

# **0171-38 – Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)**

2019

**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 2019 academic year. It will explain aspects which caused difficulty and potentially why the difficulties arose.

The document provides commentary on the following assessments:

## Year 1

- 0171-015/515 Level 3 Land-based Engineering - Theory exam (1)
  - March 2019 (Spring)
  - June 2019 (Summer)
- 0171-016/516 Level 3 Land-based Engineering - Theory exam (1)
  - March 2019 (Spring)
  - June 2019 (Summer)

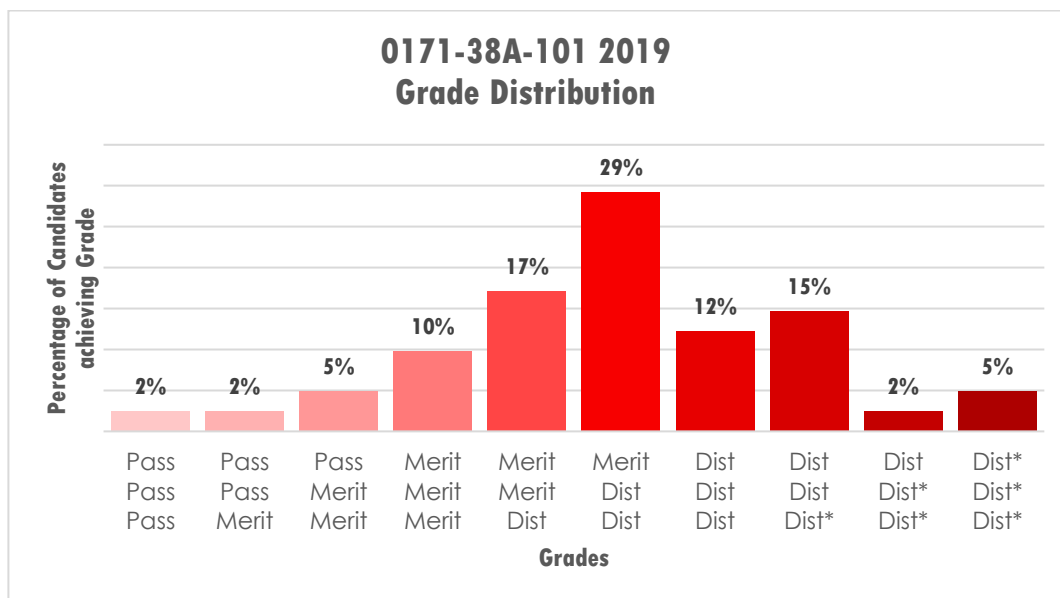
## Year 2

- 0171-018/518 Level 3 Land-based Engineering - Theory exam (2)
  - March 2019 (Spring)
  - June 2019 (Summer)
- 0171-017 Level 3 Land-based Engineering – Synoptic Assignment

# Qualification Grade Distribution

## 0171-38 – Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)

The grade distribution for this qualification is shown below:



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 Exams – Year 1

## Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)

