

0171-28 Level 2 Technical Certificate in Land-based Engineering

2024

Qualification Report

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Introduction

This document has been prepared by the Chief Examiner and Principal Moderator; it is designed to be used as a feedback tool for centres in order to enhance teaching and preparation for assessment. It is advised that this document is referred to when planning delivery and when preparing candidates for City & Guilds Technical assessments.

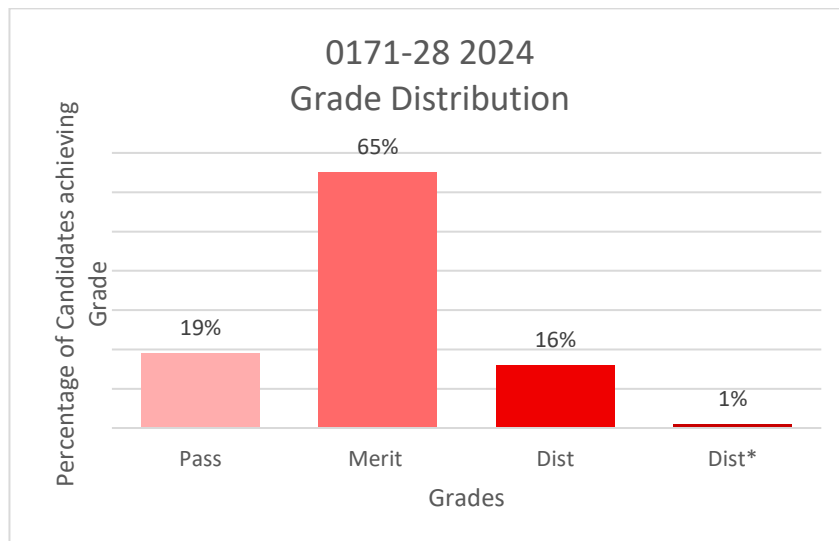
This report provides general commentary on candidate performance in both the synoptic assignment and theory exam. It highlights common themes in relation to the technical aspects explored within the assessment, giving areas of strengths and weakness demonstrated by the cohort of candidates who sat assessments in the 2024 academic year. It will explain aspects which caused difficulty and potentially why the difficulties arose.

The document provides commentary on the following assessments:

- 0171-523/023 Level 2 Land-Based Engineering – Theory exam
 - March 2024 (Spring)
 - June 2024 (Summer)
- 0171-024 Level 2 Land-Based Engineering – Synoptic Assignment

Qualification Grade Distribution

The approximate grade distribution for this qualification is shown below:



This data is based on the distribution as of 19/08/2024.

Please note City & Guilds will only report qualification grades for candidates who have achieved all of the required assessment components, including Employer Involvement, optional units and any other centre assessed components as indicated within the Qualification Handbook. The grade distribution shown above could include performance from previous years.

Theory Exam

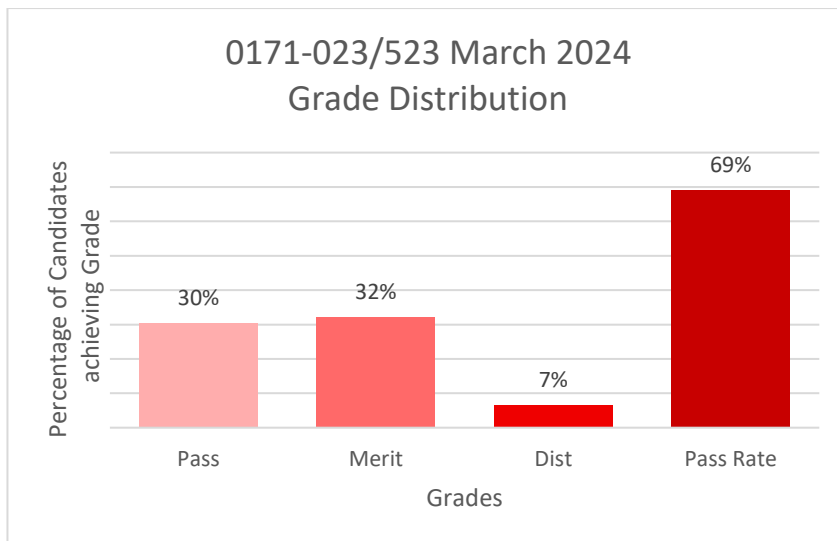
Grade Boundaries

Assessment: 0171-023/523
Series: March 2024 (Spring)

