



**Skilled
Trades**
Ontario

**Métiers
spécialisés**
Ontario

Apprenticeship
Curriculum Standard

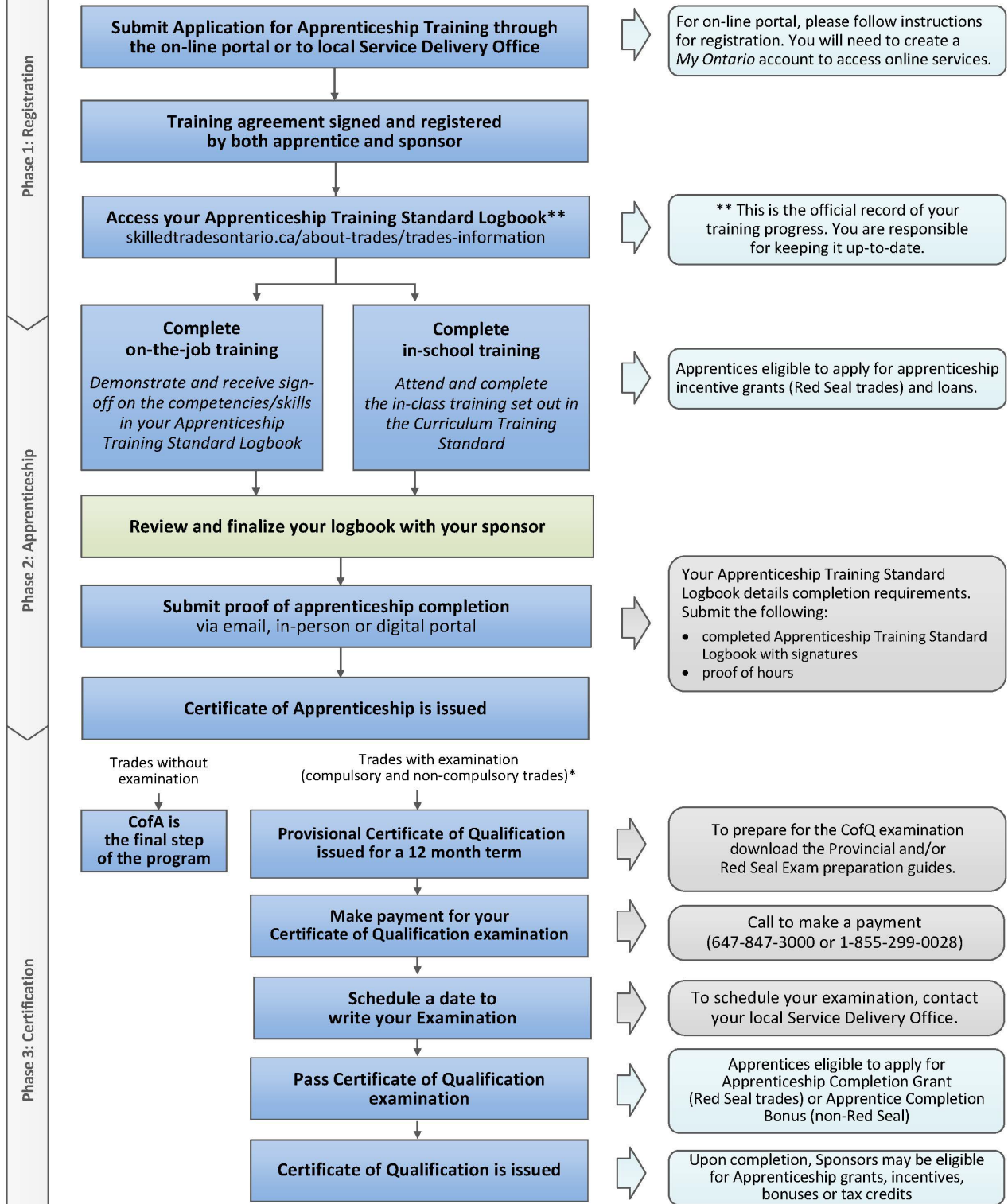
Railway Car Technician

Level 3 Advanced

268R

2008

Apprenticeship Pathway to a Certificate of Qualification



* For a list of trades subject to a certification examination, visit: skilledtradesontario.ca

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Please Note: This Standard has been revised to reflect the visual identity of Skilled Trades Ontario (STO) which replaced the Ontario College of Trades on January 1, 2022. The content of this Standard may refer to the former organization; however, all trade specific information or content remains relevant and accurate based on the original date of publishing.