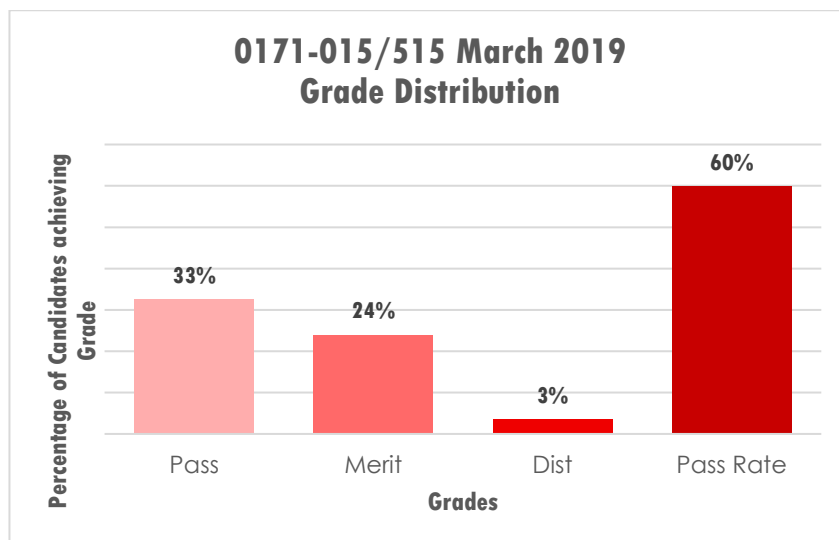
### Grade Boundaries

Assessment: 0171-015/515  
Series 1: March 2019 (Spring)

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

<b>Total marks available</b>	<b>60</b>
Pass mark	25
Merit mark	33
Distinction mark	42

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

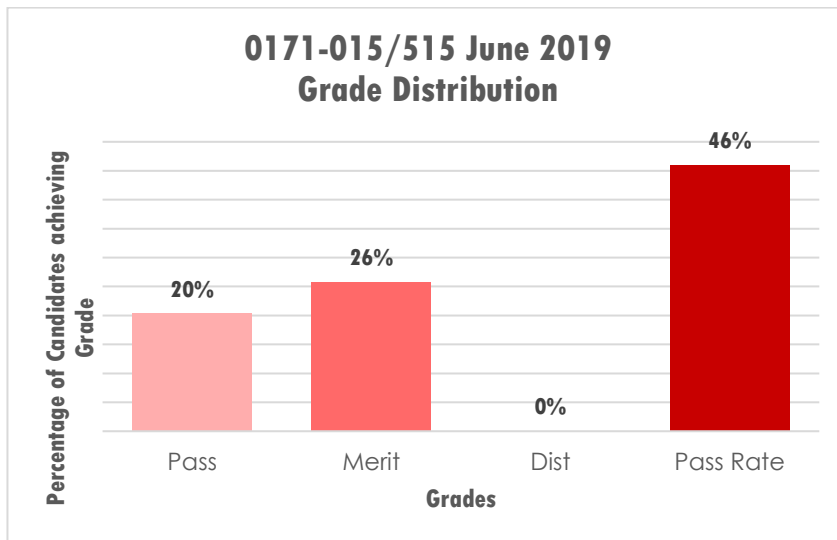


Assessment: 0171-015/515  
Series 2: June 2019 (Summer)

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

<b>Total marks available</b>	<b>60</b>
Pass mark	25
Merit mark	33
Distinction mark	42

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



# Chief Examiner Commentary

## 0171-015/515 Level 3 Land-based Engineering - Theory exam (1)

### Series 1 – March 2019

The paper contained a combination of science, mechanics and calculation based questions to test a range of knowledge and skills. The mechanics questions showed stronger answers than the science, electrical and calculation questions. Overall, the attained marks showed that candidates were unable to demonstrate the depth of knowledge across the different topics.

The technical content encompassed a range of relevant and current topics in land-based engineering. Some topics (such as fuel, oil consumption, cooling system and ignition faults) are now more current in the industry.

The majority of the candidates' responses showed an understanding of the question content but, in many cases, they did not demonstrate the depth of knowledge required – this was evident in several questions where the majority of candidates failed to access the marks available. Some candidates also provided detail that was not asked for in the question, indicating a lack of familiarity with the demands of certain question types. Better exam techniques would have improved the marks of many candidates.

Specific areas of weakness were the science and calculation based questions.

Candidates should be reminded to read the questions carefully and only provide the answers relevant to the question asked. Candidates should also be reminded to familiarise themselves with the requirements of command verbs, and for each verb the type of responses required in relation to depth and breadth.

### Extended Response Question

The majority of the candidates achieved low to middle range marks for the extended response question, with just over half of all candidates sitting in the first marking band. Only a small percentage of candidates were able to access the top marking band. The majority of candidates discussed conformation of overhaul requirement, removal and re- fitting of an engine rather than component measurements as the question asked.

