



Washington Metropolitan Area Transit Authority



**DEPARTMENT OF TRANSIT
INFRASTRUCTURE AND ENGINEERING
SERVICES**

Standard Operating Procedure

CATEGORY Organization and Administration		TOPIC First Article Inspection	
SOP NO. 113-12	TITLE First Article Inspection Procedures		
LATEST REVISION NO. Original	ORIGINATION DATE 10/16/2015	DATE REVIEW DUE 10/16/2017	EXPIRATION DATE None
LATEST REVISION DATE None	LATEST REVIEW DATE 10/16/2015		
SOP APPLIES TO: Department of Transit Infrastructure and Engineering Services (TIES)			
DEPARTMENT/OFFICE/INDIVIDUAL OF PRIMARY RESPONSIBILITY (OPR) QAAW / Director of Quality Assurance and Warranty			
EFFECTIVE PAGES/NOTES All (original issue). Procedural instructions from OAP 113-06 Rev 0 dated 03/26/2010 (same subject), re-issued in approved SOP format. Factory Acceptance Test (FAT) requirements added to sections 2 and 6.			
DISTRIBUTION Transit Infrastructure and Engineering Services (TIES) Offices		COORDINATION WITH OTHER PUBLICATIONS OAP 113-06, First Article Inspection Policies	
APPROVAL:  _____ Hakim Davis Manager, Quality Assurance and Warranty Operations		DIRECTED BY:  _____ Michael DiNatale Director, Quality Assurance and Warranty	
Date <u>10/16/15</u>		Date <u>10/21/15</u>	

SOP 113-12 First Article Inspection Procedures

1. PURPOSE

This document describes the TIES procedures for initiating, evaluating and approving First Article Inspection (FAI) of parts and components, used to maintain and enhance the WMATA rail system. The FAI process supports ensuring quality conformance to all engineering and design requirements prior to approval of new supply sources or replacement of configuration-controlled rail car parts and components.

2. SCOPE

These procedures describe preparing, processing and validating new suppliers and/or new/replacement rail car parts or components, due to design changes or obsolescence issues that change the approved supply sources or design configuration of equipment, components and sub-components, systems or subsystems maintained and configuration-controlled by TIES. FAI procedures and the documentation package requirements also apply to Factory Acceptance Test (FAT) for unique “one of” equipment.

3. RESPONSIBILITIES

- 3.1 **QAAW Director:** The Director of QAAW shall be responsible for the coordination, establishment, issuance and maintenance of this procedure, and for the assignment of qualified QAAW staff to execute the requirements.
- 3.2 **QAAW:** QAAW staff assigned to direct the FAI process shall:
 - 3.2.1 Control FAI material and enforce the FAI requirements in this procedure.
 - 3.2.2 Complete the FAI reviews, as defined in this procedure.
 - 3.2.3 Approve the FAI paperwork packages.
 - 3.2.4 Provide FAI status to WMATA requesters and users.
- 3.3 **CENV:** Engineering personnel assigned to support the FAI process shall:
 - 3.3.1 Establish the rail car part/component/equipment technical specifications.
 - 3.3.2 Provide approved Engineering documentation that defines the FAI or FAT part/component/equipment design, specifications, and configuration.

4. DEFINITIONS

- 4.1 **First Article:** A rail car procured item that is representative of the supplier’s production output from a known, specific manufacturing process: location(s), tools/equipment, raw material(s), procedures, standards/specifications, design documentation, etc.

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- 4.2 **Configuration:** The established, approved and maintained technical description of a rail car part/component performance, functional and physical attributes - with its requirements, design and operational information documented throughout its life.
- 4.3 **Obsolescence:** A decline in the availability of rail car parts/components brought about by an introduction of new technology, sources of supply no longer available, or business/marketing environment changes over time.

