**2. Part Name:**	***3. Serial Number:***	***4. FAIR Number:***
5. Part Revision Level:	***6. Drawing Number:***	***7. Drawing Revision Level:***	***8. Additional Changes:***
9. Manufacturing Process Reference:	**10. Organization Name:**	11. Supplier Code:	12. P.O. Number:
13. Detail Part: _____ Assembly FAI: _____	**14. Full FAI: ____ Partial FAI: ____ Baseline Part Number (including revision level):**		
	Reason for Partial FAI:		
a) If above part number is a detail part only, go to field 19. b) If above part number is an assembly, go to the "INDEX" section below.			
INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.			
15. Part Number:	***16. Part Name:***	***17. Part Serial Number:***	***18. FAIR Number:***
19. Signature: ___ FAI Complete ___ FAI Not Complete			**20. Date:**
21. Reviewed By:			22. Date:
23. Customer Approval :			24. Date:

FAI Review Guide – Form 1

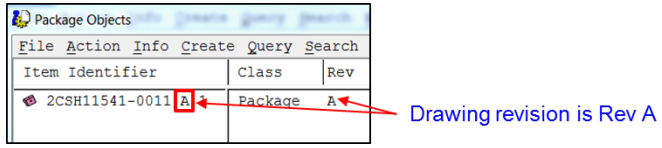
Blue Text denotes required field by AS9102 or NGAS SQAR.
Green Text denotes a conditionally required field
Red Text denotes F-35

FORM 1 - PART NUMBER ACCOUNTABILITY

Input Sheet Numbers
Sheet ___ of ___

1. Part Number: Part Number with dash number P/N is what's listed on PO	**2. Part Name:** Part Name (F-35 in PDM)	***3. Serial Number:*** Input part SN if serialized part. Input N/A if not a serialized part.	***4. FAIR Number:*** Supplier generated number. Should NOT be N/A.
5. Part Revision Level: N/A for F-35	***6. Drawing Number:*** Drawing number with dash number (F-35 in PDM) All other programs use dwg number	***7. Drawing Revision Level:*** BTP revision PDM (F-35). **See note 1** All other programs use Parts List for dwg revision	***8. Additional Changes:*** List changes over and above PO. (i.e. any Dispo 36 RCI's, Change notes or Condition of Supply that impact the FAI. Can be N/A
9. Manufacturing Process Reference: Note Mfg work order with rev, router #, batch, lot, mfg date to ensure traceability of mfg process	**10. Organization Name:** Supplier Name performing the FAI **See note 3**	11. Supplier Code: Vendor number. Should start with 9XXXXXXX **See Note 3**	12. P.O. Number: PO number. Should be NGAS PO number
13. Detail Part: _____ **Assembly FAI: _____** Check one of the types	**14. Full FAI: _____ Partial FAI: _____ See note 2** **Baseline Part Number (including revision level):**		
	Reason for Partial FAI: Complete if partial FAI. Partial FAI may be due to non-conformance identified on the full FAI. Can be N/A if partial FAI is not selected in 14.		

1. Example of the drawing revision



2. For a partial FAI, provide the previous part number, including revision level to which this partial FAI is performed and the reason for the current FAI (e.g., changes in design, process, or manufacturing location). For partial FAIs based on similar parts (reference AS9102, 4.6), provide the approved configuration FAI part number, including revision level.

   Baseline Part Number: For a partial FAI, provide the previous FAI part number or approved configuration (including revision level) to which this partial FAI is performed. State the reason for the current FAI (e.g., changes in design, process, or manufacturing location). For a partial FAI based on similar parts (reference AS9102, 4.6), provide the approved configuration FAI part number, including revision level.

3. Documenting Sub-Tier Supplier FAI
   - Option 1 – NGAS 1st tier to initiate a new Form 1 – 3 with NGAS information and reference 2nd tier FAI
   - Option 2 – If 1st tier is presenting to NGAS 2nd tier, we need the NGAS information annotated in Blocks 10 – 12 and submittal should meet all SQAR requirements

FAI Review Guide – Form 1

Blue Text denotes required field by AS9102 or NGAS SQAR.
Green Text denotes a conditionally required field
Red Text denotes F-35

a) If above part number is a detail part only, go to field 19.
b) If above part number is an assembly, go to the "INDEX" section below.

INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.

15. Part Number:	16. Part Name:	17. Part Serial Number:	18. FAIR Number:
Detail Part Numbers in Assy	Detail Part Names in Assy	Detail part SN in Assy in Assy. If Assy FAI and detail listed does not have a SN – input N/A	FAIR number of detail part in the Assy.
Include Standard parts here.	Std part names in Assy		C of C for Standard parts
			C of C number is required for Std parts for detail parts (F-35)

Mark FAI Complete if all characteristics were **accounted for** and conforming. Otherwise check as FAI not Complete. Digital Signature is acceptable

19. Signature: ___ FAI Complete ___ FAI Not Complete	20. Date: Enter FAI Date
21. Reviewed By: Printed name and signature supplier personnel that reviewed the FAI	22. Date: Enter Date reviewed
23. Customer Approval : Customer Signature and stamp if applicable. Digital Signature is acceptable; N/A if not applicable	24. Date: Enter Date reviewed

Acceptable Scenario's for Customer Approvals of Supplier Sub-Tier FAI's

Scenario 1: NGAS sign and stamp Sub-Tier FAI
Scenario 2: Supplier reviews and approve their sub-tier FAI form. Then for NGAS approval the Supplier fills out Form 1 FAI with N/A's in the boxes. Reference Sub-tier FAI number and attach. NGAS sign and stamp Form 1 FAI.

FAI Review Guide – Form 1

Best Practice for N/A Fields (Boxes 15, 16, 17, 18)

N/A in all boxes

a) If above part number is a detail part only, go to field 19.
b) If above part number is an assembly, go to the "INDEX" section below.

INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.

15. Part Number:	16. Part Name:	17. Part Serial Number:	18. FAIR Number:
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

19. Signature: Mark FAI Complete if all characteristics were conforming. Otherwise check as FAI not Complete ___ FAI Complete ___ FAI Not Complete	20. Date: Enter FAI Date
21. Reviewed By: Printed name and signature supplier personnel that reviewed the FAI	22. Date: Enter Date reviewed
23. Customer Approval : Customer date and stamp if applicable; N/A if not applicable	24. Date: Enter Date reviewed

N/A and arrow down

a) If above part number is a detail part only, go to field 19.
b) If above part number is an assembly, go to the "INDEX" section below.

INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.

15. Part Number:	16. Part Name:	17. Part Serial Number:	18. FAIR Number:
N/A	N/A	N/A	N/A

19. Signature: Mark FAI Complete if all characteristics were conforming. Otherwise check as FAI not Complete ___ FAI Complete ___ FAI Not Complete	20. Date: Enter FAI Date
21. Reviewed By: Printed name and signature supplier personnel that reviewed the FAI	22. Date: Enter Date reviewed
23. Customer Approval : Customer date and stamp if applicable; N/A if not applicable	24. Date: Enter Date reviewed

N/A and diagonal line across

a) If above part number is a detail part only, go to field 19.
b) If above part number is an assembly, go to the "INDEX" section below.

INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.

15. Part Number:	16. Part Name:	17. Part Serial Number:	18. FAIR Number:
N/A	N/A	N/A	N/A

19. Signature: Mark FAI Complete if all characteristics were conforming. Otherwise check as FAI not Complete ___ FAI Complete ___ FAI Not Complete	20. Date: Enter FAI Date
21. Reviewed By: Printed name and signature supplier personnel that reviewed the FAI	22. Date: Enter Date reviewed
23. Customer Approval : Customer Signature and stamp if applicable. Digital Signature is acceptable; N/A if not applicable	24. Date: Enter Date reviewed

FAI Review Guide – Form 2

AS9102 Form 2

FORM 2 - PRODUCT ACCOUNTABILITY - MATERIALS, SPECIAL PROCESSES, AND FUNCTIONAL TESTING

Sheet ___ of ___

1. Part Number:	2. Part Name:		3. Serial Number:		4. FAIR Number:
5. Material or Process Name:	6. Specification Number:	7. Code:	8. Supplier:	9. Customer Approval Verification:	10. Certificate of Conformance Number:

11. Functional Test Procedure Number:	12. Acceptance Report Number:

13. Comments

14. Signature	15. Date

FAI Review Guide – Form 2

FORM 2 - PRODUCT ACCOUNTABILITY - MATERIALS, SPECIAL PROCESSES, AND FUNCTIONAL TESTING

Input Sheet Numbers
Sheet ____ of ____

1. Part Number: Part Number with dash number	2. Part Name: Part Name (F-35 in PDM)		3. Serial Number: Input part SN if serialized part. Input N/A if not a serialized part.		4. FAIR Number: Supplier generated number Should NOT be N/A.
5. Material or Process Name:	6. Specification Number:	7. Code:	8. Supplier:	9. Customer Approval Verification:	10. Certificate of Conformance Number:
Material Call out **See Note 3**	(F-35 LMT – XXX)	May be N/A. **See note 7** (EMAP Code)	Material supplier name and address	(F-35 Always yes) **See Note 5**	Input C of C number for material
Special Processes used **See Note 4**	(F-35 LMA – XXXXX) **See Note 8**	May be N/A but should not be left blank	Special processor name and address if outsourced. May be N/A if performed in house but not left blank	(F-35 Always yes) **See Note 6**	Input C of C number if special process was outsourced. Otherwise N/A

3. List all materials used – paint, primer, sealants, raw metallic material, etc. Include standard hardware if modified.
4. Input any special processes used. Note that touch up is considered a special process as well.
5. All F-35 materials must be on the Lockheed Martin approved materials list – EMAP
6. All F-35 special process suppliers must be on the NGAS ASPL or LM QCS-001 approved special process listings
7. Code: Any required code from the customer for material or process listing, as applicable.
8. Per AS9102 for Special process specifications ensure including class if applicable, and permitted substitutions

Blue Text denotes required field by AS9102 or NGAS SQAR.
Green Text denotes a conditionally required field
Red Text denotes F-35

FAI Review Guide – Form 2

Form 2 – Product Accountability (continued)

11. *Functional Test Procedure Number:*	12. *Acceptance Report Number:*
Input Test Procedure number and rev or release date for functional equipment. See note 9 Input N/A for hardware.	Input Acceptance Test Report number used for test with revision or release date. Input N/A if not applicable.
13. Comments Input N/A if no comments	
14. Signature Printed name and signature of person who completed the form – must be filled in.	**15. Date** Date signed– must be filled in.

9. For Seller-designed items requiring Qualification Testing, the FAI shall remain open until Qualification Testing is completed; Form 1 Block 19 to reflect FAI "Not Complete".

Blue Text denotes required field. Per NGAS SQAR all fields on form 2 are required to be completed.

FAI Review Guide – Form 3

AS9102 Form 3

1. Part Number				2. Part Name			3. Serial Number	4. FAIR Number
Characteristic Accountability				Inspection / Test Results				
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designed / Qualified Tooling	11. Nonconformance Number	14. Additional Data / Comments	
12. Signature							13. Date	

FORM 3 - CHARACTERISTIC ACCOUNTABILITY, VERIFICATION, AND COMPATIBILITY EVALUATION

FAI Review Guide – Form 3

FORM 3 - CHARACTERISTIC ACCOUN

1. Part Number Part Number				2. Part Name Part Name			3. Serial Number Input part SN if serialized part. Can be N/A	4. FAIR Number Supplier generated number. Can be N/A.
Characteristic Accountability				Inspection / Test Results				
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designed / Qualified Tooling	11. Nonconformance Number	14. Additional Data / Comments	
5	6	7	8					

5. Char No – Unique assigned number for each characteristic. Can be drawing note number or number assigned to a bubble drawing requirement.

