National Rail Car Training Consortium

Course Catalog

Version 1
July 2020

RAIL CAR TRAINING CONSORTIUM

Table of Contents

Disclaimer: These courses are intended to educate employees of public transportation systems that have agreed to voluntarily participate in the Rail Car Training Consortium. It is intended only as informal guidance on the matters addressed, and should not be relied upon as the only method or manner for performing the tasks or work outlined in the materials. Anyone using this document or information provided in the associated training program should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of care in any given circumstances. These materials are based on compendiums of knowledge from transit employees, manufacturers and outside consultants, each of whom may approach a repair, update, or maintenance in their own unique way. Always follow the safety and maintenance procedures from your own agency, union, relevant OEM(s) and/or regulatory organizations. In addition, the course materials include examples from member agencies, nomenclature, procedures, and configurations which can vary from one transit location to another. The document that you are now referencing may have been modified by the Consortium member. For the original versions, please go to TransitTraining.net or contact the Transportation Learning Center.

The Rail Car Training Consortium, its participating agencies and labor unions, as well as the Transportation Learning Center, make no guaranty or warranty as to the accuracy or completeness of any information provided herein. The Rail Car Training Consortium, its participating agencies and labor unions, as well as the Transportation Learning Center, disclaim liability for any injury or other damages of any nature whatsoever, directly or indirectly, resulting from the use of or reliance on this document or the associated training program.

Overview

Started in late 2015, the National Rail Car Training Consortium (Rail Car Consortium or Consortium) has moved forward with its mission to create standardized national training courseware for rail car technicians. The development team composed of over 40 rail car maintenance subject matter experts (SMEs) from 18 member agencies and unions (see Figure 1) from across the country along with instructional systems designers from the Transportation Learning Center (the Center), design curriculum and courseware for the rail and transit industry. By joining the Rail Car Training Consortium, agencies improve technician skills and prepare for new fleet implementation or upgrade internal capacity to refurbish existing fleet.

Since its inception, the Rail Car Consortium has developed a full suite of courseware to include: HVAC, Auxiliary Power Systems, Propulsion and Dynamic Braking, Doors, Friction Brakes, Current Collection & Distribution, Communication Systems, Automatic Train Control, Carbody, Trucks and Axles and Couplers. Additionally, the Rail Car Consortium has developed Overview to Rail Vehicle Subsystems, Troubleshooting and Diagnostics Principles and Rail Car Train-the-Trainer.

To date, the consortium has developed 35 courses and each includes:

- Participant Guides
- Instructor Guides
- PowerPoints with instructor notes
- Pre and Post Course Assessments
- Module Quizzes
- Instructional Videos
- Hands-on learning activities

Member agencies have the advantage of implementing already developed courses immediately while working with subject matter experts across the country to develop new material. The participatory process (including running pilot courses on new material) accelerates the learning process for frontline techs.

Key accomplishments by the Consortium in Phases I & II include:

- Development of more than 300 hours **of classroom ready courseware** (35 courses) for the background knowledge, safety procedures, inspection and maintenance, and troubleshooting of:
    - Overview of Rail Subsystems
    - HVAC
    - Auxiliary Power Systems/Batteries
    - Propulsion and Dynamic Braking
    - Doors
    - Friction Brakes
    - Rail Car Troubleshooting and Diagnostics Principles
    - Automatic Train Control

    - Current Collection
    - Communication Systems
    - Trucks and Axles
    - Carbody
    - Couplers
    - Rail Car Train-the-Trainer
- 39 **Instructional Videos**
- 46 rail technician **training opportunities** through courseware pilots, totaling 424 learning hours, an average of 46% **learning gains** by participants
- Six in-person Consortium meetings where SMEs from member locations engage in concentrated courseware development with the Center's Instructional Designers and learn about best practices on rail car training
- Two **mentor training sessions** for frontline rail car maintenance mentors at two member locations
- One Consortium-wide **Train-the-Trainer** for seven rail car instructors from six member locations

For more information on the Rail Car Consortium, contact Xinge Wang at XWang@transportcenter.org.