Please refer to STO's website: skilledtradesontario.ca for the most accurate and up to date information. For information about BOSTA and its regulations, please visit [**Building Opportunities in the Skilled Trades Act, 2021 \(BOSTA\)**](#).

Any updates to this publication are available on-line; to download this document in PDF format, please follow the link: [Skilled Trades Ontario.ca](https://skilledtradesontario.ca).

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Maintained with transfer to Skilled Trades Ontario 2008 (V100)

Preface

This curriculum standard for the Railway Car Technician trade program is based upon the on-the-job performance objectives, located in the industry-approved training standard.

This is the third level of 3 levels of training. The Reportable Subjects Summary chart (located on page 3) summarizes the training hours for each reportable subject.

The curriculum identifies the learning that takes place in-school. The in-school program focuses primarily on the theoretical knowledge and the essential skills required to support the performance objectives of the Apprenticeship Training Standards.

Employers/Sponsors are expected to extend the apprentice's knowledge and skills through practical training on a work site. Regular evaluations of the apprentice's knowledge and skills are conducted throughout training to verify that all apprentices have achieved the learning outcomes identified in the curriculum standard.

It is not the intent of the in-school curriculum to perfect on-the-job skills. The practical portion of the in-school program is used to reinforce theoretical knowledge. Skill training is provided on the job.

Please refer to Skilled Trades Ontario website (www.skilledtradesontario.ca) for the most accurate and up-to-date information about Skilled Trades Ontario. For information on *Building Opportunities in the Skilled Trades Act, 2021 (BOSTA)* and its regulations, please visit [Building Opportunities in the Skilled Trades Act, 2021, S.O. 2021, c. 28 - Bill 288 \(ontario.ca\)](http://www.skilledtradesontario.ca/building-opportunities-in-the-skilled-trades-act-2021-s.o.-2021-c.-28-bill-288)

Pre-requisites

In order to advance to Level 2 of the apprenticeship program, an individual must have completed all of the units outlined in Level 1. Similarly, in order to advance to Level 3 of the program, an individual must have completed all of the units outlined in Level 1 and 2.

Hours Disclaimer (if applicable)

It is agreed that Training Delivery Agents (TDAs) may need to make slight adjustments (with cause) according to particular apprentice needs and may deviate from the unit sequencing and the prescribed practical and theoretical hours shown within the standard. However, all TDAs will comply with the hours at the reportable subject level.

Suggested Equipment for Training Delivery Agencies

Personal and Safety Equipment: Personal protective equipment is at the discretion of the TDA who must conform to Ontario Provincial Health and Safety Regulations.

Level 3

Reportable Subject Summary – Level 3

Number	Reportable Subjects	Hours Total	Hours Theory	Hours Practical
S0462	Car/Train Safety and Maintenance Inspections 2	24	9	15
S0463	Rail Car Trucks 2	39	39	0
S0464	Rail Car Underframes 2	24	15	9
S0465	Rail Car Bodies 2	39	24	15
S0466	Welding and Fabrication 3	33	9	24
S0467	Regulatory Publications 3	9	9	0
S0468	Rail Car Brakes 3	39	15	24
S0469	Rail Coaches 2	33	24	9
	Total	240	144	96

Number:	S0462		
Title:	Car/Train Safety and Maintenance Inspections 2		
Duration:	Total Hours: 24	Theory: 9	Practical: 15
Prerequisites:	L1 - S0446 to S0453; L2 - S0454 to S0461		
Content:	S0462.1	Describe procedures for a car/train Outbound #1 air brake test (8 hrs)	
	S0462.2	Describe procedures for pre-trip inspections of car/train auto-racks (8 hrs)	

Evaluation & Testing: Assignments related to theory and application skills
Final test at end of term
Periodic quizzes

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Reference Materials

AAR Publications, Transportation Technology Center,
Association of American Railroads
Safety Legislation
Interpreting Engineering Drawings
Technical Mathematics and Calculations
Metrology (Measuring and Checking)
Welding Technology
Railway Locomotive Inspection & Safety Rules
http://www.tc.gc.ca/railway/rules/tc_o_0_55.htm#contents
Railway Passenger Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-26.htm
Railway Freight Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-06-1.htm

Number: S0462.0
Title: **Car/Train Safety and Maintenance Inspections 2**
Duration: Total Hours: 24 Theory: 9 Practical: 15
Cross-Reference to Training Standards: 5578.04, 5578.06, 5578.07

General Learning Outcomes

Upon successful completion the apprentice is able to describe appropriate car/train safety and maintenance inspections.

