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

8712-311 Mechanical Occupational Specialism

Grade Standard Exemplification Material

Pass - Summer 2025

Version 1.0

Version and date	Change detail	Section	Question
v1.0 31st October 2025	First published		

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 pass 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 pass grade displays the holistic standard required across the tasks to achieve the pass grade boundary in the summer 2025 series.

The aim of these materials is to provide examples of knowledge, skills and understanding that attested to **six marks above** pass standard (threshold 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 pass 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. Candidate evidence that was or was not included in this Grade SEM has also 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 provider assessors. This was evidence that was captured as part of the assessment and then internally marked by the provider 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, scored six marks above the pass grade boundary. However, performance across the tasks may vary (i.e. some tasks completed to a higher/lower standard than pass grade).

Grade descriptors

To achieve a pass (threshold competence), a candidate will be able to:

Interpret technical information, plan, assess risk and follow safe working methods appropriately when applying practical skills to an acceptable standard to satisfy the requirements of the brief.

Adequately prepare working areas to allow safe working, acknowledging potential risks and applying acceptable housekeeping techniques during tasks.

Demonstrate basic technical skills for diagnosing components, assemblies and sub-assemblies to complete maintenance, installation and repair activities, in line with the requirements of the brief.

Demonstrate adequate skills using tools and equipment for mechanical maintenance, installation and repair, ensuring safe isolation, removal and replacement of components.

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

Work safely showing an understanding and suitable level of awareness in the preparation and application of processes, selection and use of tools, equipment, materials and components for maintenance, installation and repair activities.

Mostly use industry and technical terminology accurately across different communication methods with some 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	A list of requirements and resources, including justifications for the selections Completed 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 – Scope of work

Project name- annual maintenance on pillar drill
Activity- repairing the chuck to rotate smoothly and annual maintenance.

Scope of work

With this work I have been told by the customer that their machine is in need of annual maintenance. They have also told me that there chuck isn't running to the correct drill speeds at a constant speed. My job is to investigate this and find out what the probable cause could be.

There are a few different possibilities that could be causing the drill speed to not be constant and I will go through these and probable causes.

1) The first possible cause could be that the motor is not getting enough power. If the motor is lacking in power, it cannot produce a constant speed if there is constant jittering in power this can be checked by voltage current all the time.

2) The next possibility is that there could be a lot of slip on the belts in the pulley housing. This means if the belts are constantly slipping it will change the speed of the chuck as there not gripping onto the pulleys. This can be checked my seeing if the belt tensioner is working. If this is not, then I will need to open the machine to fix this. Once this is done, I can then check if the belts stop slipping. If they still do, I can check the tightness of the belts to make sure that they are still on the pulleys I can also check the pulleys for any oil or dirt that could be causing them to slip.

3) The third and final possibility is that the machine is not oiled and lubricated up correctly. If this is the case and the machine is being starved of oils or lubricant the dry metals will grip to much and slow and speed up. However, this can be the same for over oiling or lubricating as then there will be to much slip on the machine and this can also cause irregular drill speeds.

Task 1 – Risk Assessment

With this work there are many risks that are involved with this job and can be life changing. I will now go other the risks I have discovered from the possibilities of what could be causing the problem.

The risks will be from low to high on a scale of 1-9 this scale will be found above the risks.

x	1	2	3
3	3	6	9
2	2	4	6
1	1	2	3

With this 1-3 is low risk there colours go from light green to a more darker to indicate that as the numbers go up they become a higher risk.

4-6 these are more serious risks and again they change in colour as they progress up.

7-9 there your highest risks, ones that can change peoples lives or if not worse. These risks are to be avoided at all costs.