6. Reference location – location of unique characteristic for example, “notes list”, “page x”, “CATIA Model”.

7. Character Designator – If applicable, record characteristic type [e.g., critical items (see AS9100 clause 3.3), key characteristics (see AS9100 clause 3.4), flight safety, defined by customer].

8. Requirement: Specified requirement for the design characteristic (e.g., drawing or DPD dimensional characteristic with associated nominal dimension and tolerances, drawing notes, specification requirements).

NOTE: The organization shall record the requirements in the units specified on the drawing, DPD, or specification, unless otherwise approved by the customer.

NOTE: Per AS9102 FAQ – The company’s FAI procedure should detail how they are accounting for each design characteristic.

Blue Text denotes required field by AS9102 or NGAS SQAR.
Green Text denotes a conditionally required field

FAI Review Guide – Form 3

Characteristic Accountability				Inspection / Test Results			
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designed / Qualified Tooling	11. Nonconformance Number	14. Additional Data / Comments
				9			

9. Results: List actual measurement(s) or maximum and minimum characteristic value for a characteristic that has a tolerance range for the design characteristics from both the design specifications and process specifications as required per SQAR

   NOTE: The organization shall record the results in the units specified on the drawing, DPD, or specification, unless otherwise approved by the customer.

   NOTE: Per AS9102 FAQ: You may use any technique that provides traceability from the engineering to the FAI report.

   - For multiple characteristics,
     - Option 1: List each characteristic as individual values.
     - Option 2: For characteristics with the same dimension list once with the min/max of measured value. The quantity needs to be listed. (i.e. 0.120 – 0.125 dia. (3X)).
   - If a characteristic is found to be nonconforming, then that characteristic shall be listed separately with the measured value noted.
   - When qualified tooling (e.g., radius gauges) is used as a go/no-go gauge record the results as an attribute (e.g., pass / fail).
   - When automated inspection tooling produces measurement results, those results may be referenced Form 3, identified as pass/fail, and attached only when:
     - The characteristic numbers are clearly linked in the attached report; if different Char with number, reference applicable results Characteristic.. The results in the attached reports are clearly traceable to the characteristic numbers.
     - The results are directly comparable to the design characteristic.

Blue Text denotes required field. Per NGAS SQAR all fields on form 2 are required to be completed.

FAI Review Guide – Form 3

Characteristic Accountability				Inspection / Test Results			
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designed / Qualified Tooling	11. Nonconformance Number	14. Additional Data / Comments
				9 Continued			

NOTE: Coordinate Measurement Machine (CMM) data alone would not be acceptable for a positional tolerance; the results shall show the actual positional value.

- If a design requirement requires verification testing, record the actual results on the form. If a laboratory report or certificate of test is included in the FAIR, the results may be recorded as an attribute (e.g., pass / fail) and the test reference number recorded on the forms. The laboratory report or certificate of test shall show specific values for requirements and actual results.
- For characteristics with visual verification requirements that are rated against standard photographs, list the photo number of the closest comparison. A statement of conformance is acceptable; record the reference number on the forms.
- For processes that require verification per design characteristics, include a statement of conformance (e.g., certification of conformance, verification indicator - accept).
- For characteristics verified by attribute inspection include statement of conformance (e.g., accept).

SQAR Note: SELLER SHALL INCLUDE, ON FORM 3, VERIFICATION OF ALL MEASURABLE FEATURES/CHARACTERISTIC REQUIREMENTS OUTLINED IN ALL SPECIFICATIONS (E.G. FINISH THICKNESS, AUTOCLAVE CURE CYCLE REQUIREMENTS, NDT RESULTS – CONDUCTIVITY, SEALANT FILLETS, FASTENER TORQUE, FASTENER FLUSHNESS AND ELECTRICAL BOND, ETC.).

Blue Text denotes required field. Per NGAS SQAR all fields on form 2 are required to be completed.

FAI Review Guide – Form 3

Characteristic Accountability				Inspection / Test Results			
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designed / Qualified Tooling	11. Nonconformance Number	14. Additional Data / Comments
					10	11	14

10. Designed / Qualified Tooling
    - When design tooling or specially designed tooling, including NC programming (input NC Tape number and revision) as a media of inspection, is used for attribute acceptance of the characteristic, record the tool identification number. When qualified tooling is used for attribute acceptance, record the gauge value or range (e.g., minimum/maximum value), as applicable. This includes mylars or go / no-gages.
    - If characteristic is visual Inspection (i.e. part marking) you *may* mark as "Visual" in box 10.
    - Include Qualified Tooling for variable measurements used (e.g. Calipers)

Note: From AS9102 FAQ

B2. Question:

- After an initial FAI is complete, is a supplier required to complete partial FAI's when inspection frequency and methods are changed?

B2. Response:

- FAI (Complete/Partial) would be required for the changed inspection when the tool listed on Form 3 field 10 is changed.

11. Non-Conformance Number - If the characteristic is found to be nonconforming, record a nonconformance document reference number. Use N/A if there wasn't a non-conformances identified.

14. Additional Data / Comments – Input N/A if no additional data or comments are to be entered.

Blue Text denotes required field by AS9102 or NGAS SQAR.

FAI Review Guide – Form 3

FORM 3 - CHARACTERISTIC ACCOUNTABILITY, VERIFICATION, AND COMPATIBILITY EVALUATION

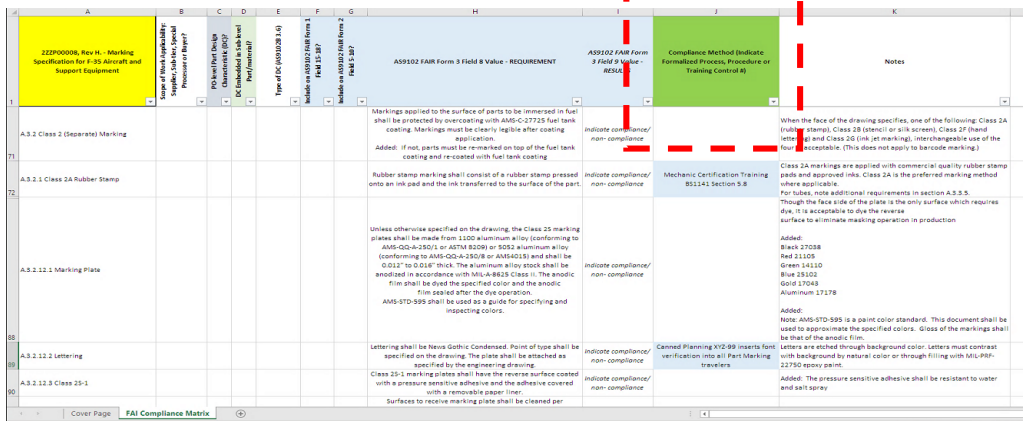
1. Part Number				2. Part Name			3. Serial Number	4. FAIR Number
Characteristic Accountability				Inspection / Test Results				
5. Char. No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designed / Qualified Tooling	11. Nonconformance Number	14. Additional Data / Comments	
12. Signature Printed name and signature of person who completed the form – must be filled in.							13. Date Date signed– must be filled in.	

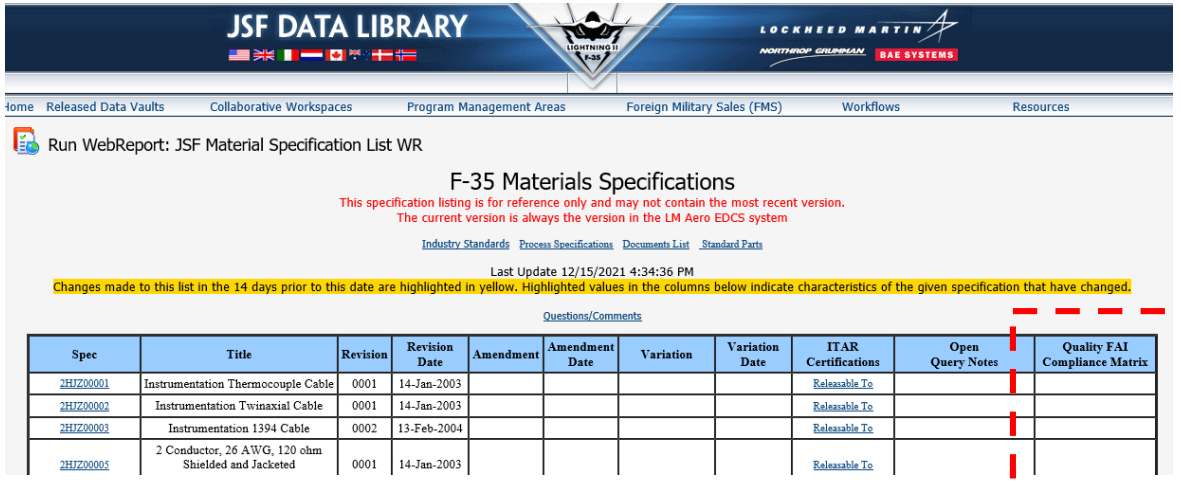
Blue Text denotes required field by AS9102 or NGAS SQAR.

F-35 Characteristic Accountability Tool – First Article Inspection (FAI) Compliance Matrix

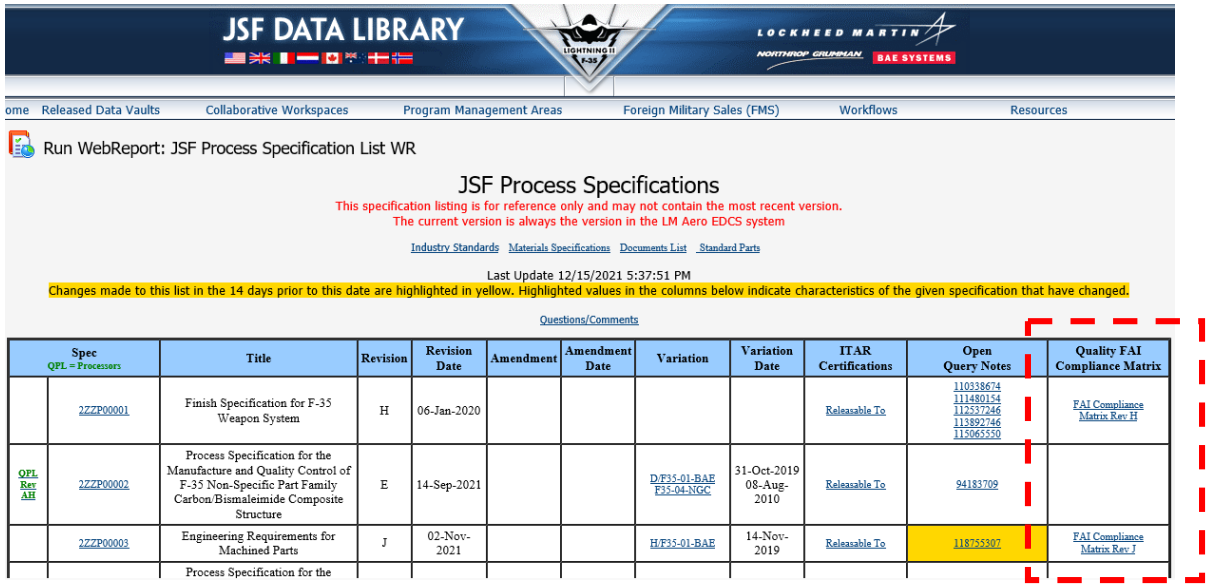
Available on JSF Data Library where the Customer's Specifications are located

- New Tool and approach can be used as a guide to assist with ensuring verification and accountability to all Customer's Raw Material and Process Specifications measurable features
- Concept can be applied to other Standards and Specifications
- FAI Compliance Matrix outlines measurable features to be captured on Form 3





