

Pearson BTEC Level 3 Nationals Extended Certificate

Set Task Release Date: 10/12/2018

Paper Reference **31708H**

Engineering

Unit 3: Engineering Product Design and Manufacture

Part A

You do not need any other materials.

Instructions

- **Part A** contains material for the completion of the preparatory work for the set task.
- **Part A** should be undertaken over no more than 3 hours in a period of 1 week as timetabled by Pearson.
- **Part A** is specific to each series and this material must only be issued to learners who have been entered to undertake the task in the relevant series.
- **Part B** materials must be issued to learners during the period specified by Pearson.
- This **Part A** task booklet must not be returned to Pearson.

Information

- In **Part B**, the task should be undertaken in 8 hours under supervision over no more than 5 consecutive working days. The supervised sessions take place in the two-week period timetabled by Pearson.

Turn over ►

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Instructions to teachers

This paper must be read in conjunction with information on conduct for the task in the unit specification and the *BTEC Nationals Instructions for Conducting External Assessments (ICEA)* document. For further details please see the Pearson website.

Part A should be issued to learners **one week** prior to undertaking **Part B** of the assessment.

Learners will be expected to conduct research.

Research is expected to be carried out over three hours. Centres must advise learners of the timetabled sessions during which they can carry out the research. It is expected that scheduled lessons or other timetable slots will be used for some or all of this work.

Learners can produce individually prepared research notes (maximum of two sides of A4) to take into the **Part B** supervised assessment.

Teachers cannot give any support to the production of the notes and the work must be completed independently by the learner.

For **Part B**, centres are free to arrange the supervised assessment period how they wish provided the eight hours for producing final outcomes are completed over no more than five consecutive days, are under the level of supervision specified and in accordance with the conduct procedures.

Refer carefully to the instructions in this task booklet and the *Instructions for Conducting External Assessments (ICEA)* document to ensure that the preparatory period is conducted correctly and that learners have the opportunity to carry out the required activities independently.

Learner research notes will be retained securely by the centre after **Part B** and may be requested by Pearson if there is suspected malpractice.

Instructions for Learners

Read the set task information carefully.

This contains **Part A**, which is the information you need to prepare for the set task.

You will need to carry out your own research over the next week and you can take up to two A4 sides of individually prepared research notes into **Part B** of the set task.

You will then be given the set task to complete under supervised conditions.

For **Part A**, you must work independently and must not share your work with other learners.

Your teacher will give guidance on when the preparation should be completed.

Your teacher cannot give you feedback during the preparation period.

Set Task Brief

You are advised to spend a maximum of three hours doing your research.

A client has asked you, as a technician engineer, to optimise the design of a retractable key. Do **not** research any electronic solutions.

You will research the design and manufacturing requirements that are relevant to the retractable key and its use. Your research should consider:

- existing designs for a retractable key
- the manufacturing processes and technologies that are being used and possible alternatives
- the health and safety requirements for the product, user and manufacturing processes
- environmental considerations including sustainability
- material requirements and suitable material properties
- any other relevant factors, such as spring types, types of blade movement and possible mechanisms, ease of use and designing out risks.

