
Overview

This standard covers the application of core land-based engineering principles: tools and equipment. It includes the identification, selection, maintenance and safe use of hand tools, powered tools and fixed and portable workshop equipment plus the personal protective equipment required to complete tasks in land-based engineering.

This standard is for those who work in land-based engineering and is appropriate for persons working under supervision.

Note: due to current regulations an approved electrician should be involved when working with mains electricity.

Performance criteria

You must be able to:

1. apply core land-based engineering principles to select the appropriate **hand tools, power tools, fixed and portable equipment** for relevant **tasks**
2. use tools and equipment in the correct manner for relevant tasks
3. use **measuring equipment**
4. use appropriate **tooling and techniques** to support, clamp, compress and extract component parts and assemblies
5. select and use **special tooling** for a given task
6. inspect hand tools, power tools, fixed and portable equipment to establish their condition
7. **maintain** hand and power tools in an appropriate condition
8. inspect and maintain **protective equipment** and **lifting equipment** in a serviceable state
9. recharge portable tool power packs
10. identify the correct **power supply** needed for power tools and equipment

Knowledge and understanding

You need to know and understand:

1. the range of hand tools, power tools, fixed and portable equipment available to undertake relevant tasks
2. the techniques required to use hand tools, power tools, fixed and portable equipment effectively and safely
3. the maintenance requirements for hand tools, power tools, fixed and portable equipment
4. how to cut and restore threads, extract broken studs and remove seized fixings
5. how to use adjustable and fixed reamers
6. how to sharpen hand tools
7. the techniques used to clamp, hold and secure materials and components while engineering tasks are carried out
8. how to identify different power supplies for power tools
9. how to isolate mains electrical equipment
10. how to charge portable tool power packs

Glossary

fixed and portable equipment - e.g. presses, powered saws, jacks, axle stands, battery chargers, air compressors, dynamometer or injector testers

hand tools - e.g. files, chisels, punches, pullers, taps and dies, drill bits, reamers, clamps, spanners, wrenches sockets, screw drivers, pliers, cutters and snips, measuring and marking equipment, gauges and extractors

lifting equipment - e.g. jacks, engine cranes, lifting platforms, pulley blocks

maintain tools- e.g. sharpen, store, clean, de-burr

measuring equipment - e.g. dial test indicator, vernier callipers, micrometer, feeler gauges, thermometer, tachometer, multi-meter, dynamometer, hydrometer

power supplies - e.g. single phase, 3 phase, portable power packs, compressed air

power tools - both electrical and air tools e.g. drills, grinders, air tools, heat guns

protective equipment - e.g. masks, goggles, screens, guards

special tooling - e.g. pullers, presses, seal protectors, guide studs, placement and centering dollies, splitting rails and trolleys

tasks - e.g. cutting, sawing, shaping, measuring, fitting, removing, testing, holding, drilling, lifting

tooling and techniques - e.g. stands, clamps, vices, pullers, slide hammers, presses, spring compressors

Apply core land-based engineering principles: tools and equipment

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