Risk	Risk level	Justification
Lose objects	Level 7/ high	This can be caught when the machine is in use. Or lose objects on the machine can fly off so it is best to check machine first
Incorrect ppe	Level 9/ high	Without the correct PPE you can injure yourself badly. Its always best to wear to much PPE than to little and always look for signs that will tell you what PPE is required
Not cleaning the machine down	Level 6/ medium risk	This can be as simple as a little dust or whole workpieces left on the machine. This is key before working on the machine assess and clean the machine to make sure that there is no chance of injury
Incorrect parts	Level 8/ high	This could cause the machine to malfunction due to the machine not being used correctly
Cuts, scrapes and bruises	Level 2/ low	This can become a higher risk but if it is treated correctly and is not left shall be a minimal risk. It can also become a higher risk if not logged.

Trip hazards	Level 7/ high	This can be a dangerous risk as if leaving tools or loose wires about others or I may trip over this and can cause serious injuries depending on what they land on or knock in to
Liquid spills/ splashes	Level 6/ medium	This is a medium risk if this is cleaned correctly then the risk is minimal. With splashes again it is a medium risk due to if wearing correct ppe you will be protected from any spills or splashes
Electrocution	Level 9 / high	This is an elevated risk due to with working on the motor its electric. This can be safe to work on as long as no power is going into the machine and has been locked out tagged out.
Fire	Level 9/ high	This is a dangerous risk as if the motor catches fire from it being faulty and sparking up a fire or if the machine is not lubricated enough, it will cause a lot of heat and friction which can cause a fire
Parts/ tools falling	Level 5/ medium	With this one the risks of tools not being placed correctly or parts and them falling can be high. To reduce this risk, you could have a tool trolley or table by the workplace, and this will be able to allow safe storage of tools and parts when they are not needed.

These are all the risks that are involved with the repair of the machine and how to avoid them and what to look for.

Task 1 – Resources list

Tools required for the work carrying out.

For this I will be going over what tools are needed for the repair and maintenance and why they are needed. This will give an idea of what the tool Is and why my purpose for needing it for the repair.

Tool	justification
Torque wrench	I will need this tool to be able to torque the chuck back to the correct specification when I have completed the work this is to stop the chuck falling off
Socket set	This will be needed to remove nuts and bolts that I cannot remove and will need extra support on reaching.
Bearing puller	This is to remove the bearings from the pulley and to be able to assess the pulleys and bearings
Allen keys	To remove screws with hexagon shapes bolts
screwdriver	This is to be able to remove any screws on the machine such as the pulley housing as they are screwed into the machine.
Spanner	To remove any bolts with the socket set and use for easier to reach bolts
Needle nose pliers	To remove any clips that are holding in bearings and to remove any small fine parts
voltmeter	To be able to check that the motor is receiving the correct voltage and that it is running smoothly
Impact drive	To remove the bolt holding the chuck in to begin with.

These are what tools are needed for the job and task.

With this I will also need ppe, these will be safety shoes to make sure that any falling objects will not hurt my foot, overalls to create an extra barrier between myself and any possible liquid spills or if anything rips it. Safety goggles, these are important especially working with liquids as these protect your eyes if anything splashes.

And safety gloves these are to protect your hands from any corrosive oils or greases that may be harmful to skin they create an extra barrier to your hands.

And ear defenders. This may be needed if the machine emits a higher volume of sound or if using the impact drill, it gets to loud.

Responsibilities

As part of this there are many responsibilities. We have me the mechanical maintenance engineer who will be conducting the work.

We have my supervisor who I will be reporting to on what has been happening and having him sign off on the work or letting me know if things I have missed and need to go back and do.

There is also a health and safety officer who would have checked to make sure that it was safe for me to conduct this work and make sure that I am safe while doing the job. However, it is also still my job as the engineer to look out for any risks as part of this and eliminate then to the best of my ability.

And then there is also the customer who I will be reporting to on what work I have conducted on their machine and when there next annual service for the machine will be.

Task 1 – Method statement

What steps will be completed to find the problem.

Firstly, the annual maintenance will be completed. This will be checking the machine over making sure that everything is working correctly and that the machine is greased up and is completely clean and ready for use. Once we have completed this we can move onto the next steps to find the fault on the chuck for an irregular speed.
With this I discovered three different possibilities and will go through them in detail and how I can find the true fault.

