T Level Technical Qualification in Engineering and Manufacturing – Maintenance, Installation and Repair

8712-311 Mechanical Occupational Specialism

Grade Standard Exemplification Material

Distinction - Summer 2025

Version 1.1

Version and date	Change detail	Section
v1.0 31st October 2025	First published	N/A
v1.1 24th November 2025	Amendments in relation to City & Guilds Limited	Back Cover

Contents

Introduction

Summer 2025 Results

This document is aimed at providers and learners to help understand the standard that was required in the summer 2025 assessment series to achieve a distinction grade for the 8712-311 Maintenance, Installation and Repair in Mechanical Engineering Occupational Specialism (OS).

The Grade Standard Exemplification Material (Grade SEM) evidence provided for the distinction grade displays the holistic standard required across the tasks to achieve the distinction grade boundary in the summer 2025 series.

The aim of these materials is to provide examples of knowledge, skills and understanding that attested to distinction competence in summer 2025. It is important to note that in live assessments a candidate's performance is very likely to exhibit a spikey profile and standard of performance will vary across tasks.

The Occupational Specialism is graded Distinction, Merit, Pass or Unclassified.

The distinction grade boundary is based on a synoptic mark across all tasks. The materials in this Grade SEM are separated into two sections as described below. Materials are presented against a number of tasks from the assignment.

Task

This section details the tasks that the candidate has been asked to carry out. What needs to be submitted for marking and any additional evidence required including any photograph/video evidence. Also referenced in this section are the assessment themes the candidates were marked against when completing the tasks within it. In addition, candidate evidence that has been included or not been included in this Grade SEM has been identified within this section.

In this Grade SEM there is candidate evidence from:

Task 1 Plan and prepare the service and maintenance activities
Task 2 Perform and record the service and maintenance activities
Task 3A Review and report the maintenance activities
Task 3B Peer review
Task 4 Complete handover

Candidate evidence

This section includes exemplars of candidate work, photographs of the work in production (or completed) and practical observation records of the assessment completed by centre assessors. This was evidence that was captured as part of the assessment and then internally marked by the centre assessor.

The Occupational Specialism brief and tasks can be downloaded from here.

Important things to note:

- We discussed the approach to standard setting/maintaining with Ofqual and the other awarding organisations before awarding this year. We have agreed to take account of the newness of qualifications in how we award this year to recognise that students and teachers are less familiar with the assessments (https://www.gov.uk/government/publications/ofqual-guide-for-schools-and-colleges-2025/ofqual-guide-for-schools-and-colleges-2025#grading), whilst also recognising the standards required for these qualifications.

- The evidence presented, as a whole, was sufficient to achieve the distinction grade. However, performance across the tasks may vary (i.e. some tasks completed to a higher/lower standard than distinction grade).

Grade descriptors

To achieve a distinction, a candidate will be able to:

Competently and thoroughly interpret technical information, applying technical skills to plan, assess risk and follow safe working methods to practical tasks and procedures to an exemplary standard in response to the requirements of the brief, working systematically, logically and efficiently producing an excellent quality of work that meets regulations and standards.

Thoroughly prepare working area, mitigating potential risks prior to commencing tasks and consistently apply exemplary housekeeping techniques during tasks that allow safe and efficient working.

Demonstrate comprehensive technical skills for diagnosing components, assemblies and sub-assemblies to complete maintenance, installation, service and repair activities, in line with the requirements of the brief, working systematically, logically and efficiently.

Demonstrate exemplary technical skills using tools and equipment for mechanical maintenance, installation and repair, ensuring safe isolation, removal and replacement of components, working systematically, logically and efficiently.

Demonstrate comprehensive knowledge and understanding of the principles and processes required for disassembly, repair, configuration and re-assembly of mechanical systems, ensuring that all tolerances and tightening torques are in-line with specification.

Work safely and make well founded and informed decisions on the selection and appropriate use of tools, materials and equipment within the working environments for maintenance, installation and repair activities.

Consistently and accurately use industry and technical terminology across different communication methods with full consideration of technical and non-technical audiences.

Task 1 Plan and prepare the service and maintenance activities

Assessment number (eg 1234-033)	8712-311
Assessment title	Mechanical Occupational Specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	1
Evidence title / description	Resource List Risk Assessment Method Statement
Date submitted by candidate	dd/mm/yy

Task 1

Assessment themes:

- Health and safety
- Planning and preparation
- Systems and components.

You must analyse the brief and technical information about the machine provided and then:

- create a list of the requirements and resources for the service and maintenance activities, justifying your selections. This should include:
    - all necessary technical information to confirm the type, scope and requirements of the activity
    - tools and equipment
    - materials, components and consumables
    - wastage and disposal requirements
    - time needed to carry out the activity
    - fault diagnosis methods to be used
    - any access requirements.
- produce and complete a risk assessment
- produce a method statement.

Additional evidence of your performance that must be captured for marking:
none

Candidate evidence

Task 1 – Resource List

Resources and requirements *Helps us to identify and understand exactly what it is that is needed for the maintenance.*		
Physical Resources *The following will be needed for the maintenance task.*		
	Quantity	Purpose and justification
Spanner set (ring, box and open)	1	For nuts/bolt fixing/fastening.
Allen key set	1	For loosening and tightening hexagonal head screws.
Tap and die set	1	Required if the thread of a screw has become worn out.
Spare parts	As required	Needed for if any parts are worn past the point of repair and/or the machine will benefit better from new ones.
Funnel	1	To top up fluids and liquids.
Measuring implements (D.T.I, rule, vernier callipers)	1	To check tolerances, levels and to calibrate. D.T.I measures the roundness of the spindle.
Slip gauge	1	To verify the accuracy of any measuring equipment and tools.
Internal and external circlip pliers	1	Needed to help remove and circlips without breakage.
Pen	1	Needed to complete paperwork.
Hook spanner	2	Special purpose tool used to fasten or loosen and fasteners.
Drift	1	A wedged shape tool that is used to remove tapered shank tools, like drills, from spindles, sockets or sleeves.
Socket set	1	To use on appropriate components/fixings.
Lock out tag out kit	1	Used to prevent accidental start up of the machines electricals while maintenance is being performed.

Barriers	1	To stop anyone from entering the site where the maintenance is being conducted.
V belts	1	Spare V belts may be needed if old ones are damaged or torn. Helps produce the power for the machine to operate.
In and out probes	1	To help us test if the machines electricals/power supply has been shut down correctly.
Platform	1	Needed to help us see the maintenance that needs to be conducted above the average height.
HGV Axel stand	1	This is used to prevent the bed of the pillar drill falling while conducting maintenance in low areas.
Pulley	1	Used to transmit energy and motion.
Pulley extractor	1	Used to apply a force that separates a pulley from the shaft or hub.
Nuts and bolts	1	To keep things in position/place.
Data sheet for lubricants	1	Helps us to determine which lubricants will be needed on which parts.
Recyclable and non-recyclable bins	2	These will be needed for the safe disposal of waste.
Materials and consumables *The following will be needed for the maintenance task.*		
Rags and cleaning fluids	1	When work is finished the floor and surfaces will likely require cleaning, therefore rags and cleaning fluids will be needed in the situation to maintain a clean and safe environment after maintenance.
Spill kit	1	In case of large spillages of fluids.
Oil (220 and 68 viscosity)	1	This will help lubricate and joints and other parts of the machine.

Grease	1	To help lubricate and parts.
De-greaser	1	Helps to remove and oils and grease during the cleaning up process of the machine.
Brushes	As required	We will need multiple brushes such as a small brush to a large brush. As well as hard brush heads and soft brush heads for specific purposes like a hard brushes head to clear and large materials off the floor.
Dustpan and brush	1	The dustpan will be helpful when picking up any debris that we have cleaned up.
Caution signs	1	To let people know not to enter the area and that we are performing maintenance.
Protective equipment *The following protective equipment as well as PPE is required to support us with safety during the maintenance activities, as well as to meet with the requirements of the Health and Safety at Work Act (HASWA).*		
Overalls	1	Necessary and basic PPE needed to meet the HASWA. Protects clothes from any spillages and contaminants that may occur during the maintenance.
Safety glasses	1	To be worn when the potential for injuries to the eyes are present.
Safety boots	1	Prevents any trauma to the feet if a heavy object or material is to be knocked or fall.
Latex gloves	1	Needed when working with any liquids, oils, or lubricants as exposure to the hands can cause potential irritation.
Engineering gloves	1	Needed for any basic engineering practical's and should be worn most times unless you need to wear other gloves such as latex.
Bump cap	1	Should be worn when working low down as there is potential to hit your head on objects above you.
Warning signs	1	To let other people in the area know not to enter the workspace during maintenance.

Technical information *The following technical information and documentation will be required to refer to during the maintenance activities to support accurate application of equipment, and to ensure the brief requirements are met.*		
Manual	1	For the pillar drill, to ensure that all information is on hand for any references. The instructions will be used on the maintenance and repair of the machine for the complete system.
MSDS for lubricants	1	Helps to provide any preventative and other COSHH (Control of Substances Hazardous to Health) related information when lubricating any joints or other parts of the machine with the oil and grease.
Risk assessment	1	This is completed for the beginning of the maintenance. The risk assessment will ensure that all the potential hazards have been identified and there are control measures in place to mitigate and risks.
Method statement	1	To be referred to during the maintenance to ensure a logical order is in place.
Assignment brief, specification and diagrams	1	Helps to aid with the understanding of the maintenance process you are about to carry out to ensure that the brief requirements are being met accurately and precisely.

Other key requirements *The following additional requirements are areas that need to be considered in detail to support the safe, effective and efficient engagement of the maintenance activity.*	
Waste disposal	Ensure that any waste is disposed into the correct waste disposal (Recyclable and non-recyclable). This ensures the safe disposable of any materials that we have used.

Time needed	Prepare the work area 1 hour Decommission and inspect system 2 hours Fault finding and diagnosis 3 hours Repair 2 hours Calibration 30 mins Recommission 1 hour Recording 1 hour Re-instating work area 30 minutes
Access requirements	Ladder or appropriate steps, follow working at height regulations to access the drive motor.
Fault finding/diagnostic techniques and testing's	
Sensory checks	Using my senses to detect and faults through noise, vibrations or unusual scents. Visually inspect the machine to identify any issues that may be obvious, such as the bed being too low down, loose drill bit, loose handlebars etc.
Input to output	Check to see if the machines values and accuracies are correct and up to speed. Also helps to find out if the current in the electricals are dead or live.