City & Guilds has produced a technical exam guide to support the work on the exam technique, which is available to download from

<https://www.cityandguilds.com/qualifications-and-apprenticeships/land-based-services/agriculture/0171-technicals-in-agriculture-and-landbased-engineering#tab=documents>

Centres may also refer to the past papers available to download from the same webpage under the Past Papers tab.

## Series 2 – June 2019

The paper contained a combination of science, mechanics and calculation based questions to test a range of knowledge and skills. The mechanically based questions produced stronger responses than the calculation questions. Overall, the attained marks indicated that candidates lacked the depth of knowledge across the different topics to access Band 3.

The technical content encompassed a range of relevant and current topics in land-based engineering. Some topics e.g. fuel consumption, engine emissions and engine fuel system testing are currently coming to the forefront in the industry and the paper reflected this.

Some candidates showed an understanding of question content; however the majority of the responses showed a limited knowledge and in a lot of cases they did not demonstrate depth of understanding or appropriate detail. This being said, in some responses there were candidates that provided additional responses, evidencing a depth of knowledge or experience beyond the answer requirements.

Specific areas of weakness were noted in calculation. However, candidates also omitted to answer electrical, emissions and graph based questions. Centres should make sure that candidates have a solid understanding of laws for example Ohm's Law, principles and key abbreviations.

Candidates should be encouraged to attempt every question on the paper to afford themselves the best chance of maximising marks.

### **Extended Response Question**

Overall the majority of the candidates achieved low to middle range marks for the extended response question. This was generally because depth of understanding was not sufficiently demonstrated. Strength was demonstrated in the area of preparation with a majority of candidates displaying knowledge of PPE and risk assessment and citing the draining and flushing of the system. There was also some discussion of initial fault verification. However, with regard to the specifics of the question, few candidates showed enough understanding to reach the upper levels. Very few discussed fuel storage and transfer issues, pressure testing, or injector leak back or discussed additional valid comments, for example, a follow up call to the customer to ascertain any customer error. Many candidates also laboured the point of looking for ingress of water and fuel filler cap with little benefit. Stronger candidates appeared to have had experience of or witnessed the repair and were therefore able to give an accurate account of a repair process and detail other relevant points to enhance their response.

City & Guilds has produced a technical exam guide to support the work on the exam technique, which is available to download from

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# Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)

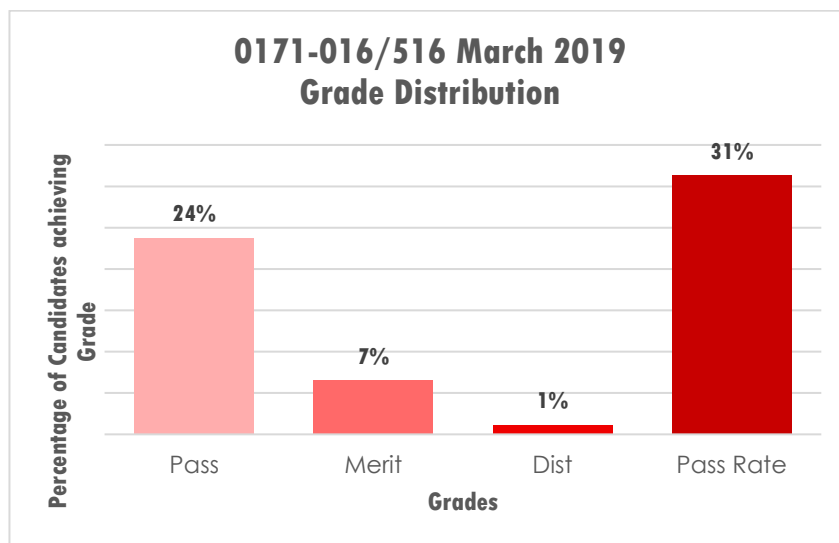
## Grade Boundaries

Assessment: 0171- 016/516  
Series1: March 2019 (Spring)