Spec	Title	Revision	Revision Date	Amendment	Amendment Date	Variation	Variation Date	ITAR Certifications	Open Query Notes	Quality FAI Compliance Matrix
2HJZ00001	Instrumentation Thermocouple Cable	0001	14-Jan-2003					Releasable To		
2HJZ00002	Instrumentation Twinaxial Cable	0001	14-Jan-2003					Releasable To		
2HJZ00003	Instrumentation 1394 Cable	0002	13-Feb-2004					Releasable To		
2HJZ00005	2 Conductor, 26 AWG, 120 ohm Shielded and Jacketed	0001	14-Jan-2003					Releasable To		



Spec QPL = Processors		Title	Revision	Revision Date	Amendment	Amendment Date	Variation	Variation Date	ITAR Certifications	Open Query Notes	Quality FAI Compliance Matrix
	2ZZP00001	Finish Specification for F-35 Weapon System	H	06-Jan-2020					Releasable To	110338674 111480154 112537246 113892746 115065550	FAI Compliance Matrix Rev H
QPL Rev AH	2ZZP00002	Process Specification for the Manufacture and Quality Control of F-35 Non-Specific Part Family Carbon/Bismaleimide Composite Structure	E	14-Sep-2021			D/F35-01-BAE F35-04-NGC	31-Oct-2019 08-Aug-2010	Releasable To	94183709	
	2ZZP00003	Engineering Requirements for Machined Parts	J	02-Nov-2021			H/F35-01-BAE	14-Nov-2019	Releasable To	118755307	FAI Compliance Matrix Rev J
		Process Specification for the									

Ballooned Drawing

- AS9102: "Verify that every design characteristic requirement is accounted for, uniquely identified and has inspection results traceable to each unique identifier".
- A ballooned drawing is used to ensure traceability for the characteristics of a FAI Report to support Box 5 of Form 3
- Balloon and number all dimensions and Drawing Notes
- Balloon lower specification measureable requirements, as applicable.

Ballooning Example - SCD

SAE AS9102 First Article Inspection (Rev. B)

Form 3: Characteristic Accountability, Verification, and Compatibility Evaluation — Sheet 1 of 1 — Shock Tech

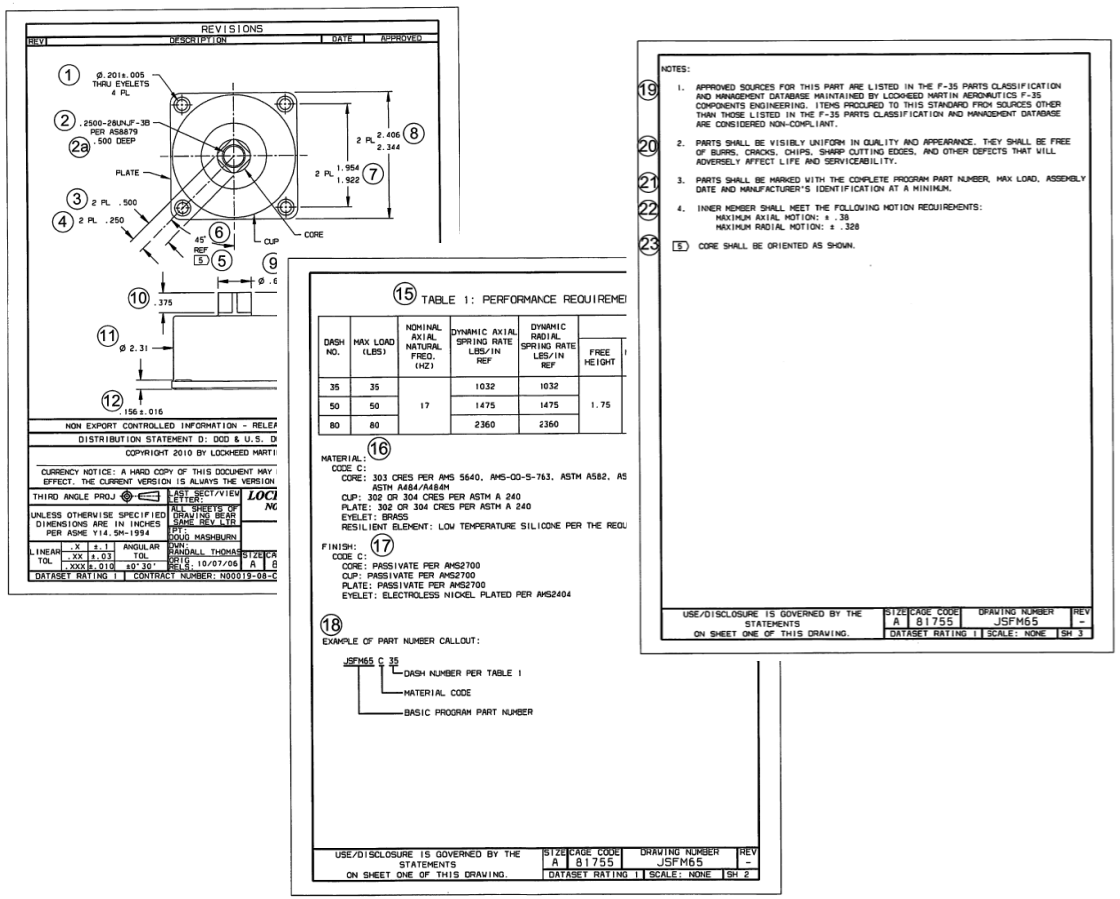
1. Part Number	2. Part Name	3. Serial Number	4. FAI Report
JSFM65C35	Mount, Shock, Cup	N/A	71102-C35

Characteristic Accountability					Inspection / Test Results					
5. Char. Num.	6. Reference Location	7. Characteristic Designator	8. Requirement		9. Results	Accept	Reject	10.Designed Tooling/Gauges	11. Non-Conformance Number	14. Comments Related To This Requirement Or Result
1	Sht. 1 of 3	N/A	ø .201 Thru Eyelets 4 PL	± .005	.196	✓		Pin Gage STI 0131	N/A	N/A
2	Sht. 1 of 3	N/A	.2500-28UNJF-3B per AS8879		Accept	✓		Thread Gage STI 0589	N/A	N/A
2a	Sht. 1 of 3	N/A	.500 Deep		> .500	✓			N/A	N/A
3	Sht. 1 of 3	N/A	.500 2 PL	± .010	.500, .502	✓		6" Caliper STI 0556	N/A	N/A
4	Sht. 1 of 3	N/A	.250 2 PL	± .010	.252 x2	✓		6" Caliper STI 0556	N/A	N/A
5	Sht. 1 of 3	N/A	Flag Note 5		Accept orientation	✓		Visual / Assy.	N/A	N/A
6	Sht. 1 of 3	N/A	45°	Reference	Assembled at 45°	✓		Assembly Fixture	N/A	N/A
7	Sht. 1 of 3	N/A	1.922 - 1.954 2 PL	Range	1.940, 1.941	✓		6" Caliper STI 0556	N/A	N/A
8	Sht. 1 of 3	N/A	2.344 - 2.406 2 PL	Range	2.383, 2.386	✓		12" Caliper STI 0342	N/A	N/A
9	Sht. 1 of 3	N/A	ø .600	+.000, -.005	.597	✓		6" Caliper STI 0556	N/A	N/A
10	Sht. 1 of 3	N/A	.375	± .010	.375	✓		6" Caliper STI 0556	N/A	N/A
11	Sht. 1 of 3	N/A	ø 2.31	± .03	2.304	✓		12" Caliper STI 0342	N/A	N/A
12	Sht. 1 of 3	N/A	.156	± .016	.144	✓		6" Caliper STI 0556	N/A	N/A
13	Sht. 1 of 3	N/A	1.219	± .016	1.235	✓		Ht. Gage STI 0551	N/A	N/A
14	Sht. 1 of 3	N/A	H Free Height: 1.75 Max Height Extended: 2.07 Min Height Compressed: 1.38		1.774	✓		Ht. Gage STI 0551	N/A	N/A
15	Sht. 2 of 3	N/A	TABLE 1: Performance Requirements (Reference Drawing No. JSFM65)		Accept (See Test Data)	✓		Test Data	N/A	N/A
16	Sht. 2 of 3	N/A	Material: Code C: Core: 303 CRES per AMS 5640, AMS-QQ-S-763, ASTM A582, ASTM A240 or ASTM A484/A484M Cup: 302 or 304 CRES per ASTM A 240 Plate: 302 or 304 CRES per ASTM A 240 Eyelet: Brass Resilient Element: Low Temperature Silicone per the requirements in Table I		Accept: Core, Cup, Plate, Eyelet, & Silicone	✓		Certification: Reference Form 2	N/A	N/A
17	Sht. 2 of 3	N/A	Finish: Code C: Core, Cup, Plate: Passivate per AMS2700 Eyelet: Electroless Nickel Plated per AMS2404		Accept: Core, Cup, Plate, Eyelet	✓		Certification: Reference Form 2	N/A	N/A
18	Sht. 2 of 3	N/A	JSFM65 C 35 DASH NUMBER PER TABLE I MATERIAL CODE BASIC PROGRAM PART NUMBER		Accept: JSFM65 C 35	✓		N/A	N/A	N/A
19	Sht. 3 of 3	N/A	Note 1. Approved Sources for this part are listed in the F-35 parts classification and management database maintained by Lockheed Martin Aeronautics F-35 components engineering. Items procured to this standard from sources other than those listed in the F-35 parts classification and management database are considered non-compliant.		Accept	✓			N/A	N/A
20	Sht. 3 of 3	N/A	Note 2. Parts shall be visibly uniform in quality and appearance. They shall be free of burrs, cracks, chips, sharp cutting edges, and other defects that will adversely affect life and serviceability.		Accept	✓		Visual	N/A	N/A
21	Sht. 3 of 3	N/A	Note 3. Parts shall be marked with the complete program part number, max load, assembly date and manufacturer's identification at a minimum.		JSFM65 C 35 MAXLOAD 35LBS MFR-ELRN7 03/18	✓		Visual	N/A	N/A
22	Sht. 3 of 3	N/A	Note 4. Inner member shall meet the following motion requirements: Maximum Axial Motion: ± .38 Maximum Radial Motion: ± .328		Accept	✓		N/A	N/A	N/A
23	Sht. 3 of 3	N/A	Note: Flag Note 5. Core shall be oriented as shown.		Accept orientation	✓		Visual / Assy.	N/A	N/A

Signature indicates that all characteristics are accounted for, meet drawing requirements or are properly documented for disposition.