Task 1 – Risk Assessment

Hazard	Risk	Control measures	L	S	Rating
Working with V belt	Trauma to the fingers, cuts bruises and maybe severance of the finger	Ensure that you keep your fingers away from the belt when removing and re applying, ensuring that you use the correct way to put it back on.	2	3	6
Isolation of the machine	Potential electrocution if the machine is not isolated correctly, burns are also likely.	Ensure correct isolation of the machine when performing maintenance.	1	2	2
Working with oils	Spillage resulting in slips and trips, or maybe skin irritation.	Use the spill kit to ensure there are no spillages getting onto the floor, also wear latex gloves when using oils.	2	1	2
Working at heights	Falling and causing trauma to the body, cuts and bruises, broken bones	Follow the correct regulations when working at heights and ensure that you have a stable steady platform.	2	2	4

Cleaning up debris	Potential eye injuries if anything is to come in contact, potential cuts if exposed to any sharp objects	Ensure eye wear is worn as well as covering up to prevent any cuts off flying debris.	1	3	3
Loose hair	Can become trapped on machinery if it is switched on causing severe problems such as potential to rip hair and scalp	Keep hair always tied up if it is going to cause an issue (if its long enough) as well as ensuring the machine is always isolated.	1	3	3
Working low down	Bruised knees as well as potential back pain	Use a soft platform to rest your knees on to prevent damage.	1	1	1
Calibrating tools	If tools are sharp, there is potential for cuts as fingers may be caught on any edges	Ensure the safe handling of sharp tools and objects.	2	1	2
Working with loud tools/machinery	Potential for hearing damage or even hearing loss depending on the decibel level	Wear ear plugs or ear defenders when working in loud areas.	1	2	2
Changing the drill bit	Potential to cut yourself on sharp edges	Ensure the safe handling of the drill bit.	1	1	1

Loose clothing	Loose clothing can get caught in the machine and this can become worse if operating potentially taking off fingers or even limbs	Ensure all loose clothing is covered and correct PPE is always worn.	1	3	3
Fire breakout	There is potential for the machine to catch on fire or if there is anything flammable near by may catch on. This can cause burns that can range from minor to severe.	Ensure that once you identify a fire you take the right precaution actions and exit the space immediately.	1	3	3
Warm appliances	Burns and scalds	Ensure that any appliances that are usually at a high temperature are lowered before touching or using.	1	3	3
Gas leakage within the work area	Potential harm if harmful chemicals are consumed as well as potential for explosions that can cause burns or even instant death due to impact.	Ensure that all the gas components have been checked before conducting maintenance.	1	3	3

		Likely	Possible	Unlikely
		3	2	1
Major injury	**3**	**9**	**6**	**3**
Minor injury	**2**	**6**	**4**	**2**
Trivial	**1**	**3**	**2**	**1**

Task 1 – Method Statement

Maintenance
Initial pre-maintenance checks

Before I start any maintenance, I will ensure that I gather all the correct PPE that will be needed to begin the maintenance on the machine at hand. The PPE that I will need is engineering and latex gloves, safety glasses, overalls, safety boots and a bump cap. I will check it over to ensure that there is no damage present and that it is fit for purpose. If the PPE is not fit for purpose or is damaged, then this should be reported to the appropriate members. New, fit for purpose PPE should be acquired instead. Once I have checked over this, the isolation of the machine comes before any cleaning up process. Therefore, I will safely isolate the machine, check the current with the probes, and use the lock out tag out kit to ensure that no one turns the appliances back on.

Once entered, I will visually check the area in and see what state it has been left in. If the area is not clean, then this is deemed not safe to work in meaning that a cleaning process should take place. I will start of by blocking the area we are going to be cleaning up as we don't want anyone entering and potentially hurting themselves as they may be unaware. I will remove any objects and/or tools that may be lying around on the floor to mitigate any chances of slipping, tripping or falling. Once I have done this, I will begin to brush around the area getting rid of any loose debris on the floor and safely disposing of it. Once all the floor is cleaned and the slipping hazards are removed, I will begin to clean the machine from the top down as this is the most effective way. I will use the rags provided as well as degreaser to clean the machine down and remove any loose components, using small brushes and a magnet to remove and swarf stuck in the bed. Again, after this I will brush round the surrounding floor area as more debris may have gathered after the clean-up. Everything mentioned above will fall under the compliance of the PPE regulations (Personal Protective Equipment at work Regulations 1992) and the HASWA (Health and Safety at Work Act 1974). During the maintenance we will also be in accordance with: RIDDOR (Reporting of injuries, Diseases and Dangerous Occurrences Regulations) because it is a UK law that employers and people in charge of work premises report any work related accidents that occur, and COSHH (Control of Substances Hazardous to Health) as we will be working with oils and lubricants that may cause harm to the skin if not handled in a safe manner.

After this has been done just before the maintenance, I will calibrate my tools to ensure that they are all the correct sizes as well as organising them appropriately. If any tools are broken or aren't the correct sizes, then I shall bring this up with the appropriate personnel and get this sorted before I begin maintenance.

The last thing before I start the maintenance is that I will check the stock levels for all my equipment such as rags, spare parts, oils, PPE if anything is to become damaged or worn, brushes etc. Stock levels are important because it saves time as well as ensuring that we have the correct equipment in on time.

Undertaking the maintenance activity

First off, it has been indicated to me in the brief that the chuck has stopped rotating at a constat speed. This gives me an idea as to what the causes might be for why the machine is doing this. With this I will complete a visual inspection, taking a closer look into the machine trying to find what problems may be causing this issue. An issue that may be is with the machines V belts. These are the belts that drive the machines motor helping it to run at a

constant speed. One issue might be that the belts are either too tight or too loose or that the motor may be too close to the machine, not giving it the tension that is required. Another issue may be that the belt is worn out due to its use over time, resulting in a lower tension or potentially the defected area catching on. If this is the case, then we can simply change the old V belts over with new ones and ensure that the tension of the belts is fitted correctly. Another potential issue with this is that the lever to move the motor may be stiff or too tight. This may mean that we need to add a lubricant to the lever. For this I will continuously refer to the manual of the machine to ensure that everything is being set up correctly.

After looking at the belts on the top I will work from the top down and start to look at any other potential problems with the machine. There may well be an issue with the bed of the pillar drill. The bed may be off at an angle or may be too low down making and operations for people using the machine difficult. If this is the case, then we will need to raise the bed up to the correct height. It may also be that we cannot raise the bed due to potential debris being stuck inside the teeth that the bed rises and lowers on. Therefore, this will need to be cleaned out before we can start to move the pillar drill bed. Once moved ensure that the bed is locked in position to avoid it dropping down causing a potential risk for employees who use the machine after maintenance. When working low down I will ensure that I am using a mat to kneel on, wear my bump cap in case I am to hit my head off anything, as well as putting the HGV Axel stand under the bed to stop it falling while I conduct the maintenance.

The pulleys on the machine may be damaged or affect and may need changed. As well as this the guard may be tightened too much, allowing for no movement so a simple adjusting of the screw can allow for this to be moved. I will also conduct a check on the spindle as this may be causing friction, also if it isn't lubricated it may be that it is too dry. Also, I will check over all the fasteners ensuring that they are all tightened up to stop anything being loose and potentially causing a rattling sound or just affecting the performance of the drill.

Once I am satisfied and I believe that all the faults have been corrected in accordance with the manual I will conduct a test with the D.T.I on the chuck of the machine. This test will ensure that I have fixed everything as well as it being fixed correctly. The D.T.I will be zeroed and will show when the machine is moving if it is out or not, if it is out the D.T.I will move off zero significantly, indicating that the problem hasn't been fixed, and we will have to reassess what other problems it may be. I will also look at the manual to keep in accordance with any tolerances that have been set ensuring that everything goes back in accordance with what the manual asks us.

Throughout the whole maintenance I will keep a log of the activities I have done and the order, updating the logbook in case we are asked for what we have done. I will also look for anywhere that may have any oils dripping as well as places that may be too dry. Ensuring that I lubricate the necessary areas and clean up any oils that may be spilling.

Post maintenance

If the D.T.I test is positive and everything has been fixed correctly then I will start to clean down the area again as the maintenance may have caused more debris to occur, I will clean from the top down to ensure that no areas are missed using the correct cleaning tools and equipment to ensure cleanliness. Tools and equipment will be put back in the dedicated storage areas ensuring that they are damage free before returning. Once this is done and my work area is tidy, I will be able to remove the barriers as well as ensuring the safe reinstalment of the power to the machine. I will then demonstrate to the assessor the functionality of the pillar drill and its condition after the maintenance. Any paperwork that

needs to be completed will be done at this point and I will amend any documentation that needs amending, before handing it over to my supervisor.

Task 2 Perform and record the service and maintenance activities

Assessment number (eg 1234-033)	8712-311
Assessment title	Occupational Specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	2
Evidence title / description	Test Record Maintenance Schedule and Records Method Statement Practical Observation Form Photographic Evidence
Date submitted by candidate	dd/mm/yy

Task 2

Assessment themes:

- Health and safety
- Planning and preparation
- Systems and components
- Working with faults
- Reviewing and reporting

You must:

- prepare the work area for the maintenance and servicing activities
- perform the annual service and maintenance activities in accordance with the method statement and planning documents produced in Task 1. This should include:
    - decommissioning and inspection of the machine
    - disassembly and reassembly of the machine
    - diagnosing and recording faults within the machine, including carrying out appropriate tests
    - repairing the faults and replacing components and consumables as required
    - safely using the appropriate tools and equipment
    - recommissioning of the machine
    - demonstration of machine functionality to the supervisor
    - re-instating the work area
- record the service and maintenance activities, to include:
    - producing and completing test record sheets
    - updating the maintenance record and control documents
    - annotating the method statement, including any recommendations for further investigation if required.

Additional evidence of your performance that must be captured for marking:

- assessor observations:
    - assessor observations of the work area preparation
    - assessor observations of the service and maintenance activities
    - assessor observation of the machine functionality demonstration.

Photographic evidence which shows:

- the prepared work area
- the pillar drill prior to any work being carried out to show condition
- the pillar drill disassembled
- the working area after disassembly
- faulty components to be repaired or replaced
- the sub-assemblies after repairs have been completed
- the pillar drill after the maintenance and service has been completed to show final condition
- the re-instated work area.

Candidate evidence

Task 2 – Test Record

Repair for a Pillar Drill: Date of maintenance 01/05/2025			
Steps to follow		Method of repair/test	Comments
Calibration of tools and equipment	✓	Calibrate tools and equipment ensuring that they are all the correct sizes before maintenance. You can do this by using vernier callipers or slip gauges.	N/A
Check for the power output for the machine	✓	Test that the machine has been safely isolated with the in and out output probes. These will tell you if there is any current following through the machine before you start the maintenance. If there is a current flowing through the machine, then the power has not been safely isolated properly.	Test came back positive with no signs of any currents going to the machine.
Check the condition of the guard	✓	Loosen the screws for the guard to stop tightness and allowing to move the guard to start the machine.	Guard needed to be cleaned so full removal of the guard was necessary. Once cleaned we put the guard back on ensuring correct tightness of the screws.
Check the rack and pinion	✓	Clean any debris that may have gotten caught in the system. Higher the bed for testing of the machine.	Cleaned down any debris caught in the rack and pinion.

Check the bed of the pillar drill	✓	Ensure that the bed of the pillar drill is smooth and lifted for the safe operation. Ensure that once the bed is in place that it is locked in position to prevent the risk of injury when operating.	Cleaned bed, lifted to the correct height, and locked into position. Bed may be hard to lift so lubrication may be helpful.
Sensory checks	✓	Run a test on the machine checking for any sounds that might not be normal, any odd smells, feeling for any vibrations as well as how smooth the machine is to operate.	Noticed rattling noise from the top of the machine which could have come from a list of problems such as: loose screws, loose pulley, damaged or loose v belts.
Checking the wiring	✓	Check for any loose or damaged wires and ensure that they are safely repaired before switching on the machine for testing.	N/A
Check the condition of the V belts	✓	Change the belts with new ones as they may be worn, or the tension may have become weak.	I replaced the belts with fresh new belts from the stock ensuring they were the same belts as before.
Check for any loose screws	✓	To move the lever for the motor the Allen keyed screw on both sides of the machine needs to be tightened up to create the correct tension for the belts as well as ensuring that the motor is perpendicular to the machine itself.	Ensure that the V belts are attached to the pulley first before this, as well as ensuring the pulley is tightened up in place.
Repeated test on the machine	✓	Once all the fixes are in place a later test would be necessary to check if any faults have been removed as well as to help see what other faults may still be occurring with the machine.	Noticed that the smoothness of the machine wasn't there as much, and a slight vibration was still occurring. This helped reveal that maybe the chuck was the issue with it being an old imperial chuck.

