
Overview

This standard identifies the competences you need to assemble and fit electrical and electronic components to commercial and passenger carrying vehicles, in accordance with approved procedures. You will be required to fit a range of electrical and electronic components, which could include cables and wires, circuit protection devices, plugs, sockets, control units, transformers, switches, sensors, motors, pumps, lighting units, junction boxes, earthing devices, coils, chokes, electronic modules, instrumentation and communication equipment. This will require you to use a variety of assembly methods and joining techniques, such as routeing cables, wires and looms, mounting and securing components, cable fixing and fasteners, screwed, crimped, clamped and soldered connections, and cable protection devices.

You will be expected to prepare the work area, ensuring it is safe and free from hazards, and to check that specified components are available and fit for purpose, to obtain all relevant and current documentation, and to obtain the tools and equipment required for the assembly operations, checking that they are in a safe and usable condition. In carrying out the assembly operations, you will be required to follow company procedures and specified assembly techniques, in order to fit electrical and electronic components to the vehicle.

The assembly activities will include making all necessary checks and adjustments, to ensure that the electrical and electronic components, when fitted to the vehicle, are checked for position, security, function, safety and completeness. You must also check that any cables and wires are routed correctly and are tidy in appearance, and that connections are mechanically sound and checked for electrical continuity.

Your responsibilities will require you to comply with organisational policy and procedures for the assembly activities undertaken, and to report any problems with the assembly activities, materials or equipment that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You will be expected to ensure that all tools, equipment and materials used in the assembly are correctly accounted for on completion of the activities, and to complete all necessary job/task documentation accurately and legibly. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to the fitting and assembly of electrical and electronic components. You will understand the relevant electrical and electronic components and joining techniques, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the assembly

activities. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow the relevant instructions, assembly drawings and any other specifications
3. ensure that the specified components are available and that they are in a usable condition
4. assemble the components in their correct positions using the appropriate methods and techniques
5. secure the components using the specified connectors and securing devices
6. check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required specification
7. deal promptly and effectively with problems within your control and report those that cannot be solved
8. ensure that work records are completed, stored securely and available to others as per organisational requirements
9. leave the work area in a safe condition on completion of the activities, as per organisational and legal requirements

Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken whilst carrying out the activities (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)
2. the health and safety requirements of the work area and the activities, and the responsibility these requirements place on you
3. the hazards associated with the activities, and how to minimise them and reduce risks
4. the personal protective equipment and clothing (PPE) to be worn during the activities
5. how to extract and use information from engineering drawings and related specifications (to include symbols and conventions to current industry standards and codes of practice)
6. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
7. how to extract the necessary information in order to fit the electrical and electronic components to the vehicle
8. the general principles of electrical and electronic fitting techniques; the purpose and function of the components, (including identification systems such as colour codes, manufacturer's specification)
9. preparations that need to be undertaken on the electrical and electronic components prior to fitting them to the vehicle
10. the correct component handling procedures, including relevant handling equipment and electrostatic discharge precautions (ESD)
11. the assembly and securing methods and procedures to be used, and the importance of adhering to them
12. how the components are to be routed, aligned, adjusted and positioned prior to securing, and the tools and equipment that are used
13. the importance of using the specified electrical and electronic components and securing devices for the assembly, and why you must not use substitutes
14. the quality control procedures to be followed during the fitting and assembly operations
15. how to conduct any necessary checks to ensure the accuracy, position, security, function, completeness and electrical continuity of the assembly
16. how to detect fitting and assembly defects (such as ineffective joining techniques, component damage) and what to do to rectify them
17. how to check that the tools and equipment to be used are correctly calibrated and are in a safe, tested and serviceable condition

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18. the importance of ensuring that all tools are used correctly and within their permitted operating range
 19. the importance of ensuring that all tools, equipment and components are accounted for and returned to their correct location on completion of the assembly activities
 20. problems with the assembly operations and the importance of informing the appropriate people of non- conformances
 21. the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve
 22. how to access, use and maintain information to comply with organisational requirements and legislation

Scope/range related to performance criteria

1. Carry out all of the following during the assembly and fitting activities:
 1. obtain and use the appropriate documentation (such as job instructions, assembly drawings, quality control documentation)
 2. adhere to procedures or systems in place for risk assessment, hazardous substances, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
 3. check that all cables, extension leads or air supply hoses are in a safe, tested and serviceable condition
 4. check that all tools and equipment to be used are within current calibration/certification dates
 5. ensure that components used are free from damage, foreign objects, dirt or other contamination before assembling them
 6. use safe and approved fitting and assembly techniques at all times
 7. return all tools and equipment to the correct location on completion of the fitting and assembly activities
 8. leave the work area in a safe and appropriate condition on completion of the activities
2. Fit electrical, electronic or electromechanical components, using all of following techniques:
 1. routing of cables, wires and looms
 2. cable fixings and fasteners
 3. mounting/securing components
3. Terminate and join cables/wires to components using three of the following:
 1. screwed connections
 2. clamped connections

3. soldering
4. crimping
5. cable protection devices (such as sleeving or grommets)
4. Make connections to six of the following components on vehicle assemblies:
 1. cables and wires
 2. transformers
 3. lighting
 4. electronic modules
 5. circuit protection devices
 6. switches
 7. junction boxes
 8. instrumentation
 9. plugs
 10. sensors
 11. earthing devices
 12. relays
 13. sockets
 14. motors
 15. coils
 16. communication equipment
 17. control units
 18. pumps
 19. chokes
 20. other specific component
5. Carry out the required quality checks using the correct tools and equipment, to include seven of the following:
 1. dimensions
 2. completeness
 3. electrical inputs and outputs
 4. position
 5. freedom from damage or foreign objects
 6. function
 7. alignment
 8. electronic inputs and outputs
 9. component security
6. Check the assembled components, and their assembly to the vehicle, comply with one of the following quality and accuracy standards:
 1. legislation, industry standards, codes of practice and

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- procedures
 - 2. specific system requirements
 - 3. customer standards and requirements
 - 4. company standards and procedures

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