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

<b>Total marks available</b>	<b>60</b>
Pass mark	26
Merit mark	34
Distinction mark	42

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

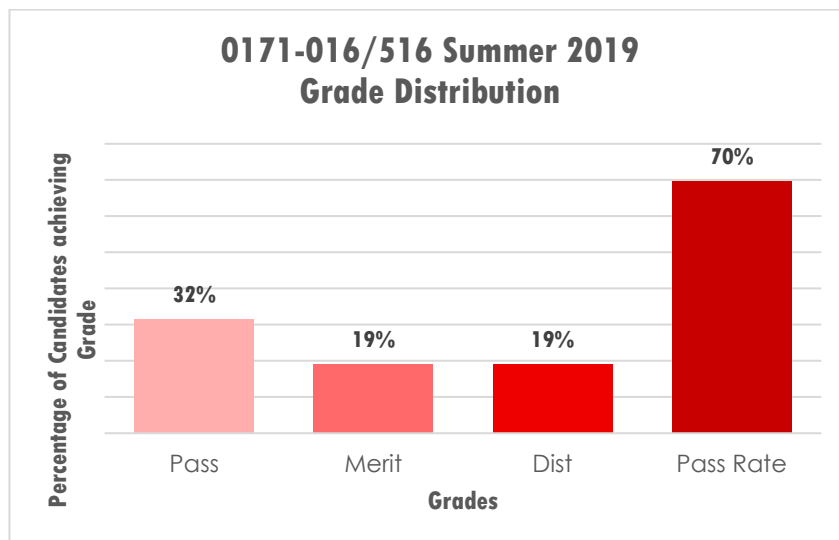


Assessment: 0171-016/516  
Series 2: June 2019 (Summer)

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

<b>Total marks available</b>	<b>60</b>
Pass mark	25
Merit mark	33
Distinction mark	42

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



# Chief Examiner Commentary

## 0171-016/516 Level 3 Land-based Engineering - Theory exam (1)

### Series 1 – March 2019

The questions in this question paper were of a technical level for this paper and sampled appropriately from the syllabus content.

There was evidence that a proportion of candidates planned their answers well. This was especially true of the longer answer question and the questions attaining higher marks. A subject that candidates tended to do well in was the practical based questions. Most candidates were able to demonstrate their basic knowledge with recall of terminology, as demonstrated in several questions across the paper.

Some candidates struggled with areas on hydraulic, electronic and electrical questions. Therefore some candidates answering questions that asked for a technical detailed description did not access the full marks available. The highest marks overall tended to be from the electrical and electronic questions with a low proportion achieving these marks.

The area that posed a problem for quite a few candidates was the explanation of the hydrostatic steering valve. Most just gave an overview and showed that it was not fully understood.

The questions specifically around steering types were not answered very well, but the higher scoring candidates were more equipped to tackle this kind of technical question. This shows candidates struggled to demonstrate an in-depth understanding for the technical questions.

There was also some confusion over the question relating to the alternator regulator internal operation. Quite a few candidates either did not answer it or discussed how the regulator functioned.

A question on preparation checks proved difficult for candidates, with a range of answers giving generic preparation of the workshop and themselves in terms of PPE and tools etc. therefore missing opportunities for marks by not stating specific basic checks and testing equipment, calibration and correct use.

### Extended Response Question

Some candidates gave excellent well thought out answers to this question, exploring a range of advantages and disadvantages of each system. The majority explained well the benefits of the scan tools but did not access the higher marks in the bands because the lack of knowledge and understanding of how the oscilloscope functioned in diagnostic checks.

Few candidates achieved the higher band marks; this was due to the limited practical examples and applications of the equipment. However, the majority of the candidates did show a degree of planning for this question.

City & Guilds has produced a technical exam guide to support the work on the exam technique, which is available to download from

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Centres may also refer to the past papers available to download from the same webpage under the Past Papers tab.