Check the condition of the chuck	✓	Replace the old imperial chuck with a newer metric chuck. We can test the machine by using a D.T.I test on both the imperial and metric.	The D.T.I test for the imperial cuck showed a reading of 0.09 mm, with the metric chuck showing a reading of 0.03 mm which is an improvement of 0.006 mm improving the quality of the machine's performance.
Check for the correct oils	✓	Oils needed for the machine have a viscosity of 68 and 220. This is needed because some areas of the machine require a heavy oil to lubricate the joint while others need a runnier oil for lubrication. Ensuring the oils are correct is a crucial check as the incorrect oil could cause problems.	Use test cups to pour out the oils to check that they are the right viscosity.
Conduct a final check on the machine	✓	Run the machine for the final time checking for any noises as well as how smooth the machine moves. If the machine has no vibrations as well as no sounds and everything has been checked and in the correct place, then the machine has been successfully repaired.	Final test the drill was a lot smoother and drilling a whole through a 6mm piece of metal felt easy compared to the start when there was a lot of vibration.

Task 2 – Maintenance Schedule and Records

Equipment/System type	Identification No.
Pillar Drill	8712-311
Brand/Model	**Location**
City & Guilds	Workshop

Equipment/System specification
When in normal operation, the chuck should function as follows: • the chuck should rotate smoothly • the operator should be able to vary the drilling speed. • the motor rotates the spindle and chuck at a constant speed • the drilling table should be adjustable to fit the required workpiece • all safety guards must be securely in place during operation • the cutting tool should rotate centrally • machine handles should be securely in place during operation

Maintenance records					
Service No	**Maintenance date**	**Maintenance type (scheduled/routine, fault/repair)**	**Checked by**	**Repair details (where relevant)**	**Maintenance Engineer – signature**
01	**20/4/2023**	**routine**	**<A>**	• **no faults or repairs required.** • **system functionality as per specification.**	**<assessor>**
02	**04/10/2023**	**fault/repair**	**<A>**	• **snapped drive belt. Replaced, re-tensioned and tested.** • **greased all grease nipples and lubricated necessary components.**	**<assessor>**
03	**28/05/2024**	**scheduled/routine, fault/repair**	**<A>**	• **drilling table set perpendicular to shaft and spindle** • **greased all grease nipples and lubricated necessary components.** • **stepped pulley incorrectly/loose fitted (spindle) – refitted the stepped pulley to the spindle.**	**<assessor>**

04	**01/05/2025**	**fault/repair**	**<A>**	• **Cleaned machine down.** • **Readjusted bed height as well as cleaned the rack and pinion to ensure the bed can be lifted.** • **Cleaned the guard as well as loosened and screws as the guard was stuck in place. Moved the guard to correct position.** • **Replaced the V/drive belts with new ones as they were worn.** • **Moved the motor to the correct position for the tension of the belts.** • **Replaced the old imperial chuck with a new metric chuck.** • **Apply necessary lubricants to correct areas that need oiling.**	**<assessor>**
05					

Maintenance Schedule					
Service No	**Year**	**Detail inspection**	**Recommended planned maintenance for future**	**Maintenance Head Engineer signature**	**Maintenance Engineer signature**
01	**2023**	**routine**	**annual- routine/scheduled**	**<assessor 1>**	**<assessor 2>**
02	**2023**	**fault/repair**	**annual - scheduled/routine, fault/repair**	**<assessor 1>**	**<assessor 2>**
03	**2024**	**scheduled/routine and fault/repair**	**annual - schedule/routine + fault/repair**	**<assessor 1>**	**<assessor 2>**
04	**2025**	**scheduled/routine and fault/repair**	**3 month – scheduled check/repair/fault finding**		**<assessor 2>**
05					

Commentary	
Service No	Recommendations for future maintenance activity
04	• Ensure that the machine is cleaned after every use as this allows for less cleaning time for any maintenance engineers giving them more time for the maintenance. • Keep a note of what tools you used for each section as well as keeping a track of what order you did steps in. • Ensure that the platform that you are choosing to use has been checked and is available for the task. • Always remember to calibrate tools before use. • Have the correct brushes at hand for the safe clean up of any debris that may cause injuries off slipping. • Always wear a bump hat when working low down. • Make sure to wear the correct gloves. • During the cleaning process remove anything that may cause a potential hazard/risk as you are performing maintenance or during the cleaning process e.g. Handles. • Use the palm of your hand when applying the V/drive belt to ensure the safety of your fingers. • Use a spanner to tighten up to the handles to prevent any hazards for users after the maintenance. • Uses little paint brushes to spread the lubricants evenly.

Task 2 – Method Statement

Maintenance

Initial pre-maintenance checks

Before I start any maintenance, I will ensure that I gather all the correct PPE that will be needed to begin the maintenance on the machine at hand. The PPE that I will need is engineering and latex gloves, safety glasses, overalls, safety boots and a bump cap. I will check it over to ensure that there is no damage present and that it is fit for purpose. If the PPE is not fit for purpose or is damaged, then this should be reported to the appropriate members. New, fit for purpose PPE should be acquired instead. Once I have checked over this, the isolation of the machine comes before any cleaning up process. Therefore, I will safely isolate the machine, check the current with the probes, and use the lock out tag out kit to ensure that no one turns the appliances back on.

Once entered, I will visually check the area in and see what state it has been left in. If the area is not clean, then this is deemed not safe to work in meaning that a cleaning process should take place. I will start of by blocking the area we are going to be cleaning up as we don't want anyone entering and potentially hurting themselves as they may be unaware. I will remove any objects and/or tools that may be lying around on the floor to mitigate any chances of slipping, tripping or falling. Once I have done this, I will begin to brush around the area getting rid of any loose debris on the floor and safely disposing of it. Once all the floor is cleaned and the slipping hazards are removed, I will begin to clean the machine from the top down as this is the most effective way. I will use the rags provided as well as degreaser to clean the machine down and remove any loose components, using small brushes and a magnet to remove and swarf stuck in the bed. While cleaning I checked around to find what faults the machine may have as well as checking the tightness of things. Again, after this I will brush round the surrounding floor area as more debris may have gathered after the clean-up. Everything mentioned above will fall under the compliance of the PPE regulations (Personal Protective Equipment at work Regulations 1992) and the HASWA (Health and Safety at Work Act 1974). During the maintenance we will also be in accordance with: RIDDOR (Reporting of injuries, Diseases and Dangerous Occurrences Regulations) because it is a UK law that employers and people in charge of work premises report any work related accidents that occur, and COSHH (Control of Substances Hazardous to Health) as we will be working with oils and lubricants that may cause harm to the skin if not handled in a safe manner.

After this has been done just before the maintenance, I will calibrate my tools to ensure that they are all the correct sizes as well as organising them appropriately. If any tools are broken or aren't the correct sizes, then I shall bring this up with the appropriate personnel and get this sorted before I begin maintenance. I opted to calibrate my tools as I went along and needed them rather than doing it all at the start to reduce the time taken.

The last thing before I start the maintenance is that I will check the stock levels for all my equipment such as rags, spare parts, oils, PPE if anything is to become damaged or worn, brushes etc. Stock levels are important because it saves time as well as ensuring that we have the correct equipment in on time.

Undertaking the maintenance activity

First off, it has been indicated to me in the brief that the chuck has stopped rotating at a constat speed. This gives me an idea as to what the causes might be for why the machine is doing this. With this I will complete a visual inspection, taking a closer look into the machine trying to find what problems may be causing this issue. An issue that may be is with the machines V belts. The first problem I encountered with the machine was the guard being stuck in place. This was the main thing that needed fixing first since a physical test couldn't be undertaken because of the guard needing to be in the correct position before the machine could power on. I noticed that the screws were too tight, therefore these needed to be loosened for the easy movement back and forth of the guard. Instead of just loosening the guard I took it all off as I noticed that it was very dirty so cleaning would help with the site for any works operating in the future. These are the belts that drive the machines motor helping it to run at a constant speed. One issue might be that the belts are either too tight or too loose or that the motor may be too close to the machine, not giving it the tension that is required. Another issue may be that the belt is worn out due to its use over time, resulting in a lower tension or potentially the defected area catching on. If this is the case, then we can simply change the old V belts over with new ones and ensure that the tension of the belts is fitted correctly. Another potential issue with this is that the lever to move the motor may be stiff or too tight. This may mean that we need to add a lubricant to the lever. Instead of the lever needing lubricant it was a problem with the tightness of the bolts on either side of the machine. For the lever to work each bolt needed to be tightened up for the lever to gain its mobility back. For this I will continuously refer to the manual of the machine to ensure that everything is being set up correctly.

After looking at the belts on the top I will work from the top down and start to look at any other potential problems with the machine. Instead of working from the top down I noticed the two main issues with the machine that needed fixing before we could test the machine's ability: The bed and the guard. There may well be an issue with the bed of the pillar drill. The bed may be off at an angle or may be too low down making and operations for people using the machine difficult. If this is the case, then we will need to raise the bed up to the correct height. It may also be that we cannot raise the bed due to potential debris being stuck inside the teeth that the bed rises and lowers on. Therefore, this will need to be cleaned out before we can start to move the pillar drill bed. Once moved ensure that the bed is locked in position to avoid it dropping down causing a potential risk for employees who use the machine after maintenance. I had to lower the bed of the machine right to the very bottom (ensuring that I was wearing a bump cap) to reveal the loose debris that was keeping the bed from smoothly rising. Once I did that, I raised the bed up to the correct height using the axel stand to prevent and damage from the bed potentially falling. I used the vice to get a gage on how high the bed should be, ensuring that it was at a height where the drill could work best.

When working low down I will ensure that I am using a mat to kneel on, wear my bump cap in case I am to hit my head off anything, as well as putting the HGV Axel stand under the bed to stop it falling while I conduct the maintenance. Once I had fixed the guard and raised the bed up to the correct height, I decided to conduct a test to check how the machine was running in its initial phase to gain an understanding of what may be the problem. I regained the power back in the machine and drilled a hole into a 6mm piece of metal. After first turning on the machine I noticed the main problem was the loud vibrating noise coming from the top of the machine as well as while drilling it wasn't very smooth or accurate producing large amounts of vibrations as well as sounds.

