

Qualifications in Traction and Rolling Stock Engineering and Telecoms

Enabling Ex-Forces personnel to be ready
for a second career in the rail industry



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Working with Ex-Forces Personnel

NTAR is working closely with industry and tri support services to develop a portfolio of training that can lead to a second career in the Rail industry. Assisting Ex-Forces personnel, and those preparing to leave the forces, to utilise the transferable skills and attributes gained whilst serving.

Qualifications in both Traction and Rolling Stock and Telecoms have been developed, enabling Ex-Forces personnel to be work ready, before they begin a career in the Rail industry. The Traction and Rolling Stock and the Telecoms qualifications are both eligible for funding.

The qualifications are accredited at Level 3, a combination of theoretical and practical training.

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.

Ex-Forces personnel

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.

To enquire or book your place on this course, contact the CTP Booking Centre:

t: 01252 954 007

w: www.ctp.org.uk/resettlement-training

e: CourseBookings@ctp.org.uk

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.

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Content Overview

Overview of Traction and Rolling Stock systems units

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



Course Code: NTAR 1205

Technical Training: Telecoms

EAL Level 3 Award Telecoms, Fibre and Copper

The qualification has a Total Qualification Time of 70 hours of which 30 are Guided Learning for each of the selected Units. Learners should expect to spend around 5 hours outside of the course, studying and completing assignments for each Unit.

Qualification

This qualification is accredited by OfQual at Level 3

What is this qualification?

The EAL Level 3 Award in Telecoms, Fibre and Copper includes two units:

- **Copper Cable Termination and Testing** – this has a total of 10 learning outcomes that the learner must complete
- **Fibre Optic Splicing, Termination and Testing** – this has a total of 10 learning outcomes that the learner must complete

This qualification is achieved when either one or both of the units (stand-alone units) have been achieved.

The two qualification units will develop the knowledge and practical skills the learner requires to progress in copper or fibre cable engineering, particularly the methods used in splicing, termination and testing of copper and/or fibre cables in the relevant industries.

What does it cover?

The learner can undertake either of the units independently or they can select both units together. Certification will be awarded for either one of the units or both.

As part of the learning outcomes, learners will also cover topics including health and safety, planning, and undertaking tasks which are relevant to the copper and/or fibre optic cable termination and testing environments for the relevant industries.

What could this qualification lead to?

This qualification is aimed at new entrants to the relevant cable splicing, termination and testing industry who wish to develop their knowledge and practical skills to enable progression within their workplace. They could be learners who may already have prior knowledge and understanding of associated engineering, or furthermore, they could have the ability to achieve a Level 3 qualification.

Alternatively, for example, upskilling or career changers for learners who may have existing technical engineering competence and knowledge at Level 3 and now wish to progress into the copper and fibre cable engineering industry.

Requirements

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.

Learners must be at least 16 years old.

Location

NTAR, Northampton

Duration

5 Days when a single Unit is selected or 10 Days when both Units are being taken

Delivery Channel

Face to Face

Maximum Attendees

12

Candidate Profile

Learners may have a prior knowledge and understanding of associated engineering and have the ability to achieve a Level 3 qualification.

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Units shown on the following pages >

Overview of Copper Cable Termination and Testing unit

Unit purpose/ aims

This qualification is intended to introduce learners to the various copper cables used within industry applications. The unit covers the component parts of copper cables, cable termination and basic cable testing.

Learners will require access to copper cables and terminating enclosures, cables to include PEUT(20/09) and Tail cables 2/0.9) and associated terminating and test equipment to complete this unit.

1. Work safely when working with internal and external copper cables

Learning criteria:

- Identify the hazards when working with copper cable products within the specified working environment
- List the control methods used to manage the hazards with the copper network

2. Install copper cables in the approved containment both armoured (external) non armoured (internal)

Learning criteria:

- Identify the different types of copper cable used within the specified working infrastructures
- Identify the different types of troughing and enclosures used in the specified working infrastructures
- Describe how specified environments identify their copper cables and the colour coding and wrapping of the PEUT type cable
- Install cables in approved containment

3. Prepare copper cables for jointing and termination within joints, enclosures and panels

Learning criteria:

- Strip armoured and Internal cable
- Clean and separate the internal pairs within the cable
- Identify cable pairs within cables and units

4. Prepare cables for termination in an enclosure or cable joint

Learning criteria:

- Separate cable pairs using the correct colour code
- Clean and strip individual cable pairs
- Terminate cables within an IDC type termination
- Extend circuits using the correct jumpering wires
- Identify circuit types using the correct jumpering wire
- Complete cable termination details for records

5. Label specified environment telecoms cables and enclosures

Learning criteria:

- Identify the cable for labelling
- Identify different types of enclosures (REB, TEH, BOP, LOC)
- Use the correct labelling method

6. Identify copper cable tests compliant with the specified work environment standards

Learning criteria:

- Identify copper cable tests compliant with specified work environment standards
- List the various cable tests for copper cables used with the external network

7. Use copper cable testing equipment

Learning criteria:

- Set cable pairs appropriately for the designated test
- Use test equipment to prove cable pair setting
- Record test results in suitable format

8. Install a Signal Post Telephone (SPT) onto a post and terminate the cable tail

Learning criteria:

- Install a SPT telephone
- Terminate the tail cable within the phone and the BOP
- Carry out a cable test
- Carry out a telephone test
- Ensure the telephone is correctly labelled to specified work environment standards

9. Extend cable circuits on a Main Distribution Frame (MDF)

Learning criteria:

- Identify how the circuits are labelled on a MDF within a specified work environment building
- Identify Individual circuits from records
- Extend circuits using the correct jumper wire

10. Identify circuits within a Main Distribution Frame (MDF)

Learning criteria:

- Trace cable jumpering on an MDF
- Record results in correct format

Overview of Fibre Optic Splicing, Termination and Testing unit

Unit purpose/ aims

This qualification is intended to introduce learners to the various fibre optic cables used within the industry infrastructure.

It covers Fibre Optic components, installation techniques including; splicing and termination and the diagnostic approach to fault finding on the Optic network.

1. Work safely when working with optical fibre cables

Learning criteria:

- Identify the hazards when working with fibre optic transmission products within the specified working environment
- List the control methods to manage the hazards with the optical transmission network

2. Route Armoured and Double Insulated Super Armoured Cable (DISAC) optical fibre cables in specified work environment approved containment

Learning criteria:

- Identify the different types of fibre optic cable commonly used within the specified working infrastructures
- Identify the different types of troughing and enclosures commonly used within the specified working infrastructures
- Describe how the specified working environment fibres are identified and the colour coding and wrapping of the internal fibre cores and strands

3. Prepare optical fibre cables for jointing and termination

Learning criteria:

- Strip armoured and DISAC cable
- Clean and separate internal fibre tubes
- Wrap into joint or panel as required

4. Use cleaving and splicing techniques for both single and multimode fibre cables

Learning criteria:

- Separate individual fibre strands using the correct colour code
- Clean and strip individual fibre stands
- Cleave and splice both single mode and multi-mode fibre

5. Seal and label specified work environment telecoms enclosures

Learning criteria:

- Close the enclosure and panels without damaging the fibres
- Seal inputs to the enclosure with heat shrink
- Use the correct labelling method

6. Use correct specified work environment procedures for fibre testing

Learning criteria:

- Interpret straight line fibre drawings and panel references
- List the correct wavelengths and pulse commonly used by the specified working environment

7. Prepare optical test (Optical Time Domain Reflectometer (OTDR) and optical component cleaning equipment

Learning criteria:

- Clean and prepare all fibre test leads and buffers
- Use equipment to confirm cables are correctly prepared
- Power up and set the OTDR within the specified working environment parameters
- Set up the file storage within the OTDR for test results

8. Apply Optical Time Domain Reflectometer (OTDR) set up parameters for bi-directional testing and fault finding

Learning criteria:

- Run a bi-directional test

9. Use Optical Time Domain Reflectometer (OTDR) distance markers and fault procedures

Learning criteria:

- Use distance markers to identify anomalies and splice points on the OTDR
- Describe the specified working environment fault tolerances and how to identify faults
- Save the results in a suitable format

10. Use Optical Time Domain Reflectometer (OTDR) red light function

Learning criteria:

- Use OTDR red light function to identify local faults and fibres

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:

t: 01604 594 440

w: ntar.co.uk

e: jennifer.carroll@siemens.com

Qualifications developed in partnership with EAL

EAL is the specialist, employer-recognised awarding organisation for engineering, manufacturing, building services and related sectors. The origins of the organisation can be traced back through various predecessor bodies to the founding of the Engineering Industry Training Board (EITB) in 1964. As the organisation has evolved it has been committed to exploring new partnerships with industry and professional associations across the UK and internationally.

EAL is the only awarding organisation to invest in the industries it serves and the skills of those who work within them. The commitment to partnering with industry and focusing on core sectors provides unrivalled knowledge and understanding of employers' skills needs. This results in qualifications that carry weight and respect with employers and deliver real career benefits for learners, employers and industry worldwide.



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NTAR is a trading name of Siemens Mobility Limited.

Siemens Mobility is a separately managed company of Siemens AG. As a leader in transport solutions for more than 160 years, Siemens Mobility is constantly innovating its portfolio in its core areas of rolling stock, rail automation and electrification, turnkey systems as well as related services. With digitalization, Siemens Mobility is enabling mobility operators worldwide to make infrastructure intelligent, increase value sustainably over the entire lifecycle, enhance passenger experience and guarantee availability. In fiscal year 2021, which ended on September 30, 2021, Siemens Mobility posted revenue of €9.2 billion and had around 39,500 employees worldwide. Further information is available at: www.siemens.com/mobility.