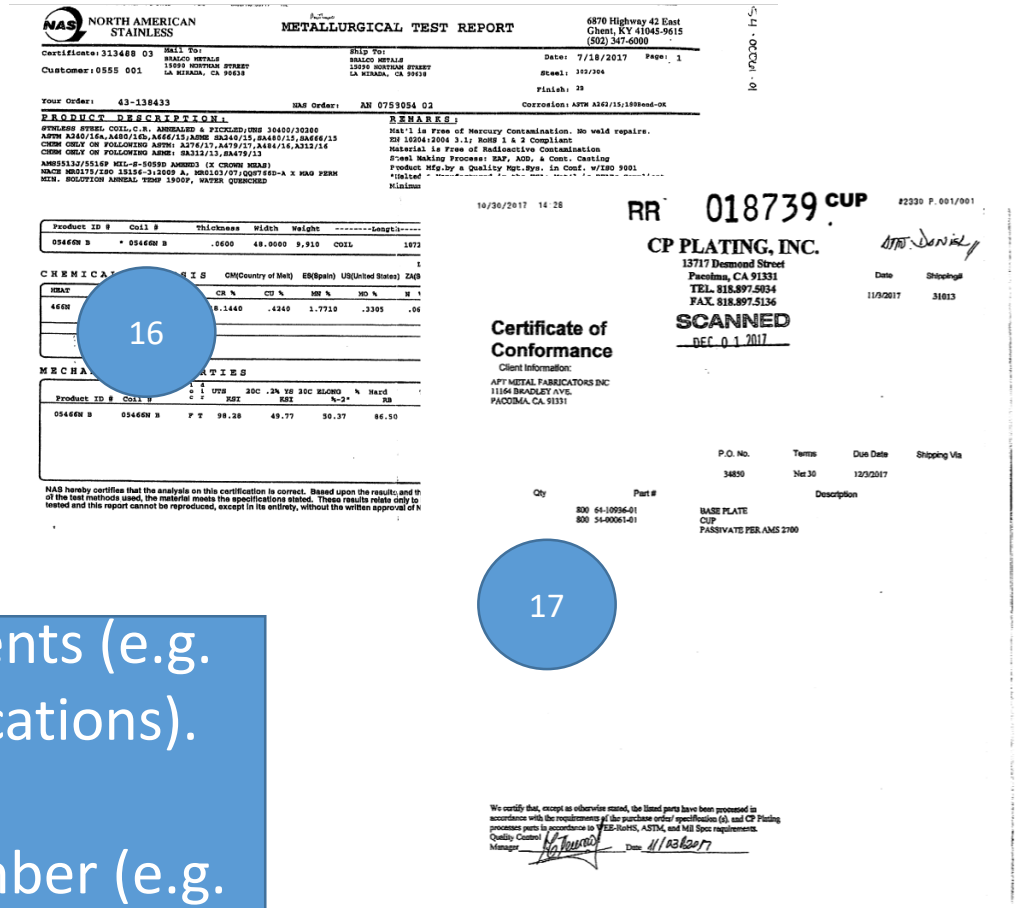
12. Prepared By: Michelle Escobar — 13. Date: 3/26/2018

(Rev. 2/13)



Ballooning Example – Traceability

			(Reference Drawing No. JSFM65)	(See Test Data)				
16	Sht. 2 of 3	N/A	Material: Code C Core: 300 CRES per AMS 5640, AMS-QQ-S-763, ASTM A582, ASTM A240 or ASTM A484/A484M Cup: 302 or 304 CRES per ASTM A 240 Plate: 302 or 304 CRES per ASTM A 240 Eyelet: Brass Resilient Element: Low Temperature Silicone per the requirements in Table I	Accept: Core, Cup, Plate, Eyelet, & Silicone	✓	Certification: Reference Form 2	N/A	N/A
17	Sht. 2 of 3	N/A	Finish: Code C Core, Cup, Plate: Passivate per AMS2700 Eyelet: Electroless Nickel Plated per AMS2404	Accept: Core, Cup, Plate, Eyelet	✓	Certification: Reference Form 2	N/A	N/A



If on Form 3, Balloon additional documents (e.g. CMM, Bench Inspection Report, Certifications).

As a minimum reference Document Number (e.g. Certification Number 12345)

Ballooning – Model Interrogation and Traceability

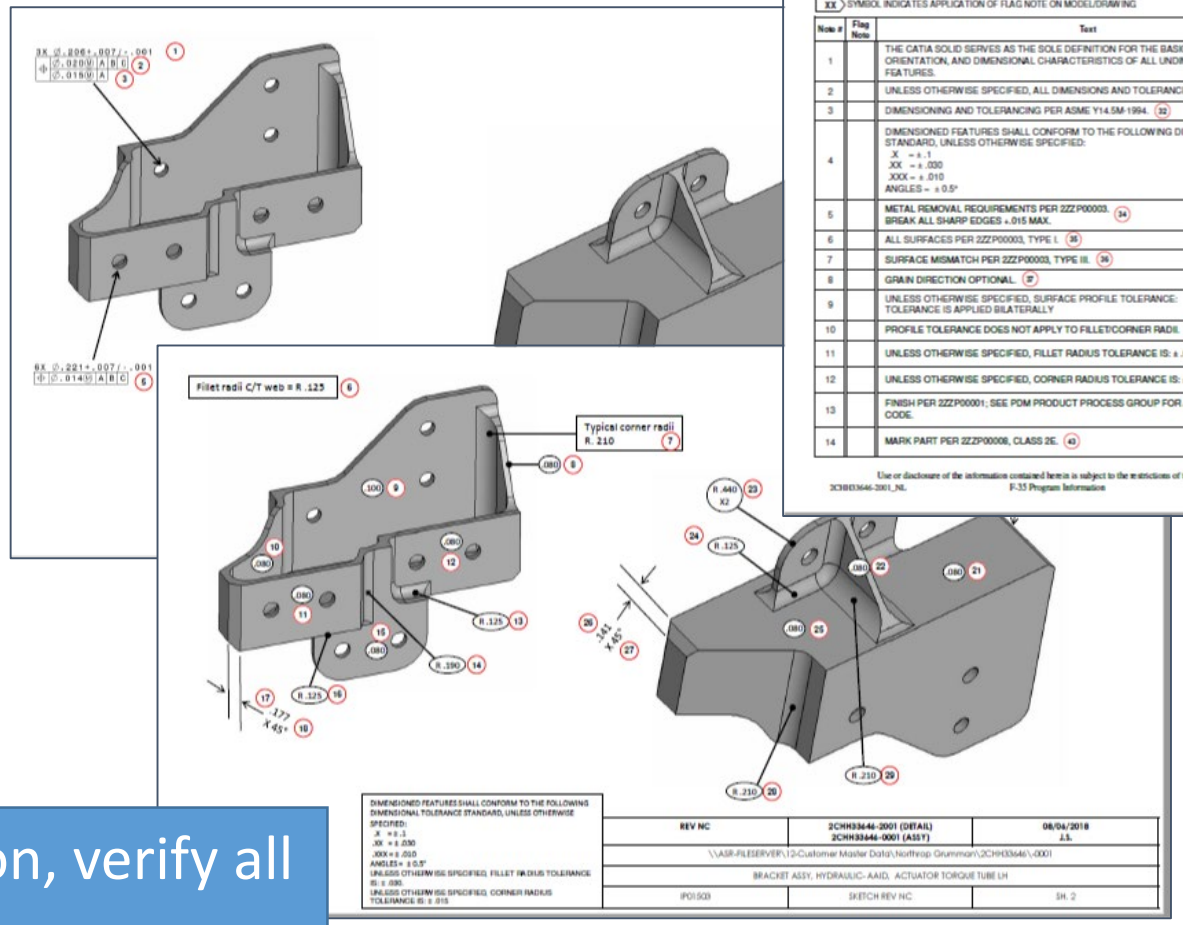
NORTHROP GRUMMAN

ATHENS, GA

1. Part Number				2. Part Name			3. Serial Number	4. FAIR Number
2CHH33646-2002				BRACKET, HYDRAULIC- AAID, ACTUATOR TORQUE TUBE			N/A	44535/R02
5. Char No.	6. Reference Location	7. Char. Desig.	8a. Count	8b. Requirement	9. Results	10. Designated Tooling	11. NCR Number	14a. Calibrated Tooling ID	14b. Comments / CMM Labels
21	2CHH33646-0001 pg.2	N/A	1	Thickness (.080 +/- .010 in)	.085	CALIPER	N/A	00496	N/A
22	2CHH33646-0001 pg.2	N/A	1	Thickness (.080 +/- .010 in)	.081	CALIPER	N/A	00496	N/A
23	2CHH33646-0001 pg.2	N/A	2	Radius (.440 +/- .030 in)	.440	RADIUS GAGE	N/A	N/A	N/A
24	2CHH33646-0001 pg.2	N/A	1	Radius (.125 +/- .030 in)	.120	RADIUS GAGE	N/A	N/A	N/A
25	2CHH33646-0001 pg.2	N/A	1	Thickness (.080 +/- .010 in)	.072-.084	CALIPER	N/A	00496	N/A
26	2CHH33646-0001 pg.2	N/A	1	Length (.141 +/- .010 in)	.150	CALIPER	N/A	00496	N/A
27	2CHH33646-0001 pg.2	N/A	1	Angle (.45 +/- .5 deg)	45°	ANGLE GAGE	N/A	N/A	N/A
28	2CHH33646-0001 pg.2	N/A	1	Radius (.210 +/- .030 in)	.210	RADIUS GAGE	N/A	N/A	N/A
29	2CHH33646-0001 pg.2	N/A	1	Radius (R.210 +/- .030 in)	.210	RADIUS GAGE	N/A	N/A	N/A
30	NOTES LIST (DETAIL) pg.2	N/A	1	Note (1. THE CATIA SOLID SERVES AS THE SOLE DEFINITION FOR THE BASIC FORM, LOCATION, ORIENTATION, AND DIMENSIONAL CHARACTERISTICS OF ALL UNDIMENSIONED PART FEATURES.)	CONFIRM	N/A	N/A	N/A	N/A
31	NOTES LIST (DETAIL) pg.2	N/A	1	Note (2. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS AND TOLERANCES ARE IN INCHES.)	CONFORMS	N/A	N/A	N/A	N/A
32	NOTES LIST (DETAIL) pg.2	N/A	1	Note (3. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.)	CONFORMS	N/A	N/A	N/A	N/A
33	NOTES LIST (DETAIL) pg.2	N/A	1	Note (4. DIMENSIONED FEATURES SHALL CONFORM TO THE FOLLOWING DIMENSIONAL TOLERANCE STANDARD, UNLESS OTHERWISE SPECIFIED: .X = +/- .1 .XX = +/- .030 .XXX = +/- .010 ANGLES = +/- 0.5°)	CONFIRM	N/A	N/A	N/A	N/A
34	NOTES LIST (DETAIL) pg.2	N/A	1	Note (5. METAL REMOVAL REQUIREMENTS PER 2ZZP00003. BREAK ALL SHARP EDGES +.015 MAX.)	CONFORMS	N/A	N/A	N/A	N/A
35	NOTES LIST (DETAIL) pg.2	N/A	1	Note (6. ALL SURFACES PER 2ZZP00003, TYPE I.)	Ra 125	PROFILOMETER	N/A	00308	N/A
36	NOTES LIST (DETAIL) pg.2	N/A	1	Note (7. SURFACE MISMATCH PER 2ZZP00003, TYPE III.)	.003	DIAL INDICATOR	N/A	00971E	N/A

ATHENS, GA

1. Part Number				2. Part Name			3. Serial Number	4. FAIR Number
2CHH33646-2002				BRACKET, HYDRAULIC- AAID, ACTUATOR TORQUE TUBE			N/A	44535/R02
5. Char No.	6. Reference Location	7. Char. Desig.	8a. Count	8b. Requirement	9. Results	10. Designated Tooling	11. NCR Number	14a. Calibrated Tooling ID	14b. Comments / CMM Labels
1	2CHH33646-0001 pg.1	N/A	1	Diameter (.206 +.007 / -.001 in)	Ø .2060 - .2055	CMM	N/A	ID003294	CIR7-9
2	2CHH33646-0001 pg.1	N/A	1	⌖ Ø.020 Ⓜ A B C	.0054 - .0056	CMM	N/A	ID003294	CIR7-9
3	2CHH33646-0001 pg.1	N/A	1	⌖ Ø.015 Ⓜ A	.0040 - .0048	CMM	N/A	ID003294	CIR7-9
4	2CHH33646-0001 pg.1	N/A	6	Diameter (.221 +.007 / -.001 in)	Ø .2208 - .2210	CMM	N/A	ID003294	CIR1-6
5	2CHH33646-0001 pg.1	N/A	1	⌖ Ø.014 Ⓜ A B C	.0030 - .0055	CMM	N/A	ID003294	CIR1-6
6	2CHH33646-0001 pg.2	N/A	1	Radius (.125 +/- .030 in)	.125	RADIUS GAGE	N/A	N/A	N/A
7	2CHH33646-0001 pg.2	N/A	1	Radius (R.210 +/- .015 in)	.210	RADIUS GAGE	N/A	N/A	N/A
8	2CHH33646-0001 pg.2	N/A	1	Thickness (.080 +/- .010 in)	.087	CALIPER	N/A	00496	N/A
9	2CHH33646-0001 pg.2	N/A	1	Thickness (.100 +/- .010 in)	.102-.107	CALIPER	N/A	00496	N/A
10	2CHH33646-0001 pg.2	N/A	1	Thickness (.080 +/- .010 in)	.087-.089	CALIPER	N/A	00496	N/A
11	2CHH33646-0001 pg.2	N/A	1	Thickness (.080 +/- .010 in)	.075-.085	CALIPER	N/A	00496	N/A
12	2CHH33646-0001 pg.2	N/A	1	Thickness (.080 +/- .010 in)	.084-.087	CALIPER	N/A	00496	N/A
13	2CHH33646-0001 pg.2	N/A	1	Radius (.125 +/- .030 in)	.120	RADIUS GAGE	N/A	N/A	N/A