The pulleys on the machine may be damaged or affect and may need changed. As well as this the guard may be tightened too much, allowing for no movement so a simple adjusting of the screw can allow for this to be moved. Again, this was a fix that we needed to do initially since the machine couldn't operate with the guard in the correct position. I will also conduct a check on the spindle as this may be causing friction, also if it isn't lubricated it may be that it is too dry. Also, I will check over all the fasteners ensuring that they are all tightened up to stop anything being loose and potentially causing a rattling sound or just affecting the performance of the drill. Once I conducted the initial test, I reisolated the machine and began working on the top of the machine looking at potential problems with the pulleys and the V/drive belts. I noticed initial degrading on the rubber suggesting that they had been worn past their use and new belts were needed. I also noticed that the pulley was loose therefore this would need tightening when it came to the tension of the drive belts. Once I had put the new belts on and put the pulley back in the correct position, I now noticed that the lever for the motor was loose meaning that the belts needed to be tightened up for us to be able to move the motor back and forth for the tension. The nuts between the motor and the machine needed to be adjusted to stop any future rattling noises as well as ensuring that the belts kept their tension. Now that we have used the drive belts new ones will needed to be ordered in in case in the future they need repairing again, it is important to maintain stock levels.

Once I am satisfied and I believe that all the faults have been corrected in accordance with the manual I will conduct a test with the D.T.I on the chuck of the machine. This test will ensure that I have fixed everything as well as it being fixed correctly. The D.T.I will be zeroed and will show when the machine is moving if it is out or not, if it is out the D.T.I will move off zero significantly, indicating that the problem hasn't been fixed, and we will have to reassess what other problems it may be. I will also look at the manual to keep in accordance with any tolerances that have been set ensuring that everything goes back in accordance with what the manual asks us. After replacing the belts and fixing the tension I conducted a second test on the machine. After this test I still noticed that there was still some vibration when drilling a hole through the piece of metal therefore I checked the chuck and noticed that it was an old imperial chuck. Instead of using an old imperial chuck I decided to change it to a new metric chuck. Before I changed it over, I took a D.T.I test for the imperial chuck and a D.T.I test for the metric chuck with there being a 0.06mm better off

difference. This means that the new metric chuck wasn't moving as far out of place as the old imperial chuck allowing for smoother movement when drilling.

Throughout the whole maintenance I will keep a log of the activities I have done and the order, updating the logbook in case we are asked for what we have done. I will also look for anywhere that may have any oils dripping as well as places that may be too dry. Ensuring that I lubricate the necessary areas and clean up any oils that may be spilling. Before I took a final test, I lubricated the areas that needed lubricating, referring to the manual for what oils and greases to use when it comes to each part of the machine. I used the 68 and 220 viscosity oils as some areas required thicker lubrication than others.

Post maintenance

If the D.T.I test is positive and everything has been fixed correctly then I will start to clean down the area again as the maintenance may have caused more debris to occur, I will clean from the top down to ensure that no areas are missed using the correct cleaning tools and equipment to ensure cleanliness. Tools and equipment will be put back in the dedicated storage areas ensuring that they are damage free before returning. Oils will be safely returned to the oil shed. Once this is done and my work area is tidy, I will be able to remove the barriers as well as ensuring the safe reinstalment of the power to the machine. I will then demonstrate to the assessor the functionality of the pillar drill and its condition after the maintenance. Any paperwork that needs to be completed will be done at this point and I will amend any documentation that needs amending, before handing it over to my supervisor.

Task 2 – Practical Observation Form

8712-311 Maintenance Engineering Technologies: Mechanical - Summer 2025

Candidate Name	Candidate number
<candidate>	**ABC1234**
Provider name	**Date**
<provider>	**dd.mm.yyyy**

Complete the table below referring to the relevant marking grid, found in the assessment pack.
Do not allocate marks at this stage.

This observation must cover	Assessor observation should include:	Assessment Themes
Work area preparation	• The work area preparation.	• Health and Safety • Planning and Preparation • Systems and Components
Service and maintenance activities	• decommissioning and inspection of the machine • disassembly and reassembly of the machine • diagnosis and recording of faults within the machine, including carrying out appropriate tests • repairing the faults and replacing components and consumables as required • safely using the appropriate tools and equipment • recommissioning of the machine • demonstration of machine functionality to the supervisor • re-instating the work area.	• Health and Safety • Systems and Components • Working with faults • Reviewing and reporting

Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*

Work Area Preparation

Once the task had been delivered, the candidate demonstrated continual awareness of the needs of the task, fair consideration of process sequence, alternatives methods and uses of equipment as well as a robust approach to safety though security and isolation methods and a keen awareness for and towards sustainability by ensuring correct waste disposal.

Health and Safety

The quality of the candidate's work in aspect of work area preparation was high and followed a logical form, Barriers were used to secure the workshop and the machine was isolated before any other actions were taken.

The candidate had the correct Personal Protective Equipment (PPE) for the various tasks and was able to change items such as gloves/bump hat without prompting.

The candidate referred to their own risk assessment from Task 1 as the risk assessment provided by the college was weak.

The candidate confidently and fluently carried out isolation of the machine and testing along with Tag Out Lock Out (TOLO) processes.

The candidate chose from and used a range of cleaning equipment to produce a high quality of tidiness of the work area and would return items once finished.

Planning & Preparation

The candidate was able to review and use their method statement from Task 1 to provide a strong reference for the sequence of tasks or when a need for 'what to do next?' arose after a certain task was complete or when they had an unexpected result, for example the worn chuck key and old imperial chuck.

The candidate was able to use the machine manual and other provided documentation for guidance and was familiar with, and used, correct terminology to identify key components on the machine and their function.

The candidate was able to recognise the range of tools and equipment provided in the tool chest and around the workshop and to independently use the best option and give reasons/justifications for its use – for example, a particular type of brush best suited for removing swarf, types of screwdriver, Allen keys etc.

The candidate was able to independently conduct preparatory checks for suitable tools and equipment, including those associated with and for calibration – Dial Test Indicator (DTI), slip gauges etc, isolation requirements, work area needs, use of sensory feedback, and also understand the terminology/drawings/data and specifications of the machine.

During the maintenance process, the candidate marshalled the tools, PPE and equipment into a suitable area throughout the task due to space restrictions.

Ensuring that the workspace was clear was a priority and was conducted in a safe and methodical way and referred to their paperwork from Task 1 as well as the manual and associated data sheets.
The safety of the workshop was of high importance and the candidate took time to ensure a clean/safe environment by using appropriate cleaning materials/equipment such as various brushes, cloths and bins to avoid any slips, trips or fall hazards etc.

Preparation of the work area to a high standard with the safety of people paramount and in accordance with the needs of the task requirements and abided by college rules, barriers with warning signs were used on entrance to the workshop and items such as the tool chest /tool trolley were moved to avoid obstructions and maintain safety.

Systems & Components

The candidate was able to use mostly correct terminology for the elements of the pillar drill and associated tools / equipment and components used in the maintenance process.

Additionally, they were able to successfully use a fault-finding system – for example, when they understood that, with the chuck guard seized in its original position, no machine operation could take place.

Strength

The quality of work carried out was high, the candidate was independent, chose items, equipment and tools correctly, did not have any accidents or near misses or any issues, referred to notes that they were taking and other technical documentation.
They abided by all regulations and conducted tasks with consideration and care.

Weakness

On a few occasions, the candidate forgot their current planned step and worked out of the sequence of activity that they had planned and commented upon. However, they referred back to their documentation and were able to reset.

Service and Maintenance Activities:

The candidate conducted service and maintenance activities on the pillar drill, identifying the faults set and providing appropriate and adequate solutions to remedy the initial issues.

There was a constant awareness of Health and Safety and a drive to produce high quality work in finding and resolving faults, as well as ensuring a clean working environment for handover.

Decommissioning and inspection of the machine

The candidate wore and used suitable PPE and correctly followed all steps of isolation procedures (TOLO) before starting work on the pillar drill and obtained permission to start work.

The candidate was not able to undertake a test run of the pillar drill to inform them of the current ‘state’ of operation as the chuck safety guard was seized in a position which would not allow the safety switch to begin operation.

The candidate checked their method statement and technical information as appropriate and kept a log of notes as they progressed through the task.

The candidate completed a thorough visual and physical inspection, checked expected outcomes and noted any issues which would cause their initial plans or sequencing to deviate. Information gathered from the cleaning down of the machines was used to highlight areas which needed more attention – loose screw, seized table etc, and informed how to prioritise tasks.
The candidate kept written records of all sections of the process in their notebook.
They then identified which order they would start to remove items in order to conduct a test and started to dismantle and repair items.

All appropriate PPE was worn at all times and changed when required, for example, gloves when dealing with different tasks, for example, dealing with lubricants.
When disassembling equipment, the candidate followed good health and safety techniques relating to storage of removed components and making sure the location was not an obstruction to them or others surrounding them, as well as ensuring that cleaning of tools/equipment/floor etc was conducted for safe use and access.

Overall, the candidate performed initial decommissioning, disassembly and inspection activities correctly, following a logical and defined sequence of steps and was able to adapt when needed. Through reflection and taking their time, they were able to work their way through issues when faced with an unexpected problem.

On discovering that the source of the noise and inconsistent chuck rotation was due to belt tension, loose pulley assembly and incorrectly positioned motor, the candidate used a suitable working platform for safe access to the top of the machine to start the task. They did this by following a logical fault diagnosis sequence, which lead to identification and then a resolution of the seized chuck guard due to overtightening of screws preventing movement and so the micro switch on the pillar drill would not allow safe operation.

Additionally, during the inspection, the candidate found that the table was jammed in position on the pillar due to compacted debris in the rack and pinion, preventing both raising and lowering of the table. Both of these issues were resolved prior to the candidate operating the pillar drill and conducting a test drilling on a workpiece. This generated noise and vibration and the candidate was able to feel that the chuck was slowing down and speeding up during the drilling process and the quality of the drilling was poor – swarf was not consistent and had various styles – The candidate commented that drilling operation was not consistent with past experiences of drilling similar holes in a similar material. The candidate then logically worked their way around the machine from the chuck back to the drive section where the noise was coming from. After a visual and physical inspection, they could see and feel that the Drive V belts were loose as well as the pully assembly and the tension adjustment lever was slack. They needed a platform to work from and had a choice of two, both were suitable and appropriate but on different scales of size. They safely proceeded to completely remove the Drive V belts and pulley assembly and inspected them, which then lead to the candidate replacing the V belts from stock and refitting, tensioning and adjusting to the required values. However, at this point, the candidate needed support; after they had been working for a period of time without a break, they inadvertently tightened the locking screws out of sequence, preventing the tensioning of the belt and they were unable to recognise the issue.

The candidate continued to undertake fault diagnosis checks on the machine, using a DTI to aid identification that the imperial chuck and chuck key fitted in the machine were both worn down.

Disassembly and reassembly of the machine

The candidate, using suitable PPE, went on to logically reassemble the pillar drill using the technical information to reassemble all parts, components and sub-assemblies correctly.

The candidate checked the cable connections to ensure that they were sound and ensured that all items and tools were replaced correctly.

After reassembling the pillar drill, the candidate conducted both a visual check of the machine and also physically checked areas that they had worked on to ensure the quality of their work and check they had not missed any elements.

After these checks, they removed the TOLO and restored power to the pillar drill to conduct a test drilling on a sample workpiece. The candidate completed this with the necessary checks to ensure that operational condition had been achieved, and the final product was machined to an accurate finish, checking this by eye.

Diagnosing and recording faults within the machine, including carrying out appropriate tests

The candidate, using suitable PPE, approached the fault finding logically and methodically. They started by checking and noting potential and issues during the cleaning process, first noticing that the chuck guard was fixed in one position, before moving onto other areas of the milling machine and understanding the sequence of which faults needed to be tackled.

