



HIGH-SPEED TRAINING PROJESİ

RAILWAY VEHICLE MAINTAINER BASIC COURSE



High-Speed TrainING Projesi

This training program aims to ensure that railway vehicle maintenance and repair workers working in Vehicle Maintenance units in the Rail Systems Sector adapt to Vehicle Maintenance units, master basic terminology related to railways, create awareness about railway safety, introduce the operating systems and components of traction vehicles, provide technical and administrative information on railway operation and reinforce this information with workshop applications; and has been prepared under the coordination of TCDD Taşımacılık A.Ş. within the scope of the High-Speed TrainING project with the participation of the partners whose logos are given below.

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TERMS / ABBREVIATIONS

T : Theoretical Training

SE: Classroom Training

SDE: Out-of-Class Training, Activities carried out in **factories**, workshops, warehouses, depots, **stations**, vehicles, trains, simulators, etc. to reinforce theoretical training

T1: Theoretical Exam

BG: Information

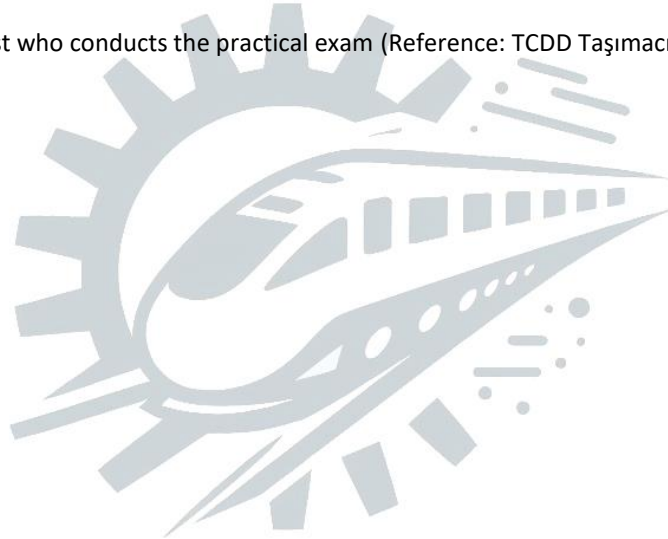
Qualification Unit: A compulsory or elective, independently measurable, transferable qualification section in the education program (Reference: TCDD Taşımacılık Inc. Personnel Training Directive)

Y1/Y2/Y3: Qualification Units

Trainer: Teachers and field experts who are given paid lectures in in-service training activities (Reference: TCDD Taşımacılık Inc. Personnel Training Directive)

Supervisor: Those assigned to ensure exam discipline (Reference: TCDD Taşımacılık Inc. Personnel Training Directive)

Examiner: The teacher or field specialist who conducts the practical exam (Reference: TCDD Taşımacılık Inc. Personnel Training Directive)



Railway Vehicle Maintainer Basic Course

1	NAME OF THE TRAINING PROGRAM	Railway Vehicle Maintainer Basic Course																						
2	NUMBER OF PARTICIPANTS	20 persons																						
3	SCOPE OF THE TRAINING PROGRAM																							
This training program is intended for workers working in maintenance and repair works in Vehicle Maintenance units.																								
4	TERM(S) OF THE PARTICIPATION IN THE TRAINING PROGRAM																							
<ul style="list-style-type: none"> General Qualifications Professional Qualifications Special Cases 																								
5	STRUCTURE OF THE TRAINING PROGRAM																							
<p>Compulsory Qualification Units Y1- General Railway Knowledge Y2- Towing Vehicle Knowledge Y3- Towed Vehicle Knowledge</p> <p>Optional Qualification Units No</p>																								
6	COURSE / QUALIFICATION UNIT TABLE																							
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2" style="width: 50%;">COURSES / QUALIFICATION UNITS</th><th colspan="2">THEORETICAL</th><th rowspan="2">TOTAL</th></tr> <tr> <th style="width: 15%;">SE</th><th style="width: 15%;">SDE</th></tr> </thead> <tbody> <tr> <td style="text-align: left;">Y1- General Railway Knowledge</td><td>12</td><td>6</td><td>18</td></tr> <tr> <td style="text-align: left;">Y2- Towing Vehicle Knowledge</td><td>12</td><td>12</td><td>24</td></tr> <tr> <td style="text-align: left;">Y3- Towed Vehicle Knowledge</td><td>12</td><td>6</td><td>18</td></tr> <tr> <td style="text-align: left;">Total Training Duration</td><td></td><td></td><td>60</td></tr> </tbody> </table>			COURSES / QUALIFICATION UNITS	THEORETICAL		TOTAL	SE	SDE	Y1- General Railway Knowledge	12	6	18	Y2- Towing Vehicle Knowledge	12	12	24	Y3- Towed Vehicle Knowledge	12	6	18	Total Training Duration			60
COURSES / QUALIFICATION UNITS	THEORETICAL			TOTAL																				
	SE	SDE																						
Y1- General Railway Knowledge	12	6	18																					
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Y3- Towed Vehicle Knowledge	12	6	18																					
Total Training Duration			60																					
7	CERTIFICATION	-																						