Learning Outcomes and Content

62.1 Describe procedures for a car/train Outbound #1 air brake test. (8 hrs)

Describe procedures for an Outbound #1 air brake test:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- blue flag procedures
- inspection procedures
 - air line coupling
 - train line continuity
 - brake application and release
 - leakage
 - gaskets
 - piston travel
 - retainer valve
 - air-to-set brakes
 - position of brake shoes
- troubleshooting procedures
- hand tools and power equipment
- checking and inspection devices
- repair procedures
- adjustment procedures
- recommendations for further action
- verification process
- site clean-up procedures
- work documentation

62.2 Describe procedures for pre-trip inspections of car/train auto-racks. (8 hrs)

Describe procedures for pre-trip inspections of auto-racks:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
 - operations and functioning of mechanical parts
 - safety appliances
 - interiors
 - securement devices
 - stencils
 - lubrication
- troubleshooting procedures
- verification process
- recommendations for further actions
- work documentation

62.3 Describe procedures for the inspection of rail car wreck damage. (8 hrs)

Describe procedures for the inspection of rail car wreck damage:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- blue flag procedures
- inspection procedures
- level and type of damaged components
 - bent
 - broken
 - missing components
- date and location of defect cards
- troubleshooting procedures
- verification process
- recommendations for further actions
- work documentation

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
35%	65%	100%

Number:	S0463		
Title:	Rail Car Trucks 2		
Duration:	Total Hours: 39	Theory: 39	Practical: 0
Prerequisites:	L1: S0446 to S0453; L2: S0454 to S0461		
Content:	S0463.1	Describe procedures for servicing and overhaul of rail car truck brake beams (7 hrs)	
	S0463.2	Describe procedures for servicing of rail car truck brake shoes (8 hrs)	
	S0463.3	Describe procedures for servicing and overhaul of rail car truck levers (8 hrs)	
	S0463.4	Describe procedures for servicing and overhaul of rail car truck brake rods (8 hrs)	
	S0463.5	Describe procedures for servicing and overhaul of rail car truck friction bearings (8 hrs)	

Evaluation & Testing: Assignments related to theory and application skills
Final test at end of term
Periodic quizzes

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Reference Materials

AAR Publications, Transportation Technology Center,
Association of American Railroads

Safety Legislation

Interpreting Engineering Drawings

Technical Mathematics and Calculations

Metrology (Measuring and Checking)

Welding Technology

Railway Locomotive Inspection & Safety Rules

http://www.tc.gc.ca/railway/rules/tc_o_0_55.htm#contents

Railway Passenger Car Inspection and Safety Rules

http://www.tc.gc.ca/railway/rules/tc_0-26.htm

Railway Freight Car Inspection and Safety Rules

http://www.tc.gc.ca/railway/rules/tc_0-06-1.htm

Number: S0463.0
Title: **Rail Car Trucks 2**
Duration: Total Hours: 39 Theory: 39 Practical: 0
Cross-Reference to Training Standards: 5574.06, 5574.07, 5574.08, 5574.09, 5574.10

General Learning Outcomes

Upon successful completion the apprentice is able to describe procedures for the servicing and overhauling of rail car truck brake beams, brake shoes, levers, brake rods, and friction bearings.

Learning Outcomes and Content

63.1 Describe procedures for servicing and overhauling rail car truck brake beams. (7 hrs)

Describe procedures for servicing and overhaul of truck brake beams:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- brake beam components
 - heads
 - guides
 - tension members
 - hangers
 - wear plates
 - safeties
- inspection procedures
- troubleshooting procedures
- defects/damage
- overhaul procedures
 - replacing
 - rebuilding
 - repairing
- hand tools and power equipment
- checking and inspection devices
- verification process
- recommendations for further actions
- site clean-up procedures
- work documentation

63.2 Describe procedures for servicing rail car truck brake shoes. (8 hrs)

Describe procedures for inspecting and servicing truck brake shoes:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- brake shoes and keys
- inspection procedures
- replacement procedures
- troubleshooting procedures
- hand tools and power equipment
- checking and inspection devices
- verification process
- recommendations for further action
- work documentation