The candidate demonstrated consideration of a range of valid potential causes, before isolating the fault accurately as incorrectly tensioned drive belts and a loose pulley assembly.
The candidate followed the correct and logical process to remove and replace the components using appropriate equipment, along with methods, techniques and competencies, to gain suitable and safe access.

The candidate used a combination of tools to check, adjust, set and lock the correct tension of the belts into their original configuration.

They continued to undertake fault diagnosis checks on the pillar drill and, following a further test, changed the Imperial chuck to a metric chuck, which the candidate decided provided a strong quality of operation and performance.

Repairing the faults and replacing components and consumables as required safely using the appropriate tools and equipment

Using suitable and appropriate PPE, the candidate was able to find and resolve the set faults on the pillar drill effectively by replacing damaged and worn parts, such as the Drive V belts, imperial chuck and key, along with applying consumables used in lubrication of the pillar drill in a safe and considered manner and to a good quality.

The candidate chose to use a number of tools and pieces of equipment during the process which were appropriate and suitable for the task. If they found if a tool was not effective – for example, a short arm Allen key - they would exchange it for a more appropriate tool and provided an explanation as to why.

The candidate always used the kneeling pad and the correct PPE – a bump hat - when working on the floor and accessing parts of the machine at a low level.

No accidents, trips, slips, cuts or abrasions occurred during the process.

Recommissioning of the machine

Employing suitable use of PPE, the candidate went on to logically reassemble the pillar drill using the technical information shown within the manual.

Settings and previous configurations - for example, the speed and belt drive positions - were observed and followed by the candidate using a range of suitable tools and equipment.
The candidate checked the connections to ensure that they were functionally correct and ensured that all elements were replaced in the correct sequence.

There was no cutting fluid in the machine but the pipe for the cutting fluid line was also checked for kinks, wear and tear and traps.

After reassembling the pillar drill, the candidate then restored power to the milling machine to test run drilling a hole in a piece of mild steel strip using the existing imperial chuck.
The candidate could sense and feel that the drilling operation was not smooth.
The candidate took measurements using a DTI on the spindle, chuck body and drill bit and then replaced the chuck with a metric chuck. They then used a DTI on the same datum which provided better results and ran a third test which the candidate decided was of a high quality of operation and gave a stronger result. The candidate completed this with the necessary checks to ensure that operational condition of the pillar drill had been achieved, and the faults resolved.

Demonstration of machine functionality to the supervisor

During the maintenance process, the candidate explained to the supervisor the actions they were taking and what they had found and planned to do next.

Aspects of the pillar drill functionality were demonstrated as faults were found and resolved– for example, the chuck guard being seized and, after repair, fully operational – throughout the process.

The candidate was able to explain and demonstrate the function and need for elements – for example, the screws to lock the motor in place - on the machine with confidence to the supervisor.

Prior to drilling holes on the work piece, the candidate would go through a series of safety checks on the pillar drill – checking the area was clear, the table was at a suitable height, the drill bit was tight/not eccentric, the vice was tightened etc.

The candidate was able to demonstrate the function of the element of the machine they had worked on, as well as safely set up the pillar drill to conduct a series of drilling operations.

Re-instating the work area

The candidate, wearing suitable PPE, worked safely and neatly throughout all activities, following all the college’s workshop and health and safety requirements.

All disconnected parts, components, sub-assemblies and tools were placed onto the mobile trolley, tool chest draws or the worktable, which reduced searching for tools or unnecessary walking and so mitigated any trip hazards, kept the workspace environment tidy and demonstrated consideration for any for appropriate waste disposal.

All tools and equipment were cleaned and returned to correct storage; waste was disposed of in the correct separate bins and the working area left safe, clean and tidy with clear access available.

Strength

Quality of work carried out was good, The candidate was confident in certain aspects, independent, conscious about safety, quality of their work and chose PPE, consumables, equipment and tools with consideration and accuracy.

They did not have any accidents or near misses or any issues with respect to health and safety. They took their time and updated, and referred to, their notebook with records of measurements that they were taking and also referred to other technical documentation.
They worked methodically in the use of tools, equipment and consumables.
All set faults were resolved to a good standard.

They abided by all regulations and conducted tasks with consideration and care.

Weakness

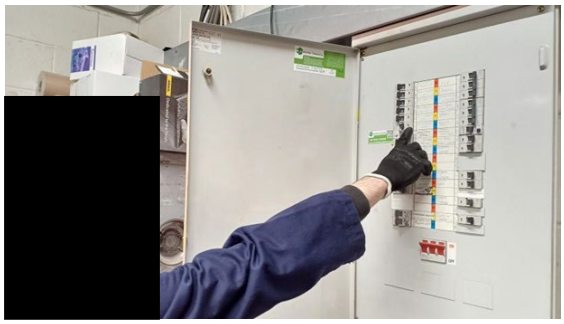
On a couple of occasions, the candidate became disorientated in the process and worked out of sequence, choosing some incorrect tools initially – types of screw drivers / Allen keys. However, they either referenced their notes/documents or just needed time to stop and think and were able correct and continue accurately,

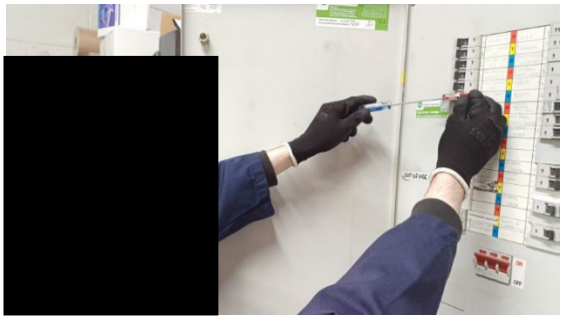
The candidate did demonstrate some loss of confidence after some unsuccessful actions and receiving support, causing them to stop and need to reference notes and gather thoughts.

Internal assessor signature	• Date
•	

If completing electronically, double-click next to the 'X' to add an electronic signature once the record is **finalised**.

Task 2 – Photographic Evidence

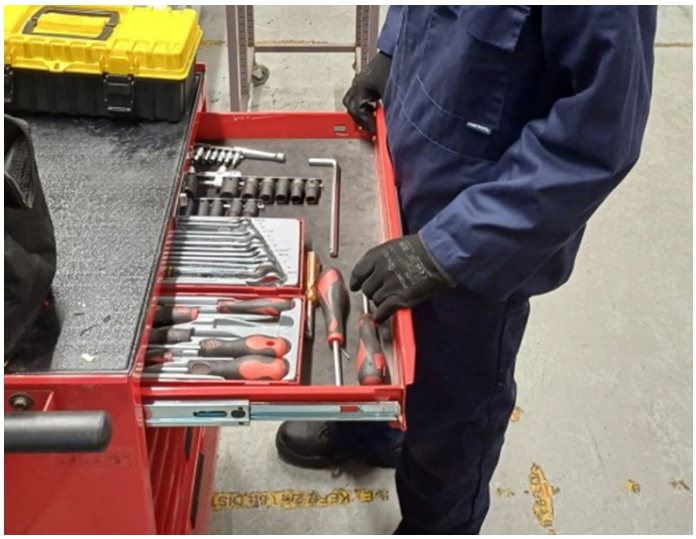




Section 1
The prepared work area

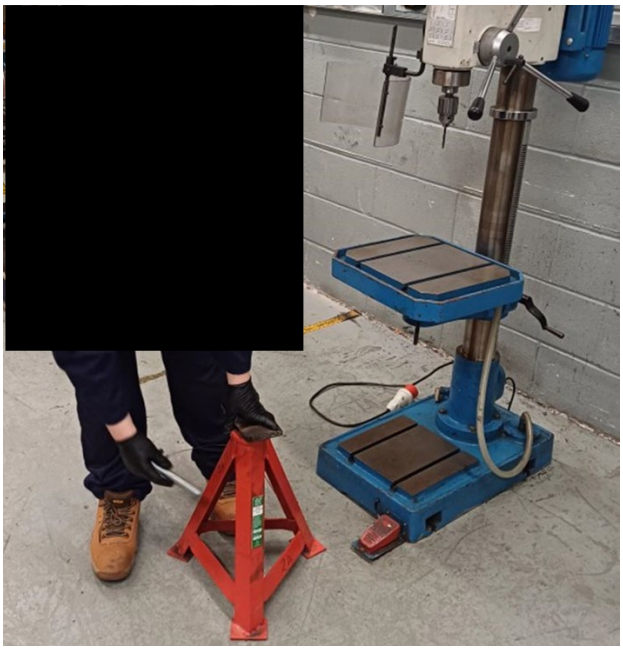
Safe isolation procedures whilst wearing the correct PPE **(HS).**

Images showing the electrical isolation procedures conducted including ensuring supply was DEAD and Lock Out Tag Out (LOTO).



Section 1
The prepared work area
The candidate checking the correctly selected tools and equipment for service and repair activities (**PP**).

Image showing the tool chest and the candidate reviewing the top drawer of tool chest and its range.

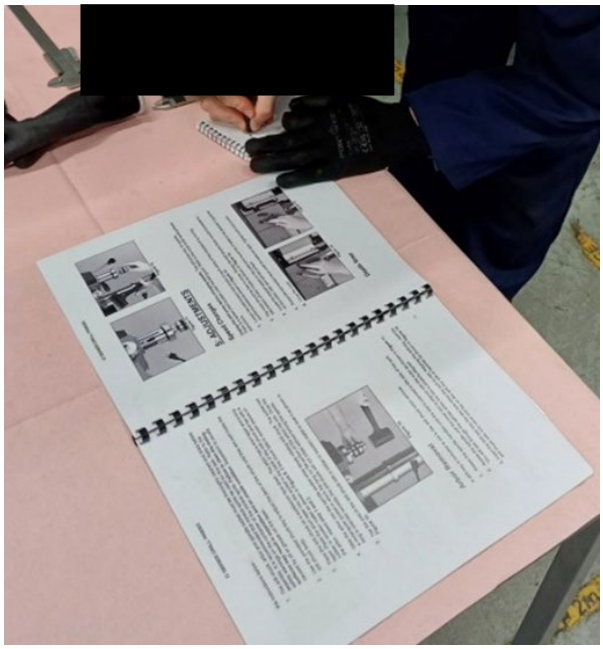


Section 1

The prepared work area

The candidate checking the correctly selected tools and equipment for service and repair activities **(PP).**

Image showing preparatory checks on equipment.



Section 1

The prepared work area

The candidate checking the correctly selected tools and equipment for service and repair activities **(PP).**

Image shows preparatory checks on equipment to allow for changes of spindle speed.

Section 1

The prepared work area

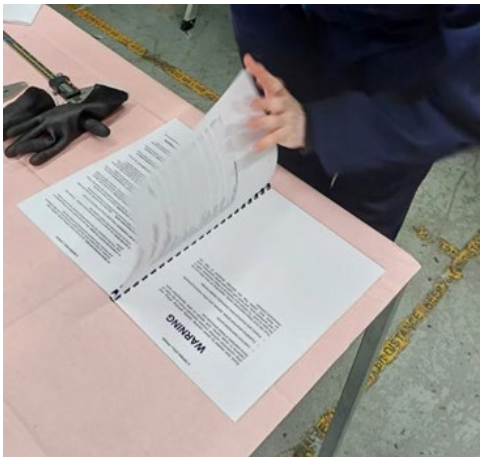
The candidate calibrating any tools and equipment (**PP**).