Y1- GENERAL RAILWAY KNOWLEDGE QUALIFICATION UNIT

1	QUALIFICATION UNIT / COURSE NAME	General Railway Knowledge
2	DURATION	Classroom Training 24 hours, Out-of-Class Training 6 hours Total 30 saat
3	PRE-REQUISITE	-
4	GENERAL AIM	<ul style="list-style-type: none"> * Teaching basic railway terms to the participants * Raising awareness on railway safety * Raising awareness on OHS * To have knowledge about railway infrastructure, superstructure, legal regulations related to railway, international organizations
5	TEACHING METHODS	<p>Oral Expression ; Course topics will be explained in the classroom with oral expression method. Lectures will be supported by demonstrations such as photographs, slides, videos, etc.</p> <ul style="list-style-type: none"> • Question-Answer; Participation in the course will be ensured by mutual participation in the form of question and answer. • Out-of-Class Training; The subjects explained in the classroom will be reinforced by demonstration in TÜRASAŞ Eskişehir Regional Directorate and Locomotive/Wagon Maintenance and Repair Workshop/Directorate/Supervision and/or Station/Station roads. <p>The trainers of the courses in the program list the general objectives of their course and the targeted outcomes for the participants at the end of the course; they inform the participants about the way the course is taught and the evaluation methods related to the course. At the beginning of each unit, the specific objectives of the unit are stated, and at the end of the unit, the targeted outcomes are listed. An end-of-unit assessment is made to determine whether the targeted outcomes have been achieved. The teaching of the subjects related to the gains determined not to have been achieved is repeated.</p>
6	TRAINING TOOLS	<ul style="list-style-type: none"> • Writing board and pen, • Smart board, • Computer, • Projection, • Related locomotive/set and diesel engines
7	TRAINING ENVIRONMENT	<ul style="list-style-type: none"> • Classroom equipped with educational tools, • Field with locomotive/set and engine technology
8	COURSE MATERIALS	<ul style="list-style-type: none"> • Lecture notes, • Slides, • Videos.
11	CONTENT OF QUALIFICATION UNIT	<p>* RAILWAY SECTOR STRUCTURE (SE: 6 hours, SDE:, Total 6 hours)</p> <p>Historical Development of Rail Systems in the World and Turkey</p> <p>Railway Sector Structure</p> <p>TCDD Taşımacılık Inc. Structure and Units</p> <p>Structure and Units of Vehicle Maintenance Department</p> <p>Organizations Leading Railways in the World</p> <p>Railway Reform Process in the World</p> <p>European Union Railway Policies</p>

*** OCCUPATIONAL SAFETY ON RAILWAYS (SE: 6 hours, SDE:, Total 6 hours)**

Order No. 641

OHS Law No. 6331

Legal Rights and Responsibilities of Employees

Obligation to Perform Duties in Accordance with the Legislation

Right to Refrain from Working

Workplace Cleanliness and Order

Basic Concepts

Quality Working Environment and Continuity

Effects on Occupational Illness, Work Accidents, Productivity and Motivation

Legal Consequences of Work Accidents and Occupational Diseases

Obligation and Process of Notification of Occupational Accident and Occupational Disease

