



Quality Assurance Auditors & Industry Conference
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2.12 Final Inspection

Brandon Box
Greenbrier

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(formerly TTCI)*

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Auditing Final Inspection

Best Practices



Final Inspection

- What it is
- What is required
- How to Audit



Final Inspection

- **What it is**

- A detailed inspection to determine the overall acceptability of a product or service
 - May include
 - Physical attributes
 - Test
 - Records
 - Required



Final Inspection

- **Requirements**
 - Final inspection identified on the ITP
 - Procedures are used
 - Records completed
 - Records verified
 - Records retained
 - Inspectors trained



How To Audit

- **Inspector**

- Evaluate knowledge of procedures used for final inspection
 - Ex: SOPs, NDT Procedures, etc.
- Evaluate ability to identify the criteria used for final inspection
 - Ex: Coating , Welding Specifications, drawings, etc.
- Verify knowledge of the process and status indicator
 - if the product is accepted or rejected



Completed Inspection Report

GREENBRIER
Manufacturing

Job #: 494
Steel #: 581152
Visual Testing Form



Inspector (print name): <u>Kristen Gilbre</u> <u>Jeff Ranna's</u>	Inspector Level: <u>II</u>
Reporting Facility: <u>Thermohic</u>	Facility Station Stencil: <u>AR1A</u>
Plant Inspection Area: <u>Paint Shop Final</u>	

Unit: Component:

Running Number: <u>ETHX 00220</u>	Type: <u>Tank</u>
	Material type: <u>TL 128</u>
	Thickness: <u>9/16</u>

Procedure Number: PACTC 2-11-09 Procedure Revision Level: 4

Surface Preparation Acceptable: Yes No New Repair Existing Weld(s)

Weld Gauges / Equipment Used	Calibration Due Date
<u>Flashlight</u>	<u>N/A</u>

Weld / Component	Location and Identification	Initial Exam		Repair Exam		Comments
		Pass	Fail	Pass	Fail	
<u>Buckles</u>	<u>mechanicals</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<u>Bolts</u>	<u>/</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<u>Box</u>	<u>/</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<u>Stack edge</u>	<u>/</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Notes:						




How to Audit





- **Records**

- Evaluate knowledge of procedures used for record verification
- Evaluate Records available required by the inspection and test plan
- Evaluate Records completeness



SOP for Record Verification

		Document No	P-AC-2.12-100-MM
		Issue Date	7/30/2021
		Rev. Date	N/A
		Rev. Level	0
DOCUMENT:	Quality Assurance Procedure	Approved by	J. Midkiff
TITLE:	SOP Verify Inspection and Test Record	Page	1 of 1

Task	WORK INSTRUCTIONS		CHARACTERISTICS TO CONTROL
1	Documents are received from appropriate functional area for completeness and legibility.		The only acceptable correction on documentation is to draw a single line through the mistake, correct, initial and date the correction. Notify Quality Manager of any white out or other changes to a document.
2	Quality will notify responsible party to make any corrections or complete the paperwork.		Documents are complete and legible.
3	Place document into envelope or scan into OnBase.		
4	Complete any acceptance on Envelope Inspection and Test record once document is found to be compliant.		
5	<p>STATUS INDICATOR</p> <p><u>Acceptance:</u> Sign off on envelope</p> <p><u>Nonconformance:</u> Return to responsible party.</p>		

Work Instructions



How to Audit

- **Final Inspection Records**
 - Verify storage of records required by Document retention policy



Final Inspection Checklist

GREENBRIER
Manufacturing

Job #: 494
Steel #: 581153
Paint Final Checklist



B End	Prod. Init.	Insp. Init.	Comments
B END DECAL INSPECTION WITH PRINT	AS	SL	
B END PAINT INSPECTION	SLC	SL	
PLACARD CORRECT/BOLT TACKED	PS	SL	
GRATING CORRECT/BOLTS TACKED	PS	SL	corbit
REMOVE SHARP EDGES ON GRATING	PS	SL	yes
GLAD HOSE PRESENT	PS	SL	
HOSE CHAIN PRESENT (MIN: 3" - MAX: 8")	NA	SL	
DRAFT KEY BENT	SL	SL	
DRAFT GEAR CARRIER PLATE HUCKED	PS	SL	
COUPLER OPERATES CORRECTLY	ASF	SL	NA
COUPLER WEAR PLATE CORRECT	MAG	SL	mag
TOGGLE CLEARANCE 1/4" TO 1/2"	SL	SL	
COUPLER ROD BRACKET BOLT SPACER PRESENT	SL	SL	
COUPLER ROD BRACKET BOLT TACKED/CHISEL CHECKED	NA	SL	
UNCOUPLING ROD BRACKET TO BEND 4 1/2" (MIN)	SL	SL	
UNCOUPLING ROD HANDLE TO RAIL 15" (MIN)	SL	SL	
TRUCK BOLSTER STENCILED	SL	SL	
BRAKE BOX BOLTS TACKED	SLC	SL	
HANDBRAKE OPERATES CORRECTLY	SL	SL	cw 9300-3long
HANDBRAKE COTTER KEY PRESENT / BENT	MJ	SL	
HANDBRAKE RIGGING ATTACHED AND WELDED	SL	SL	
HANDBRAKE RIGGING COTTER KEYS PRESENT /BENT	SLC	SL	
TOP OF HANDBRAKE CHAIN LINKS ARE PAINTED CORRECTLY TO THE PRINT	wabtec	SL	MO
2" CLEARANCE ALL PARTS	SLC	SL	
B END SIDE FRAMES CORRECT	ASF	SL	
B END TRUCK BOLSTER CORRECT	ASF	SL	
Left Side	Prod. Init.	Insp. Init.	Comments
LS DECAL INSPECTION WITH PRINT	JL	SL	
LS PAINT INSPECTION (Profile)	SLC	SL	
BL PLACARD HOLDER PRESENT AND TACKED	PS	SL	
LS GROUNDING LUG ON LADDER	brass	SL	