63.3 Describe procedures for servicing and overhauling rail car truck levers. (8 hrs)

Describe procedures for inspection, servicing, and overhaul of truck levers:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
 - pins
 - bushings
 - lever angularity
 - sizes
- defects/damage
 - broken
 - cracked
 - bent
- overhaul procedures
 - replacing
 - rebuilding
 - repairing
- hand tools and power equipment
- checking and inspection devices
- verification process
- recommendations for further action
- work documentation

63.4 Describe procedures for servicing and overhauling rail car truck brake rods. (8 hrs)

Describe procedures for servicing and overhaul of truck brake rods:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- badge plates
- inspection procedures
 - broken
 - cracked
 - bent
 - worn
 - dimension of rods
- troubleshooting procedures
- servicing procedures
- replacement procedures
- rebuilding procedures
- repairing procedures
- checking and inspection devices
- hand tools and power equipment
- verification process
- recommendations for further overhauling
- site clean-up procedures
- work documentation

63.5 Describe procedures for servicing and maintaining rail car truck friction bearings. (8 hrs)

Describe procedures for servicing and maintaining of truck friction bearings:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- badge plates
- inspection procedures
- troubleshooting procedures

- friction bearing components
 - brasses
 - wedges
 - lubricators
 - journal stops
 - lubricants
- servicing procedures
- replacement procedures
- removal procedures
- hand tools and power equipment
- checking and inspection devices
- verification process
- recommendations for further actions
- site clean-up procedures
- work documentation

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
100%	0%	100%

Number:	S0464		
Title:	Rail Car Underframes 2		
Duration:	Total Hours: 24	Theory: 15	Practical: 9
Prerequisites:	L1: S0446 to S0453; L2: S0454 to S0461		
Content:	S0464.1	Describe procedures for refurbishing rail car floors or decking (6 hrs)	
	S0464.2	Describe maintenance procedures for rail car superstructures (6 hrs)	
	S0464.3	Describe procedures for reconditioning rail car body bolsters (6 hrs)	
	S0464.4	Describe procedures for reconditioning rail car centre sills (6 hrs)	

Evaluation & Testing: Assignments related to theory and application skills
Final test at end of term
Periodic quizzes

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Reference Materials

AAR Publications, Transportation Technology Center,
Association of American Railroads
Safety Legislation
Interpreting Engineering Drawings
Technical Mathematics and Calculations
Metrology (Measuring and Checking)
Welding Technology
Railway Locomotive Inspection & Safety Rules
http://www.tc.gc.ca/railway/rules/tc_o_0_55.htm#contents
Railway Passenger Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-26.htm
Railway Freight Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-06-1.htm

Number: S0464.0
Title: **Rail Car Underframes 2**
Duration: Total Hours: 24 Theory: 15 Practical: 9
Cross-Reference to Training Standards: 5575.04, 5575.05, 5575.06, 5575.07

General Learning Outcomes

Upon successful completion the apprentice is able to describe procedures for servicing rail car floors, decking, superstructures, body bolsters and centre sills.

Learning Outcomes and Content

64.1 Describe procedures for refurbishing rail car floors or decking. (6 hrs)

Describe procedures for refurbishing floors or decking:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job specifications
- inspection procedures
- refurbishing procedures
 - repairing
 - patching
 - welding
 - grinding
 - fastening
 - sanding
 - painting
- replacement procedures
- tools and equipment
 - measuring tapes
 - power tools
 - grinders
 - drills
 - sanders
 - welding equipment
 - painting equipment
- verification process
- recommendations for further actions
- work documentation

64.2 Describe maintenance procedures for rail car superstructures. (6 hrs)

Describe maintenance procedures for superstructures:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
- superstructure components
 - main beams
 - intermediate beams
 - floor stringers
 - end sills
 - side sills
- troubleshooting procedures
- maintenance procedures
 - welding
 - cutting
 - grinding
 - fitting
 - splicing
 - straightening
- replacement procedures
- tools and equipment
 - torches
 - welding equipment
 - plasma arc equipment
 - sledge hammers
 - grinders
 - clamps
 - drills
- checking and inspection devices
- verification process
- recommendations for further action
- site clean-up procedures
- work documentation

64.3 Describe procedures for reconditioning rail car body bolsters. (6 hrs)

Describe procedures for reconditioning body bolsters:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
- magnetic particle tests
- troubleshooting procedures
- reconditioning procedures
 - welding
 - grinding
 - splicing
 - straightening
 - riveting
 - heating
 - painting
- replacement procedures
- tools and equipment
 - torches
 - welding equipment
 - grinders
 - paint equipment
 - riveting machine
- checking and inspection devices
- verification process
- recommendations for further actions
- work documentation