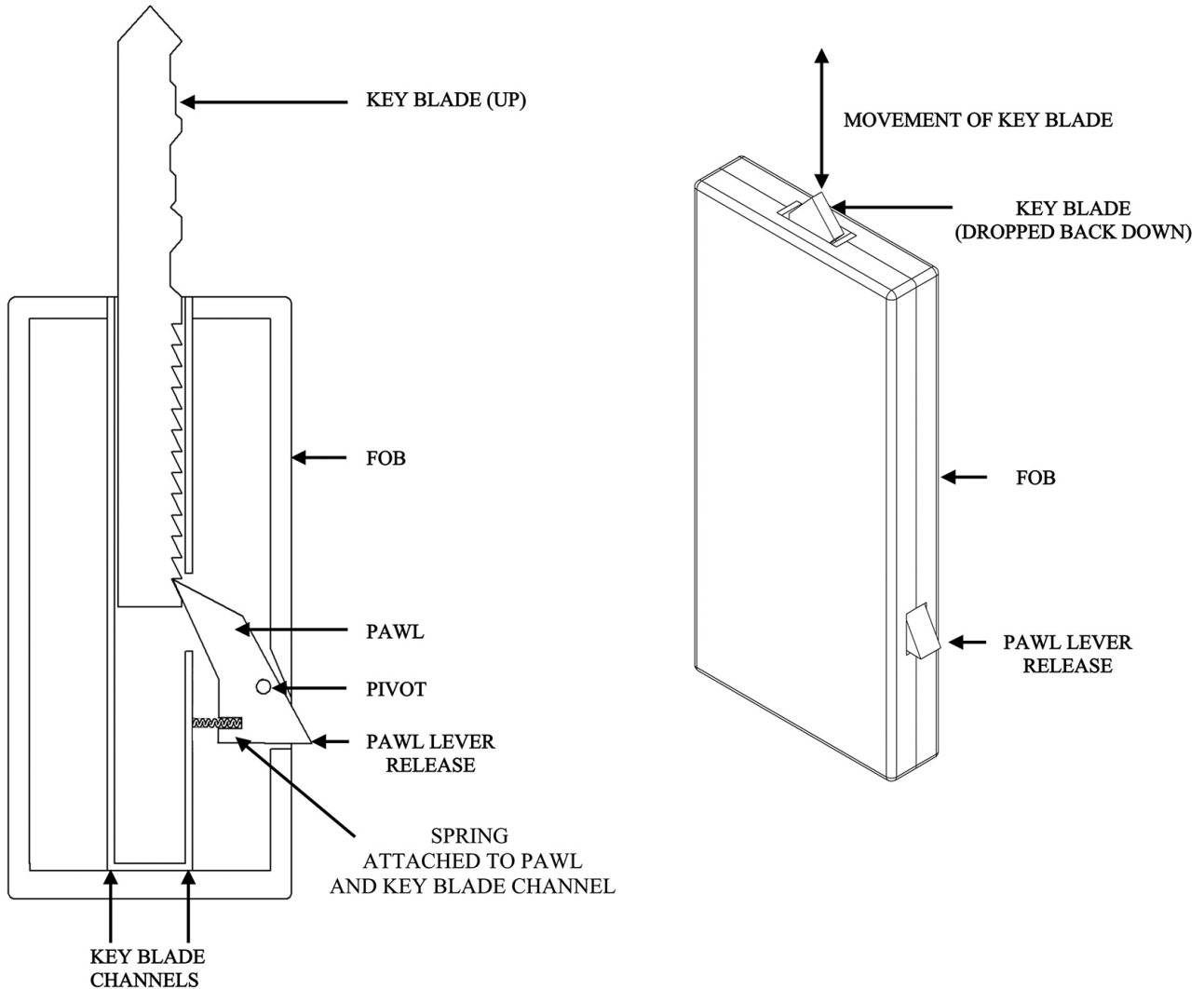
In **Part B** you will be given further information on the specific issues with the retractable key that will allow you to redesign the retractable key and evaluate your solution against the issues. Therefore, you are advised **not** to undertake any design work during **Part A** (the research stage).

You will be able to take up to two sides of individually prepared A4 research notes from **Part A** into **Part B** of the set task.

Part A Set Task Information

The product is a retractable key that is used to open a lock. The key blade is designed to be pulled up by the user when needed and a ratchet mechanism holds it in place. The user can press the pawl lever release so the key blade drops back down into the fob after use. The retractable key is manufactured in batches of 10,000.

The key blade and pawl are made from high carbon steel.



CUT AWAY FRONT VIEW

Fob dimensions: Depth = 10 mm, Width = 40 mm, Height = 85 mm