Figure 1. Member Locations of the Rail Car Consortium (2019)

Bay Area Transit/SEIU 1021	Maryland MTA/ATU 1300	San Francisco MTA (MUNI)/IBEW 6	Edmonton Transit Service/ATU 569
Chicago Transit Authority/ATU 308	MBTA (Boston)/ATU 589	Valley Transit Authority/ATU 265	Port Authority Transit Corporation
Dallas Area Rapid Transit/ATU 1338	Metro Transit (Minneapolis)/ATU 1005	Washington Metro/ATU 689	San Diego MTS
Denver RTD/ATU 1001	NFTA (Niagara)/ATU 1342	Charlotte Area Transit System	Sound Transit
Greater Cleveland RTA/ATU 268	Sacramento RT/ IBEW 1245		

Figure 2. Course Sequence

Topic Areas	100 Level Overview		200 Level Inspection & Maintenance		300 Level Troubleshooting	
Overview	100	Vehicle Theory of Operation and Overview of Major Systems		Not Applicable	300	Troubleshooting Principles
Couplers	101	Intro and Overview to Couplers	201	Couplers Inspection and Maintenance	301	Troubleshooting Couplers
Trucks and Axles	102	Intro and Overview to Trucks and Axles	202	Trucks and Axles Inspection and Maintenance	302	Troubleshooting Trucks and Axles
Propulsion/Dynamic Braking	103	Intro and Overview to Propulsion/Dynamic Braking	203	Propulsion/Dynamic Braking Inspection and Maintenance	303	Troubleshooting Propulsion/Dynamic Braking
APS & Batteries	104	Intro and Overview to APS & Batteries	204	APS & Batteries Inspection and Maintenance	304	Troubleshooting APS & Batteries
Friction Brakes	105	Intro and Overview to Friction Brakes	205	Friction Brakes Inspection and Maintenance	305	Troubleshooting Friction Brakes
HVAC	106	Intro and Overview to HVAC	206	HVAC Inspection and Maintenance	306	Troubleshooting HVAC
Current Collection & Distribution	107	Intro and Overview to Current Collection and Distribution	207	Current Collection Inspection and Maintenance	307	Troubleshooting Current Collection & Distribution
Carbody	108	Intro and Overview to Carbody	208	Carbody Inspection and Maintenance	308	Troubleshooting Carbody
Doors	109	Intro and Overview to Doors	209	Doors Inspection and Maintenance	309	Troubleshooting Doors
Communication	110	Intro and Overview to Communication Systems	210	Communication Systems Inspection and Maintenance	310	Troubleshooting Communication Systems
ATC	111	Intro and Overview to Automatic Train Control	211	Automatic Train Control Inspection and Maintenance	311	Troubleshooting Automatic Train Control
Networking and Communications	112	Intro and Overview to Networking and Communications	212	Networking and Communications Inspection and Maintenance	312	Troubleshooting Networking and Communications
Re-railing	TBD	Overview to Re-railing Principles	Not Applicable			

Key:

	Developed		To be developed 2020

100 Level Courses

Course 100: Introduction and Overview to Rail Vehicle Systems, Operation and Maintenance

Course Description

This two-day course presents an overview of rail vehicle systems as well as general inspection and maintenance procedures. Participants engage in a series of activities that help them prepare to work on rail vehicles in a maintenance facility for passenger rail cars. Content is supplemented with examples to support participants' successful application of the course content to their work.

This course is organized into five modules. Within each module there may be several learning application activities and demonstrations. Before starting the course instruction, participants are expected to complete a **Pre-Course Assessment** to assess their knowledge of the subject. Similarly, after instruction of all the modules, participants will complete a **Post-Course Assessment** as well as a course evaluation.

Classroom Instruction: 15.7 hours	**Hands-on Instruction:** 45 minutes/participant *Hands-on instruction time provided is the amount of time to complete in the field activities. Instructors will have to calculate hands-on instruction time based on the number of participants in each class to determine* ***total course instruction time****.*

Module 1: Introduction to the Rail Vehicle

Outcome: Explains parts, classes and environment of the rail vehicle.
Duration of this Module: 151 minutes
This Module has a Quiz

Learning Objectives
Following the completion of this Module, the participant should be able to complete the objectives with an accuracy of 75% or greater:

- Identify classes of rail
- Identify parts of the rail vehicle
- Explain the rail vehicle dynamic envelope
- Explain the rail vehicle environment
- Identify the Direct Current (DC) disconnect