



ONTARIO COLLEGE OF TRADES

ORDRE DES MÉTIERS DE L'ONTARIO

Apprenticeship
Curriculum Standard

Railway Car Technician

Level 3 Advanced

Trade Code: 268R

Date: 2008

Please Note: Apprenticeship Training and Curriculum Standards were developed by the Ministry of Training, Colleges and Universities (MTCU). As of April 8th, 2013, the Ontario College of Trades (College) has become responsible for the development and maintenance of these standards. The College is carrying over existing standards without any changes.

However, because the Apprenticeship Training and Curriculum Standards documents were developed under either the *Trades Qualification and Apprenticeship Act* (TQAA) or the *Apprenticeship and Certification Act, 1998* (ACA), the definitions contained in these documents may no longer be accurate and may not be reflective of the *Ontario College of Trades and Apprenticeship Act, 2009* (OCTAA) as the new trades legislation in the province. The College will update these definitions in the future.

Meanwhile, please refer to the College's website (<http://www.collegeoftrades.ca>) for the most accurate and up-to-date information about the College. For information on OCTAA and its regulations, please visit: <http://www.collegeoftrades.ca/about/legislation-and-regulations>

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Introduction

This curriculum revision for the Level 3 – Railway Car Technician is based upon the on-the-job performance objectives, located in the industry approved training standard.

The curriculum is organized into 8 reportable subjects. The Program Summary of Reportable Subjects chart summarizes the training hours for each reportable subject.

The curriculum identifies only the learning that takes place off-the-job. 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 the work site. Regular evaluations of the apprentice's knowledge and skills are conducted throughout training to ensure that all apprentices have achieved the learning outcomes and content 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.

Railway Car Technician – Level 3

Program Summary of Reportable Subjects - 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

Railway Car Technician – Level 3

Number: **S0462**

Title: **CAR/TRAIN SAFETY AND MAINTENANCE
INSPECTIONS 2**

Duration: Total 24 hours Theory 9 hours Practical 15 hours

Prerequisites: L1 - S0446 > S0453; L2 - S0454 > 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)**
S0462.3 Describe procedures for the inspection of rail
car wreck damage **(8 hrs)**

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

Mark Distribution:

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

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Railway Car Technician – Level 3

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

S0462.0 Car/Train Safety and Maintenance Inspections 2

Duration: Total 24 hours Theory 9 hours Practical 15 hours

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

Railway Car Technician – Level 3

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

Railway Car Technician – Level 3

Number: **S0463**

Title: **RAIL CAR TRUCKS 2**

Duration: Total 39 hours Theory 39 hours Practical 0 hours

Prerequisites: L1: S0446 > S0453; L2: S0454 > 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

Mark Distribution:

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

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Railway Car Technician – Level 3

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

S0463.0 Rail Car Trucks 2

Duration: Total 39 hours Theory 39 hours Practical 0 hours

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

Railway Car Technician – Level 3

63.1 Continued

- 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

Railway Car Technician – Level 3

63.3 Continued

- 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

Railway Car Technician – Level 3

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

Railway Car Technician – Level 3

Number: **S0464**

Title: **RAIL CAR UNDERFRAMES 2**

Duration: Total 24 hours Theory 15 hours Practical 9 hours

Prerequisites: L1: S0446 > S0453; L2: S0454 > 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

Mark Distribution:

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

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Railway Car Technician – Level 3

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

S0464.0 Rail Car Underframes 2

Duration: Total 24 hours Theory 15 hours Practical 9 hours

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

Railway Car Technician – Level 3

Number: **S0465**

Title: **RAIL CAR BODIES 2**

Duration: Total 39 hours Theory 24 hours Practical 15 hours

Prerequisites: L1: S0446 > S0453; L2: S0454 > 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

Mark Distribution:

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

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Railway Car Technician – Level 3

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

S0465.0 Rail Car Bodies 2

Duration: Total 39 hours Theory 24 hours Practical 15 hours

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

Railway Car Technician – Level 3

65.1 Continued

- 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

Railway Car Technician – Level 3

65.2 Continued

- 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

Railway Car Technician – Level 3

Number: **S0466**

Title: **WELDING AND FABRICATION 3**

Duration: Total 33 hours Theory 9 hours Practical 24 hours

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

Mark Distribution:

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

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Railway Car Technician – Level 3

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

S0466.0 Welding and Fabrication 3

Duration: Total 33 hours Theory 9 hours Practical 24 hours

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

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- 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

Railway Car Technician – Level 3

Number: **S0467**

Title: **REGULATORY PUBLICATIONS 3**

Duration: Total 9 hours Theory 9 hours Practical 0 hours

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

Mark Distribution:

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

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Railway Car Technician – Level 3

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

S0467.0 Regulatory Publications 3

Duration: Total 9 hours Theory 9 hours Practical 0 hours

Cross Reference to Training Standards: U5570.0 > 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

Railway Car Technician – Level 3

- 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.

Railway Car Technician – Level 3

Number: **S0468**

Title: **RAIL CAR BRAKES 3**

Duration: Total 39 hours Theory 15 hours Practical 24 hours

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

Mark Distribution:

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

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Railway Car Technician – Level 3

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

S0468.0 Brakes 3

Duration: Total 39 hours Theory 15 hours Practical 24 hours

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

Railway Car Technician – Level 3

68.1 Continued

- 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

Railway Car Technician – Level 3

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

Railway Car Technician – Level 3

Number: **S0469**

Title: **RAIL COACHES 2**

Duration: Total 33 hours Theory 24 hours Practical 9 hours

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

Mark Distribution:

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

Instructional/Delivery Strategies: Lecture
Video
Paper based material
CBT

Railway Car Technician – Level 3

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

S0469.0 Rail Coaches 2

Duration: Total 33 hours Theory 24 hours Practical 9 hours

Cross Reference to Training Standards: 5580.01 > 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