64.4 Describe procedures for reconditioning rail car centre sills. (6 hrs)

Describe procedures for reconditioning centre sills:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
- type of centre sills
 - fixed
 - sliding

- centre sills components
 - car cushioning devices
 - sill carriers
 - main members
 - stiffeners
 - coupler carriers
 - casting body springs
 - casting carrier springs
 - draft lugs
 - striker castings
- troubleshooting procedures
- reconditioning procedures
 - welding
 - grinding
 - splicing
 - straightening
 - riveting
 - fitting
 - painting
- replacement procedures
- tools and equipment
 - torches
 - welding equipment
 - grinders
 - paint equipment
 - riveting machine
 - hydraulic equipment
- checking and inspection devices
- verification process
- recommendations for further action
- work documentation

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
60%	40%	100%

Number:	S0465		
Title:	Rail Car Bodies 2		
Duration:	Total Hours: 39	Theory: 24	Practical: 15
Prerequisites:	L1: S0446 to S0453; L2: S0454 to S0461		
Content:	S0465.1	Describe procedures for maintaining hopper rail cars (18 hrs)	
	S0465.2	Describe procedures for maintaining tank rail cars (21 hrs)	

Evaluation & Testing: Assignments related to theory and application skills
Final test at end of term
Periodic quizzes

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Reference Materials

AAR Publications, Transportation Technology Center,
Association of American Railroads
Safety Legislation
Interpreting Engineering Drawings
Technical Mathematics and Calculations
Metrology (Measuring and Checking)
Welding Technology
Railway Locomotive Inspection & Safety Rules
http://www.tc.gc.ca/railway/rules/tc_o_0_55.htm#contents
Railway Passenger Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-26.htm
Railway Freight Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-06-1.htm

Number: S0465.0
Title: **Rail Car Bodies 2**
Duration: Total Hours: 39 Theory: 24 Practical: 15
Cross-Reference to Training Standards: 5579.04, 5579.05

General Learning Outcomes

Upon successful completion the apprentice is able to describe procedures for maintaining hopper rail cars and tank rail cars.

Learning Outcomes and Content

65.1 Describe procedures for maintaining hopper rail cars. (18 hrs)

Describe procedures for maintaining hopper cars:

- safety legislation
- AAR regulations
- protective clothing, equipment and gear
- job documentation
- components of hopper cars: car ends, sides, roofs, doors, top hatch covers, gaskets, locks, partitions, hinges, interior dividers, walkways, chutes, bottom gates, gates, locks, top and side chord, sills, pressure hoses, gauges, end caps,
- inspection procedures
 - holes
 - rust
 - leaks
 - cracks
 - body damage
- maintenance procedures
 - welding
 - grinding
 - straightening
 - riveting
 - fastening
 - replacing
- hand tools and power equipment
- checking and inspection devices
- welding equipment
- hoisting or rigging equipment
- verification process
- recommendations for further actions
- work documentation

65.2 Describe procedures for maintaining tank rail cars. (21 hrs)

Describe procedures for maintaining tank cars:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- way bill
- placards
- components of tank cars
 - car valve housing
 - safety railings
 - car valves
 - stub sills
 - bottom outlet caps
 - centre sills
- inspection procedures
- troubleshooting procedures
- defects/damage
 - holes
 - leakage
 - cracks
 - rust
 - leaks
 - body damage
 - damaged valves and caps
- maintenance procedures
 - welding
 - grinding
 - straightening
 - adjusting
 - heating
- replacement procedures
- hand tools and power equipment
- checking and inspection devices
- welding equipment
- hoisting and rigging equipment
- verification process
- recommendations for further actions
- site clean-up procedures
- work documentation

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
60%	40%	100%

Number:	S0466		
Title:	Welding And Fabrication 3		
Duration:	Total Hours: 33	Theory: 9	Practical: 24
Prerequisites:	L1 - S0451; L2 - S0458		
Content:	S0466.1	Demonstrate Gas Metal Arc Welding (GMAW) procedures (29 hrs)	
	S0466.2	Demonstrate procedures for operating emergency safety equipment when performing welding processes (2 hrs)	
	S0466.3	Demonstrate procedures for handling hazardous material and dangerous goods/commodities when performing welding processes (2 hrs)	

Evaluation & Testing: Assignments related to theory and application skills
Final test at end of term
Periodic quizzes

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Reference Materials

AAR Publications, Transportation Technology Center,
Association of American Railroads
Safety Legislation
Interpreting Engineering Drawings
Technical Mathematics and Calculations
Metrology (Measuring and Checking)
Welding Technology
Railway Locomotive Inspection & Safety Rules
http://www.tc.gc.ca/railway/rules/tc_o_0_55.htm#contents
Railway Passenger Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-26.htm
Railway Freight Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-06-1.htm

Number: S0466.0
Title: **Welding and Fabrication 3**
Duration: Total Hours: 33 Theory: 9 Practical: 24
Cross-Reference to Training Standards: 5571.12

General Learning Outcomes

Upon successful completion the apprentice will be able to demonstrate (GMAW) Gas Metal Arc Welding processes.