Firstly, we can check the voltage of the motor, I will do this by getting a voltmeter and checking that when the power is on that the motor is getting the correct voltage it needs. Once we have done this if the voltage is not to the correct voltage, I will fault find till I find the fault and fix it. If the voltage is at the correct voltage and is maintaining this voltage I will move onto the next possible problem.

We will check the belts to make sure that they are tight and not slipping on the pulleys. We can do this by looking at how much tension is on the belts this can be visual or physical by giving a tug on the belts. If the belts are moving quite a lot without me having to pull on them this can be a cause for concern as this means that they are not sitting properly on the pulleys and are slipping and moving. To fix this we can either see if the tensioner on the pulleys is in or replace the belts and see what happens when you replace them.

Upon checking the belts, if they are fine are third and final check will be to make sure that the machine is oiled and greased up correctly. If they are not this can cause friction and heat which can warp the metal parts and could cause the chuck to be slipping so you would need to lubricate these up to stop this. However with the third one there is a chance that the chuck or pulleys are over lubricated meaning they can also either stick for being to lubricated and this drying up or that there is so much it will constantly slip as there isn't a good point for grip, if this is the case then you will need to clean up the machine and make sure that there is no excess oils or grease on the machine and then refit and re lubricate.

For all these the best tests to begin with will be to run the machine and find out what this could be if it is the motor I will remove all power from the machine. I will then use 12mm-14mm sized sockets and spanners to be able to remove the motor. I will then use screwdrivers to open it up and find the fault within. This could be something simple as dirt build up in the motor has caused it to fail as connections have gotten to dirty.

Once I have found the fault and fixed it, I will put the motor back on and perform testing which will be observed by my supervisor to make sure that I have gotten everything correct.

Emergency procedures

In the event of a fire, I will leave all the work that I am doing in a safe manner and go to my nearest fire exit. Upon doing that I will report to my nearest muster point and wait for further instruction. As part of the emergency procedures, I will make sure that all access to the room from all doors are always clear making it an easy escape from anywhere within the room.

Service and maintenance.

With the service and maintenance, I will be checking that the machine is working in full order after the repair has been carried out. This means that I will be checking that the belts are not cracking or wearing down, checking that the vice hasn't got drill holes through and is still safe

to use and hold things, checking that its oiled correctly and got enough grease within it and that correct ones are or have been used. This will also be checking for damage to the machine such as dents cracks holes and other. If any of these do arise it will be repaired.

The maintenance will also check that all the interlocks are working perfectly and that they stop the machine when they are triggered such as opening the pulley housing or not putting the guard on properly.

This will also involve cleaning the machine to make it safer and easier to spot any damage or cracks happening to the machine.

Conclusion

In conclusion I believe that the chuck has got irregular speeds due to a lack of power in the motor. This is mainly due to the fact that the motor will be able to keep it at a constant speed. I will however check other ideas I have brought up as it may not be the motor, but I will check them to make sure that I have managed to fault find and possibly stop something else breaking down on the machine fully.

Sign off.

Engineer name- <candidate>

Engineer signature- <candidate>

Supervisor name- _____

Supervisor signature- _____

Task 2 Perform and record 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)	2
Evidence title / description	Completed test record sheets Updated maintenance record and control documents Annotated method statement, including any recommendations for further investigation if required 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 – Pillar Drilling Machine Test Record Sheet

Pillar Drilling Machine Test Record Sheet

Date: _ [redacted] Machine ID: _ [redacted]

Operator: _ [redacted] Location: _ [redacted]