F-35 Program Information
EXPORT CONTROLLED INFORMATION
Page 2 of 3

SEPARATE NOTES LIST
CAGE CODE: 76823

ASSOCIATED PART NUMBER	ASSOCIATED DRAWING/MODEL TITLE	Notes Rev.	Rev. Author
2CHH33646-2001	BRACKET, HYDR - AAI DOOR, TORQUE TUBE CLAMP	NC	CO-020001-0205, CO-020001-0005

XX SYMBOL INDICATES APPLICATION OF FLAG NOTE ON MODEL/DRAWING

Note #	Flag Note	Text
1		THE CATIA SOLID SERVES AS THE SOLE DEFINITION FOR THE BASIC FORM, LOCATION, ORIENTATION, AND DIMENSIONAL CHARACTERISTICS OF ALL UNDIMENSIONED PART FEATURES. 30
2		UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS AND TOLERANCES ARE IN INCHES. 31
3		DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994. 32
4		DIMENSIONED FEATURES SHALL CONFORM TO THE FOLLOWING DIMENSIONAL TOLERANCE STANDARD, UNLESS OTHERWISE SPECIFIED: .X = ± .1 .XX = ± .030 .XXX = ± .010 ANGLES = ± 0.5° 33
5		METAL REMOVAL REQUIREMENTS PER 2ZZP00003. BREAK ALL SHARP EDGES +.015 MAX. 34
6		ALL SURFACES PER 2ZZP00003, TYPE I. 35
7		SURFACE MISMATCH PER 2ZZP00003, TYPE III. 36
8		GRAIN DIRECTION OPTIONAL. 37
9		UNLESS OTHERWISE SPECIFIED, SURFACE PROFILE TOLERANCE: ⌓ .020 A B C TOLERANCE IS APPLIED BILATERALLY 38
10		PROFILE TOLERANCE DOES NOT APPLY TO FILLET/CORNER RADII. 39
11		UNLESS OTHERWISE SPECIFIED, FILLET RADIUS TOLERANCE IS: ± .030. 40
12		UNLESS OTHERWISE SPECIFIED, CORNER RADIUS TOLERANCE IS: ± .015. 41
13		FINISH PER 2ZZP00001; SEE PDM PRODUCT PROCESS GROUP FOR APPLICABLE FINISH CODE. 42
14		MARK PART PER 2ZZP00008, CLASS 2E. 43

Use or disclosure of the information contained herein is subject to the restrictions of the Cover Page
2CHH33646-2001_NL F-35 Program Information Printed: 9/20/2018

In addition to Engineering annotation, verify all features/characteristics

Ballooning – Traceability

ATHENS, GA

1. Part Number					2. Part Name			3. Serial Number	4. FAIR Number
2CHH33646-2002					BRACKET, HYDRAULIC- AAID, ACTUATOR TORQUE TUBE			N/A	44535/R02
5. Char No.	6. Reference Location	7. Char. Desig.	8a. Count	8b. Requirement	9. Results	10. Designated Tooling	11. NCR Number	14a. Calibrated Tooling ID	14b. Comments / CMM Labels
37	NOTES LIST (DETAIL) pg 2	N/A	1	Note (8. GRAIN DIRECTION OPTIONAL.)	CONFIRM	N/A	N/A	N/A	N/A
38	NOTES LIST (DETAIL) pg 2	N/A	1	Note (9. UNLESS OTHERWISE SPECIFIED, SURFACE PROFILE TOLERANCE: ⌓ .020 A B C TOLERANCE IS APPLIED BILATERALLY)	.0143	CMM	N/A	ID003293	SCN1
39	NOTES LIST (DETAIL) pg 2	N/A	1	Note (10. PROFILE TOLERANCE DOES NOT APPLY TO FILLET/CORNER RADII.)	CONFORMS	N/A	N/A	N/A	N/A
40	NOTES LIST (DETAIL) pg 2	N/A	1	Note (11. UNLESS OTHERWISE SPECIFIED, FILLET RADIUS TOLERANCE IS: +/- .030.)	CONFIRM	N/A	N/A	N/A	N/A
41	NOTES LIST (DETAIL) pg 2	N/A	1	Note (12. UNLESS OTHERWISE SPECIFIED, CORNER RADIUS TOLERANCE IS: +/- .015.)	CONFORMS	N/A	N/A	N/A	N/A
42	NOTES LIST (DETAIL) pg 2	N/A	1	Note (13. FINISH PER 2ZZP00001; SEE PDM PRODUCT PROCESS GROUP FOR APPLICABLE FINISH CODE.)	Primer Thickness: 1.8mils Topcoat Thickness: 2.1mils	N/A	N/A	N/A	SEE PROCESSING CERT
43	NOTES LIST (DETAIL) pg 2	N/A	1	Note (14. MARK PART PER 2ZZP00008, CLASS 2E.)	CONFORMS	N/A	N/A	N/A	N/A
44	NOTES LIST (DETAIL) pg.3	N/A	1	Note (15. VERIFY MATERIAL CONDITION PER LMA-PC009.)	CONDUCTIVITY: 39.46-40.65 HARDNESS: 85.2- 87.5	CONDUCTIVITY METER/ HARDNESS TESTER	N/A	00019/ 00054	POST MACHINING
45	NOTES LIST	N/A	1	Note (16. PENETRANT INSPECT PER LMA-PC201. ACCEPTANCE CRITERIA PER LMA-	CONFORMS	N/A	N/A	N/A	SEE PROCESSING

If on Form 3, Balloon additional documents (e.g. CMM, Bench Inspection Report, Certifications).

As a minimum reference Document Number (e.g. Certification Number 12345)

Packing Slip No. 75932

Chromic Acid Type 1B, Class 1, per MIL-A-8625 F AMD 1.
This operation follows PPC-SOP-721, MIL-A-8625F per LMA 2ZZP00001F
Were close tolerances masked/plugged per customer's purchase order (if required)?
Circle One
YES/NO/(NA)

PARTS SEALED: If parts get painted then don't seal them.

FINAL PART PH: 7

COMPLETION TIMES STAMP:
9:04 PM

LOCKHEED ABRASIVE CLEANING — 1-21-19

Abrasive Clean per 2ZZP00001F

240B - PJ013E Chem-Film Class 3 T — 1-21-19

Brush Chemical Film, Chromate Conversion Coating, Low Electrical Resistance per MIL-DTL-5541F CL 3 and LMA-PJ013E, Process Code 240B and LMA Specification 2ZZP00001F

EBG OR GAB17G MASKING — 1-22-19

EBG Mask per Drawing and GAMPS 2605 F, GAMPS 6113 A, GAB17G J,and per PS430400F, also meets specification 2ZZP00001F

LMA-MR003F Water base Primer — 1-22-19

This operation covers the application of Water Born Epoxy primer LMA-MR003F Type #2, Class 2, Grade A, per LMA PJ264A, 2ZZP00001 REV F

42

Base Lot#: 116937
Catayst Lot#: 116938
Thickness: 1.8
Expiration Date: 3/19

(APPLIED 2 COATS):
(YES) OR NO

MIL-PRF-85285 TY1 CLH, Polyureth — 1-22-19

Polyurethane, Semi Gloss, White 17925, MIL-PRF-85285 Rev E per LMA PJ264A. Meets specification 2ZZP00001 REV F

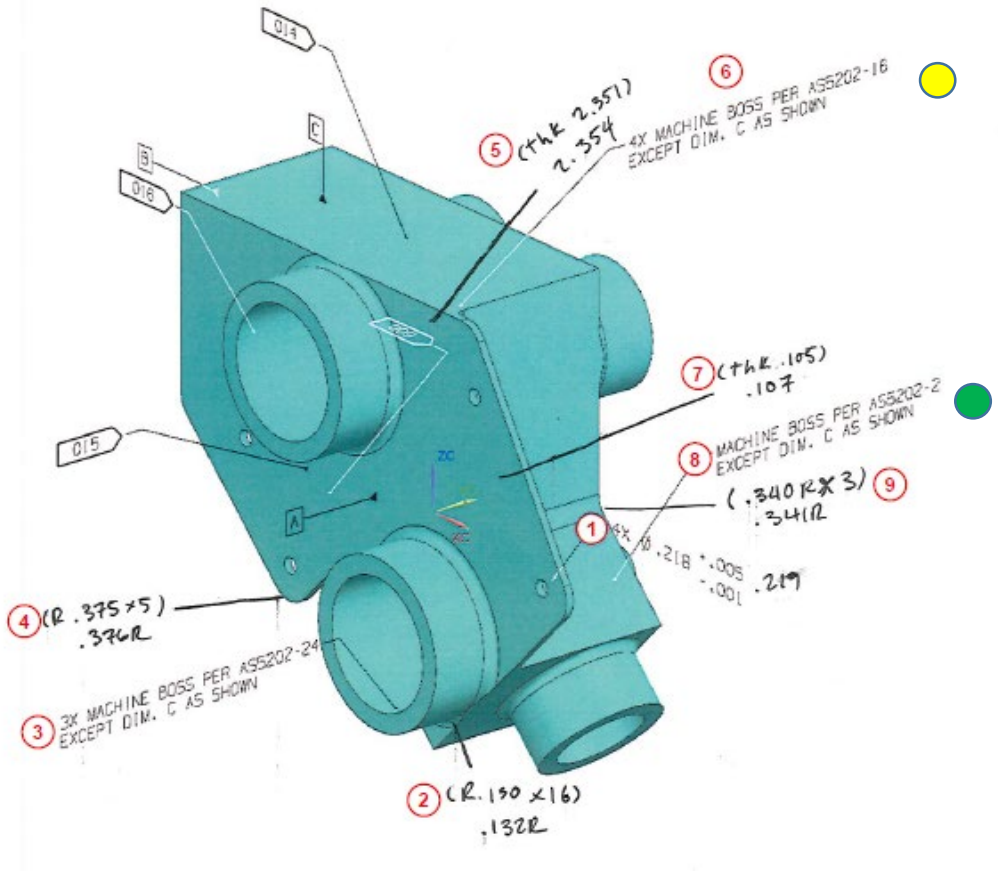
Paint Manufacturer: DEFT/PPG # 03-W-127A Semi gloass white