Record Verification Checklist

GREENBRIER
Marmaduke 581153

Inspection and Test Records - Envelope ETHX10022C

Customer	GATX	Lot No.	70494	Steel No.		Road No.	ETHX/ETPX
Form No.	70494E	Date:	4/30/21	Rev	1	Approved	WM
Shell Course Traveler (1 per plate)						F-ACTC-2.11-200-MM	
Tub Assembly						F-ACTC-2.11-201-MM	
Tank Production Tank						F-ACTC-2.11-203-MM	Tank Fit
Production Fittings						F-ACTC-2.11-202-MM	
Tank Thickness Record						F-ACTC-2.11-03	
Visual Testing Form (Shotgun)						F-ST-2.11-53	
Pre-Xray Checklist						F-ACTC-2.11-204-MM	
Head Analysis (2)						F-ACTC-2.11-205-MM	
Magnetic Particle Report (Lift Lug)						F-ST-2.11-20	X-Ray
Radiography Report						F-ST-2.11-59	
Radiograph Inspection Record (Intersections) [category cars may have F-ST-2.11-62, -63, or -64]						F-ST-2.11-61	
Production South End						F-ACTC-2.11-206-MM	
Coil Air Test (as applicable)						F-ACTC-2.11-207-MM	Pad App.
Visual Testing Form (Pre-Furnace)						F-ST-2.11-53	
Furnace Inspection Checklist						F-ACTC-2.11-208-MM	
OK to Furnace Tag						QA 068	Furn.
Furnace Chart						Chart	
Water Gauge Report		Gauge Table	10004	Capacity (Gallons)	410	30347	
Hydro Report						F-ST-2.11-10	
Coil Hydro						F-ST-2.11-10A	Steel Shop Final
Tank Roundness						F-ACTC-2.11-06	
Manway Roundness						F-ACTC-2.11-26	
Steel Shop Final Track						F-ACTC-2.11-212-MM	
Pre-Jacket Primer Readings						F-ACTC-2.11-210-MM	
Spiral Mill						F-ACTC-2.11-211-MM	
Visual Testing Form (Steel Final)						F-ST-2.11-53	
Steel Final Checklist						F-ACTC-2.11-209-MM	
OK Assembly Tag						QA 068	
Exterior Blast Record						F-ACT-2.12-18	
Exterior Coating Record 1 Coat						F-ACT-2.12-19	
Exterior Coating Record 2 Coat						F-ACT-2.12-20	
Exterior Paint Inspection						F-ACT-2.12-21	
Truck Records:		(A)	✓	(B)	✓	F-ACTC-2.11-218-MM	Paint Shop
Single Car Test (Air Brake Report)						F-ACTC-2.11-216-MM	
Top Valve Application						F-ACTC-2.11-217-MM	
BOV Application & Cert (Cert vendor Supplied AR)						F-ACTC-2.11-224-MM	
Bubble Leak Form						F-ST-2.11-13	
Top Unloader Sub Assembly						F-ACTC-2.11-220-MM	
Safety Valve Certification (Vendor Supplied) / Certificate of Test (F-ACTC-2.11-16)						Vendor	
Visual Testing Form (Top Valves)						F-ST-2.11-53	
Paint Final TOP Checklist						F-ACTC-2.11-219-MM	
Production Paint Shop						F-ACTC-2.11-215-MM	
Interior Blast						F-ACT-2.12-23	Lining
Interior Coating 1 coat						F-ACT-2.12-24	
Interior Coating 2 coat						F-ACT-2.12-25	
Interior Coating Inspection						F-ACT-2.12-27	
Interior Bake Chart						Chart	
Interior Coating Visual Inspection						F-ST-2.11-53	
Paint Shop Final Visual Inspection						F-ST-2.11-53	
Paint Final Checklist						F-ACTC-2.11-223-MM	
Weigh Ticket						Road #	Yard
Gasket Torque Sheet						F-ACTC-2.11-221-MM	
Final Shipment Visual Checklist						F-ST-2.11-53	
Yard Checklist						F-ACTC-2.11-222-MM	
Green Tag						QA 035	

All paperwork complete and car ready to ship:

Signed: _____ Date: 2/17/22





Thank you



Association of American Railroads
Quality Assurance Committee