Below identifies the final grade boundaries for this assessment, as agreed by the awarding panel:

Total marks available	50
Pass mark	25
Merit mark	32
Distinction mark	40

The graph below shows the approximate distribution of grades and pass rates for this assessment:

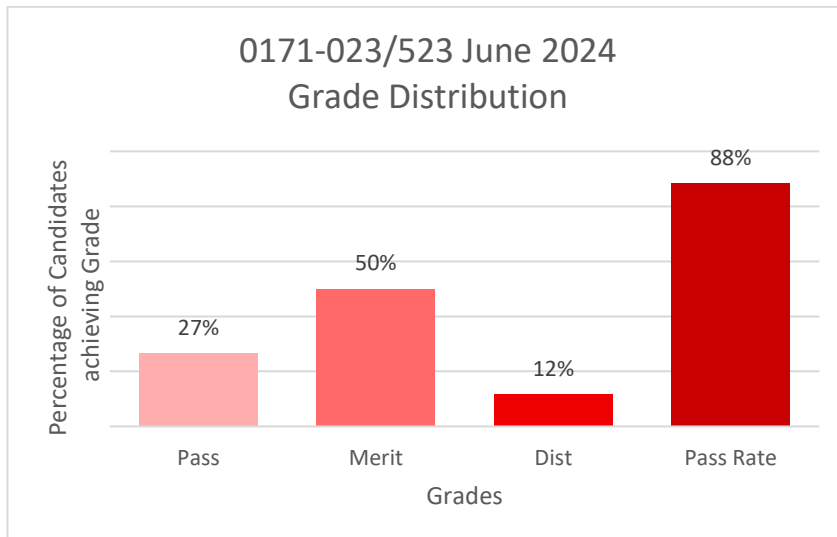


Assessment: 0171-023/523
Series: June 2024 (Summer)

Below identifies the final grade boundaries for this assessment:

Total marks available	50
Pass mark	25
Merit mark	32
Distinction mark	40

The graph below shows the approximate distributions of grades and pass rate for this assessment using the above boundary marks:



Chief Examiner Commentary

0171-023/523 Level 2 Technical Certificate in Land-Based Engineering - Theory exam

Series 1 – March 2024

A good breadth of knowledge and understanding was evident across all units assessed in this examination. Candidates accessed marks in all areas of the assessment, suggesting they have prepared well for the exam. Identification questions were answered correctly by most candidates along with functionality questions. Some areas were not answered well including questions that required demonstration of applied knowledge and understanding, and some questions looking at the identification of equipment and symbols.

Unit 209: Transmission and driveline operation principles

This unit focuses on the drive lines and components of the drive lines used in the land-based equipment. Candidate responses overall demonstrated a high level of knowledge and understanding, along with a wide breadth of knowledge within this area.

Unit 210: Engine operation principles

This unit focuses on the construction, operation and maintenance of engines, their components and related systems. Candidates were able to access marks across most the questions demonstrating a breadth of knowledge and understanding. Overall, depth of knowledge and understanding was evident too, with gaps only appearing in areas where a particular depth of understanding was required when relating to operating cycles and the specific function of diesel exhaust fluid.

Unit 212: Land-based vehicle electrics

This unit looks at the principles of electricity and how this is applied on land-based equipment. Candidates demonstrated a knowledge and understanding of the application of circuit layouts, the symbols used to represent components in a schematic, and the identification of electrical components. Gaps in understanding were evident when candidates were responding to questions around the testing of electrical systems.

Unit 213: Hydraulic systems

This unit looks at the function, layout of systems and operating principles of hydraulic systems used on land-based equipment. Overall, candidates performed well in this area and were able to identify basic hydraulic symbols, identify the systems which use high pressure, suggest the correct use of testing procedures, and demonstrate knowledge of the risks posed by hydraulic systems.