Actions to be Taken by the Employer and Employee in the Event of a Work Accident

*** SAFETY CULTURE ON RAILWAYS (SE: 6 hours, SDE:, Total 6 hours)**

A – SAFETY CONCEPT IN RAILWAYS

History of the Concept of Safety

Historical Development of Safety Concept in Railways

Approaches to Accidents

Accident statistics

Safety Management System (SMS)

Safety Management System (SMS) applications

B- SAFETY CULTURE ON RAILWAYS

Culture

Safety Culture

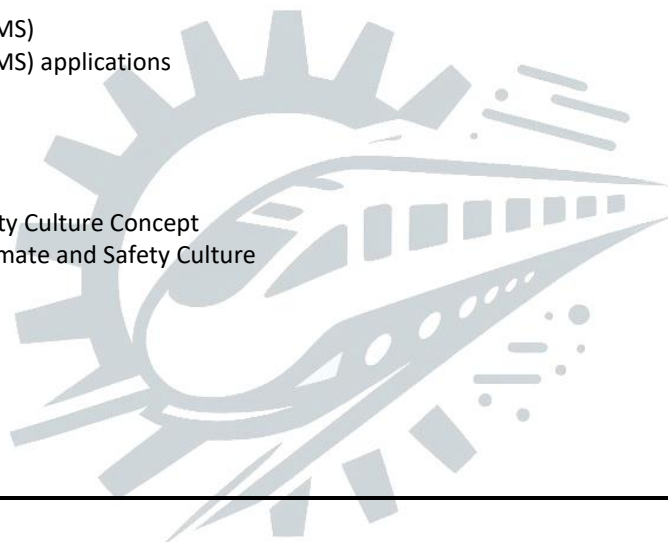
Historical Development of Safety Culture Concept