5. ABBREVIATIONS and ACRONYMS

3.1 Department / Office Acronyms:

- CENV Vehicle Program Services
- QAAW Quality Assurance and Warranty
- PRMT Procurement and Materials
- TIES Transit Infrastructure & Engineering Services

5.2. Other Abbreviations or Acronyms:

- BOM:** Bill of Material
- CofC:** Certificate of Compliance
- ETP:** Engineering Test Plan
- FAI:** First Article Inspection
- FAT:** Factory Acceptance Test
- KPC:** Key Product Characteristics
- SDS:** Safety Data Sheet
- OEM:** Original Equipment Manufacturer
- SDS:** Safety Data Sheet

6. PROCEDURES

Procedure #	Content
6.1	Requesting First Article Inspections
6.2	FAI Coordination

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6.3	FAI at Supplier Facility
6.4	FAI at WMATA
6.5	FAI/FAT Design Documentation Package
6.6	FAI Review and Disposition
6.7	FAI Action Items and Report

- 6.1 Requesting First Article Inspections.
- 6.1.1 The requester shall complete and submit and FAI Request Form 113-F-005 to QAAW (Attachment B).
 - 6.1.2 QAAW shall log the FAI request in the FAI Status Log (Attachment A).
 - 6.1.3 FAI is required for the first production units produced; and is required prior to implementation of part/component changes.
 - 6.1.4 FAI sample parts/component shall be submitted to QAAW, and shall be from the Supplier's full rate production set up. QAAW will specify the number of production-representative samples – typically ten (10) – that must be provided for the FAI. WMATA QAAW will select the specific sample items to be used for the FAI.
 - 6.1.5 In cases where size, complexity and/or cost prohibits the Supplier from providing ten units, a written request for a smaller sample size shall be submitted to WMATA QAAW for approval.
 - 6.1.6 QAAW shall perform the FAI in accordance with this procedure
- 6.2 FAI Coordination.
- 6.2.1 QAAW shall provide a list of items required to complete the FAI package. In circumstances where contractual requirements are established, this effort shall be coordinated with the responsible project office.
 - 6.2.2 Depending on the type of article being evaluated, the FAI may be conducted at a WMATA facility or at the Supplier(s) manufacturing facility.
 - 6.2.3 The FAI schedule will be coordinated with QAAW.
- 6.3 FAI at Supplier Facility.
- 6.3.1 The Supplier shall submit in advance, all required documentation to WMATA, prior to the physical FAI visit.
 - 6.3.2 The FAI shall be conducted in a well-lit workspace with the necessary inspection and handling aids.

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- 6.3.3 The inspection article shall be displayed on a stand or table.
- 6.3.4 The Supplier shall provide all tools and labor to take mechanical or electrical measurements.
- 6.3.5 The Supplier shall have the capability to perform a functional test, or provide evidence of a previously performed test with supporting documentation.
- 6.4 FAI at WMATA.
 - 6.4.1 Submit an FAI Request Form 113-F-005 to QAAW (Attachment B).
 - 6.4.2 CENV shall provide QAAW a complete FAI documentation package.
 - 6.4.3 Any “trial” parts/components used during the performance of an Engineering Test Plan (ETP) – and new part/component samples that are designed as a result of the ETP – shall be provided to QAAW at the time of the FAI.
- 6.5 FAI/FAT Design Documentation Package.
 - 6.5.1 All packages shall include, unless otherwise specified by QAAW, a complete set of signed, dated and stamped drawings/documentation used to build/inspect/test the item to the approved revision level – as set by CENV.
 - 6.5.2 The documentation package shall include, but not be limited to, all:
 - Mechanical drawings
 - Electrical drawings
 - Assembly drawings
 - Bills of Material (BOM)
 - Configuration data – hardware and software
 - 6.5.3 Other required technical data, as available:
 - Dimensional inspection results, with all Key Product Characteristics (KPC) listed. NOTE: Dimensional KPC are those that affect form, fit or function.
 - Approved Factory Acceptance Test (FAT) procedure with pass/fail requirements: evidence of acceptable functional performance – via testing as a module, subassembly, assembly, subsystem, or system – at all applicable levels
 - Part/component dimensional inspection report for the production-representative samples
 - Part/component material test(s) that certify meeting material specifications and applicable industry standards; make sure the

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samples' data is included.

