

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

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### Overview

This standard covers the service and repair of electronic control and monitoring systems on land-based equipment. It includes the electrical and electronic components and systems used in the generation, processing and transmission of data in the control and monitoring of land-based equipment and their associated activities.

It also 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 to manufacturers' requirements.

This standard is for those who work in land-based engineering.

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## Performance criteria

You must be able to:

1. diagnose faults in electronic **control and monitoring systems** and **components** on land-based equipment
2. service/repair and/or replace components to ensure satisfactory performance of electronic control and monitoring systems
3. retrieve/interpret/migrate stored information from electronic control and monitoring systems
4. set parameters, calibrate and verify the performance of electronic control and monitoring systems
5. maintain electronic control and monitoring equipment to ensure satisfactory performance
6. recognise the characteristics of an electromagnetic field and the influence this has on associated circuits

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### Knowledge and understanding

You need to know and understand:

1. how electrical, electronic and wireless **signals** are generated and communicated
2. the function and operation of an electronic control and monitoring system on land-based equipment
3. the function of key electronic control and monitoring system components
4. the function, types and application of screening for electronic components to inhibit external electronic influence
5. the methods and equipment used to diagnose faults in electronic control and monitoring systems and components used in land-based engineering
6. the methods used to test and repair or replace electronic control and monitoring system components on land-based equipment
7. the methods used to maintain the integrity of electronic control and monitoring systems
8. the methods used to check system integrity
9. how to retrieve, interpret and reinstate information stored in electronic control units (ECU)
10. how to calibrate and verify the correct operation of electronic control and monitoring systems

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## Glossary

### **control and monitoring systems** - e.g.

- engine management
- transmission management
- headland management
- performance monitoring
- closed-circuit television monitoring
- equipment instrumentation
- driver information
- suspension control
- hydraulic control
- pilot steering
- global positioning service (GPS)
- multiplexing
- Pulse Width Modulation (PWM)
- telemetry
- automatic guidance systems

### **components** - e.g.

- capacitors
- regulators
- resistors
- thermistors
- transducers
- transmitters
- electronic control units (ECUs)

**signals** - e.g. CAN bus diagnostic communication, GPS (Global Positioning System), radar, sensor types and signal formats

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<b>Developed by</b>	Lantra
<b>Version Number</b>	2
<b>Date Approved</b>	December 2015
<b>Indicative Review Date</b>	December 2020
<b>Validity</b>	Current
<b>Status</b>	Original
<b>Originating Organisation</b>	Lantra
<b>Original URN</b>	LANLEO23
<b>Relevant Occupations</b>	Land-based Engineering
<b>Suite</b>	Land-based Engineering Operations
<b>Keywords</b>	land-based; equipment; machinery; electronic; control systems