Learning Outcomes and Content

66.1 Demonstrate gas metal arc welding (GMAW) procedures. (29 hrs)

Demonstrate gas metal arc welding (GMAW) procedures:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- power source
- feeders
- welding cable assemblies
- welding gun
- gun liners
- gas distributor
- gas cup and seals
- contact tubes
- flow meter
- purging equipment
- assembly of welding equipment
- setting up of welding equipment
- attachments and tooling
- checking and inspection devices
- testing of welding equipment
- calibration procedures
- verification process
- site clean-up procedures
- welding documentation

66.2 Demonstrate procedures for operating emergency safety equipment when performing welding processes. (2 hrs)

Describe procedures for operating welding emergency safety equipment:

- type of emergency safety equipment
- safety legislation
- AAR regulations
- protective equipment and gear
- fire suppression equipment
- fire extinguishers
- respirators
- first aid equipment
- operational procedures
- storage and maintaining of equipment
- work documentation

66.3 Demonstrate procedures for handling welding hazardous material and dangerous goods/commodities when performing welding processes. (2 hrs)

Describe procedures for handling hazardous material and dangerous goods/commodities:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- handling procedures
- storage procedures
- work documentation

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
30%	70%	100%

Number:	S0467		
Title:	Regulatory Publications 3		
Duration:	Total Hours: 9	Theory: 9	Practical: 0
Prerequisites:	L1 - S0451; L2 - S0459		
Content:	S0467.1	Interpret regulations and procedures from the Association of American Railroads Mechanical Section, Manual Sections D, G, H, C, E, B (4 hrs)	
	S0467.2	Interpret the regulations from the Association of American Railroads (AAR) Field Manual related to Freight Cars, Freight Brakes, and welding of Tank Car Tanks (5 hrs)	

Evaluation & Testing: Assignments related to theory and application skills
Final test at end of term
Periodic quizzes

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Reference Materials

AAR Publications, Transportation Technology Center,
Association of American Railroads
Safety Legislation
Interpreting Engineering Drawings
Technical Mathematics and Calculations
Metrology (Measuring and Checking)
Welding Technology
Railway Locomotive Inspection & Safety Rules
http://www.tc.gc.ca/railway/rules/tc_o_0_55.htm#contents
Railway Passenger Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-26.htm
Railway Freight Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-06-1.htm

Number: S0467.0
Title: **Regulatory Publications 3**
Duration: Total Hours: 9 Theory: 9 Practical: 0
Cross-Reference to Training Standards: U5570.0 to U5580.0 (All)

General Learning Outcomes

Upon successful completion the apprentice will be able to interpret specifications, standards, and practices in the Association of American Railroads Mechanical Manual, Manual Sections D, G, H, C, E, B. and the regulations from the Association of American Railroads (AAR) Field Manual related to Freight Cars, Freight Car Brakes, and welding of Tank Car Tanks

Learning Outcomes and Content

67.1 Interpret specifications, standards, and practices in the Association of American Railroads Mechanical Manual, Manual Sections D, G, H, C, E, B. (4 hrs)

Interpret specific regulations from Section D:

- codes
- design features
- trucks
- truck details
- side frames
- truck bolsters

Interpret specific regulations from Sections G and H:

- wheels
- axles
- roller bearings

Interpret specific regulations from Sections C:

- car construction

Interpret specific regulations from Section E:

- brakes

Interpret specific regulations from Section B:

- couplers

67.2 Interpret the regulations from the Association of American Railroads (AAR) Field Manual related to Freight Cars, Freight Car Brakes, and welding of Tank Car Tanks. (5 hrs)

Interpret specific regulations related to the Care and Repair of Freight Cars.
Interpret specific regulations related to Interchange of Freight Cars.

Interpret specific regulations related to Brakes.

Interpret specific regulations related to Welding of Tank Car Tanks.

