

LANLEO23 - SQA Unit Code F9GP 04

Service and repair electronic control and monitoring systems on land-based equipment



Overview

This standard covers the electrical and electronic components and systems used in the generation, processing and transmission of data used in the control and monitoring of land-based equipment and their associated activities, e.g.

1. engine management
2. transmission management
3. headland management
4. performance monitoring
5. closed circuit television monitoring
6. equipment instrumentation
7. driver information
8. suspension control
9. hydraulic control
10. pilot steering
11. global positioning service
12. multiplexing
13. Pulse Width Modulation (PWM)
14. telemetry
15. automatic guidance systems

It includes the fundamental skills and knowledge to enable the technician to understand the function and application of components and systems used, the technology employed and how to verify system performance, diagnose and rectify system non-conformity to manufacturers' specifications.

Any testing equipment used should be calibrated appropriately.

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Performance criteria

You must be able to:

- P1 repair and/or replace components to ensure satisfactory performance of electronic control and monitoring equipment
- P2 diagnose faults in land-based equipment electronic control systems and components
- P3 retrieve/interpret/migrate stored information from electronic control and monitoring systems
- P4 set parameters, calibrate and verify performance of control and monitoring systems
- P5 maintain electronic control and monitoring equipment to ensure satisfactory performance
- P6 recognise the characteristics of electromagnetic field and the influence this has on associated circuits

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Knowledge and understanding

You need to know and understand:

- K1 how electrical, electronic and wireless signals are generated and communicated, e.g. CAN bus diagnostic communication, GPS, radar, sensor types and signal formats
- K2 the function and operation of electronic control and monitoring system components, e.g. transistors, capacitors, regulators, resistors, transformers, thermistors, transducers, transmitters, actuators, electronic control units (ECU)
- K3 the function, types and application of screening for electronic components to inhibit external electronic influence
- K4 the function and operation of land-based equipment electronic control and monitoring systems used
- K5 the methods and equipment used to diagnose faults in electronic control and monitoring systems and components used in land-based engineering
- K6 the methods used to test and repair or replace land-based equipment electronic control and monitoring system components
- K7 the methods used to maintain the integrity of electronic control and monitoring systems, e.g. ECUs, connections to wiring harness
- K8 the methods used to check system integrity
- K9 how to retrieve, interpret and reinstate information stored in electronic control units (ECU)
- K10 how to calibrate and verify the correct operation of electronic control and monitoring equipment

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