Differences Between Safety Climate and Safety Culture

Improving Safety Culture

Safety Culture Models

ERA Safety Culture Model

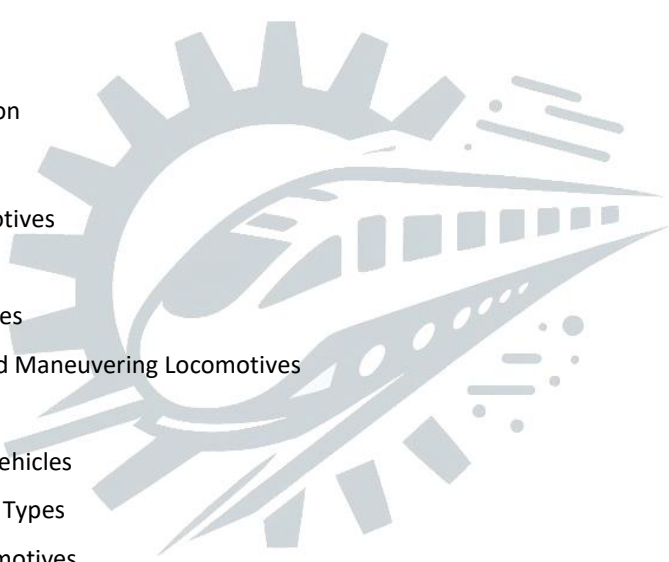


Y1- GENERAL RAILWAY KNOWLEDGE		
No	Knowledge Statement	Assessment Tool
BG.1	Explains the historical development of rail systems in the world and in Turkey.	-
BG.2	Explains the work steps of the railway sector structure.	-
BG.3	Explains the organizations that shape the railway in the world.	-
BG.4	Explains the railroad reform process in the world.	-
BG.5	Explains the railway policies of the European Union.	-
BG.6	Explains the terms used in rail systems management.	-
BG.7	List international railway organizations such as UIC, OTIF, ERA.	-
BG.8	Explains the duties of international railway organizations.	-
BG.9	Explains the reforms in the European railway sector.	-
BG.10	Explains the existing regulations in the European railway sector.	-
BG.11	Explains information about work legislation.	-
BG.12	Explains legal norms and hierarchy of norms.	-
BG.13	Explains the obligation and scope of accountability of public officials.	-
BG.14	Explains the Law No. 6331 on Occupational Health and Safety and Related Regulations.	-
BG.15	Explains the Legal Rights and Responsibilities of Employees.	-
BG.16	Explains the obligation to perform tasks in accordance with the legislation.	-
BG.17	Explains the right to refrain from work.	-
BG.18	Explains workplace cleaning and organization.	-
BG.19	Explains how to ensure a quality working environment and its continuity.	-
BG.20	Explains the effects of occupational diseases, work accidents, productivity and motivation.	-
BG.21	Explains the legal consequences of work accidents and occupational diseases.	-
BG.22	Explains the obligation and process of notification of occupational accidents and occupational diseases.	-
BG.23	Explains the history of the safety concept.	-
BG.24	Explains the historical development of the concept of safety in railways.	-
BG.26	Explains approaches to accidents.	-
BG.27	Explains accident statistics.	-
BG.28	Explains the Safety Management System (SMS).	-
BG.29	Explains SMS applications.	-
BG.31	Explains the concept of culture.	-
BG.32	Explains safety culture.	-
BG.33	Explains the historical development of the concept of safety culture.	-

Y1- GENERAL RAILWAY KNOWLEDGE		
No	Knowledge Statement	Assessment Tool
BG.34	Explains the differences between safety climate and safety culture.	-
BG.35	Explains the ERA safety culture model.	-

Y2- TOWING VEHICLE KNOWLEDGE QUALIFICATION UNIT

1	QUALIFICATION UNIT / COURSE NAME	Towing Vehicle Knowledge
2	DURATION	Classroom Training 12 hours, Out-of-Class training 12 hours Total 24 hours
3	PRE-REQUISITE	-
4	GENERAL AIM	<p>It is aimed to gain knowledge and attitude about:</p> <ul style="list-style-type: none"> *Engine terms, concepts and definitions, working principle and basic parts, technical specifications, layout, systems, malfunctions and periodic maintenance of diesel engines of DE 24000, DE 22000 / DE 33000 and DE 36000 type locomotives, *Electrical terms, concepts and laws, electrical circuits, magnitudes and types, active and passive circuit elements, electrical machines, electrical circuits, working principles, malfunctions and periodic maintenance of Generator Wagons and DE 22000 / DE 33000 type locomotives, *Common components in electric vehicles, general and electrical structure, lighting and air conditioning arrangements, common basic parts, welds and receivers of E 68000 type locomotive and YHT 80100 type train set, *Mechanical parts and components in towing vehicles, hydraulic transmission from auxiliary equipment, boden lubrication system, train control system, power transmission systems, auxiliary power unit, locomotive central air system, CCTV system, ATP, APU, FDU and multiple control, electrification, speed control system and multiple control, * Water used in cooling systems, treatment, antifreeze applications, oil and fuel used in diesel engines.
5	TEACHING METHODS	<ul style="list-style-type: none"> • Oral Expression ; Course topics will be explained in the classroom with oral expression method. Lectures will be supported by demonstrations such as photographs, slides, videos, etc. • Question-Answer; Participation in the course will be ensured by mutual participation in the form of question and answer. • Out-of-Class Training; The subjects explained in the classroom will be reinforced by demonstration in TÜRASAŞ Eskişehir Regional Directorate and Locomotive/Wagon Maintenance and Repair Workshop/Directorate/Supervision and/or Station/Station roads. <p>The trainers of the courses in the program list the general objectives of their course and the targeted outcomes for the participants at the end of the course; they inform the participants about the way the course is taught and the evaluation methods related to the course. At the beginning of each unit, the specific objectives of the unit are stated, and at the end of the unit, the targeted outcomes are listed. An end-of-unit assessment is made to determine whether the targeted outcomes have been achieved. The teaching of the subjects related to the gains determined not to have been achieved is repeated.</p>
6	TRAINING TOOLS	<ul style="list-style-type: none"> • Writing board and pen, • Smart board, • Computer,