Unit 214: Land based vehicle and machinery operation

This unit focuses the operation of land-based machinery and equipment. The majority of candidates demonstrated a breadth of knowledge and understanding across the unit. Candidates were able to identify functions of systems and equipment, how to use them safely, and relevant checks which can be applied to ensure fitness for use. Gaps in applied knowledge were seen when identifying specific equipment and the correct operational settings for particular tasks.

AO4/Scenario-based questions

The scenario-based question was set around a servicing and repair task which covered a number of units. Candidates are required to refer to information from the scenario to answer the related questions. Candidates demonstrated a depth of knowledge and understanding in some topics and weaknesses in others. Strengths were seen from looking at the servicing procedures. The topics which were answered least effectively related to the causes of faults, the impact of using jump leads and the procedures for electrical and performance testing.

Centres are continuing to prepare students to a good standard, and this is supported by the overall pass rate. To allow for further enhancements, candidates would benefit from a greater depth of knowledge around electrical and hydraulic systems. In particular, the identification of common symbols used within workshop manuals and the basic diagnostic tasks carried out on a regular basis within the sector.

All documents are available to download from [Technicals in Agriculture and Land-based Engineering qualifications and training courses | City & Guilds \(cityandguilds.com\)](https://www.cityandguilds.com/Technical-Subjects/Technical-Subjects-Home)

Past papers and marking schemes: Documents – Level 2 – Assessment materials – Past Papers tabs

Exam guide: Documents – Level 2 – Assessment materials

Series 2 – June 2024

Overall performance has improved compared to June 2023 and June 2022.

All candidates performed well on questions where health and safety, potential risks, or environmental impacts were being assessed. In the main, all candidates accessed marks in areas on transmissions and their components, engines, their working principles and their components, and general land-based machinery, particularly when identifying them and looking at safe operation. Lower-scoring candidates did not access as many marks in areas looking at electrics and hydraulics, particularly areas around testing and the function of tests. Questions that require applied knowledge and understanding were a challenge to most candidates sitting this paper.

Unit 209: Transmission and driveline operation principles

All candidates performed well in the transmission and driveline operation principles questions; candidates performed well in the AO1 questions with most candidates accessing marks consistently. AO2 questions did differentiate with more than 60% of the high scoring candidates accessing marks in each of these questions in comparison to around 40% of the lower scoring candidates. Overall performance was high in this area demonstrating a depth and breadth of knowledge and understanding at this level.

Unit 210: Engine operation principles

Candidates demonstrated excellent depth and breadth of knowledge and understanding within this unit. AO1 questions were answered well with over 85% of all candidates achieving marks in the five AO1 questions. The AO2 questions provided more of a challenge with most candidates struggling to apply their knowledge of the four-stroke cycle when relating to crankshaft revolutions.

Unit 212: Land-based vehicle electrics

Candidates found the electrics unit slightly more challenging; most candidates were able to access marks in the AO1 questions, however, were unable to identify the correct unit of measure for current, with even the high-scoring candidates finding this challenging. The test used to verify the operation of a fuse was a good differentiating question with high and medium scores accessing marks more regularly than low-scoring candidates. The same was evident when identifying the function of a specific gravity test on a battery. Questions on health and safety and safe systems of work were answered well indicating that candidates have a good awareness of how to reduce risk when working on electrical systems.

Unit 213: Hydraulic systems

Candidates performed to a good level on questions relating to hydraulics when looking at areas of health and safety and risk, component symbol identification, and basic processes used when working on hydraulic systems. Candidates did however find questions around identifying system types and the operating pressures of circuits more challenging. The function of tests was identified correctly by most candidates.

Unit 214: Land based vehicle and machinery operation

Candidates were able to access marks consistently in the vehicle and machinery unit, particular strengths were evident in areas of health and safety and safe operation of machinery. Candidates were able to identify common pieces of equipment. There were differentiating questions such as why refuelling takes place post-operation with the vast majority of high scorers accessing marks.