## **Series 2 – June 2019**

The questions in this question paper were of a technical level for this paper and sampled appropriately from the syllabus content. The broad depth of knowledge and understanding from the three units covered in this examination, gives a good indication of the level and ability of the Level 3 work that the candidates should be able to demonstrate, especially in the electrical and electronic fields.

Overall the questions were well answered showing a broad spread of marks with a strong percentage reaching the mid and upper levels and demonstrating good coverage of units and topics with depth of knowledge. That being said, it was evident that some technical calculations proved challenging for lower level candidates and understanding was a concern for all, especially in relation to electronic fault finding.

Stronger candidates distinguished themselves by adding good detail and demonstrating depth of understanding particularly in relation to the hydrostatic transmission system.

Specific areas of weakness were noted in the use and understanding of formulas and their associated calculations. This was particularly notable with regard to resistances in circuits.

Candidates should be encouraged to show clear working on calculation questions and employ accurate use of terminology, as there was evidence of component names being muddled with functions and confusion between terms

### **Extended Response Question**

The extended response question clearly showed the level of skills and knowledge of the candidates and it was clearly evident from the responses those who had practical knowledge and training in this area to understand the complexity of diagnostics. This question tended to be a discriminator between the levels. Lower level candidates, who generally demonstrated a lack of technical knowledge, described basic diagnostic procedure that lacked depth and detail. Stronger candidates shone here, producing excellent responses that included figures and logical sequencing for complex diagnostics.

# Theory Exams – Year 2

## Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)

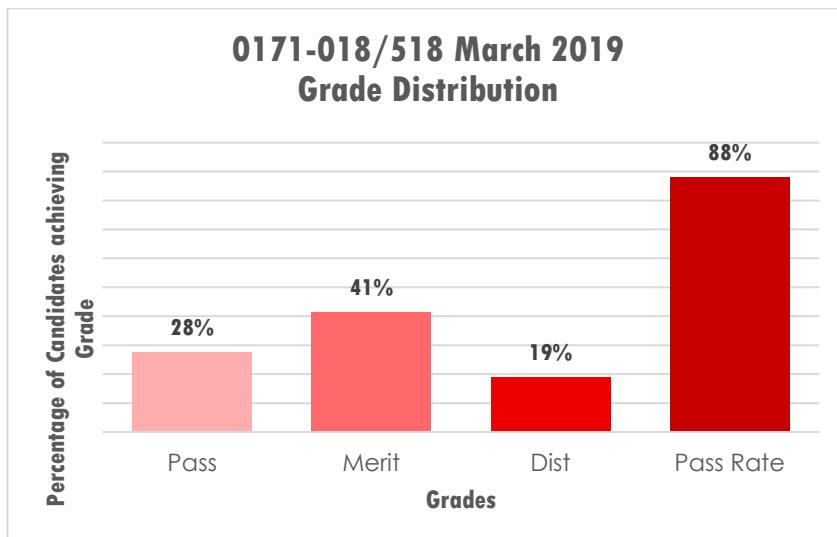
### Grade Boundaries

Assessment: 0171-018/518  
Series 1: March 2019 (Spring)

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

<b>Total marks available</b>	<b>60</b>
Pass mark	26
Merit mark	34
Distinction mark	43