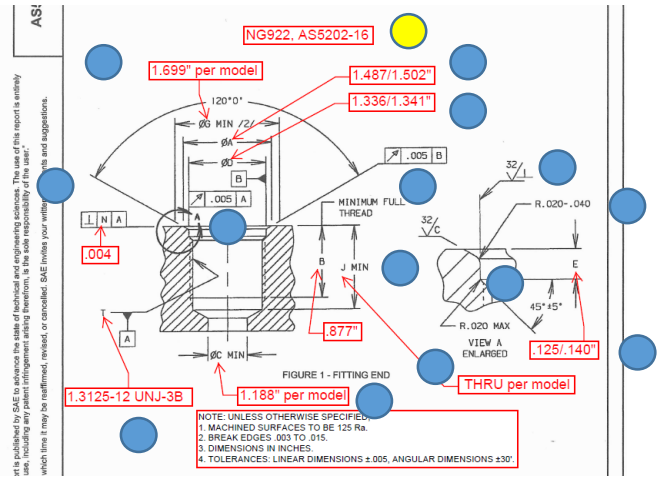
42

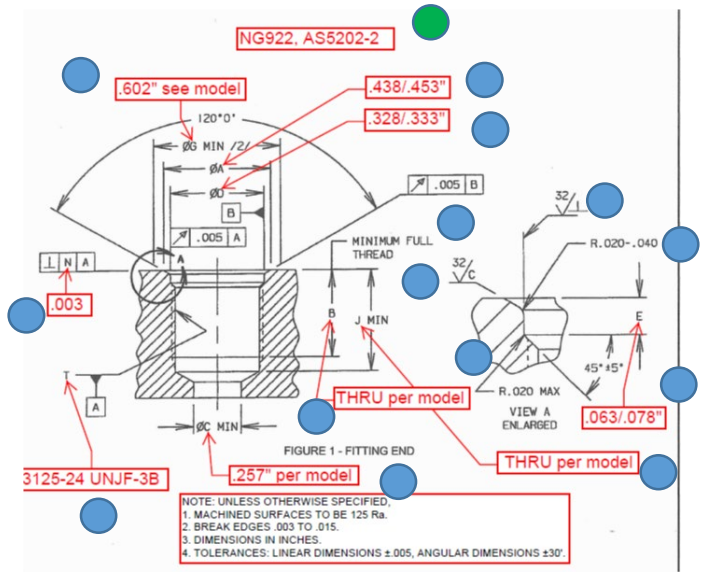
Base Lot#: 17911353
Catayst Lot#: 17775292
Thickness: 2.1
Expiration Date: 5/19

(APPLIED 2 COATS):
YES OR (NO)

Ballooning – Lower Tier/Reference Specification







Ballooning – Lower Tier/Reference Specification

Form 3

16	01TN Step 010 Page 19 G/N#12	Fastener flushness	Fastener Flushness is between -0.005 to -0.019 in IAW Figure 16 Exterior Surface Flushness Condition B).	Min: -0.008 in Max: -0.012 in	Caliper	N/A

17	01TN Step 010 Page 20 F/N#27	Sealing fillet	Partial Fillet Seals formed around assembled parts as defined in Figure 17 2ZZP00017 Fillet Seal. Max dim C: 0.090 in	Min: 0.081 in Max: 0.090 in	Caliper	N/A

Ballooned Section from Process Specification

(16) Check that Fastener Flushness is between -0,005 to -0,019 inch (-0,076 to -0,482 mm) IAW **Figure 16 Exterior Surface Flushness** Condition B).

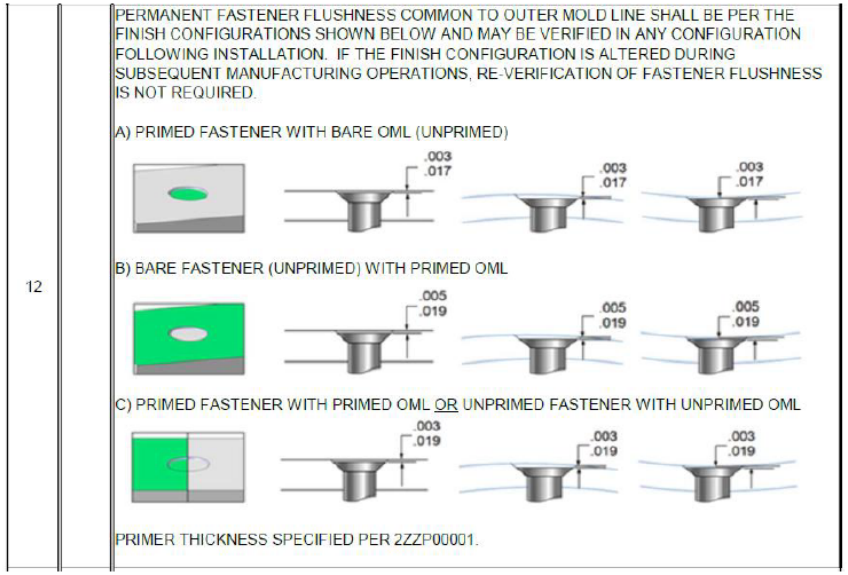


Figure 16 Exterior Surface Flushness

(17) Form partial Fillet Seals around assembled parts as defined in **Figure 17 2ZZP00017 Fillet Seal**. Fillet seal target conditions per **Figure 18 Fillet Seal Target Conditions**.
Note: Sealant tack-free time is 24 hours/ full cure 72 hours at room temperature.

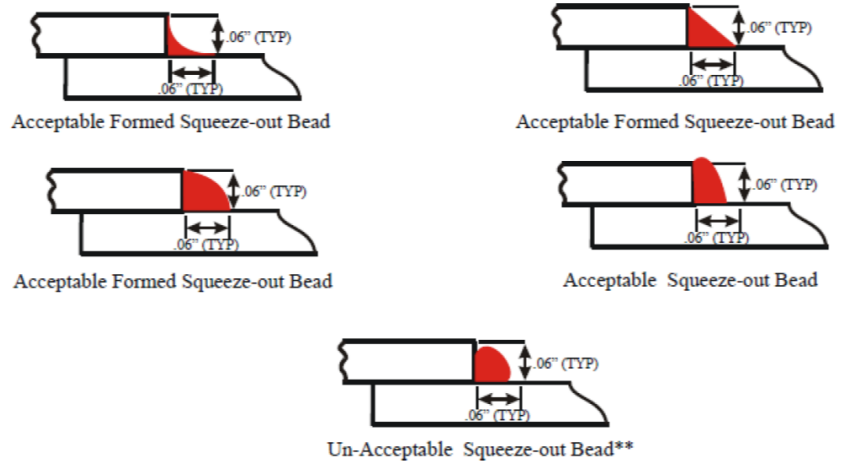


Figure 17 2ZZP00017 Fillet Seal

Ballooning – Lower Tier/Reference Specification

Form 3

5. Char No.	6. Reference Location	7. Characteristic Designator	8. Requirement	9. Results	10. Designed Tooling	11. Non-Conformance Number	14.[Insert columns, etc, as required by Organization or Customer]
24	01TN Step 010 Page 24 F/N#25 G/N#13 SNL2	Part marking	Part identification and marking to specification 2ZZP00008 class 2F. Mark using hand lettering. Letter size 0.14 inch (3.6 mm) or larger, in area as described in Figure 23 Part Mark and IUID.	Min: 0.147 in Max: 0.221 in	Caliper	N/A	IAW 2ZZP00055 sect 3.2.3.1

Ballooned Section from Planning (ref. Process Spec)

Part mark

(24) Part identification and marking to specification 2ZZP00008 class 2F. Mark using hand lettering. Letter size 0.14 inch (3.6 mm) or larger, in area as described in **Figure 23 Part Mark and IUID**. See **Table 3 Part Mark Definition** for details. Approved pens and ink described in [redacted]

Note: Lines containing Criticality and Serial number reference MUST be in RED.

Serial No. is stated in the Shop Order.

Clear coat part mark

Clear Coat over all ink markings with DEFT MIL-PRF-85285 (50040331) Topcoat IAW [redacted]
Clear Coating of Part Marking JSF Parts.

Note: Ink markings must be touch-dry before clear coat can be applied.

Table 3 Part Mark Definition

Marking	Legend
76823 / 2CSH00310-5037	NGC Part number
MFR [redacted]	[redacted] Cage Code
FSCT	Criticality
FSCNN5250XXXXXX	Serial number
INTERCHANGEABLE – DO NOT ALTER	Interchangeable
DD/MM/YYYY	Day/Month/Year

Traceability within Form 3

Form 3 with No Traceability

24	5-N/A	N/A	BASIC DEFINITION FOR .098 DIA HOLE LOCATIONS PER SOLID MODEL. DIAMETRICAL TOLERANCE TO BE ±.003. POSITIONAL TOLERANCE OF HOLE AS FOLLOWS: ⌖Ø.028Ⓜ A B C	Pass
25	5-N/A	N/A	BASIC SIZE FOR SLOTTED HOLES: .240 ± .010 x .50 ± .03	Pass
10	7-4B	N/A	5X Ø.098 ±.003	0.100
11	7-4B	N/A	⌖Ø.028Ⓜ A B C	0.0091
1	7-4D	N/A	2X .240 ±.010	0.2384 / 0.2386
4	7-4C	N/A	2X .50 ±.030	0.4970 / 0.4973

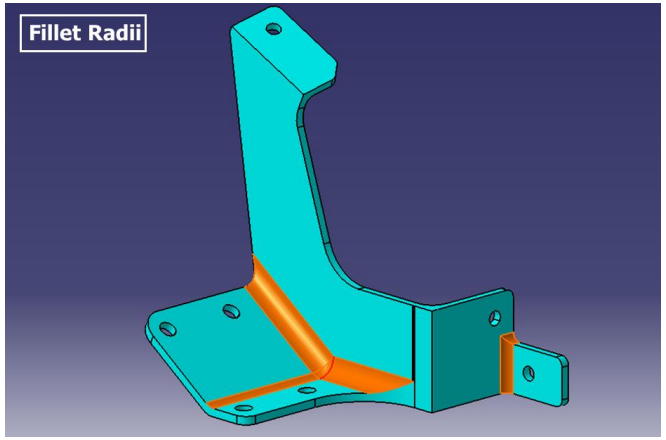
Form 3 with Traceability

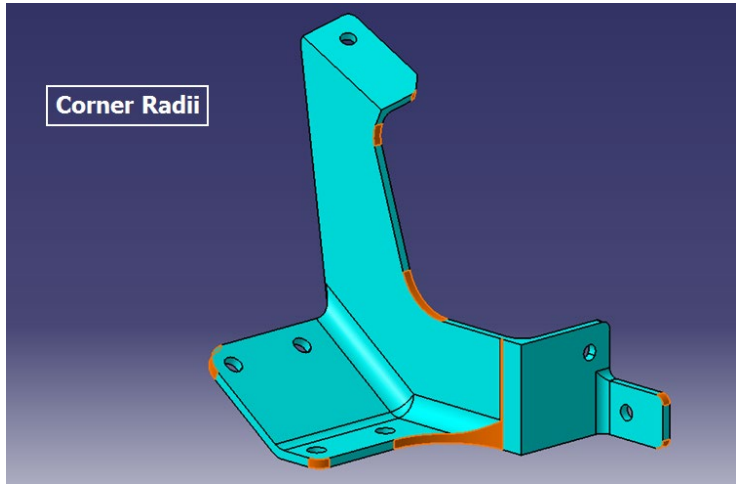
24	5-N/A	N/A	BASIC DEFINITION FOR .098 DIA HOLE LOCATIONS PER SOLID MODEL. DIAMETRICAL TOLERANCE TO BE ±.003. POSITIONAL TOLERANCE OF HOLE AS FOLLOWS: ⌖Ø.028Ⓜ A B C	REFER TO DIM 10 & DIM 11
25	5-N/A	N/A	BASIC SIZE FOR SLOTTED HOLES: .240 ± .010 x .50 ± .03	REFER TO DIM 1 & DIM 4
10	7-4B	N/A	5X Ø.098 ±.003	0.100
11	7-4B	N/A	⌖Ø.028Ⓜ A B C	0.0091
1	7-4D	N/A	2X .240 ±.010	0.2384 / 0.2386
4	7-4C	N/A	2X .50 ±.030	0.4970 / 0.4973