- For subassemblies/assemblies: test/verification data that provides evidence of compliance with all technical design and functional requirements
- Documentation that supports compliance with all Safety requirements
- All Final Inspection results
- All Incoming Inspection results
- All Certificates of Compliance (CofC)
- All In-Process Inspection results used to control and accept in-process work shall be available upon request.
- Surface Finish Acceptance Criteria – if applicable
- Safety Data Sheets (SDS) – if applicable
- Packaging and Shipping standards – if applicable
- Article identification standard (how the supplier identifies its product)
- Training Certifications for all operators – if applicable
- Manuals and Operating Instructions
- All required certifying agency marks – example: UL®, CE®, FCC
- Verification of calibration for measuring and test equipment used to accept and test the FAI item
- Lot and Serialization Traceability documentation – if applicable

6.6 FAI Review and Disposition.

6.6.1 QAAW shall review the FAI package to verify compliance with the above requirements.

6.6.2 QAAW shall complete all applicable sections of (and attach all applicable documentation to) the FAI Report Form 113-F-006 (Attachment C).

6.6.3 QAAW shall provide a disposition (passed or failed).

6.6.4 Passed FAI:

- QAAW completes the FAI Certificate of Compliance Form 113-F-008 (Attachment D).
- QAAW uploads the FAI package information to the data base kept in Documentum.
- QAAW notifies CENV and PRMT by providing a copy of the FAI Certificate of Compliance form.
- QAAW shall document the disposition in the FAI Status log (Attachment A).

6.6.5 Failed FAI:

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- QAAW completes the FAI Not Approved Notification Form 113-F-009 (Attachment E).
- QAAW notifies CENV and PRMT by providing a copy of the FAI Not Approved Notification Form.
- QAAW shall document the disposition in the FAI Status log (Attachment A).

6.7 FAI Action Items and Report.

6.7.1 QAAW shall complete all applicable blocks, document all Supplier and WMATA Action Items approved by QAAW, and sign the FAI Report Form.

6.7.2 QAAW shall distribute copies of the form to CENV and PRMT representatives. File a copy of the FAI documentation package and update the FAI status tracking log.

7. REFERENCES

7.1 OAP 113-06, First Article Inspection Policies

8. ATTACHMENTS

- 1) Attachment A – Sample FAI Status Log
- 2) Attachment B – Sample FAI Request Form
- 3) Attachment C – Sample FAI Checklist and Report
- 4) Attachment D – Sample FAI Certificate of Compliance
- 5) Attachment E – Sample FAI Not Approved Notification


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Attachment A – Sample FAI Status Log

Date	Inspection Reference	Reason (EMI, ETP, etc.)	WIMATA Part Number	Supplier / contact info	Supplier Part Number	First Article Inspection Description	Drawing Number / Revision (list both WIMATA & MFG # if available)	QA/W Officer	Originator	WIMATA Status	Closed on	Comments
4/29/2013	QAAW2013-037	FAI	Not assigned yet	SEPSA NA McCrae Road, Babylon Spa, NY	073389; 073396 073399	Event Recorder, ATCD module TR/VPB Module	S061886 Rev G, S062377 Rev D S062405 Rev D	Baldassano	Tara Seesbee	10+ Closed	5/22/2013	Issued "FAI Not Approved Notification" to Tara Seesbee on 05/02/2013.
5/24/2013	QAAW2013-038	FAI	Not assigned yet	Frank Ursone Alp Rail Industries, Inc. 610-328-1100	4M-2041-3	Cap Screw Hex 1/2-20 UNRF 3A x 3.5" Long 2K3K Disk Mounting Bolt	MFG: 4M-2041-3 Rev H	Baldassano	Sachil Kakkar	0 Closed	5/24/2013	FAI approved for 2nd set of samples provided and responses received from the action item list per QAAW2013-038
5/31/2013	QAAW2013-039	FAI	Not assigned yet	Craig Ross, QA Manager EuroTECH 913.543.1000 x232	See Report	DynaCOR Mobile Computer, WiFi Antenna and Cables	See FAI Package	Baldassano	Tara Seesbee	4 Closed	6/13/2013	FAI approved. Sent CoC to suppliers and report on 06/13/2013.
6/13/2013	QAAW2013-040	FAI	Not assigned yet	MGI Steve Fecica 416 892-8017	CP-00215-11 Rev 1	MGI Crossbar Assembly for 1k HVAC	WDR000254	Baldassano	Jeff Thompson	1 Closed	6/13/2013	FAI approved. Sent CoC to supplier and report on 06/13/2013 – copied Jeff Thompson
6/14/2013	QAAW2013-041	FAI	WIMATA: Patag Bhagwat Phone : 202-962-5973 Cell : 202-594-6647	WIMATA: Patag Bhagwat Phone : 202-962-5973 Cell : 202-594-6647	WDX000269-A Gage WDX000262-A Right Side 70 degree profile WDX000271-A Left Side 70 degree profile	70 degree wheel profiles and inspection gage	WDX000269-A WDX000262-A WDX000271-A	Baldassano	Patag Bhagwat	1 Closed	6/21/2013	WDX000269-A Gage – Not Approved – Approved WDX000271-A Left Side 70 degree profile – Approved WDX000262-A Right Side 70 degree profile – Approved CENV purchased a new gage from Winchester Industries Inc. See FAI Report QAAW2013-042
6/21/2013	QAAW2013-042	FAI	WIMATA: Patag Bhagwat Phone : 202-962-5973 Cell : 202-594-6647	WIMATA: Patag Bhagwat Phone : 202-962-5973 Cell : 202-594-6647	w669-11	70 degree inspection gage	w669-11	Baldassano	Patag Bhagwat	0 Closed	6/22/2013	w669-11 Serial Number 001 Approved
6/26/2013	QAAW2013-043	FAI	Not assigned yet	SEPSA NA McCrae Road, Babylon Spa, NY	073389; 073396 073399	Event Recorder, ATCD module TR/VPB Module	S061886 Rev G, S062377 Rev D S062405 Rev D	Baldassano	Tara Seesbee	2 Open		FAI Approved. Will send CoC when 2 action items are closed.

