



Australian Government

UEEEL0045 Diagnose and rectify faults in traction lift systems

Release: 2

UEEEL0045 Diagnose and rectify faults in traction lift systems

Modification History

Release 2. Minor Change. Typographic error in prerequisites corrected.

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to diagnose and rectify faults in traction lift systems and equipment.

It includes working safely; replacing and/or adjusting lift circuit and associated components; diagnosing and repairing faults in lift circuits and associated components, including governors, brakes, safety gear, safety devices, lift machines, door components and controllers.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, a relevant contract of training, such as an Australian Apprenticeship, may be required.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Pre-requisite Unit

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

UEECD0019 Fabricate, assemble and dismantle utilities industry components

UEECD0020 Fix and secure electrotechnology equipment

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications

UEEEL0003 Arrange circuits, control and protection for general electrical installations

UEEEL0020 Solve problems in low voltage a.c. circuits

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits

UEEEL0019 Solve problems in direct current (d.c.) machines

UEEEL0021 Solve problems in electromagnetic devices

UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits

UEEEL0008 Evaluate and modify low voltage heating equipment and controls

UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls

UEEEL0010 Evaluate and modify low voltage socket outlets circuits

UEEEL0024 Test and connect alternating current (a.c.) rotating machines

UEEEL0025 Test and connect transformers

and

UEECD0043 Solve problems in direct current circuits

or

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

Competency Field

Electrical

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to diagnose and rectify lift system faults

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 1.1** WHS/OHS requirements and workplace procedures for a given work area are identified and applied
- 1.2** WHS/OHS risk control measures and workplace procedures in preparation for work are followed
- 1.3** Scope of work to be undertaken is determined from workplace procedures or fault/breakdown reports and/or discussions with appropriate person/s
- 1.4** Advice is sought from the work supervisor to ensure work is coordinated effectively with others
- 1.5** Tools, equipment and testing devices to carry out work are obtained in accordance with workplace procedures and checked for correct operation and safety

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|--|---|
| 2 Diagnose and rectify lift system faults | <ul style="list-style-type: none">2.1 WHS/OHS risk control measures and workplace procedures for carrying out work are followed2.2 Need to test or measure live electrical work is determined in accordance with WHS/OHS requirements and, as required, conducted within workplace safety procedures2.3 Circuits/machines/plant are checked and isolated in accordance with WHS/OHS requirements and workplace procedures2.4 Safety hazards resulting from fault or breakdown are documented on job safety assessments, risks assessed and control measures implemented in consultation with appropriate person/s2.5 Logical diagnostic methods are applied to diagnose lift system apparatus faults employing measurements and estimations of system operating parameters referenced to system operational requirements2.6 Suspected fault-finding scenarios are tested as being possible cause/s of lift system fault in accordance with workplace procedures2.7 Cause of lift system fault/s is identified and appropriately competent person/s engaged to rectify the fault where it is outside the scope of the lift systems2.8 Fault/s in the lift components of the system is rectified to apparatus manufacturer specifications and lift system relevant operational standards2.9 System is inspected and tested to verify that the lift system operates as intended and to manufacturer specified requirements2.10 Control methods for dealing with unplanned situations are responded to on the basis of workplace safety and specified work outcomes2.11 Diagnosis and fault/s rectification activities are carried out efficiently without unnecessary waste of materials or damage to apparatus, the surrounding environment or services using sustainable energy practices |
| 3 Complete rectification activities and | <ul style="list-style-type: none">3.1 WHS/OHS work rectification risk control measures and workplace procedures are followed |

documentation

- 3.2 Reusable, faulty or worn components are tagged and despatched for repair in accordance with workplace procedures
- 3.3 Rectification of fault/s is documented in accordance with workplace procedures
- 3.4 Appropriate person/s is notified that the lift system fault/s has been rectified in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Replacing and/or adjusting of lift equipment must include at least three of the follow types of lift equipment:

- electric traction lift
- electro-hydraulic lift
- goods lift
- passenger lift

Diagnosing and rectifying faults in lift systems must include at least three the following:

- brakes
- controllers
- door components
- governors
- lift machines
- release passengers from a lift, which has become immobilised
- safety devices
- safety gear

Unit Mapping Information

This unit replaces and is equivalent to UEENEEG116A Diagnose and rectify faults in traction lift systems.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEEEL0045 Diagnose and rectify faults in traction lift systems

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and include:

- applying sustainable energy principles and practices
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including using risk control measures
- completing and reporting fault diagnosis and rectification activities
- dealing with unplanned events in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- diagnosing and rectifying faults in traction lift systems, including:
 - brakes
 - door components
 - governors
 - lift machines
 - safety devices
 - safety gear
- preparing to diagnose and rectify faults.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- brake types, function, operation, inspection and adjustment, circuitry and manual release, including:
 - brake circuitry
 - electrical operations, including stall motor, solenoid and hydraulic
 - geared machine brakes
 - gearless machine brakes

