SEMEEE326

Assembling rotor and armature windings

Overview

This standard identifies the competences you need to assemble rotor and armature windings, in accordance with approved procedures. This will involve selecting the correct components and materials, fitting and insulating components and fitting and terminating the coil. You will be required to select the appropriate tools and equipment to use, based on the operations to be performed and type of components to be fitted and to check that they are in a safe and serviceable condition. In carrying out the operations, you will be required to follow laid-down procedures and specific assembly techniques. The assembly activities will also include making all necessary checks and adjustments to ensure that components are correctly positioned and free from damage.

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, components or equipment that you cannot personally resolve, or are outside your permitted authority, to the relevant people. 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 applying assembly techniques and procedures to rotor and armature windings. You will understand the rotor or armature being assembled and its application and will know about the assembly techniques, tools and methods, 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 operations. 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 legislation, regulations, directives and other relevant 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 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 it 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 obtain and interpret drawings, planning sheets and records and other documents needed for the assembly activities
6. the basic operating principles of the rotor and armatures being assembled
7. the factors to consider when choosing pre-formed coils
8. the assembly methods and techniques to be used when assembling rotating equipment rotor/armature windings
9. the common types of winding configuration used for rotor/armature assembly
10. the methods used to fit slot insulators
11. the purpose of insulation cuffs
12. the factors that determine the wedge length, width, squareness and profile
13. the methods used to mark out and cut materials for the manufacture and trimming of wedges
14. the methods used to fit wedges into slots
15. the methods used to splice windings and the factors that affect the pitch of coils
16. the procedure for protecting coil ends
17. the common methods of attaching rotor/armature windings to the commutator
18. the method used to check the electrical integrity of joints
19. the methods used to apply insulating varnish and the types used
20. the visual checks and preparation requirements for components to be used in electrical assembly activities
21. the methods and tools/equipment used to transport, handle and lift the components into position
22. how to check that the tools/equipment are within current certification dates, free from damage and defects , in a safe and usable condition, and configured correctly for purpose
23. the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve
24. how to access, use and maintain information to comply with

organisational requirements and legislation

Scope/range related to performance criteria

1. Assemble the rotor and armature windings by carrying out all of the following activities:
    1. use the correct assembly drawings, specifications and job instructions
    2. adhere to health and safety regulations, systems and procedures to realise a safe system of work
    3. ensure that components are free from damage, foreign objects, dirt or other contamination
    4. check that all tools and equipment are within calibration date, where appropriate
    5. use safe and approved techniques to assemble and connect rotor/armature components
    6. leave the work area in a safe and tidy condition
2. Prepare and assemble windings using all of the following:
    1. rotor/armature wires
    2. slot wedges
    3. brazing materials
    4. preformed coils
    5. dummy coils
    6. solders
    7. insulating materials
    8. equaliser rings
    9. fluxes
    10. separating strips
    11. resin/glass bonding tapes
3. Use all of the following equipment and tools for the assembly operations:
    1. tinning and soldering equipment
    2. drying and baking ovens
    3. lathes
    4. multimeters
    5. insulating resin baths
    6. shaft supports
    7. impedance testers
    8. coil winding machines
4. Use all of the following assembly procedures:
    1. prepare components (such as coil ends, wedge length,

width, squareness and profile)
2. insulate (such as slot, shaft, end winding support)
3. secure windings (such as main, auxiliary, lap, wave, duplex, triplex, multiplex)
4. band end windings
5. solder connections (such as risers, coil ends)
6. check mechanical integrity
7. check electrical integrity (such as continuity, insulation, voltage withstand)

5. Assemble rotating equipment to one of the following quality and accuracy standards:

    1. organisational drawings and procedures
    2. customer drawings and requirements
    3. current industry standards, codes of practice and procedures
    4. other international standards

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