NTAR
NATIONAL TRAINING ACADEMY FOR RAIL

Traction and Rolling Stock

TECHNICAL TRAINING

Contents

What is NTAR?

Our history

The idea of a National Training Academy for Rail (NTAR) came from the recognition that a significant skills gap existed in the rail industry just as the transition to the 'Digital Railway' gathered speed.

In fact, the shortage was a predicted 8,000 people over a ten year period.

So a collaboration between the National Skills Academy for Rail (NSAR), the Department for Business Energy and Industrial Strategy, along with the Department for Transport, and Siemens Mobility, conceived an idea to create a training academy that would 'mind the gap' and create a highly-skilled workforce for the future.

In 2015, NTAR opened its doors to its first intake of students.

Since then, more than 21,000 delegates have attended our multi-million pound training facility in Northampton to upskill, learn, and retrain on our many practical, skills development and educational programmes. We pride ourselves on providing trainees with the skills to ensure they have the competency to do their job and an experience that makes them eager to return.

Welcome from Joanna Binstead

NTAR is a unique environment where everyone who trains or tutors is part of the operational business. We believe in providing our trainees and learners with a positive experience and delivering the highest quality education from rail industry experts who have years of proven practical experience. For us, NTAR is a place to inspire and skill, so the people who attend our programmes leave feeling highly accomplished.

When you operate in a safety-critical industry like rail, you need to be confident that experts have trained your experts and they have the level of competency required for your work to be conducted safely and skilfully.

If you are an armed forces leaver you need to be sure that as you transition to your second career, your transferable skills will be applied to new learning as you retrain for the rail industry.

Or, if you're supporting a young person through an apprenticeship as they start their career, you need to be convinced that they will be equipped with the specialist training that will contribute to your business. I'm here to assure you that this is what NTAR delivers daily.

Technical Training in Traction and Rolling Stock Systems

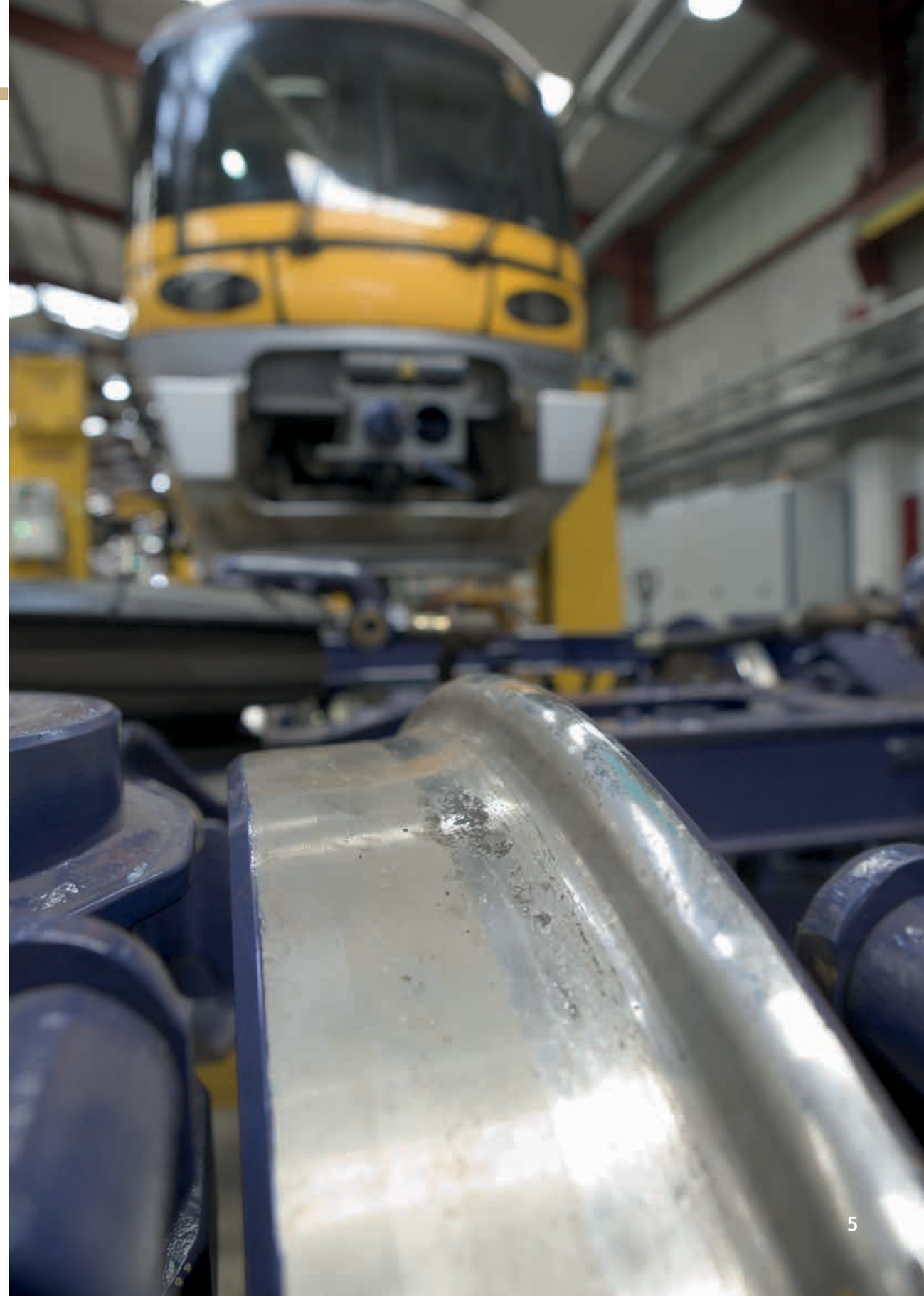
The Traction and Rolling Stock sector require an additional 4,900 technicians and engineers by 2025 just to keep up with today's needs, and a further 3,300 for future projects and technology such as HS2, and to support the transition to the 'Digital Railway'. With demand exceeding supply, this is an exciting time to train or build a skills base in the rail industry.