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Attachment B – Sample FAI Request Form

	OFFICE OF QUALITY ASSURANCE AND WARRANTY				
	FIRST ARTICLE INSPECTION (FAI)				
	REQUEST FORM				
					113-F-005 Rev 1
Requestor's Information:					
Office:	Name:			Date:	
Part / Component Information					
New Part to WMATA?	YES			NO	
New Supplier for an existing part?	YES			NO	
Part Description:					
WMATA part number:					
Supplier's part number:					
Is a MSDS required?	YES			NO	
Supplier Information					
Supplier's Name:					
Supplier Address:					
Contact Person:				Phone #:	
E-mail (if available):					

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Attachment C – Sample FAI Report (seven pages)

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DATE _____

PROGRAM _____ CONTRACT No _____ FAI# _____

SUPPLIER: _____

FAI LOCATION _____

EQUIPMENT IDENTIFICATION _____

WMATA PART NUMBER _____

ARTICLE ID: _____

NAME <small>(Please Print)</small>	COMPANY	SIGNATURE

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DRAWING DATA

DRAWING NUMBER	SERIAL NUMBER	DESCRIPTION

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DOCUMENT DATA COLLECTION

DOCUMENT TITLE	DOCUMENT No.	COMMENTS
WMATA Contract Specification		
Product Drawing:		
Purchase Order		
Qualification Test Procedures		
Quality Assurance Inspection Report		
Qualification Test Results		
Acceptance Test Procedures		
Acceptance Test Results		
Smoke Density Flammability Toxicity		
Certificate of Compliance for Fasteners		
Shock/Vibration Level Test Procedures and Results		
Heavy Running Repair Manual Running Maintenance Manual Illustrated Parts Catalog		

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FAI PLANNING CHECK LIST:

Suppliers Name: _____

Contact Person: _____

Suppliers Address: _____

#	FAI ITEM	PROVIDED	DOC. #	REVIEWED/COMMENTS
1	FAI Location			
2	FAI Date/Time			
3	FAI Agenda			
4	Copy Of The Purchase Order & Subcontract (without cost itemized)			
5	Deviations, Waivers & Status			
6	List of LRU & LLRU			
7	CDRL List and Status			
8	Drawing List (including LRU and LLRU and lower level drawings) Revision & Status			
	Software Configuration and Status			
9	List of Qualification and Routine Inspection and Test Procedures & Status			
10	List of Unit Qualification Test Reports & Status			
11	Routine Test Inspection Reports			
	List of Assembly/Service/Repair Procedures (title and numbers)			
13	List of Material Certification Test Reports Results and Status			
	Manufacturing Plan, including Work Order Diagram			
15	Other Requirements (e.g. AWS weld qualifications, color verification, acceptance criteria, serialization, list of samples with their approval status)			
16	List of all correspondence between Supplier and WMATA concerning this item and Open Items to be reviewed at FAI			
17	Maintenance Tasks			