AO4/Scenario-based questions

The scenario questions were based on electrical and hydraulic testing. A similar theme emerged with high-scoring candidates accessing marks regularly with some challenges. Lower-scoring candidates accessed marks around safety and basic faults, however, they struggled to access marks where deeper applied knowledge was required.

Past papers and marking schemes are available on the City and Guilds website which should be used for exam practice.

City & Guilds also offers a technical exam guide to support the work on the exam technique.

All documents are available to download from [Technicals in Agriculture and Land-based Engineering qualifications and training courses | City & Guilds \(cityandguilds.com\)](https://www.cityandguilds.com/Technical-Engineering-qualifications-and-training-courses)

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Synoptic Assignment

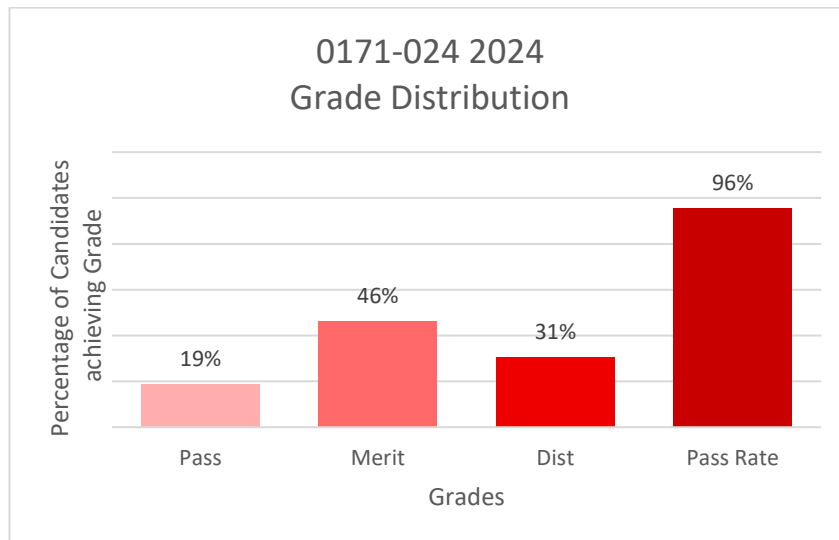
Grade Boundaries

Below identifies the final grade boundaries for this assessment, as agreed by the awarding panel:

Assessment: 0171-024
Series: 2024

Total marks available	60
Pass mark	23
Merit mark	33
Distinction mark	43

The graph below shows the approximate distributions of grades and pass rate for this assessment:



Principal Moderator Commentary

Candidates' work shows a wide range of abilities and is comparable to previous years with some candidates unable to achieve the required standard whilst others excel. On the whole, candidates were reasonably well prepared for the synoptic assignment and were aware of what was required to complete each task to industry standard.

Areas of strength

- Tool selection and use for all four tasks

Areas which proved more challenging

- Identification of likely causes of faults
- Referencing legislation

Areas with differentiation

- Risk assessments – hazards identified

As would be expected, there was some variation in the standard of practical work by candidates and a greater variation in the level of knowledge and understanding. Candidates generally completed the practical service tasks well and, in most cases, selected the correct tools and used them well. Candidates also generally worked in a safe logical way.

Across all the tasks, higher-performing candidates tended to have a better work ethic and greater attention to detail.

Across the different centres, the majority of candidates seen during centre visits were diligent and professional in their approach to the tasks. Centres should be proud of what the candidates have achieved.

Centres are asked to be mindful of the final submission date. Centres are reminded that candidates' synoptic assignments may be uploaded in advance of this deadline as soon as work is completed. This would support the moderation process to ensure that any errors are promptly flagged up and that centres have the opportunity to correct errors well in advance of the final submission dates.

Centres are asked:

- To include areas for improvement on the Candidate Record Form (CRF) unless the mark awarded is in the excellent band.
- To carefully check the addition of the total marks on the CRF.
- To annotate on candidate's work, incorrect statements and the quality of the work, e.g. areas that are good or lacking detail.
- When using dictation software to carefully check what has been typed.
- To upload all the forms and evidence as one document.