	<ul style="list-style-type: none"> • Projection, • Related locomotive/set and diesel engines
7	TRAINING ENVIRONMENT
	<ul style="list-style-type: none"> • Classroom equipped with educational tools, • Field with locomotive/set and engine technology
8	COURSE MATERIALS
	<ul style="list-style-type: none"> • Lecture notes, • Slides, • Videos.
11	CONTENT OF QUALIFICATION UNIT
	 <ol style="list-style-type: none"> 1. History of Rail System Vehicles 2. Definitions of Rail System Vehicles 3. Trains <ol style="list-style-type: none"> 3.1. Passenger Trains 3.2. Freight Trains 3.3. Mixed Trains 3.4. Other Trains 4. Towing Vehicle Information <ol style="list-style-type: none"> 4.1 Locomotives <ol style="list-style-type: none"> 4.2. Passenger Train Locomotives 4.3. Universal Locomotives 4.4. Freight Train Locomotives 4.5. Short Distance Road and Maneuvering Locomotives 4.6. Maneuver Locomotives 5. Classification of Towing Vehicles <ol style="list-style-type: none"> 5.1. Classification by Energy Types <ol style="list-style-type: none"> 5.1.1. Steam Powered Locomotives 5.1.2. Diesel Powered Locomotives 5.1.3. Locomotives Powered by Electric Energy 5.2. Classification According to Powertrain 5.3. Classification According to Wheel Arrangements <ol style="list-style-type: none"> 5.3.1. Definition of Towing Vehicles Moving on Wheels 5.3.2. Description of Wheel Arrangements in Bogie Towing Vehicles 6. Common Structure of Rail System Vehicles <ol style="list-style-type: none"> 6.1. Common Features According to Walking Teams <ol style="list-style-type: none"> 6.1.1. Bogies (Bogie) 6.2. Common Features by Common Carrier <ol style="list-style-type: none"> 6.2.1. Structure of the Main Carrier (Chassis) 6.2.2. Buffers 6.2.3. Pulling Assembly 6.2.4. Frame (Bodywork)