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
100%	0%	100%

Number:	S0468		
Title:	Rail Car Brakes 3		
Duration:	Total Hours: 39	Theory: 15	Practical: 24
Prerequisites:	L1 - S0451; L2 - S0459		
Content:	S0468.1	Describe procedures for maintaining rail car slack adjusters (13 hrs)	
	S0468.2	Describe procedures for maintaining a rail car reservoir tank (13 hrs)	
	S0468.3	Describe procedures for maintaining rail car hand brakes (13 hrs)	

Evaluation & Testing: Assignments related to theory and application skills
Final test at end of term
Periodic quizzes

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Reference Materials

AAR Publications

Safety Legislation

Interpreting Engineering Drawings

Technical Mathematics and Calculations

Metrology (Measuring and Checking)

Welding Technology

Railway Locomotive Inspection & Safety Rules

http://www.tc.gc.ca/railway/rules/tc_o_0_55.htm#contents

Railway Passenger Car Inspection and Safety Rules

http://www.tc.gc.ca/railway/rules/tc_0-26.htm

Railway Freight Car Inspection and Safety Rules

http://www.tc.gc.ca/railway/rules/tc_0-06-1.htm

Number: S0468.0
Title: **Brakes 3**
Duration: Total Hours: 39 Theory: 15 Practical: 24
Cross-Reference to Training Standards: 5576.05, 5576.06, 5576.07

General Learning Outcomes

Upon successful completion the apprentice will be able to describe procedures for maintaining rail car slack adjusters, reservoirs, and hand brakes.

Learning Outcomes and Content

68.1 Describe procedures for maintaining rail car slack adjusters. (13 hrs)

Describe procedures for maintaining slack adjusters:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
- single-car testing procedures
- slack-adjuster testing procedures
- defective/damage components
- out-of-adjustment slack adjusters
- replacement procedures
- tagging defective slack adjusters for further action
- maintenance procedures
 - repairing
 - straightening
 - adjusting
 - welding
- tools and equipment
 - single-car test devices
 - wrenches
 - sockets
 - hammer
 - pliers
 - screwdrivers
- checking and inspection devices
- verification process
- site clean-up procedures
- work documentation

68.2 Describe procedures for maintaining a rail car reservoir tank. (13 hrs)

Describe procedures for maintaining a reservoir tank:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- single-car testing procedures
- inspections procedures
 - quality of replacement parts
 - checking and inspection devices
- defective/damage components
- maintenance procedures
 - removing
 - replacing
 - repairing
- hand tools and power equipment
 - single-car test devices
 - ratchet
 - drift
 - pneumatic tools
 - air guns
 - fasteners
- verification process
- recommendations for further action
- site clean-up procedures
- work documentation

68.3 Describe procedures for maintaining rail car hand brakes. (13 hrs)

Describe procedures for maintaining hand brakes:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
- checking and inspection devices
- defective/damage components
- maintenance procedures
 - removing
 - replacing
 - lubricating

- tools and equipment
 - torches
 - wrenches
 - pliers
 - sockets
- tagging defective brakes for further action
- verification process
- recommendations for further action
- site clean-up procedures
- work documentation

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
45%	55%	100%

Number:	S0469		
Title:	Rail Coaches 2		
Duration:	Total Hours: 33	Theory: 24	Practical: 9
Prerequisites:	L1 - S0451; L2 - S0459		
Content:	S0469.1	Describe procedures for maintaining rail coach kitchens and bathrooms (6 hrs)	
	S0469.2	Describe procedures for maintaining rail coach emergency equipment (5 hrs)	
	S0469.3	Describe procedures for maintaining rail coach electrical components (6 hrs)	
	S0469.4	Describe inspection procedures of rail coach plumbing fixtures and appliances (6 hrs)	
	S0469.5	Describe procedures for maintaining rail coach brake systems (5 hrs)	
	S0469.6	Describe procedures for maintaining rail coach roller bearing (5 hrs)	

Evaluation & Testing: Assignments related to theory and application skills
Final test at end of term
Periodic quizzes

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Reference Materials

- AAR Publications
- Safety Legislation
- Interpreting Engineering Drawings
- Technical Mathematics and Calculations
- Metrology (Measuring and Checking)
- Welding Technology
- Railway Locomotive Inspection & Safety Rules
http://www.tc.gc.ca/railway/rules/tc_o_0_55.htm#contents
- Railway Passenger Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-26.htm
- Railway Freight Car Inspection and Safety Rules
http://www.tc.gc.ca/railway/rules/tc_0-06-1.htm

Number: S0469.0
Title: **Rail Coaches 2**
Duration: Total Hours: 33 Theory: 24 Practical: 9
Cross-Reference to Training Standards: 5580.01 to 5580.10

General Learning Outcomes

Upon successful completion the apprentice will be able to describe procedures for inspecting, servicing and maintaining rail coach kitchens, bathrooms, emergency equipment, electrical components, plumbing, brake systems, and roller bearings.