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

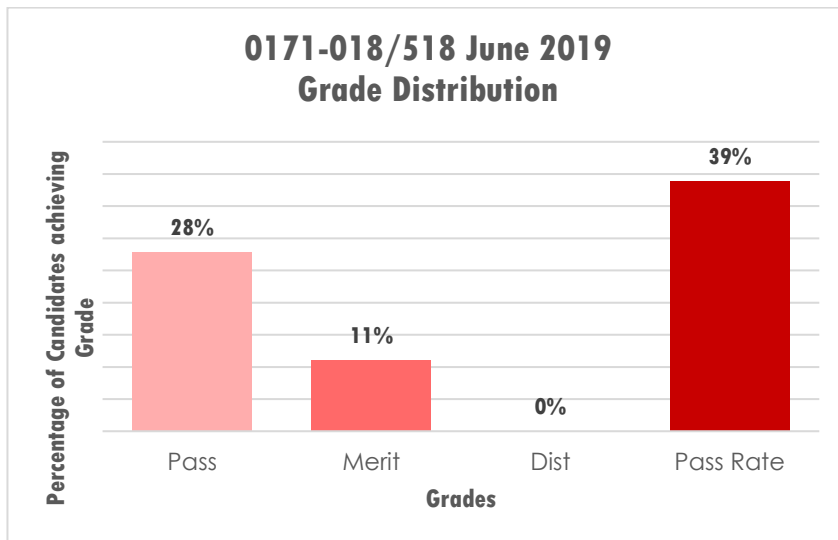


Assessment: 0171-018/518  
Series 2: June 2019 (Summer)

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

<b>Total marks available</b>	<b>60</b>
Pass mark	24
Merit mark	33
Distinction mark	42

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



# Chief Examiner Commentary

## 0171-018/518 Level 3 Land-based Engineering - Theory exam (2)

### Series 1 – March 2019

The questions in this question paper were of a technical level for this paper and sampled appropriately from the syllabus content.

In general, the answers to the questions relating to gears, chain and belt were weaker than the questions on mechanics demonstrating that this may be an area of future revision for learners.

The paper included a range of relevant and current topics in land-based engineering. Some topics (such as CVT, hydrostatic transmissions) are now more current in the industry. Candidates showed a good grasp of CVT but not the in-depth knowledge required to access the full marks available. Some candidates also provided a detail that was not asked for in the question, indicating a lack of familiarity with the demands of certain question types. Better exam techniques would have improved the marks of many candidates.

Many candidates used the incorrect formula for one particular question which demonstrated a gap in knowledge and the need for more support with this aspect.

Candidates should be reminded to read the questions carefully and only provide the answers relevant to the question asked. Candidates should also be reminded to familiarise themselves with the requirements of command verbs, and for each verb the type of responses required in relation to depth and breadth.

### Extended Response Question

The majority of the candidates achieved low to middle range marks for the extended response question. The majority of candidates discussed preparation extensively but did not develop a logical test procedure and expected outcomes as the question asked. Some candidates did expand and develop electrical test aspects.

City & Guilds has produced a technical exam guide to support the work on the exam technique, which is available to download from

<https://www.cityandguilds.com/qualifications-and-apprenticeships/land-based-services/agriculture/0171-technical-in-agriculture-and-landbased-engineering#tab=documents>

Centres may also refer to the past papers available to download from the same webpage under the Past Papers tab.

## Series 2 – Summer 2019

The questions in this paper were of a technical level for this paper and sampled appropriately from the syllabus content

The paper was generally accessible, with responses to the calculation, mechanical, hydraulic and hydraulic/mechanical based questions showing a fairly equal spread across all candidates. There were very few candidates that did not attempt all the questions.

The technical content encompassed a range of relevant and current topics in land-based engineering. Some topics e.g. power shift, hydrostatic transmissions are currently at the forefront in the industry, whereas belt drive systems, bearings and mechanical gearboxes could be considered 'traditional', but are currently extensively used.

Correct and incorrect answers were fairly evenly spread over the paper. Where candidates gave an incorrect answer it was generally owing to a lack of basic knowledge. The most prominent areas in which this lack was evident were: bearing component nomenclature, identification of a synchroniser and hydrostatic principles.

The majority of the candidates' responses showed a grasp of the question content, but in a lot of cases they did not show depth of knowledge. That being said, some candidates provided additional responses, for example in vee belt systems, symptoms of bearing failure and power shift transmission faults that demonstrated a depth of knowledge beyond the answer requirements.

Candidates should be encouraged to read the question carefully and demonstrate only relevant extended knowledge when attempting to show depth of understanding. Centres should ensure that candidates use accurate terminology and do not neglect the mechanical element when answering questions.