The Certificate in Traction and Rolling Stock Systems is a unique, internationally recognised Level 3 qualification based around six primary units, which deliver knowledge and / or competency relating to the fundamentals of how a train's components work and include how to maintain or fix problems that arise on Traction and Rolling Stock in a depot. It has been specifically designed to meet the challenges and needs of an ever-developing rail industry.

Qualifications:

- EAL Level 3 Certificate Traction and Rolling Stock Systems
- NVQ Certificate Level 3 Traction and Rolling Stock.

Developed and delivered in partnership with



Qualification content

EAL Level 3 Certificate Traction and Rolling Stock

Qualification	Level 3 Certificate | KNOWLEDGE	Units	Assignments	Assessment
What is it about?	The contents of this qualification covers the **knowledge** and practical skills required to progress in Traction and Rolling Stock engineering.			
Who is it for?	• New entrants • Career changers • Ex-Forces (eligible for ELCAS Ex-Forces funding) With a Level 2 mechanical or electrical bias			
Units 10 Days	**1** Current collection and electrical systems **2** Train systems and schematic drawings **3** Train saloon (HVAC) systems **4** Train radio and cab safety systems **5** Traction and Rolling Stock braking systems **6** Exterior and saloon door systems	✓		
Assignments 5 Days	At NTAR		✓	
Assessments	**Not required for this qualification**			

NVQ Certificate Level 3 Traction and Rolling Stock

Qualification	Level 3 NVQ | KNOWLEDGE & COMPETENCE	Units	Assignments	Assessment
What is it about?	The content of this qualification covers the **knowledge and competency** requirements of a Level 3 Traction and Rolling Stock engineering technician.			
Who is it for?	• Contractors who wish to demonstrate competence within the workforce • Upskilling of the current workforce With a Level 2 mechanical or electrical bias			
Units 10 Days	**1** Current collection and electrical systems **2** Train systems and schematic drawings **3** Train saloon (HVAC) systems **4** Train radio and cab safety systems **5** Traction and Rolling Stock braking systems **6** Exterior and saloon door systems	✓		
Assignments 5 Days	In delegate's own time		✓	
Assessments	• The average number of assessments for this qualification is between 6 and 10 • The assessments must be taken in the workplace, which means only people employed within the industry can take the qualification • This qualification takes place over at least a 1 year period • Will be assessed by a qualified NTAR assessor			✓

Course Code: **NTAR 3103**

Traction and Rolling Stock - Technical Training

EAL Level 3 Certificate Traction and Rolling Stock systems

The qualification has a Total Qualification Time of 100 hours of which 70 are Guided Learning. Learners should expect to spend around 30 hours outside of the course, studying and completing assignments.

Qualification
This qualification is accredited by OfQual at Level 3

What is this qualification?
This qualification is intended to provide the introductory knowledge and practical skill requirements for the maintenance of Traction and Rolling Stock systems. It is suitable for new entrants into the industry who may need to update or convert their existing knowledge.

What does it cover?
The contents of this qualification covers the knowledge and practical skills required to progress in Traction and Rolling Stock engineering. This includes the different types of vehicles in fleets and the major systems and components on those vehicles.

What could this qualification lead to?
Rail Engineering Traction and Rolling Stock technicians may work on site or in a depot or in a technical office. They will lead on, and carry out, Rail Engineering tasks. Their work will require an understanding of how traction units and carriages work as an integrated, complex system. Traction and Rolling Stock technicians maintain equipment, process and fault find systems failures.