- inspection and adjustment of mechanical and electrical brakes
- internal and external mechanical brakes
- manual release devices and safety procedures
- communication at site
- electro-hydraulic lifts circuitry, controls and components, including:
 - electrical circuitry
 - faulty components diagnosis
 - governor switch
 - hydraulic circuitry
 - hydraulic components
 - levelling switch
 - over travel limits
 - pump motor and starter
 - servicing
 - stop button
 - up, down limit switches
 - up, down solenoids
- electro-hydraulic lifts - mechanical operation – fluid power principles and components, operation, arrangements, lift code and other requirements and emergency passenger release, including:
 - bleeding lines
 - control of hydraulic pressure
 - directional flow including pressure gauge
 - filters
 - fluids
 - general operation
 - hydraulics
 - oil cooler
 - oil reservoir
 - Pascal's Law
 - pump
 - ram/cylinders, including single and multi-stage
 - safety considerations of fluids under pressure
 - seals
 - solenoid valves
 - types of arrangements, including side acting, direct and suspended
- electric lifts – mechanics, including:
 - governor operation testing and rope tension testing
 - governor types, including vertical shaft, overspeed devices and horizontal shaft
 - governors

- release procedures for each type of safety gear/governor combination
- safety gear types: A instantaneous, B flexible guide clamp, C wedge clamp and D oil buffer
- emergency release procedures - trapped passengers – WHS/OHS considerations and communication with passengers, including:
 - determining numbers and condition of passengers
 - direction of lift travel before stopping
 - emergency medical support
 - fault indication
 - hand winding
 - information related to impending movement and opening of doors
 - moving under power
 - passenger safety
 - reassurance as to safety of passengers
 - status of doors
 - warnings about standing near doors and using controls
- escalators and moving walks components, including:
 - balustrade lighting
 - controller
 - drive chain
 - handrail
 - handrail earthing
 - machine brakes
 - rollers and tension carriage
 - safety devices
 - step/pallet chains
 - steps/pallets/belts
 - track systems
 - truss
- geared types including rack and pinion and chain, including:
 - application
 - brakes
 - drum
 - efficiency
 - electric prime mover (motor types and control)
 - speed/load characteristics
- lift car, including:
 - access
 - buttons and indicators
 - communication devices

- door operator
- frame
- safety gear
- superstructure
- travelling cable
- lift components - electro-mechanical employing relay logic components, including:
 - acceleration circuits
 - button circuit
 - directional circuitry
 - door operator circuitry
 - fans
 - floor selector circuitry
 - indicator/lantern circuit
 - key switch circuits
 - mains supply
 - motor room control (selector)
 - power circuits
 - re-levelling circuitry
 - slowing and stopping circuitry
 - well control (transducer)
- lift components - electro-mechanical safety circuits, including:
 - car door locks
 - car top switch
 - car trap-door limit switch
 - circuit switches are all highlighted
 - emergency stop
 - fire service
 - landing door locks
 - pit switch
 - safety gear switch
 - tappet switch
 - terminal stopping
- lift components – electrical, including:
 - brushes
 - fuses
 - lamps
 - limit switches
 - motor/generator
 - relays: reverse phase and phase failure

- selectors
- tachos
- terminals
- transformers
- lift components - electronic, including:
 - capacitors
 - electronic boards
 - encoders
 - input/output (I/O) board
 - processor board
 - rectifiers
 - resistors
 - selectors
 - transducers
- lift control circuits using relay logic, including:
 - acceleration, button, indicator/lantern, key switch and power circuits
 - directional, door operator, floor selector, re-levelling and slowing and stopping circuitry
 - fans
 - mains supply
 - motor room control (selector)
 - well control (transducer)
- lift electrical layout and special requirements, including:
 - colour coding and labelling
 - communication cabling
 - conduits
 - segregation low voltage (LV)/extra-low voltage (ELV)
 - special lift symbols
 - travelling cable
 - troughing
- lift machine room, including:
 - access
 - controller
 - floor selector
 - governor
 - machine
- lift pit, including:
 - access
 - buffers
 - compensators

- safety equipment
- lift safety circuits, including:
 - car door locks
 - car top switch
 - car trap-door limit switch
 - circuit breakers
 - circuit switches
 - door protection
 - emergency stop
 - fire service
 - governor/switch
 - landing door locks
 - limit switches
 - overloads
 - phase failure relay
 - pit switch
 - reverse phase relay
 - safety gear switch
 - tappet switch
 - terminal stopping
- lift systems - drive types, construction and operation of passenger, goods and service lifts, including:
 - drive constructions
 - drive types
 - emergency procedures
 - goods
 - passenger
 - rive operations
 - service
 - single and team manual handling
- lift well equipment, including:
 - counterweights
 - guide rails
 - landing doors and locks
 - limit switches/operating devices
 - ropes
 - roping systems
- maintenance, replacement and adjustment of mechanical lift components, including:
 - air cords
 - bearings: roller, sleeve, guide shoes and slipper

- car doors
- door guides
- landing doors
- selectors
- tapes/chains
- traction, including:
 - application
 - brakes
 - efficiency
 - electric prime mover (motor types and control)
 - speed/load characteristics
- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures
- sustainable energy principles and practices
- relevant technical industry standards, regulations, statutory requirements and codes for lifts systems.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in suitable simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, relevant industry standards, codes of practice and operation manuals.

Links

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