	CORRECT	INCORRECT	RECTIFIED
Safety: Pre-Operation Checks:			
Visual Inspection:			
The guards are correctly fitted and in good condition	✓		
The emergency stops well fitted and working efectively	✓		
The drill in good condition with no visible damage		✓	
The drill has been left clean with no risidua swarf visible	✓		
The drill is correctly isolated when not in use	✓		
All interlocks checked and functional	✓		
Table moves up and down and clamps easily	✓		
Work vice firmly fixed and fit for purpose	✓		
Electrical connections; cables safe and intact	✓		
Lubrication:			
Lubrication points	✓		
Coolant System: Not applicable			
Coolant level:			
Coolant flow:			
Operational Checks			
Spindle Speed:			
Speed setting:	✓		
Actual Speed	✓		
Feed Rate:	✓		
Feed Rate:			
Feed setting:	✓		
Actual feed:	✓		
Drive Belt Condition:			
Tensioned correctly	✓		
No crack / breakages / signs of frailing	✓		
Noise and Vibration:			
Noise level:	✓		
Vibration level:	✓		
Declaration			
The pillar drill is safe to use	✓		

Inspector [redacted]

Signature

[redacted]

Print Name in CAPITAL letters

Task 2 –Test Record Sheet

NAME- <candidate>

TEST RECORD- 001

TEST TYPE- MAKING SURE CHUCK WILL SPIN WHEN CUTTING WORKPIECE

Equipment

The equipment I was using was the jet JDP 17FT. this machine had a problem with its chuck not rotating and cutting properly.

The equipment used to fix this was,

- A socket set, this was to make sure that any nuts were able to be tightened up and wouldn't be lose
- A screwdriver, this was to make sure that I could replace the screws within the pulley housing.
- Hydraulic press, this was to be able to put the bearings back into the pulley.
- Hammer, to be able to put the swivel part back into the pulley to be able to freely move to whatever side for tension.
- Ratchet spanner, this was to be able to tighten up the bolt on the table feed handle to put it on the flat part so it wouldn't move about and cause a problem within the
- Allen key, to undo the ring which holds the table feed in and lower it to hold it in.

Environment

I have carried out this work in a workshop. The environment was dirty around the machine to begin with but before carrying out any work I have made sure it was cleaned up to the best of my ability.

Once I done this with the tools around me I started to make good use of finding what the problem to the machine was and used tools provided to fix this.

TEST PROCEDURE

The pillar drill had a problem where when the drill piece entered the workpiece it stopped spinning this was caused by belts being to lose and slipping.

What I done first was I decommissioned the machine. I done this by taking all power away from the machine this meant taking the power cable out at both ends to stop the power. This meant that the machine was out of order for use as I had moved the power cable away and switched off at the wall.

I also made sure that when decommissioning the machine that I cleaned it off as there was a lot of metal shavings on there. I made sure that these were disposed off in there correct waste bins.

I then looked over the machine to find the fault and I done this by removing the pulleys from the housing as there was no bearings in them. This was one cause of this stopping the machine from working as it had a random cylinder block in the pulley.

The record of faults is in the maintenance repair records. This means that whoever comes to repair this machine next will need to look at the records before starting any work. This will be able to tell them what work has been done and what work to look out for.

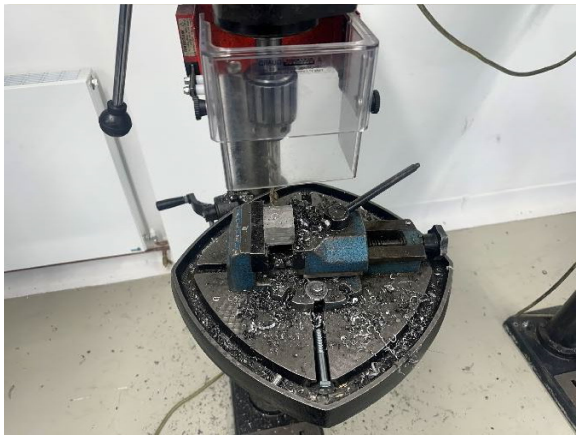
Repairs and faults that were found were that the bearings needed to be put back into the pulley for it to work correctly. Once I had done this I had checked again to see if this was the fix, but it still hadn't fixed my problem. Upon further inspection I have found that the belt tensioner lock wasn't on the machine. This was causing the belts to not stay at the correct tension and meant that it couldn't cut properly. Upon fitting this back into the machine, it locked into place and the machine works completely fine now.