6.2.4.1. Driver Control Cabinet

7. Components Used in Towing Vehicles

7.1. Power Supply Components and Components

7.1.1. Engines and Components Used in Diesel Towing Vehicles

7.1.1.1. Electricity Generators in Diesel Towing Vehicles

7.1.2. Transformers and Components Used in Electric Towing Vehicles

7.2. Common and Similar Components

7.2.1. Traction Motors

7.2.1.1. Collector Direct Current Motors

7.2.1.2. Alternating Current Squirrel Cage Asynchronous Traction Motors

7.2.1.3. Using Traction Motors for Braking

8. Common Auxiliary Components Used in Towing Vehicles

8.1. Air Compressor

8.2. Battery and Charging Circuit

8.3. Traction Motor Coolers

8.4. Cooling of Current Exchanger (Converter) Components

8.5. Auxiliary Components Used in Electric Towing Vehicles

8.5.1. Current Receivers

8.5.2. Rail Return Current and Grounding Equipment

8.5.3. Main Circuit Breaker (Fast Circuit Breaker)

8.5.4. Earthing Sectionalizer

8.5.5. Phase Converters (Current Diverters)

9. Other Components

9.1. Windshield Wipers

9.2. Sandbanks

9.3. Illuminations

9.4. Doors and Controls

9.5. Heating-Ventilation-Cooling Systems (HVAC)

9.6. Instruments

9.6.1. Indicators

9.6.2. Light and Sound Warnings

9.6.3. Controls

9.6.3.1. Traction/Brake Control

9.6.3.2. Control of Auxiliary Components and Other Components

9.6.3.3. Speed Sensors

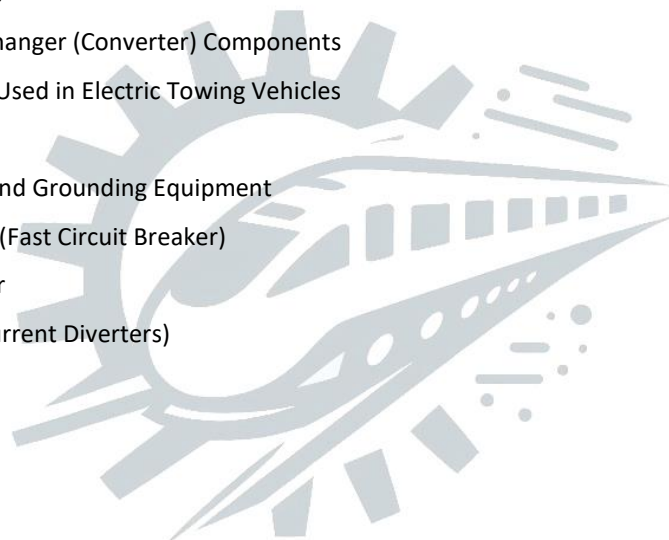
9.6.3.4. Load Sensors

10. Protection And Security Systems

10.2. Emergency Brakes

10.3. Automatic Train Braking System (ATS)

10.4. Passenger Information Systems



Y2 – TOWING VEHICLE KNOWLEDGE QUALIFICATION UNIT		
No	Knowledge Statement	Assessment Tool
BG.1	Knows the History of Rail System Vehicles.	-
BG.2	Defines rail system vehicles.	-
BG.3	Explains the types of trains.	-
BG.4	List the types of locomotives.	-
BG.5	Classifies towing vehicles.	-
BG.6	Explains wheel arrangements in bogie towing vehicles.	-
BG.7	Explains the common structure of rail system vehicles.	-
BG.8	Describes bogies.	-
BG.9	Explains the structure of the prime mover (chassis).	-
BG.10	Describes buffers.	-
BG.11	Describes the towing device.	-
BG.12	Explains the frame (body) assembly.	-
BG.13	Describes the driver control cabin.	-
BG.14	Explains power supply components and their components.	-
BG.15	Explains the engines and components used in diesel traction vehicles.	-
BG.16	Explains electric generators in diesel-powered vehicles.	-
BG.17	Explains transformers and components used in electric traction vehicles.	-
BG.18	Explains common and similar components.	-
BG.19	Describes traction motors.	-
BG.20	Explains the use of traction motors in braking.	-
BG.21	Explains common auxiliary components used in towing vehicles.	-
BG.22	Explains other components used in towing vehicles.	-
BG.23	Explains protection and security systems.	-
BG.24	Explains automatic train braking system.	-
BG.25	Explains passenger information systems.	-

Y2 – TOWING VEHICLE KNOWLEDGE QUALIFICATION UNIT		
No	Skills and Competence Statement	Assessment Tool
BY.1	Performs locomotive level controls.	-

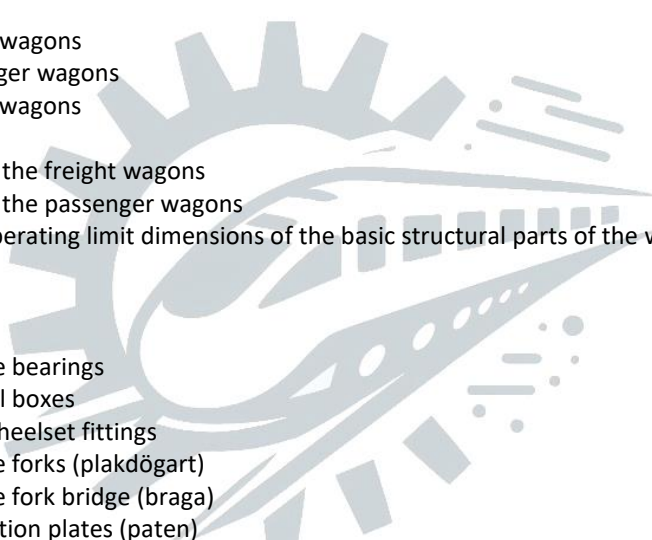
Y3 – TOWED VEHICLE KNOWLEDGE QUALIFICATION UNIT