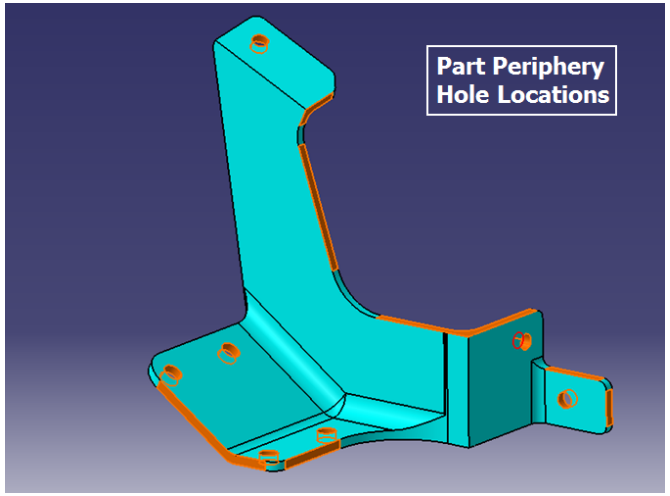
Comments: N/A							
19.01 Op #1	N -2CSH51136-0020 Bubble #19.01	N/A	UNLESS OTHERWISE SPECIFIED, A THICKNESS TOLERANCE OF +/-.007 APPLIES TO ALL WEBS	Pass	N/A	N/A	14A: N/A
Comments: N/A							
19.02 Op #1	2 SH51136-0020.CATPa rt Bubble #19.02	N/A	THICKNESS MAX (0.044 +/- 0.007)	.051	N/A	N/A	14A: N/A
Comments: N/A							
19.03 Op #1	2 SH51136-0020.CATPa rt Bubble #19.03	N/A	THICKNESS MIN (0.044 +/- 0.007)	.051	N/A	N/A	14A: N/A
Comments: N/A							

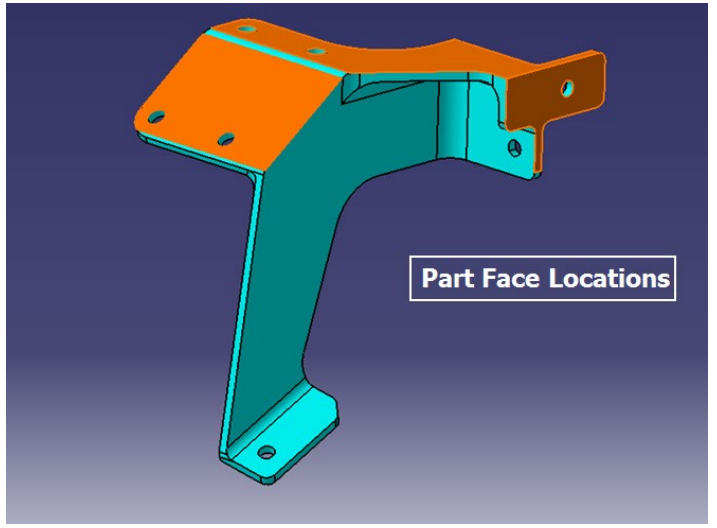
Created using Net-Inspect

Examples of 3D Features/Characteristics that require Model Interrogation

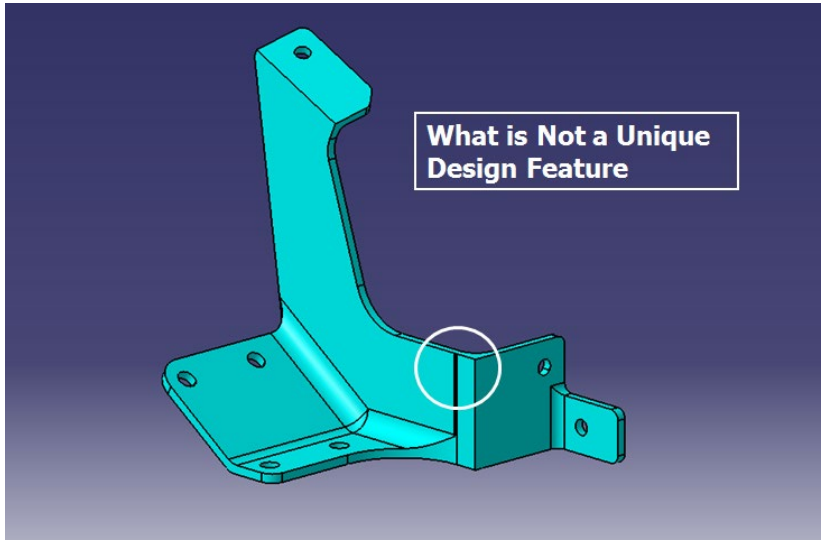


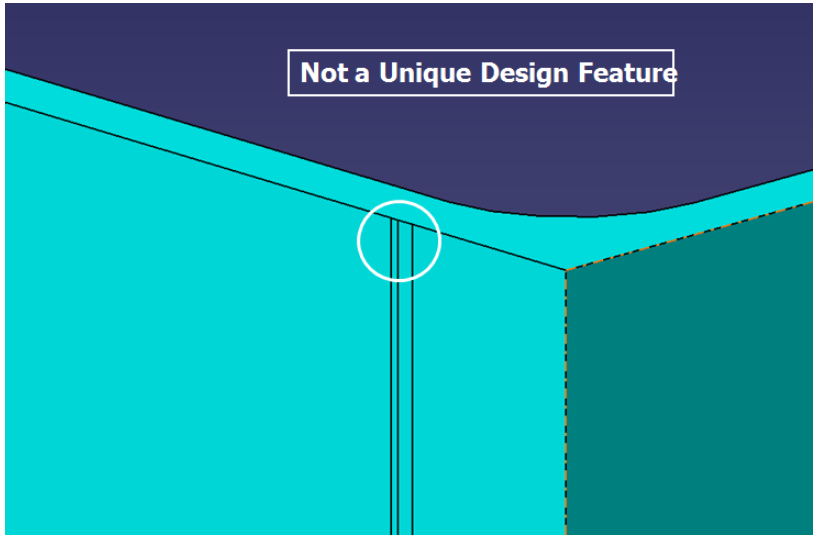


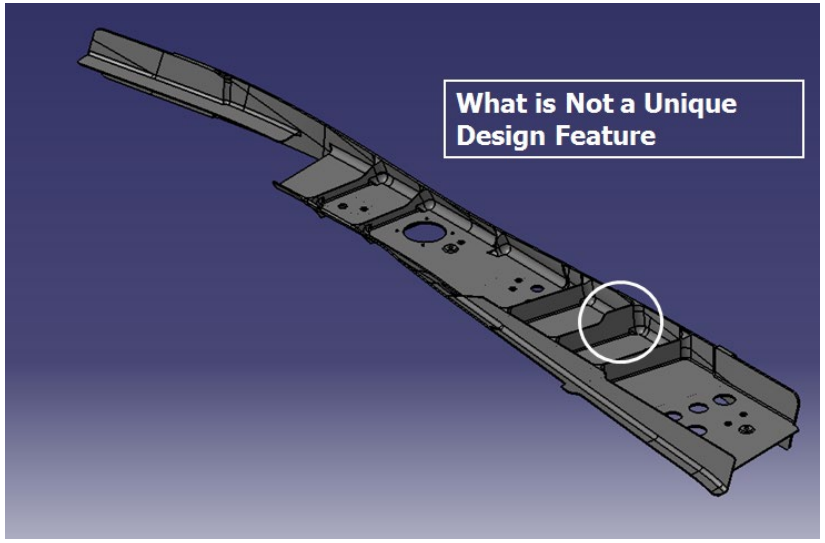


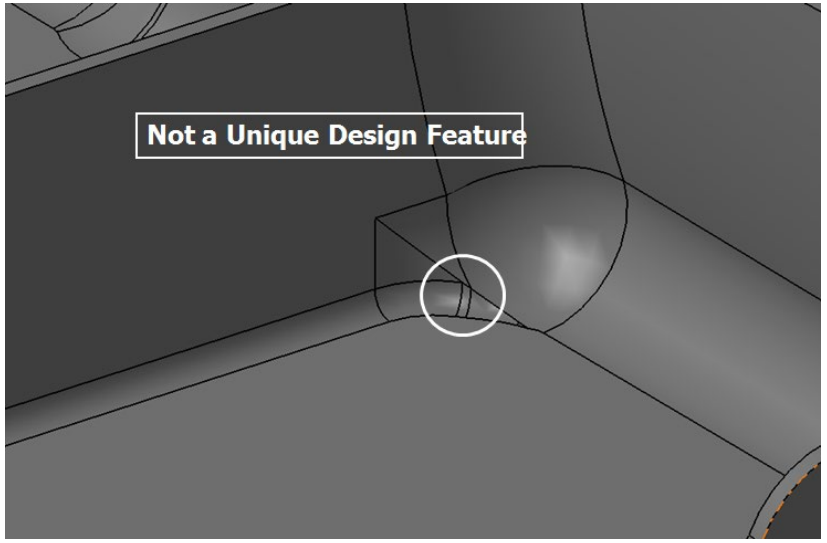


Example of Feature Exclusions in F-35 Models









NORTHROP GRUMMAN

FAI Report Package

- FAI Forms 1, 2 and 3; with Customer Signature, if applicable
  - Line Item Deliverable, inclusive of Spares
  - Lower Details, Sub-Assemblies if requested
- All Raw Material and Special Process Certificate of Conformances (CofC) on Form 2
- Test Reports, as applicable (e.g. Acceptance Test Procedures – ATP, Raw Material Test Reports)
- Ballooned Drawing, Visual Aides, Screen Shorts, Shop Travelers, etc.
- Any Reference documentation (e.g. See CMM Report, Shop Traveler, CofC, Autoclave Cure Cycle, etc.) for Results

NORTHROP GRUMMAN

Other Items to verify during FAI Process, When Required

- Manufacturing Plans
- Interchangeable and Replaceable (I-R) Manufacturing Plans
- Nondestructive Testing Techniques
- Supplier Data Requirements List (SDRL) for Technical Drawings, Acceptance Test Procedure, and Qualification Reports
- Approved on Qualified Processor List (QPL)
- Engineering First Article Evaluations (EFAEs)
- PAL, Deviations/Waivers, as applicable

FAI Checklist

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First Article Inspection Checklist

Supplier:	**Date:**
Checklist Initiator:	**Supplier Code:**
Reference: SQAR, SQAR Supplements, AS9102	**Program ID:**
Part Number:	
▪ **FAI Planning:** ☐ **FAI In-Process:** ☐ **FAI Final** ☐ **AGILE**	**FAIR Number:**

REF: FAI Report Guide SG-0181 on OASIS;
OASIS LINK

FAI Form 1	**Compliant YES**	**NO**	**N/A**
1. All Blocks completed. REF. SQAR for Mandatory Fields	☐	☐	☐
2. Engineering revision levels are correct to "RELEASED" Engineering of PO Part Number (inclusive of Source Controlled Drawings – SCD)	☐	☐	☐
3. Accounted for additional changes (e.g. Condition of Supplier, PO Text, Request for Change/Information, etc.)	☐	☐	☐
4. Standard Catalogue Details listed (BOM). Recommend listing Certificate of Conformance in Block 18	☐	☐	☐
5. When NGAS furnished Details are provided, Serial Number of assembled Detail noted in Block 17 (when applicable), and NG Shipper/Certification/FAI Report noted on Block 18	☐	☐	☐
6. FAI is marked Non Complete for nonconformance tags, incomplete FAI Report (e.g. missed features in FAI Planning), Qualification Testing not complete, etc.	☐	☐	☐
7. FAI Reviewed by an independent individual and noted on Block 21	☐	☐	☐
8. When mandatory NGAS Source Inspection required by PO and/or SQAR, or SQAR Supplement, Customer Signature on Block 23	☐	☐	☐
FAI Form 2			
9. All Special Processes Listed including lower tier Process Specifications (e.g. Pre-penetrant Etch, Finish, etc.)	☐	☐	☐