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Check List

Item No.	REQUIREMENT <small>(include source of requirement)</small>	COMMENTS	CONFORMS <small>(Yes or No)</small>
General Characteristics			
1	- Verify Dimensional Characteristics per Drawings		
2	- Verify new parts		
3	- Verify Purchase Order contains Quality Requirements		
4	- Verify Bar-Coding		
5	- Verify Serialization		
6	- Verify Weight per drawing		
7	- Inspect Visually for damage/cracks/leaks, etc.		
Assembly / Workmanship			
8	- Verify Torque Striping		
9	- Verify Painting/Finishing/Coating		
10	- Verify Fasteners		
11	- Verify Plating of Fasteners		
12	-Verify Crimp & Termination.		
Testing and Documentation			
13	- Verify Qualification and acceptance test procedures and results		
14	- Verify Functional testing per		
15	- Verify Noise testing per		
16	- Verify Vibration testing per		
17	- Verify Magnetic Particle testing		
18	- Verify Temperature Readings and results per		
19	- Verify Smoke, flame and toxicity results for all combustible materials		
Overhaul, Maintenance, Shipping & Packaging Procedures			
20	Heavy Repair		
21	Running Maintenance		
22	Packaging & Shipping		
Warranty and Spares			
23	Warranty		
24	Spare & Spare Warranty <small>(warranty should start upon installation of spare part)</small>		

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ACTION ITEM LIST

Item No.	ACTION ITEM	RESPONSIBILITY	Due Date	Closure Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
19				
20				
22				
23				
24				
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28				
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ACTION ITEM LIST

Item No.	ACTION ITEM	RESPONSIBILITY	Due Date	Closure Date
31				
32				
33				
34				
35				
36				
37				
38				
39				

FIRST ARTICLE STATUS STATEMENT (i.e. released for production, based on action item implementation, hold as benchmark for future production, or other)
FAI ACCEPTED PENDING CLOSURE OF ACTION ITEMS.
ALL BE HELD AS BENCHMARK FOR FUTURE PRODUCTION, FAI UNIT WILL BE LAST ONE INSTALLED TO COMPLETE THE ORDER.

SIGNATURES

WMATA QAAW. _____ **SUPPLIER REP.** _____
 (Signatures indicate concurrence with action item list and First Article Status Statement)

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Attachment D – Sample FAI Certificate of Compliance



Washington Metropolitan Area Transit Authority

First Article Inspection
Certificate of Compliance

To (Supplier): _____ Supplier's Number _____
Supplier Contact Person: _____ Phone: XX-XX-XXXX Ext: XXX
Supplier Part Number: _____ WMATA Part Number: _____
Part Description: _____

After completing the review of the documentation submitted for the item described above, the Office of Quality Assurance and Warranty determines that the Supplier has complied with the First Article Inspection requirements and that the samples submitted comply with engineering specifications.

This certificate validates the Supplier as an Approved Supplier only for the part listed above and as long as the Supplier's manufacturing process and material remain unchanged. The Supplier is responsible for the Authority of any changes in materials and or manufacturing process affecting the part listed above.

QAAW Representative: _____ Date: _____
Phone: _____

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Attachment E – Sample FAI Not Approved Notification



Washington Metropolitan Area Transit Authority

First Article Inspection
Not Approved Notification

To (Supplier): _____ Supplier's Number _____
Supplier Contact Person: _____ Phone: _____
Supplier Part Number: _____ WMATA Part Number: _____
Part Description: _____

After completing the review of the documentation submitted for the item described above, the Office of Quality Assurance and Warranty determined that the Supplier failed to comply with the First Article Inspection requirements and that the Supplier's request to be approved as a supplier for the item listed above HAS BEEN DENIED.

Reasons for Rejection:

Please provide any additional information that can correct the discrepancies listed above.

QAAW Representative: _____ Date: _____

Phone: _____

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