1	QUALIFICATION UNIT / COURSE NAME	Towed Vehicle Knowledge
2	DURATION	Classroom Training 12 hours, Out-of-Class Training 6 hours Total 18 hours
3	PRE-REQUISITE	-
4	GENERAL AIM	It is aimed to explain, -Wagon types, technical specifications, equipment, numbering, maintenance, ECM and ECM functions, loading and inspection, -Wagon lighting and air conditioning systems and wagon complementary systems, -Pneumatic terms, concepts, circuit elements, compressed air brakes, towed and towing vehicle braking system and pneumatic components, operation and malfunctions of brakes.
5	TEACHING METHODS	
	<ul style="list-style-type: none"> Oral Expression ; Course topics will be explained in the classroom with oral expression method. Lectures will be supported by demonstrations such as photographs, slides, videos, etc. Question-Answer; Participation in the course will be ensured by mutual participation in the form of question and answer. Out-of-Class Training; The subjects explained in the classroom will be reinforced by demonstration in TÜRASAŞ Eskişehir Regional Directorate and Locomotive/Wagon Maintenance and Repair Workshop/Directorate/Supervision and/or Station/Station roads. <p>The trainers of the courses in the program list the general objectives of their course and the targeted outcomes for the participants at the end of the course; they inform the participants about the way the course is taught and the evaluation methods related to the course. At the beginning of each unit, the specific objectives of the unit are stated, and at the end of the unit, the targeted outcomes are listed. An end-of-unit assessment is made to determine whether the targeted outcomes have been achieved. The teaching of the subjects related to the gains determined not to have been achieved is repeated.</p>	
6	TRAINING TOOLS	
	<ul style="list-style-type: none"> Writing board and pen, Smart board, Computer, Projection, Related locomotive/set and pneumatic stand 	
7	TRAINING ENVIRONMENT	
	<ul style="list-style-type: none"> Classroom equipped with educational tools, Field with locomotive/set and pneumatic 	
8	COURSE MATERIALS	
	<ul style="list-style-type: none"> Lecture notes, Slides, Videos. 	
9	QUALIFICATION OF THE TRAINERS	
	<p>(1) Trainers who will work in the railway training and examination center must fulfill at least one of the following conditions:</p> <p>a) To have at least three years of experience as an trainer or teacher in formal or non-formal education institutions in the field of the training program to be carried out.</p> <p>b) To have at least five years of work experience in the field of the training program to be conducted.</p> <p>(2) Trainers falling within the scope of subparagraph (b) of the first paragraph must have completed and documented a training of trainers program of at least forty hours organized by an institution approved by the Ministry of National Education or a higher education institution. (Reference: DDGM Railway Training and Examination Center Regulation)</p>	
10	ASSESSMENT AND EVALUATION	
	10 a) Theoretical Exam	
	-	

10 b) Performance Based Exam

11 CONTENT OF QUALIFICATION UNIT

* **WAGON KNOWLEDGE (SE:4 hours, SDE:2, Total 8 hours)**

- 
- 1 Decommissioning and return to operation of wagons
 - 2 ECM regulation
 - 2.1 Certification processes
 - 2.2 Maintenance supply certificate
 - 2.3 ECM certification
 - 2.4 Train operators
 - 3 Definitions of internal agreements
 - 3.1 UIC
 - 3.2 RIC
 - 3.3 COTIF
 - 3.4 OTIF
 - 3.5 GCU
 - 3.6 RID
 - 3.7 TSI
 - 3.8 YVBK
 - 4 Wagon types
 - 1.1 Classification of wagons
 - 1.2 Types of passenger wagons
 - 1.3 Types of freight wagons
 - 5 Numbering of the wagons
 - 5.1 Numbering of the freight wagons
 - 5.2 Numbering of the passenger wagons
 - 6 Function, properties and operating limit dimensions of the basic structural parts of the wagon
 - 6.1 Chassis
 - 6.2 Frame
 - 6.3 Wheelset
 - 6.3.1 Axle bearings
 - 6.3.2 Axle boxes
 - 6.4 Chassis and wheelset fittings
 - 6.4.1 Axle forks (plakdögar)
 - 6.4.2 Axle fork bridge (braga)
 - 6.4.3 Friction plates (paten)
 - 6.4.4 Suspensions
 - 6.4.5 Suspension brackets
 - 6.4.6 Fasteners (menot, pin, spacer, socket, coupling)
 - 6.4.7 Bogies
 - 6.5 Buffers
 - 6.6 Traction devices
 - 7 Definition of derailment, causes of derailment and actions to be taken for derailed wagons
 - 8 Maintenance and repairs of the wagons
 - 8.1 Maintenance and repair times of passenger wagons
 - 8.2 Maintenance and repair times of freight wagons
 - 9 Malfunction models
 - 9.1 National models (2017, 2018, 2019, 2020, 2077, 5519, 5551)
 - 10 Inspection of the trains
 - 10.1 Departure inspection
 - 10.2 Intermediate inspection
 - 10.3 Arrival inspection