Images showing the use of slip gauges to calibrate measuring tools and equipment during disassembly and re-assembly procedures.

Section 2
The machine prior to any work being carried out to show condition

The condition of the machine and working parts, demonstrating the machine is in good working order and has all the working components required to fulfil the needs of the brief (**SC**).

Image showing first test drill operation with imperial chuck post inspection to demonstrate the machine is in working order but has a number of issues.



Section 2

The machine prior to any work being carried out to show condition

The condition of the machine and working parts, demonstrating the machine is in good working order and has all the working components required to fulfil the needs of the brief **(SC).**

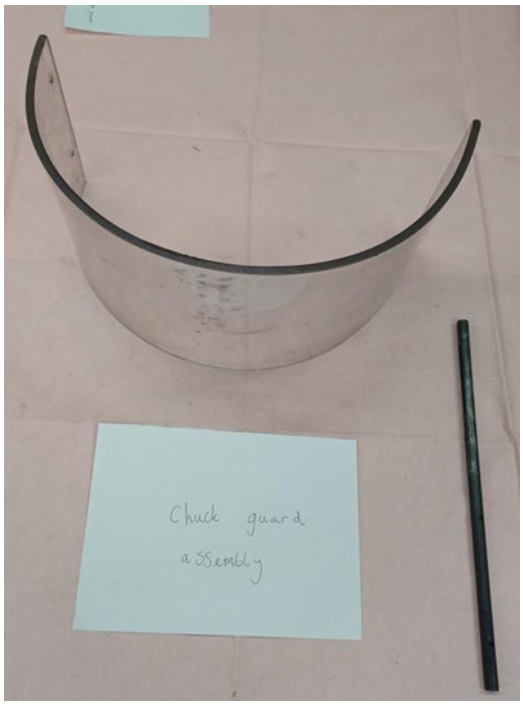
Images showing the candidate reviewing machine manual for cross referencing to aid fault finding post drilling test.

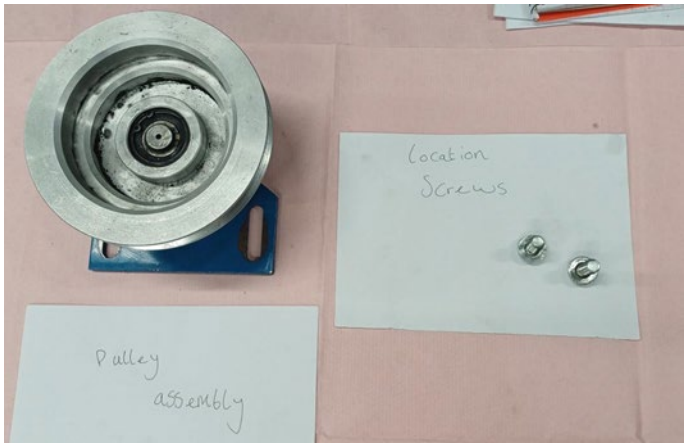
Section 3

The machine disassembled

What parts are to be removed, before removal (**SC).**

Image showing the original loose b elt drives and loose pulley assembly.





Section 3

The machine disassembled

What parts the candidate has removed from the machine and in which order they have positioned the parts in the work area to aid repair and assembly **(SC)**

Images showing examples of the chuck guard and associated tools and the V belts and pulley assembly with the order in which removed parts have been positioned.

Section 3

The machine disassembled

The decommissioning process **(SC)**

Images showing the candidate working on the pillar drill and cleaning it down, removing items which could cause impedance/ harm such as drill bit and operation handles.

Separating into recyclable / non-recyclable and swarf waste on an LOTO Isolated machine as part of the decommission process.

Section 3

The machine disassembled

The candidate using tools and equipment to disassemble the machine.

Images showing the candidate using a platform/ mobile tool trolley, spanner to aid with the disassembly and removal/ inspection of the pillar drill drive belts and pulley assembly.

Also, images of the screw drivers and Allen key used in the chuck guard removal/inspection.

Section 4

The working area after disassembly

The candidate has maintained a safe work environment during their service and maintenance task **(HS).**

Images showing the candidate at the table after repositioning of mobile tool tray to side of space in order give a clear working area around the Pillar Drill.

Also, candidate accessing the COSHH Room and returning lubricant to Spill Tray after filling a beaker.

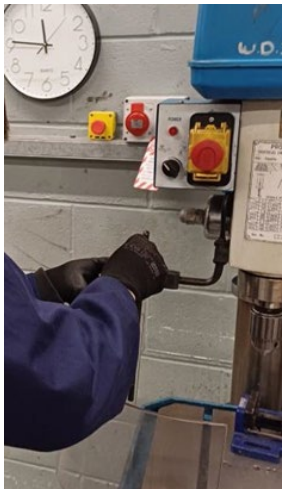
Section 5

The sub- assemblies after repairs have been completed

To show the faults the candidate repaired and standard of fault repair **(WWF).**

Images showing the fault with debris in the rack and pinion mechanism causing the table to not raise & lower.

Also fault with loose drive belts and loose pulley assembly causing inconstant rotational speed during a drilling operation speed as well as noisy operation.



Section 5

The sub- assemblies after repairs have been completed

To show the faults the candidate repaired and standard of fault repair **(WWF).**

Images showing the faults shown in the result of the first drill test which demonstrated the chuck not rotating at a consistent speed – so drilling operation stopped.

Section 5

The sub- assemblies after repairs have been completed

To show the faults the candidate repaired and standard of fault repair **(WWF).**

Images show an example of the standard of repair as a degreaser is used to remove dirt, particles and accumulated grease to improve the transparent property of the guard material and reduce the risk of errors when viewing through the chuck guard when in position.

Section 5

The sub-assemblies after repairs have been completed

To show the calibration of machine components (**WWF**).

Image showing the calibration using the new metric drill chuck located in the pillar drill spindle.

Section 5

The sub-assemblies after repairs have been completed

To show accurate selection and use of measurement and testing equipment **(SC).**

Images showing use of hook spanners to test the security of the slotted locking washers on drive pulley assembly.

Use of rule to measure gap between motor and pillar drill body after adequate suitable tensioning of drive belts.

Section 5
The sub-assemblies after repairs have been completed

To show the commissioning of sub-assemblies, eg lubrication, test before use **(SC).**

Images showing the lubrication of the rack using a brush to aid the smooth operation of the raising & lowering the drilling table.

Also, the use of the feed handles to raise and lower the spindle during lubrication to ensure free spindle retraction.

Section 6

The machine after the maintenance and service has been completed to show final condition

The candidate has correctly reassembled the machine to pre-service and maintenance status **(SC).**

Image shows the Pillar Drill post maintenance and repaired with all the found faults and issues resolved.

Section 6

The machine after the maintenance and service has been completed to show final condition

The post-repair performance checks completed by the candidate **(SC)**

Images show an example of the candidate checking maintenance and lubrication information in manual prior to making further test holes in the work piece to see if the drill chuck is rotating at a consistent speed and without noisy operation.

Section 6

The machine after the maintenance and service has been completed to show final condition

Calibration/tolerance values are within operational specification ensuring system functionality **(WWF).**

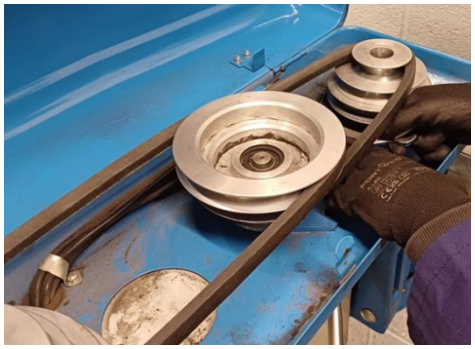
Image showing the candidate conducting a quality check post service and maintenance procedure by use of a Dial Test Indicator (DTI) to measure the pillar drill spindle and metric chuck to ensure it is within the manufactures limits.

Section 6

The machine after the maintenance and service has been completed to show final condition

The quality of repairs **(WWF).**

Images showing the candidate about to use a calibrated spanner to retighten a locking nut to support the mass of the motor to ensure correct alignment of the motor, drive pulley and drive belt.



Section 6

The machine after the maintenance and service has been completed to show final condition

The quality of repairs **(WWF).**

Images showing the candidate inspecting the original V Drive belts displaying signs of wear and tear and checking the condition and speed configuration before tensioning of the new high quality replacement V Drive belts in situ prior to operation.

Section 6

The machine after the maintenance and service has been completed to show final condition

The machine working correctly on a work piece.

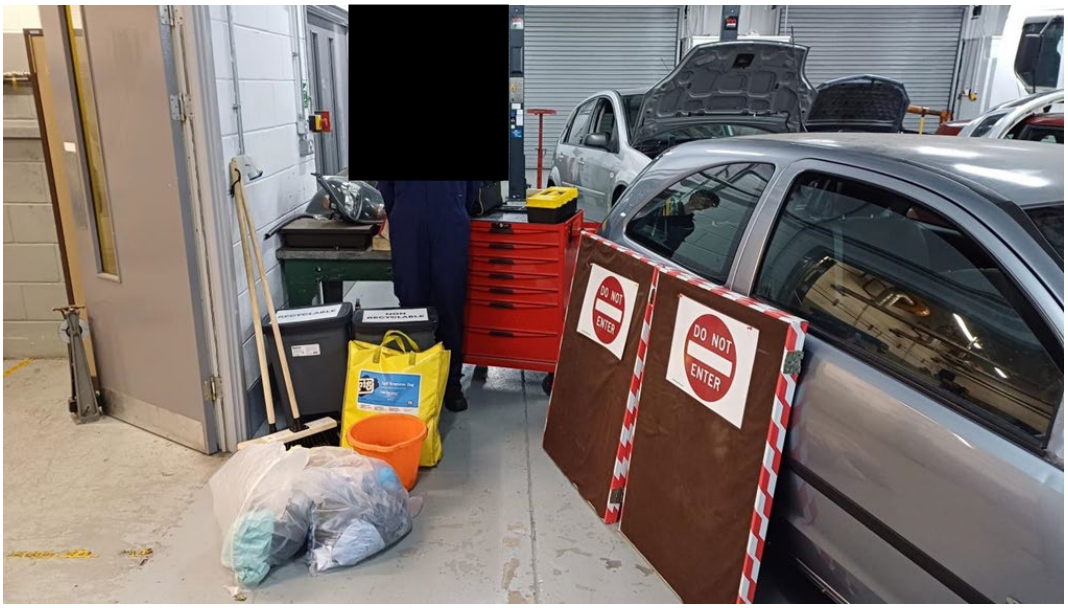
Image showing the test drilling on machine with no noisy operation, replaced and tensioned drive belts, an unseized chuck guard, a new Metric chuck & chuck key, lubricated components along with a table which is able to be raised and lowered freely.

Section 7

The re-instated work area

The condition of the work area after the service and maintenance activity has been completed (**HS, SC**).

Images showing the condition of the machine and the nature of the working area environment post service and maintenance activity.



Section 7

The re-instated work area

The return of tools and equipment to the correct storage area and waste disposed of correctly **(HS, SC).**

Image showing the equipment, returned tools & associated equipment in tool storage and bags/boxes, tools, access barriers, separated waste removed from the workshop.