### **Extended Response**

The majority of the candidates achieved low to middle range marks for the extended response question. Some candidates' responses indicated they could have been involved in a repair as set out in the scenario, but the majority of candidates discussed preparation extensively and did not develop a comprehensive response especially with regard to calibration after repair, operational testing, system pressure test and clearing error codes.

City & Guilds has produced a technical exam guide to support the work on the exam technique, which is available to download from

<https://www.cityandguilds.com/qualifications-and-apprenticeships/land-based-services/agriculture/0171-technical-in-agriculture-and-landbased-engineering#tab=documents>

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# Synoptic Assignments

## Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)

### Grade Boundaries

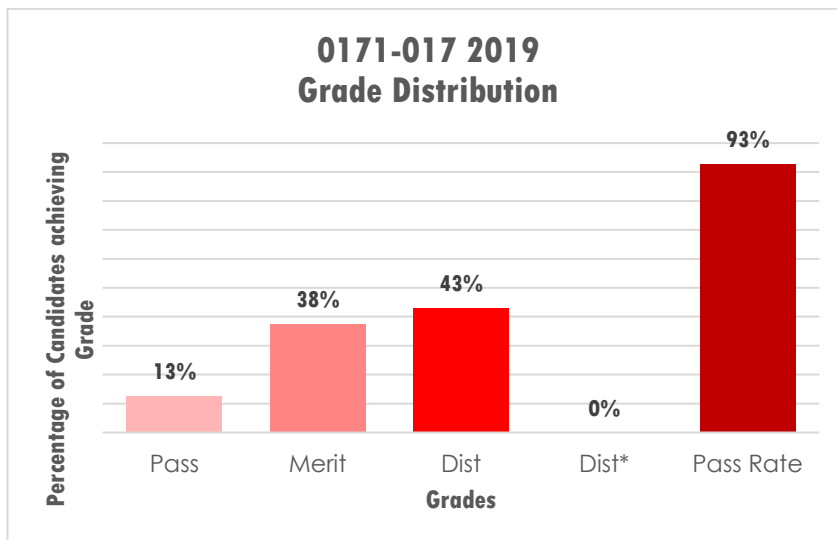
Below identifies the final grade boundaries for this assessment, as agreed by the awarding panel:

Assessment: 0171-017

Series: 2019

<b>Total marks available</b>	<b>60</b>
Pass mark	24
Merit mark	33
Distinction mark	43

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



## Principal Moderator Commentary

This year we had multiple centres delivering this qualification for the first time

Overall the synoptic assignments were well presented by the candidate. Candidates excel during the practical test, generally doing well across the group, and this year was no exception. This synoptic performed well and was accessible to candidates across the levels. There was a range in quality of work, as you would expect for this level of student. Overall the standard was high, with a pass rate of over 90% and some of the work was outstanding, so well-done candidates and centres.

The synoptic assignment contained a good spread of practical tasks with a good flow through the diagnostic process enabling candidates to demonstrate their skills and background knowledge at the appropriate level and spread across all tasks. Overall, candidates performed very well; worked to industry standards with commercial timing, and were confident and competent in this area.

Stronger candidates demonstrated confident use of tools and approached jobs in a logical sequence, whilst showing depth of understanding through attention to detail and making appropriate links and recommendations.

Specific weaknesses demonstrated included the filling in of standard forms.

For future assignments, consideration should be given to marking candidates on how they apply a risk assessment, rather than just correctly completing one, although there was very good evidence from assessors observing health and safety practices of their candidates.

The range of AO's was appropriately assessed with some assessors and centres showing best practice with their use of Candidate Report Form descriptors to clearly differentiate between candidates abilities.

The marking was generally very accurate and all centres were moderated "within tolerance".

The centres used the forms for observation and candidate marking very well.

To assist in moderation, please can markers of written material insert comments on student scripts of strengths and weaknesses. This enables the moderator to see how the marks have been derived.