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First Article Inspection Checklist

10. All Raw Materials that are part of Deliverable used Listed and Certificate of Conformance noted. Inclusive of Paint, Primer, Sealants, Solder, Shim Material, etc.	☐	☐	☐
11. Special Process and Raw Material Supplier's Name and Address provided under Block 8	☐	☐	☐
12. Special Processes and Raw Material **that require Customer Approval** verified. NOTE 1: If not approved and required, this is a nonconformance. NOTE 2: If not a Customer required approval, NA in Block 9 (Ref AS9102) NOTE 3: Verification of approval to unique Special Process requirements (e.g. Qualification/Demonstration of Penetrant inspection for Fracture Critical Parts). NOTE 4: Confirm no restrictions are applicable to the Source	☐	☐	☐
FAI Form 3			
13. Each Characteristic **uniquely identified**	☐	☐	☐
14. Accounted for all features in provided Drawings and Model (Product Definition Design), and/or Source Control Drawings. Note Model Interrogation may be needed to account for other features not annotated in Model (e.g. Radius, Flange Heights, Web Thickness, Part Periphery, Hole Locations, Part Face Locations, etc.). REF: SQARUSUP 0100: SQAR Supplement for Control and Use of Digital Datasets	☐	☐	☐
15. Has a Ballooned Drawing diagram/Screen Shots/Visual Aids used for traceability of Characteristics on Form 3	☐	☐	☐
16. Have all Drawing Notes (inclusive of those on Source Control Drawings), been accounted for and Ballooned for traceability	☐	☐	☐
17. Has lower Process Specification requirements that are measureable been accounted for (e.g. Paint Thickness, Pre-penetrant Etch, Grain Direction, Ply Orientation, Sealant Fillets, Fastener Torque, Fastener Flushness, Electrical Bond, Fillet Relief, reference to industry standard features, Clickbond Push Tests, Hardness/Conductivity, Surface Roughness, etc.)	☐	☐	☐
18. Have all measureable Features have a Value (Actual) & Tolerance unless a No-Go/Go gage or Tool Media of Inspection is used in Block 9	☐	☐	☐
19. Have all Inspection Tools been accounted for with Tool Number in Block 10. Note: Recommended that Bench Inspection Tools also be traceable with Tool Number	☐	☐	☐
20. Recommend referencing in Controlled Work Instructions/Visual Aides that are used be referenced in the Remarks (Block 14) for traceability	☐	☐	☐

FAI Checklist (cont)

21. When Testing is required, reference applicable Test Report Number that has results	☐	☐	☐
22. When lower tier result are used and referenced, include Report/Cert Number that has the results for traceability. NOTE: Merely a Cert with no results is not satisfactory	☐	☐	☐
23. If CMM Report or other metrology is used and referenced, traceability back to Balloon Drawings/Visual Aides/Point Map is included	☐	☐	☐
OTHER VERICATIONS APPLICABLE TO FAI PROCESS			
24. Customer required Manufacturing Plan approved (e.g. Critical Parts, Composite Panels, etc.)	☐	☐	☐
25. Customer required Interchangeable Replaceable (IR) Manufacturing Plans approved	☐	☐	☐
26. Customer required Packaging Plans approved	☐	☐	☐
27. NDT Techniques approved (REF: SQARSUP-0120; SQAR – Supplement for NDT Submittals)	☐	☐	☐
28. Engineering First Article Evaluations (EFAE) approved	☐	☐	☐
29. Customer approved Technical Supplier Data Requirements List SDRL: Technical Drawings; Acceptance Test Procedures, Qualification Report.	☐	☐	☐
30. Customer approved deviations/waivers, SMRRs, Provisional Acceptance Letters	☐	☐	☐
31. Corrective Actions/RCI initiated for Not Complete FAI Report	☐	☐	☐
FAI REPORT PACKAGE, when submittal is requested by NGAS NOTE: REF F-35 SQAR Supplement	☐	☐	☐
32. Completed Forms 1, 2 and 3	☐	☐	☐
33. Certificate of Conformances referenced on Forms 1, 2 and/or 3	☐	☐	☐
34. CMM or other Metrology used and referenced on Form 3	☐	☐	☐
35. Ballooned Drawings, Drawing Notes, Visual Aids, Limited Dimensional Drawings, Point Maps, etc.	☐	☐	☐
36. Other referenced documents (e.g. Inspection Records, Ply Orientations, RCIs, Test Reports, Autoclave Cure Charts, etc.)	☐	☐	☐

37. Copy of Other Verifications required for FAI (listed above); RCI, SDRL approvals, as applicable.	☐	☐	☐
Signature			

FAI Review

Summary

- It is the responsibility of the Supplier to ensure product meets released engineering design, PO, and applicable requirements
- FAI Report Validation/Verification – *a Product compliance Audit*
- Perform careful part analysis to ensure all part features are accounted, identified, inspected, and recorded
- CMM inspection results and LDD actuals must be properly identified and recorded on FAI report
- All remaining features and characteristics (model annotations, drawing notes, measurable specification requirements, etc.) must also be recorded
- NGAS Supplier Quality will maintain a SPHR Record for all FAI activity; Upfront Planning Review, In-process and Final

Frequently Asked Questions

For listing of all AS9102 FAQ's go to the following link: https://iaqg.org/wp-content/uploads/2019/10/9102-FAQ.pdf

FAI Frequently Asked Questions (FAQ)

I4. Question

The current revision of 9102 does address Digital Product Designs. How is an organization expected to complete FAI if there is no traditional 2D drawing?

I4. Response:

When design requirements are in a DPD format and traditional 2D drawing information is not available for all applicable design requirements, DPD design characteristics required for product realization should be extracted, verified, and included in the First Article Inspection Report. To complete the FAI the organization should:

- Establish a process to extract the applicable DPD design characteristics.
- Extract the DPD design characteristics required for product realization. The characteristics required to actually manufacture the product must also be inspected, all dimensional characteristics or feature definitions.
- Ensure the production, inspection, and operations requiring verification have been completed as planned to achieve DPD design characteristics.

FAI Frequently Asked Questions (FAQ)

B3. Question:

If Manufacturing is moved from one location/facility to another, is a new FAI required?

B3. Response:

9102 - 4.6.f.1 states: A change in manufacturing source(s), process(es), inspection method(s), location of manufacture, tooling or materials, that can potentially affect fit, form or function. The key wording is "potentially affect fit, form or function". If you have good rationale supporting a position that the change doesn't "potentially affect fit, form or function" (and you can convince your customer) an updated FAI is not required. The move distance isn't a factor. Record the reason for Partial FAI on field No.14 of Form 1.

FAI Frequently Asked Questions (FAQ)

A3. Question:

What is the difference between field 5 and field 7 on form 1?

A3. Answer:

Field 6 of Form 1 is the Drawing Number; this field should have the drawings (including parts list), that contain design characteristics needed for product realization. There may be more than one drawing listed in this field.

Field 7 of Form 1 is the Drawing Revision Level, this would be the revision level of the drawing or DPD set that is listed in field 6. When there is more than one entry in field 6 then the entries in this field need to correspond to the entries in field 6.

Field 5 of Form 1 is the Part Revision Level, this is the revision level that is identified on the part. Not all organizations use a part revision level for tracking configuration.

FAI Frequently Asked Questions (FAQ)

A8. Question:

Can parts lists, reports and other records be noted on the forms and attached rather than copying all the data onto the forms?

A8. Response:

Yes, you may reference the attachments on the forms and attach parts lists, reports etc. You may also attach drawings to form 3 and note the drawing on the form as long as the characteristics and results are clearly identified on the drawing. Any efficient, time saving method is acceptable but you must maintain clear traceability and the data on the attachments must be verified.

When automated inspection tooling produces measurement results, those results may be referenced on form 3, identified as pass/fail, and attached when:

- The characteristic numbers on form 3 are clearly linked in the attached report
- The results in the attached reports are clearly traceable to the characteristic numbers on form 3.
- The results are directly comparable to the Design Characteristic. E.g., coordinate data alone would not be acceptable for a positional tolerance; the results should show the actual positional value.

FAI Frequently Asked Questions (FAQ)

A10. Question:

Can an electronic signature be used in field 19 of form 1?

A10. Response:

An electronic signature is acceptable as long as it is acceptable within your Quality management system. The Quality management system must define electronic signature usage and control.

FAI Frequently Asked Questions (FAQ)

E1. Question:

Does 9102 allow inspection to Purchase Order requirements? These are Condition of Supply (COS) requirements. A part with condition of supply requirements is notes on the PO by a part number that has a second dash number. e.g., 2CSH11111-0001-01. The second -01 dash number indicates that there are condition of supply requirements on the part that need to be accounted for on the FAIR.

E1. Response:

Yes. The 9102 definition of drawing requirements indicates that the requirement may be invoked by purchasing document. 9102 definitions: "DRAWING REQUIREMENTS: ”Requirements of the drawing and associated parts lists, specification, or purchasing document to which the product is to be produced from, including any notes, specifications, and lower-level drawings invoked.." Use Form 1, field 8 to list the Additional Changes. The Additional Changes in the Purchase Order including added and deleted characteristics are to be reported in Form 3. (e.g. omit fasteners, excess material)

FAI Frequently Asked Questions (FAQ)

F3. Question:

What does "First Production Run" mean?

F3. Response:

The first production run is the first group of one or more parts that are the result of a planned process designed to be used for future production of these same parts. The first production delivery parts require an FAI. Development and prototype parts that are not intended for production use are not considered as part of the first production run.

FAI Frequently Asked Questions (FAQ)

F4. Question:

How is a partial FAI documented?

F4. Response:

When performing a partial FAI, use form 1 and only the additional forms required to document the change. Also, reference the original FAI on form 1, field 14. The original forms must never be altered. You may use attachments to any form if more space is needed. Ensure any unused fields contain N/A as required by NGAS SQAR requirements for FAIR's.

FAI Frequently Asked Questions (FAQ)

F5. Question:

Can an FAI be completed when a non-conformance exists?

F5. Response:

The non-conformance must be corrected and the correction verified and documented on new forms at the next production run before considering the FAI "completed".

The FAI with design characteristic nonconformance(s) is Not Complete. An FAI with noted nonconforming design characteristics should have field 19 signed and noted as “Not Complete”

- When processing a FAIR with documented non-conformances:
- Record the nonconforming design characteristic(s) on form 3.
- Record the nonconformance document reference number on form 3 field 11.

Check the box “FAI Not Complete” on form 1 field 19. Note: this standard does not control disposition of the nonconformance.

The Organization implements corrective actions and performs a partial FAI for all affected characteristics on the next production run after implementation of the corrective action. If the partial FAI does not clear all non-conformances, the FAI is still Not Complete and the requirement to complete the FAI is still in effect. Note: a full FAI may be done in lieu of a partial FAI. A Request for Change/Information (RCI) to NGAS may be a form of corrective action for producibility issues.

FAI Frequently Asked Questions (FAQ)

F8. Question:

Is N/A required to be entered on fields that do not contain information?

F8. Answer:

Yes, The NGAS SQAR states that all unused fields must have N/A input in the field.


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