Task 3A Review and report the maintenance activities

Assessment number (eg 1234-033)	8712-311
Assessment title	Mechanical Occupational specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	3A
Evidence title / description	Technical Report Revised Maintenance Schedule
Date submitted by candidate	dd/mm/yy

Task 3A

Assessment themes:

- Health and safety
- Systems and components
- Reviewing and reporting

You must:

- produce a technical report for the supervisor. This should typically be 850 words and include:
    - a review of the maintenance activities, including fault diagnosis/detection techniques and suggestions for future improvements
    - the faults found and how they were rectified
    - any outstanding faults, including recommendations that may require attention before the next planned maintenance activity according to the current maintenance schedule
    - reporting of stock levels and waste disposal.
- produce a revised maintenance schedule from your activities and findings, this should include:
    - recommendations for future planned maintenance, including justifications
    - due date of next maintenance activity.

Additional evidence of your performance that must be captured for marking:
none

Candidate evidence

Task 3A Technical Report

Maintenance on a pillar drill - May 2025

The full maintenance of the pillar drill has been fully finished and completed. The stages of the maintenance included inspecting the machine, completing sensory checks (smell, touch and see), fault checking, measurements of the parameters, operational and functional checks of each component. The maintenance that was carried out and completed allowed for all the components to be accurately inspected and effectively maintained, however I would recommend that the maintenance is conducted on a more regular basis such as every 3 months. This is because the faults and problems that had arisen at the time may have been avoided if maintenance was conducted more often as parts wouldn't be given as much time to wear out if repairs were carried out more frequently, thus leading to less downtime and a higher quality of product/machinery. While carrying out the maintenance, I ensured that I was always following the brief requirements. Reading through it and ensuring that I understood the technical specifications, so that I knew what to expect from the pillar drill operation. I followed the method statement that I had completed in task 2, but made deviations, as noted and changed on the modified version, when unexpected faults or issues were developed during the inspection. This will require a new method statement to be created to ensure that these changes are reflected in any future maintenance of the machine.

While carrying out the maintenance always I ensured that I was following any safety precautions that were necessary at the time. This included ensuring that the machine was fully isolated (unless operating tests) using LOTO (Lock out, tag out) procedures to ensure that nobody was harmed whilst maintenance work was being carried out. I ensured that I was always wearing the correct PPE (Personal protective equipment) such as: safety goggles, safety boots, put and latex gloves, overalls, and a bump cap.

As well as PPE I ensured that used signs and barriers to block off any access to the maintenance area. Whilst working on the machine I used a working platform which I ensured was checked and signed off as being eligible to use during any work.

During the maintenance of the machine, I discovered, investigated, diagnosed and rectified the following faults:

- Bed being too low and jammed
- Guard jammed/stuck in place
- Damaged and loose V/drive belts
- Loose pulleys
- Dried spindle
- Loose handlebars
- Old imperial chuck
- Loose nuts and bolts
- Motor not locked in place

I noticed first off with the bed that the rack and pinion was full up with debris therefore meaning that the bed was jammed in position and couldn't be raised freely. To rectify this, I cleaned the rack and pinion fully and cleared out any loose/stuck debris. This allowed for the bed to be raised freely and to the correct height for the machine to be used. With the bed being loose I ensured that once in the right position it was locked in place so that no movement would occur during the use. All while doing this, I ensured I wore a bump cap and used the HGV Axel stand to prevent the bed from falling onto me during the cleaning process.

To be able to carry out a test on the machine the guard needed to click in place before the power would work. I noticed that the guard was stuck therefore I knew straight away that the screws were too tight. To rectify this, I fully removed the guard, cleaned it with a degreaser as the screen was extremely dirty, and reapplied the guard back onto the machine tightening up the screws to the right tightness to allow for free movement but with enough tightness to prevent it from slanting.

After this I regained power back into the machine and tested it on a 6mm piece of metal. The noises were noticeable and there were also vibrations while drilling with the movement not being smooth. I stopped the machine and re isolated to investigate the faults causing these problems. The noises were noticeably coming from the top of the machine where the pulley system is as well as the drive belts. I noticed that the pulleys were loose as well as the drive belts also being loose but also damaged and worn. To recertify these issues, I changed the pulleys to new fresh ones from the stock ensuring that they were the correct ones, and they were to a good quality standard.
Once the belts had been applied safely, I rectified the loose pulleys by tightening the bolts up on either side to allow for it to stay in position with no rattling noises during future work.

Once I applied the belts and tightened the pulleys, I now needed to move the motor as it was too close to the machine. I noticed that the lever was loose therefore the nuts needed tightening on either side of the machine to allow us to move the motor away from the machine. Once I rectified that issue, I moved the motor away from the machine while also moving the nuts to keep the motor in place and prevent and rattling noises in the future. The distance between the motor and the machine was around 25mm distance. Once all the faults at the top were rectified, I did a second test on the machine which still showed slight vibrations in the machine and not so smooth movement.

I conducted a D.T.I test on the imperial chuck which gave off high measurements: Drill body 0.09 mm and the chuck body at 0.06 mm. With these measurements I decided that to rectify the issue it would be best to change the old imperial chuck to a new metric chuck. Once replaced I conducted another D.T.I test on the metric chuck which gave out readings: Chuck body 0.02mm and drill body 0.003mm. These differences are significant and should ensure that the drill now performs at a safe, high-quality standard.

Finally, I lubricated all the joints that required lubrication using the correct viscosity (68 and 220) ensuring that the machine could move smoothly. I did a final test and compared each of the testing's, showing that the machine now was significantly better than how it was before the maintenance. All results were logged in a notebook as well as all the steps I took for any future maintenance.

I cleaned down the machine and returned and tools and equipment to the correct place ready to be returned. I also disposed of any rubbish into the correct bins ready to be collected.

During the whole maintenance I was ensuring the quality control of the tools, equipment and spare parts were kept to a high level. I made sure that I was taking measurements during each process of the maintenance to ensure the quality of my tools and equipment. I conducted physical checks at the end inspects parts to ensure there were no defected or damaged parts. This also links in with quality assurance ensuring that the customer is satisfied with the maintenance we have carried out as well as the state that we have left the machine in after the maintenance. Ensuring good quality of products used for the machine will give the customer satisfaction that we have given them high quality replacement products, leading to them using our services for often as well as giving us positive feedback and reviews for customer retention and service awareness.

Any problems with the products we have provided the customer will always link back to the company. This is why we opt to use an independent parts company rather than mainstream companies as they provide the parts directly from them rather than places like B&Q who source the products and sell for other companies. This is useful as we can trace down any problems to the company and bring it up directly with them. The company we are using will ensure that their parts follow ISO 9000 meaning that

all their parts should be of a good quality and checked before selling, reducing the number of faults with bought parts by consumers.

Since we used new drive belts and a pulley system, we should ensure we maintain the stock levels of our parts to reduce downtime while waiting for parts while improving customer satisfaction as we have the parts on hand. We should order around 6 more V/drive belts as well as 2 more sets of pulleys to maintain a good stock level for future maintenance.

Task 3A Revised Maintenance Schedule

System:	Findings during maintenance:	Recommendations to seniors:	Justification to seniors:	Recommended next planned maintenance due date:

Pillar drill machine	• Pillar drill bed was jammed with debris and too low down which was cleaned and lifted to correct height. • Tightened guard which was loosened and cleaned. • Worn V/drive belts that were also loose which had to be replaced and the tension to be tightened. • Loose pulleys which were replaced and tightened. • Loose lever which was tightened. • Motor too close to the machine which was moved back. • Old imperial chuck which was replaced with a new metric chuck. • Dry joints and spindle which was lubricated.	• Add a sensor to the machine to tell you when the lid at the top of the machine is still open. • Apply a system that allows you to gain readings for the speed of the machine. • Use Allen keys with a longer handle rather than shorter to gain more torque when loosen and tightening. • Use copper grease on screws to allow for them to be unscrewed easier. • Keep tools in an organised manner. • Make sure the work trolley is in a convenient place to reduce time. • Use heel of hand to apply belt easier and safer. • Always bin any used rags straight away to remove build up of rubbish and to maintain a clean workplace.	• This would be helpful as it is an easy mistake to leave the lid of the machine opening before. This will help in indicating that the lid needs to be shut before you attempt to turn on the power. • This will help when it comes to knowing what speed the machine needs to be and should be wafter maintenance. • The longer handle Allen keys allow for more torque when loosening and tightening screws rather than short handle Allen keys. • Copper grease will allow for easier removal of screws during the next maintenance. • Keeping tools organised reduces the time taken to find anything. • Keeping the table at hand reduces time taken. • Using the heel of your hand increases the safety of applying the drive belts. • Binning anything straight after use allows to maintain cleanliness of work area as well as well as maintaining wastage.	01/08/2025

Task 3B Peer Review

Assessment number (eg 1234-033)	8712-311
Assessment title	Mechanical Occupational specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	3B
Evidence title / description	Peer Review Form 1 Peer Review Form 2 Amended Risk Assessment
Date submitted by candidate	dd/yy/mm

Task 3B

Assessment themes:

- Reviewing and reporting

You must:

- carry out a peer review on two annotated risk assessments provided by the assessor. You must consider the following:
    - *how well does the risk assessment enable safe working practices for the planned maintenance activities to be performed?*
    - *how appropriate are the recommended control measures and why?*
    - *what are the implications to the business of the proposed control measures?*
    - *how could the risk assessment be optimised/improved?*
- write up feedback for each of the risk assessments produced by other candidates on separate peer review forms
- update your own risk assessment following feedback from the peer review. Any updates need to include justifications for these changes and any changes not made will be reviewed in the handover.

Additional evidence of your performance that must be captured for marking:
none

Candidate evidence

Task 3B Peer Review Form 1

Assessment ID	Qualification number
8712-31 Mechanical	8712-311
Candidate name	**Candidate number**
<candidate> Reviewed by <peer 1>	ABC1234
Provider name	**Provider number**
<provider>	
Date	**Series**
May 2025	Summer 2025

Question	Feedback
How well does the risk assessment enable safe working practices for the planned maintenance activities to be performed?	The risk assessment clearly states the risks involved in performing the maintenance and shows how safe or not they are to perform using a number and coloured coded system which is easy to follow. Some risks such as Gas leakage within the work area may be redundant and not needed on the risk assessment.
How appropriate are the recommended control measure and why?	The recommended control measure are overall appropriate using the right terminology and have the proper control measures in place such as ppe, and isolating the machine which will protect the user.
What are the implications to the business of the proposed control measures?	The business implications are that they must have the correct ppe, a spill kit in case of having lubricants spill, and also having a stable platform and a soft platform for the users knees.
How could the risk assessment be optimised/improved?	The risk assessment could be optimised by having headers and being sorted into different sections such as maintenance and pre maintenance so that it is more convenient to the user. It could also be improved by having a section on slip, trip or falling on rubbish and debris.