Requirements
There are minimal entry requirements for this qualification; these are Level 2 Technical Certificate in Mechanical Engineering and or Level 2 Technical Certificate in Electrical or similar.

Learners must have the minimum levels of literacy and numeracy to comply with the health and safety aspects of the qualification, the completion of the learning outcomes and the assignments.

The difference between a Certificate and a NVQ
The content of EAL Rail Engineering Traction and Rolling Stock NVQ is identical to the EAL Level 3 Certificate in Traction and Rolling Stock however in order to attain the NVQ it is necessary to undergo at least 1 year of assessment.

Location
NTAR, Northampton

Duration
15 Days

Delivery Channel
Face to Face

Maximum Attendees
6

Candidate Profile
This qualification is aimed at new entrants to the rail engineering industry with technical skills who wish to develop their knowledge to enable progression.

They could be learners who may have a prior knowledge and understanding of associated engineering and have the ability to achieve a Level 3 qualification, for example:

- Upskilling of career changers who may have existing technical engineering competence and knowledge at Level 2 and now wish to progress into Traction and Rolling Stock systems engineering

NTAR will consider the support, guidance and opportunities learners will need to enable them to meet the demands of the units during delivery of the qualification and preparation of assignments.

Developed in partnership with

Overview

EAL Level 3 Certificate Traction and Rolling Stock

CTRS3-001 Current collection and electrical systems

Unit purpose/ aims
This unit is designed to give learners an overview of train electrical systems including current collection components and the train line systems with a view to achieving fault finding within those systems.

1. Understand overhead line current collection systems

Learning criteria:
- Locate current collection equipment on overhead line electric trains
- Locate the key electrical control circuits on overhead line electric trains
- Explain how train control electric circuits work on overhead line electric trains
- Identify electrical control circuits on an overhead line schematic diagram

2. Understand 3rd and 4th rail current collection systems

Learning criteria:
- Locate current collection equipment on 3rd and 4th rail electric train systems
- Locate the key electrical control circuits on a 3rd and 4th rail train
- Explain how 3rd and 4th rail control electric circuits work
- Identify electrical control circuits on a 3rd and 4th rail schematic diagram

Units 2 – 6 are shown on the following pages >

CTRS3-002 Train systems and schematic drawings

Unit purpose/ aims
This unit is intended to enable the learner to understand the role of schematic drawings in identifying systems and components and carrying out fault finding on trains.

1. Understand how schematic drawings are used to identify train components and systems

Learning criteria:
- Describe the different conventions used on schematic drawings to describe components, systems and layouts
- Interpret schematic drawings associated with train systems and components
- Identify the purpose of the main components identified on schematic drawings

2. Use schematic drawings to identify train components, systems and carry out fault finding

Learning criteria:
- Use schematic drawings to locate train components and systems
- Use schematic drawings to carry out fault finding techniques on a single train system

CTRS3-003 Train saloon (HVAC) systems

Unit purpose/ aims
This unit is intended to introduce the Heating, Ventilation and Air Conditioning (HVAC) systems used in providing passenger comfort in the saloon vehicle of specific fleets. It covers the legal requirements of dealing with refrigerant and safety precautions when working on HVAC equipment. It also covers how to test a system using an external laptop and how to identify faults in the system.

Summary of learning outcomes

1 Understand the main components and how they work within a HVAC unit
2 Test a HVAC system and identify faults

CTRS3-004 Train radio and cab safety systems

Unit purpose/ aims
This unit is intended to support the learner in understanding the location, function and critical nature of radio and cab safety systems and how to carry out testing on the systems in respect of train into service requirements.

1. Understand the location, function and critical nature of radio and cab safety systems

Learning criteria:
- Describe the function of components in respect of radio and cab safety systems
- Explain the critical nature of radio and cab safety systems in the safe operation of a train

2. Understand the testing of radio and cab safety systems

Learning criteria:
- Locate all components in respect of radio and cab safety systems
- Carry out the testing of all components of radio and cab safety systems in respect of train into service requirements

CTRS3-005 Traction and Rolling Stock braking systems

Unit purpose/ aims

This unit is intended to introduce learners to the brake systems on traction units and carriages. The unit covers integrated products, air supply, brake control, Wheel Slide Prevention (WSP), ancillary equipment and the Brake Control Unit (BCU) maintenance tool.

