Pearson BTEC Level 3 Nationals
Extended Certificate

Engineering

Unit 3: Engineering Product Design and Manufacture

Part A

Set Task Release Date: 28/04/2017

Paper Reference
31708H

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 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 8 hours for producing final outcomes are completed over no more than 5 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 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 weeks 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 should spend no more than three hours on your research. The product is a jig.

A machine shop supervisor has asked you, as a junior tooling designer, to redesign a jig that is not working effectively.

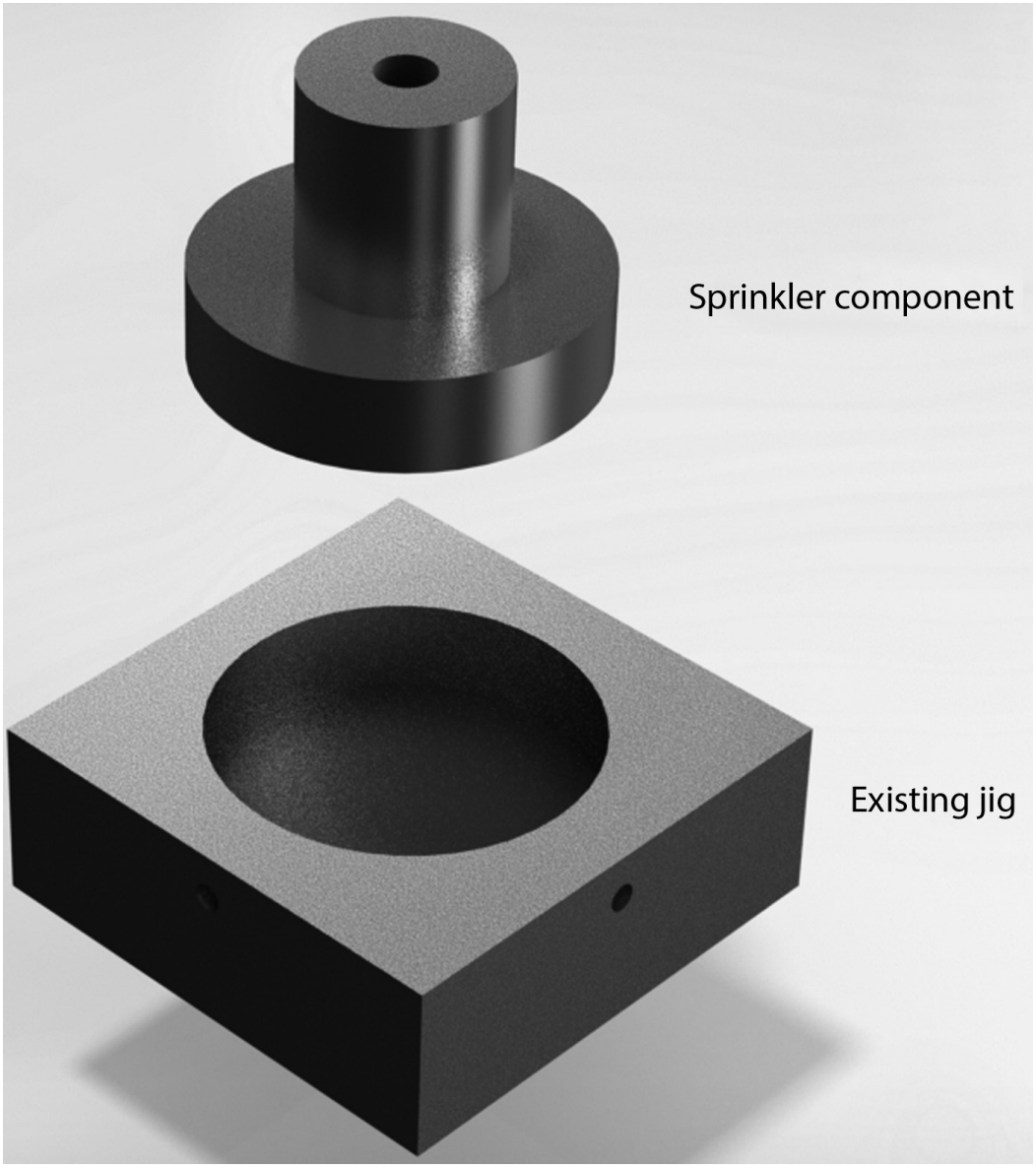
You should research the design and manufacturing requirements that are relevant to jigs and their application. Your research may consider:

- existing designs for jigs
- the manufacturing processes and technologies that are being used and possible alternatives
- the health and safety requirements for the manufacturing processes and technologies
- environmental considerations including sustainability
- material requirements and suitable material properties
- any other relevant factors, such as ease of use.

In **Part B** you will be given further information on the specific issues with the existing jig that will allow you to redesign the jig and evaluate your solution against the issues. 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 jig. The jig holds a sprinkler component when it is drilled. Operators place the sprinkler component into the jig to drill two ∅3 mm holes using a bench drill. The jig itself is held in a machine vice that is clamped to the bench drill table. Currently, the jig is made from low carbon steel and there are six jigs in use at any one time, with a number of spare jigs available. The sprinkler components are made from aluminium alloy, manufactured in batches of 1000, and are used in washing machines and dishwashers.



Jig dimensions: L= 56 mm, W= 56 mm, H=20 mm