Learning Outcomes and Content

69.1 Describe procedures for maintaining rail coach kitchens and bathrooms.(6 hrs)

Describe procedures for maintaining coach kitchens and bathrooms:

- safety legislation
- AAR regulations
- protective clothing, equipment and gear
- job documentation
- inspection procedures
- accessories:
 - securements
 - griddles
 - range hoods
 - fire suppression systems
 - fridges/freezers
 - small appliances
 - microwave ovens
 - dish racks
 - cash registers
 - dispensers
 - rails
 - waste receptacles
 - mirrors
- replacement procedures
- fastening procedures
- hand tools and electrical power tools
- verification process
- recommendations for further action
- site clean-up procedures
- work documentation

69.2 Describe procedures for maintaining rail coach emergency equipment. (5 hrs)

Describe procedures for maintaining emergency equipment:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
- emergency equipment components
 - window units
 - release hardware
 - axes
 - saws
 - sledge hammers
 - fire extinguishers
 - pry bars
 - first aid kits
 - stretchers
 - trauma kits
- replacement procedures
- fastening procedures
- hand tools
- power tools
- checking and inspection devices
- verification process
- recommendation for further action
- site clean-up procedures
- work documentation

69.3 Describe procedures for maintaining rail coach electrical components. (6 hrs)

Describe procedures for maintaining electrical components:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures

- electrical components
 - heaters
 - lighting
 - fans
 - evaporators
 - blowers
 - speakers
 - amplifiers
 - players
 - disc players
 - television
 - audio equipment
- replacement procedures
- fastening procedures
- hand tools
- electric power equipment
- recommendation for further action
- verification process
- site clean-up procedures
- work documentation

69.4 Describe inspection procedures of rail coach plumbing fixtures and appliances. (6 hrs)

Describe inspection procedures of plumbing fixtures and appliances:

- safety legislation
- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
- plumbing components
 - hot water tanks
 - water storage tanks
 - exchangers
 - waste piping
 - piping
 - taps
 - faucets
 - plugs
 - bowls
 - stands
 - shower stalls
 - shower brackets
 - shower curtains and rods

- toilet seats
- toilet lids
- toilet drip pans
- toilet flush mechanism
- toilet shrouds
- toilet diaphragms
- holding tanks
- troubleshooting procedures
- fastening procedures
- securing procedures
- hand tools
- power equipment
- checking and inspection devices
- recommendations for further action
- verification process
- side clean-up procedures
- work documentation

69.5 Describe procedures for maintaining rail coach brake systems. (5 hrs)

Describe procedures for maintaining coach brake systems:

- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
- single-car brake test device
- coach brake system components
 - service and emergency portions
 - pressure relief valves
 - reservoir relief valves
 - pipe brackets and manifolds
 - strainers
 - housings
 - piston return assemblies
 - seals
 - gaskets
 - lubricants
 - brake cylinders
 - pneumatic slack adjusters
- troubleshooting procedures

- maintenance procedures
 - reconditioning
 - replacing
 - fastening
 - securing
- hand tools
- power equipment
- checking and inspection devices
- air brake testing equipment
- lapping machine
- recommendations for further action
- verification process
- side clean-up procedures
- work documentation

69.6 Describe procedures for maintaining rail coach roller bearings. (5 hrs)

Describe procedures for maintaining roller bearings:

- AAR regulations
- protective clothing
- protective equipment and gear
- job documentation
- inspection procedures
- roller bearing components
 - caps
 - cups
 - cone assemblies
 - spacers
 - seal wear rings
 - seals
 - backing rings
 - adaptors
 - lubricators
- troubleshooting procedures
- maintenance procedures
 - cleaning
 - reconditioning
 - replacing
 - fastening
 - securing
- hand tools
- power equipment
- checking and inspection devices

- hydraulic press
- dial indicators
- grease slingers
- gauges
- torque wrench
- recommendations for further action
- verification process
- side clean-up procedures
- work documentation

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
75%	25%	100%



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