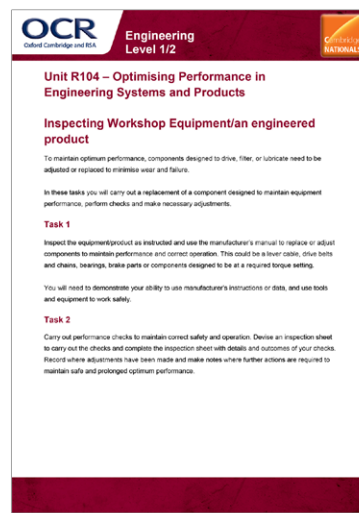


## **Unit R104 – Optimising Performance in Engineering Systems and Products**

### **Inspecting workshop equipment/an engineered product**

#### ***Instructions and answers for teachers***

*These instructions should accompany the OCR resource ‘Inspecting workshop equipment/an engineered product’ activity which supports OCR Cambridge Nationals in Engineering.*



#### **The Activity:**

This resource comprises of 2 tasks. The activities are best completed either in pairs or small groups. Learners may need to use online resources to research material uses or check their understanding to complete the activity.



*This activity offers an opportunity for English skills development.*

#### **Associated materials:**

'Inspecting Workshop Equipment/an engineered product' learner activity sheet

#### **Suggested timings:**

**Tasks 1 and 2:** 1 hour

To maintain optimum performance, components designed to drive, filter, or lubricate need to be adjusted or replaced to minimise wear and failure.

In these tasks you will carry out a replacement of a component designed to maintain equipment performance, perform checks and make necessary adjustments.

### **Task 1**

Inspect the equipment/product as instructed and use the manufacturer's manual to replace or adjust components to maintain performance and correct operation. This could be a lever, cable, drive belts and chains, bearings, brake parts or components designed to be at a required torque setting.

You will need to demonstrate your ability to use manufacturer's instructions or data, and use tools and equipment to work safely.

***Learners inspect and maintain a typical workshop pillar drill and replace a worn drive belt.***

#### **Example**

Learners isolate the electrical supply to the drill. Learners use the manufacture's manual to identify the drill drive belt mechanism and inspect the drill to determine wear of the belt. Learners interpret the manufacturer's data to use to measure the tension of the belt and confirm replacement is necessary due to wear and or contamination and slackness in belt tension. Learners also inspect pulleys for wear.

Learners arrange for the correct belt to be ordered or check that the required belt is available.

Learners check again that the electrical supply to the drill is isolated before starting work. Learners identify and select the appropriate and recommended tools to enable the removal of the drive belt from the drill motor mechanism. Learners remove the belt and carry out further inspection of the belt drive mechanism for wear, poor lubrication, and clean parts and housings of any contaminates.

Learners replace the drive belt adhering to any necessary orientation and ensure that the required belt is secure, adjusting the belt tension to conform to the manufacture's data setting.

Learners secure fixings and fasteners following manufacturers' data/instructions.

## **Task 2**

Carry out performance checks to maintain correct safety and operation. Devise an inspection sheet to carry out the checks and complete the inspection sheet with details and outcomes of your checks. Record where adjustments have been made and make notes where further actions are required to maintain safe and prolonged optimum performance.

### **Example**

Once reassembled, learners test the drill at different rotational speeds. Learners drill a test piece of work whilst carrying out visual and audible observations to confirm correct operation.

- Learners carry out visual and security checks to check.
- Security and condition of cables, electrical connections/plugs, electrical switches and isolation.
- Panel fixings, mountings.
- Security, condition and correct operation of guards/visors.
- Correct lubrication, signs of leakage, ingress.
- Drive belt and pulleys, condition and tension, signs of wear or contamination.
- Security, safety, operation and cleanliness of tools and work holding devices, chucks.
- Visual and audible checks for smooth running and operation. Ease of vertical movement of drill.
- Overall cleanliness of the equipment and immediate work area.

**Example of learner's work**

**OCR School of Engineering**

**Workshop Equipment Safety, Maintenance and Servicing Checklist**

Learners present a maintenance /service work sheet record

**Job Number:** OCR0082

**Workshop Equipment ID:** OCR/WE/PD 002

**Description:** Pillar Drill

***Ensure the equipment is electrically isolated before carrying out any work!***

Maintenance / Service Item		Serviceable	
		Y	N
<b>1</b>	Security and condition of cables, electrical connections/plugs, electrical switches and isolation.  Comments:		
<b>2</b>	Panel fixings and mountings are secure, all parts present.  Comments:		
<b>3</b>	Security, condition and correct operation of guards/visors, interlocks.  Comments:		
<b>4</b>	Correct lubrication and coolant levels, signs of leakage, ingress, contamination.  Comments:		



Maintenance / Service Item		Serviceable	
		Y	N
5	Drive belts, chains and pulleys, condition and tension, signs of wear or contamination. Adjustments required.  Comments:		
6	Security, safety, operation and cleanliness of tools and work holding devices, chucks.  Comments:		
7	Visual and audible checks for smooth running and operation. Ease of vertical movement of drill, bed surface, traverse.  Comments:		
8	Overall cleanliness of the equipment and immediate work area are free from obstruction.  Comments:		

### Recommendations/actions required

<b>Signed:</b>	<b>Date:</b>
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To give us feedback on, or ideas about the OCR resources you have used, email [resourcesfeedback@ocr.org.uk](mailto:resourcesfeedback@ocr.org.uk)

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