A – BASIC PNEUMATICS

1. General Pneumatics
 - 1.1. Basic concepts related to pneumatics
2. Brake applications in railway vehicles
3. Compressed air brakes
 - 3.1. Direct-acting compressed air brakes
 - 3.2. Indirect-acting compressed air brakes
 - 3.3. Combined use of direct and indirect acting brakes on locomotives
 - 3.4. Definitions of compressed air brake technique

B – TOWED VEHICLE BRAKING AND PNEUMATIC SYSTEMS

1. Design types of wagon brakes
 - 1.2. Freight and passenger wagon brakes
2. Basic parts of the wagon braking system
 - 2.1. Brake pipe (Auxiliary reservoir)
 - 2.2. Main reservoir pipe
 - 2.3. Air shut-off valve
 - 2.4. Air hose
 - 2.5. Triblivalve (distributor valve)
 - 2.6. Brake cylinder
 - 2.7. Air reservoirs
 - 2.8. Brake rods and bogie integrated (compact) brake
 - 2.9. Brake regulator (slack adjuster)
 - 2.10. Brake shoes and types
 - 2.11. Replacement devices
 - 2.11.1. Open-Close replacement device
 - 2.11.2. Brake type replacement device
 - 2.11.3. Full-empty replacement device
 - 2.12. Drain wire (purge wire)
 - 2.13. Emergency brake devices
 - 2.14. Weight valve and load relay valve
 - 2.15. Parking brake device

D – BRAKE OPERATION AND MALFUNCTIONS

1. Operation of the brakes
 - 1.1. Brake tests
2. Brake failures
 - 2.1. Failures occurring in a wagon
 - 2.2. Failures occurring in several wagons

Y3 – TOWED VEHICLE KNOWLEDGE QUALIFICATION UNIT

No	Knowledge Statement	Assessment Tool
BG.1	Explains the processes of decommissioning and return to operation of wagons.	-
BG.2	Knows international agreements and ECM regulation.	-
BG.3	Knows wagon types, numbering.	-
BG.4	Knows the task and properties of the basic parts of the wagon.	-
BG.5	Knows the derailment, its causes and the actions to be taken for derailing wagons.	-
BG.6	Explains periodic inspections of wagons.	-
BG.7	Knows inspection of trains and failure modes.	-
BG.8	Knows pneumatic systems in railway vehicles in general.	-
BG.9	Explains brake applications in railway vehicles.	-
BG.10	Knows direct and indirect acting compressed air brakes.	-
BG.11	Explains the definitions of compressed air brake technique.	-
BG.12	Knows wagon brakes.	-
BG.13	Explains the basic parts of wagon brake system.	-
BG.14	Knows the brake pipe.	-
BG.15	Knows the main reservoir pipe.	-
BG.16	Knows the air shut-off valve.	-
BG.17	Knows the air hoses.	-
BG.18	Knows Triblivalve	-
BG.19	Knows the brake cylinders.	-
BG.20	Knows air reservoirs.	-
BG.21	Knows brake rods and compact braking system.	-
BG.22	Knows the brake regulator.	-
BG.23	Knows brake shoes and brake pads.	-
BG.24	Knows the replacement devices.	-
BG.25	Knows the drain rod.	-
BG.26	Knows emergency braking devices.	-
BG.27	Knows the weight valve.	-
BG.28	Knows the load valve.	-
BG.29	Explains the handbrake mechanism.	-
BG.30	Explains brake failures.	-
BG.31	Knows brake tests.	-

Y3 – TOWED VEHICLE KNOWLEDGE QUALIFICATION UNIT		
No	Skills and Competence Statement	Assessment Tool
BY.1	Performs simple brake practice.	-
BY.2	Performs brake cancelation.	-
BY.3	Adjusts the load-passenger device.	-
BY.4	Sets the full-empty lever	-