1. Understand the main components that combine into traction or rolling stock braking systems

Learning criteria:

- Identify the main components of the braking systems on a train bogie
- Identify the main components of the braking systems on a train carriage/ cab
- Identify the main components of the train regenerative braking systems

2. Understand the operating principles of traction or rolling stock braking systems

Learning criteria:

- Describe the operational principles of the braking systems on a train bogie
- Describe the operational principles of the braking systems on a train carriage/ cab
- Describe the operational principles of the train regenerative braking systems

3. Understand the operating principles of brake control

Learning criteria:

- Carry out a practical brake test on a traction or rolling stock vehicle in line with relevant maintenance procedures

CTRS3-006 Exterior and saloon door systems

Unit purpose/ aims

This unit enables the learner to develop their knowledge of the maintenance and installation of railway vehicle doors. Learners will carry out fault finding activities and produce reports on the activities carried out.

1. Understand the operation and set up of train exterior and saloon door systems

Learning criteria:

- Explain the operating principles of electrical and pneumatic, exterior and saloon door systems
- Describe the components, materials and operational requirements of exterior and saloon door systems
- Describe the electrical control methods used for the operation of exterior and saloon door systems
- List the safety devices fitted to exterior saloon doors and describe the operation of these devices
- Explain the term ‘wrong side failure’ and any implications that such a failure would have on the exterior saloon door systems

2. Carry out fault finding on exterior and saloon door systems

Learning criteria:

- Undertake fault finding on exterior and saloon door systems
- Report results of fault finding within limits of own authority

NVQ Certificate
Level 3 Traction and Rolling Stock

Qualification code: 601/0159/3 **Guided Learning hours: 169**

This qualification is a National Vocational Qualification (NVQ). It involves the skills and knowledge needed for working in the maintenance of railway engineering traction and rolling stock. NVQs are based on national occupational standards, which the learner must meet to be competent in a particular task.

Assessment Route

Mandatory assesment routes- Must achieve 20 credits

EAL code	Unit title	Credit value	GL (hrs)	OFQUAL Code
QTRS3-001	Prepare to Undertake Duties in the Rail industry	2	18	F/601/7815
QTRS3-002	Contribute to the Security of the Work Environment in the Rail Industry	1	5	L/502/65074
QTRS3-003	Obtain and Communicate Information in the Rail Industry	5	40	Y/601/7819
QTRS3-004	Identify and Assess Defects and Discrepancies in Railway Traction and Rolling Stock Assets	9	44	K/502/7521
QTRS3-005	Establish Compliance with Railway Traction and Rolling Stock Specifications	3	12	T/502/7523

Group A- minimum of 2 credits must be achieved

EAL code	Unit title	Credit value	GL (hrs)	OFQUAL Code
QTRS3-006	Plan for Further Professional Development in the Rail Industry	2	4	K/601/7825
QTRS3-007	Work with Tools, Equipment, Drawings and Specifications in the Rail Engineering Environment	3	10	J/502/6506
QTRS3-008	Support Learners by Coaching in the Workplace	4	26	L/502/6118
QTRS3-009	Contribute to Safe Working Practices in the Rail Engineering Industry	3	10	F/502/6505

Group B- must achieve a minimum of 10 credits

EAL code	Unit title	Credit value	GL (hrs)	OFQUAL Code
QTRS3-010	Accept and Return Responsibility for the Control of Railway Traction and Rolling Stock Assets	3	10	D/502/7533
QTRS3-011	Allocate and Supervise Railway Traction and Rolling Stock Resources	4	14	L/502/7527
QTRS3-012	Diagnose Faults in Ancillary Systems on Railway Traction and Rolling Stock	8	28	R/502/7531
QTRS3-013	Diagnose Faults in Railway Traction and Rolling Stock Assets	8	28	F/502/7525
QTRS3-014	Install and Test Railway Traction and Rolling Stock Assets and Components	4	20	Y/502/7532
QTRS3-015	Plan Railway Traction and Rolling Stock Engineering Activities	9	30	J/502/7526
QTRS3-016	Provide Operational Support to Users of Railway Traction and Rolling Stock Assets	5	28	H/502/7534
QTRS3-017	Supervise the Movement of Traction and Rolling Stock Assets, Components and Equipment	2	12	Y/502/7529
QTRS3-018	Undertake the Removal and Replacement of Railway Traction and Rolling Stock Components	4	20	D/502/7516

Additional Units- Not required

EAL code	Unit title	Credit value	GL (hrs)	OFQUAL Code
QTRS3-019	Employment Rights and Responsibilities in the Passenger Transport Sector	3	18	L/602/5934

The difference between a Certificate and a NVQ

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Contact us

We welcome all enquiries.

If you are a business or individual interested in finding out more about NTAR, and the qualifications, courses and services that we offer, please do not hesitate to contact us at our state-of-the-art facility in Northampton.

We would also be keen to hear from you if you are a training provider or supplier interested in working with NTAR, to further support our curriculum.

We can be contacted through the enquiry form on our website, by email or by calling us on:

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