Task 3B Peer Review Form 2

Assessment ID	Qualification number
8712-31 Mechanical -	8712-311
Candidate name	**Candidate number**
<candidate> Reviewed by <peer 2>	ABC1234
Provider name	**Provider number**
<provider>	
Date	**Series**
May 2025	Summer 2025

Question	Feedback
How well does the risk assessment enable safe working practices for the planned maintenance activities to be performed?	The risk assessment clearly states all the possible hazards that could occur and how to deal with them safely without extravagance in a logical manner. It enables safe working practices as it prepares the person doing maintenance for any of the hazards listed above and ensure they are aware of the likeliness and the method to prevent them from happening.
How appropriate are the recommended control measure and why?	The control measures are very appropriate in my opinion as the instructions given to deal with the hazards are very simplistic and logical. It would not take too much effort or time to deal with the hazards listed above which is why I believe it has been structured correctly and in a necessary manner. In my opinion, the control measures are stated in a great manner without exaggeration or an explanation which could a little too brief, providing the person doing maintenance with sufficient information to handle any possible danger.
What are the implications to the business of the proposed control measures?	The business implications to comply with, given by the control measures are things like the PPE (safety goggles, bump hat, boots, gear gloves, overalls) which would need to be provided before hand and in the case of any PPE equipment becoming faulty. It is also required to have a spill kit ready and cleaning equipment purchased in order to comply with the control measures.
How could the risk assessment be optimised/improved?	I think that the risk assessment could be improved by excluding some hazards that would not appear, such as working with loud tools/machinery as the pillar drill and all the tools given will not produce a sound that could cause any potential damage to the ears. The risk assessment also should have had headers to specify which hazard could happen in what part of the whole process whether it is pre-maintenance, the maintenance activity or post maintenance. Could also mention the hazard of any heavy objects or parts of the machine dropping, like the drill table and how to prevent that from happening. The candidate should have also mentioned some heal and safety rules and regulations, backing up the control measures and why the hazard is appropriate to mention.

Task 3B Amended Risk Assessment

Preparation for maintenance					
Hazard	Risk	Control measures	L	S	Rating
Isolation of the machine	Potential electrocution if the machine is not isolated correctly, burns are also likely.	Ensure correct isolation of the machine when performing maintenance.	1	2	2
Working with oils	Spillage resulting in slips and trips, or maybe skin irritation.	Use the spill kit to ensure there are no spillages getting onto the floor, also wear latex gloves when using oils. Complying with COSHH (Control of Substances Hazardous to Health)	2	1	2
Working at heights	Falling and causing trauma to the body, cuts and bruises, broken bones	Follow the correct regulations when working at heights and ensure that you have a stable steady platform.	2	2	4
Cleaning up debris	Potential eye injuries if anything is to come in contact, potential cuts if exposed to any sharp objects	Ensure eye wear is worn as well as covering up to prevent any cuts off flying debris.	1	3	3
Working low down	Bruised knees as well as potential back pain	Use a soft platform to rest your knees on to prevent damage.	1	1	1

Cleaning up rubbish off floor e.g. cans and packets	Slipping and damaging back or hitting head cause further minor injuries such as cuts and bruises.	Be careful and mindful when cleaning up. Watch where you are stepping.	1	3	3

Maintenance					
Hazard	Risk	Control measures	L	S	Rating
Working with V belt	Trauma to the fingers, cuts bruises and maybe severance of the finger.	Ensure that you keep your fingers away from the belt when removing and re applying, ensuring that you use the correct way to put it back on.	2	3	6
Working with oils	Spillage resulting in slips and trips, or maybe skin irritation.	Use the spill kit to ensure there are no spillages getting onto the floor, also wear latex gloves when using oils. Complying with COSHH (Control of Substances Hazardous to Health)	2	1	2
Working at heights	Falling and causing trauma to the body, cuts and bruises, broken bones	Follow the correct regulations when working at heights and ensure that you have a stable	2	2	4

		steady platform.			
Loose hair	Can become trapped on machinery if it is switched on causing severe problems such as potential to rip hair and scalp	Keep hair always tied up if it is going to cause an issue (if its long enough) as well as ensuring the machine is always isolated.	1	3	3
Working low down	Bruised knees as well as potential back pain	Use a soft platform to rest your knees on to prevent damage.	1	1	1
Calibrating tools	If tools are sharp, there is potential for cuts as fingers may be caught on any edges	Ensure the safe handling of sharp tools and objects.	2	1	2
Working with loud tools/machinery	Potential for hearing damage or even hearing loss depending on the decibel level	Wear ear plugs or ear defenders when working in loud areas.	1	2	2
Changing the drill bit	Potential to cut yourself on sharp edges	Ensure the safe handling of the drill bit.	1	1	1
Loose clothing	Loose clothing can get caught in the	Ensure all loose clothing is covered and	1	3	3

	machine and this can become worse if operating potentially taking off fingers or even limbs	correct PPE is always worn.			
Fire breakout	There is potential for the machine to catch on fire or if there is anything flammable nearby may catch on. This can cause burns that can range from minor to severe.	Ensure that once you identify a fire you take the right precaution actions and exit the space immediately.	1	3	3
Warm appliances	Burns and scalds	Ensure that any appliances that are usually at a high temperature are lowered before touching or using.	1	3	3
Gas leakage within the work area	Potential harm if harmful chemicals are consumed as well as potential for	Ensure that all the gas components have been checked before conducting maintenance.	1	3	3

	explosions that can cause burns or even instant death due to impact.				
Dropping heavy objects e.g. drill bed	Dropping a heavy object could cause significant trauma to the foot such as bruising as well as potential breakage of bones.	Ensure that you wear the correct PPE when handling the heavy equipment such as safety boots as well as having the HGV Axel stand stopping the bed dropping.			

		Likely	Possible	Unlikely
		3	2	1
Major injury	3	9	6	3
Minor injury	2	6	4	2
Trivial	1	3	2	1

Justification

Black = suggested removal of section	
Purple = suggested added section	
Text in red are parts that I have been recommended to add	

From the view off my fellow peers, I have taken their recommendations into my consideration. They both suggested that I should create two sections with one being pre-maintenance and one being maintenance. I think this is a good suggestion and I believe it should be added to final risk assessment for the maintenance. Rows highlighted in black are sections that I have been

recommended to remove as they may not be suitable to the maintenance of the pillar drill. I have decided that these rows should be removed for the final risk assessment as they don't totally link in with the pillar drill and the equipment and tools used. Parts highlighted in purple have been recommended to me to add in. I agree with the two sections that have been recommend to me and believe that these should be added to the final risk assessment because they link in well with the maintenance of the machine and can be crucial in risk mitigation when it comes to starting the maintenance as well as pre-maintenance. A recommendation that was put forward to me was to add more health and safety regulations. I have added in COSHH for when working with oils and hazardous substances but it wasn't outlined to me what regulations to add in exactly therefore, I have stuck with only the working at heights regulations as well as adding in COSHH as I am not aware of what to add specifically.

Task 4 Complete Handover

Assessment number (eg 1234-033)	8712-311
Assessment title	Mechanical Occupational specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	4
Evidence title / description	Practical observation form
Date submitted by candidate	dd/mm/yy

Task 4

Assessment themes:

- Health and safety
- Reviewing and reporting

You must now hold a meeting with the supervisor to return to service and complete handover procedures, including:

- confirmation of work completed
- amended risk assessment and how you addressed peer review feedback, including any suggested changes that were not made and why
- appropriate handover documentation.

Additional evidence of your performance that must be captured for marking:

- Assessor observations of:
    - the handover meeting

Candidate evidence

Task 4 Practical observation form

8712-311 Maintenance Engineering Technologies: Mechanical - Summer 2025

Name	number
<candidate>	**ABC1234**
Provider name	**Date**
<provider>	**May 2025**

Complete the table below referring to the relevant marking grid, found in the assessment pack.
Do not allocate marks at this stage.

This observation must cover	Assessor observation should include:	Assessment Themes
Handover	• the handover of the work completed.	• Health and Safety • Reviewing and Reporting

Notes – detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.

Handover

The candidate chose suitable and appropriate PPE to conduct the handover and complete application of handover procedures.

They conducted the handover using mostly correct terminology, which was appropriate for audience.

Relevant documentation was referenced and shared as part of handover procedure with strong detailed explanations, using a range of relevant and effective communication methods.

The faults set on the machine were identified and how the resolution of each of the issues was covered in detail and in a safe manner.

References to measurements, stock, quality, maintenance procedures, where and how improvements could take place, were made.

They performed a thorough operational demonstration of the machine's functionality and its elements with a good verbal commentary as well as appropriate descriptions and explanations of work completed, which were communicated accurately.

Strength

Performed the handover and demonstration of machine functions well and with much improved confidence compared to their maintenance task, no trips, slips, falls or drops.

Good reference to how flawed the provided risk assessment was and evaluation as to why theirs was more effective along with where and why they would make changes to the actions they took if the candidate was to repeat the maintenance task.

Linking and expanding as to the needs of effective maintenance within industry and associated aspects of quality, stock and future planning which was relevant to the task.

Weakness

A couple of times, terminology and detail could have been stronger. Also, the candidate did not justify any suggested changes they had chosen not to make.

Internal assessor signature	Date
•	

If completing electronically, double-click next to the 'X' to add an electronic signature once the record is **finalised**.

Principal Moderator Commentary

The candidate's resource list is exceptionally comprehensive, systematically distinguishing between physical resources, materials and consumables, protective equipment, technical documentation and diagnostic techniques. Each resource is fully justified, and the list is presented in a clear and logical format that supports efficient planning and execution.

The candidate has competently and thoroughly interpreted technical information, applying advanced technical skills to plan activities, assess risks and follow safe working methods. All tasks were completed systematically, logically and efficiently, producing excellent-quality work that clearly meets regulations, standards and the requirements of the brief.

The working area was thoroughly prepared, with all potential risks identified and mitigated prior to commencing tasks. Exemplary housekeeping techniques were applied consistently throughout the activity, ensuring a safe and efficient working environment.

The candidate demonstrated comprehensive technical skills in diagnosing components, assemblies and sub-assemblies, completing maintenance, installation, service and repair activities to a professional standard. Tools and equipment were selected and used appropriately, with safe isolation procedures fully adhered to and documented. Removal and replacement of components was performed methodically, in line with manufacturer specifications, ensuring all tolerances and tightening torques were correctly applied.

All four faults were accurately diagnosed and fully resolved by the candidate, as evidenced in the photographic record. The images show the use of appropriate diagnostic equipment, systematic fault-finding, corrective actions taken, and verification of resolution prior to reinstating the system.

Inspection and testing activities were carried out with precision and attention to detail. Suitable tests were selected and executed correctly, with equipment set up and used safely and competently. Readings and outputs were systematically compared with manufacturer specifications, with discrepancies identified and addressed appropriately.

The candidate's technical report demonstrates their comprehensive understanding of the principles and processes involved in mechanical maintenance. It provides a detailed and accurate evaluation of the completed tasks, techniques, and methods used. The candidate used industry-standard technical terminology consistently and appropriately across the written report and supporting documentation, making it clear and accessible to both technical and non-technical audiences.

Finally, the candidate provided well-founded recommendations for changes to maintenance processes and procedures, with detailed reasoning and appropriate scheduling for future maintenance activities.

Overall, the candidate's work reflects systematic planning, logical execution, comprehensive technical knowledge, accurate fault diagnosis and resolution, and consistently high standards of safe working practice.

Get in touch

The City & Guilds Quality team are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

Should you require assistance, please contact us using the details below:

Monday - Friday | 08:30 - 17:00 GMT

T: 0300 303 53 52

E: **technicals.quality@cityandguilds.com**

W: **http://www.cityandguilds.com/tlevels**

Web chat available **here**.