

0171-015/515 – Level 3 Land-based Engineering – Theory Exam (1)

March 2023

Examiner Report

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Introduction

This document has been prepared by the Chief Examiner, it is designed to be used as a feedback tool for centres to use in order to enhance teaching and preparation for assessment. It is advised that this document be referred to when preparing to teach and then again when candidates are preparing to sit examinations for City & Guilds Technical qualifications.

This report provides general commentary on candidate performance and 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 the **March 2023** examination series. It will explain aspects which caused difficulty and potentially why the difficulties arose, whether it was caused by a lack of knowledge, incorrect examination technique or responses that failed to demonstrate the required depth of understanding.

The document provides commentary on the following assessment:
0171-015/515 Level 3 Land-based Engineering – Theory Exam (1).

Theory Exam – March 2023

Grade Boundaries and distribution

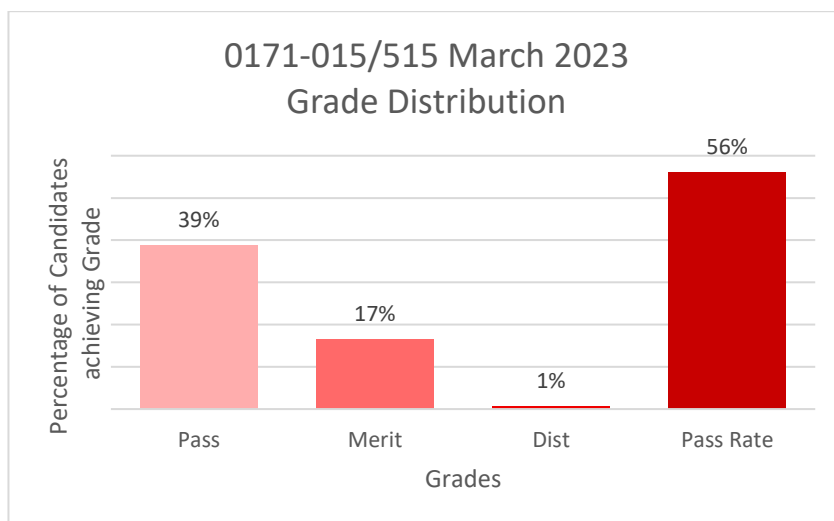
Assessment: **0171-015/515**

Series: **March 2023**

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

Total marks available	60
Pass mark	24
Merit mark	33
Distinction mark	42

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



Chief Examiner Commentary

General Comments on Candidate Performance

Assessment component: 0171-015/515

Series 1 (March)

The examination paper covered a wide range of learning outcomes from across the assessed units of the qualification, including service engineering calculations, fundamental and current technologies. The paper was comparable to previous series of the examination in terms of range, suitability and level. Compared to the March 2022 series, there was an improvement in performance from both the lower achieving and mid-achieving candidates. Responses indicated stronger performance in areas requiring practical application of knowledge and in some specific mathematical topics.

A particular area of strength was evident when calculating a percentage. Most candidates were able to interpret a range of data and provide evidence of all stages of the calculation. For other calculation questions, some candidates used and applied alternative mathematical methods with success. Good knowledge and understanding was also demonstrated when summarising engine operating principles, with a range of marks achieved across the different ability levels.

Whilst candidates performed well in percentage calculations, the remaining maths and science-based questions proved more challenging. Some candidates missed the opportunity to access marks on two parts of a question relating to gear ratios, with some providing no answers and some being unable to demonstrate recall of the correct formula. Responses relating to methods of heat transfer also demonstrated weaknesses in knowledge and understanding, with most candidates unable to determine the temperature difference for the calculation part of the question. Finally, candidates were challenged when asked to give examples of forces acting on internal engine components.

Responses relating to the function and operation of systems were mixed, as candidates were unable to demonstrate breadth and depth of knowledge and understanding across all areas. This was particularly evident in questions divided into multiple parts, where candidates responded well to some parts but showed weakness in others, such as oil specifications and the function of exhaust gas recirculation valve.

The extended response question provided an opportunity for candidates to demonstrate their knowledge and understanding of testing and fault finding in a realistic scenario relating to a land-based liquid-cooled engine. Many candidates discussed basic diagnostic procedures or concentrated on one area, such as header tanks or coolant hoses. This limited depth in diagnostic testing impacted performance, limiting achievement to the lower/middle mark ranges. Those candidates who encompassed diagnostics for the whole system using a logical approach were able to access marks in the higher mark range.

Centres are advised to help candidates develop their use and understanding of fundamental principles, technical terminology and mathematical and science-based concepts across the qualification. Practising examination techniques when preparing for future series would be particularly beneficial to fully understand the requirements of the question before answering.

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/qualifications/0171-015/515)

Past papers and marking schemes: Documents – Level 3 – Assessment materials – Past Papers tabs

Exam guide: Documents – Level 3 – Assessment materials