I carried these the repairs by using a hydraulic press to put the bearings into the pulley to make sure that they were firmly in there and safely not coming out. I also made sure that no power to the machine was able to happen before work. This meant that it would be safer to carry out the repairs that were needed. I also looked for the belt tensioner and was making sure that the belt tensioner was working properly. I also fixed the table lowering handle as it wasn't sitting properly on the peg meaning it was harder to raise or lower the table as it would slip more.

Safe use of tools, I used a variety of tools but before each use made sure that there was the correct PPE being worn. I also made sure that when working with the ladder that before climbing up onto it that it was safe and secure before use. This meant making sure that the floor is clean and it wouldn't slip, it was also checking that the arms on the ladder were locked in and wasn't going to break when I used it. I also used the tools that were provided to me in there correct use. This meant that I wasn't trying to use a hammer for a screw etc. I used every tool to its correct purpose.

Reinstating work area, once I had completed the work and was happy with what I had done I had to reinstate my work area. I done this by making sure that all the tools that had been used was stored away correctly in there correct positions. I then also made sure that the machine was clean from any testing that I had done with the drill. This meant that whoever used it next can use it safely as its ready to be used.

tools that were used for the work



before cleaning and during decommissioning

this is the pulley without any form of bearings in.

these pictures represent what it looked like before I done any work to them and what tools I used for the job

Task 2 - Maintenance records and schedule

Maintenance records for pillar drill

Service no	Maintenance date	Maintenance type (scheduled/ routine, fault/repair)	Checked by	Repair details	Maintenance engineer signature
1	03/04/2025	Annual maintenance	<candidate>	In this I checked over the machine to see for any faults. No faults found and cleaned the machine to make cleaner and easier to see faults on machine	
2	03/04/2025	repair	<candidate>	-With these bearings on pulley were gone so had to repair this - also had to put in screws into the pulley housing to stop movement of this - put a belt tensioner lock back onto the machine so it would be held into place and will not loosen and stop drilling	

Maintenance schedule for the pillar drill

Service no	year	Detail inspection	Recommended planned maintenance for future	Maintenance head engineer signature	Maintenance engineer signature
1	2025	Scheduled/routine and repair/fault	Annual- routine/ scheduled	xx	<candidate>
2					
3					

Commentary

Service number	Recommendations for future maintenance activity
1	Check the pulley and make sure that the bearings haven't come lose or the belt tensioner lock hasn't come off or away from the machine

Task 2 – Annotated Method Statement

Project name- annual maintenance on pillar drill
Activity- repairing the chuck to rotate smoothly and annual maintenance.

Scope of work

With this work I have been told by the customer that their machine is in need of annual maintenance. They have also told me that there chuck isn't running to the correct drill speeds at a constant speed. My job is to investigate this and find out what the probable cause could be.

There are a few different possibilities that could be causing the drill speed to not be constant and I will go through these and probable causes.

1) The first possible cause could be that the motor is not getting enough power. If the motor is lacking in power, it cannot produce a constant speed if there is constant jittering in power this can be checked by voltage current all the time.

2) The next possibility is that there could be a lot of slip on the belts in the pulley housing. This means if the belts are constantly slipping it will change the speed of the chuck as there not gripping onto the pulleys. This can be checked my seeing if the belt tensioner is working. If this is not, then I will need to open the machine to fix this. Once this is done, I can then check if the belts stop slipping. If they still do, I can check the tightness of the belts to make sure that they are still on the pulleys I can also check the pulleys for any oil or dirt that could be causing them to slip. (I can also check to make sure that bearings are in there. I can do this by checking that the pulleys have the correct amount of bearings in them)

3) The third and final possibility is that the machine is not oiled and lubricated up correctly. If this is the case and the machine is being starved of oils or lubricant the dry metals will grip to much and slow and speed up. However, this can be the same for over oiling or lubricating as then there will be to much slip on the machine and this can also cause irregular drill speeds.

Risk Assessment

With this work there are many risks that are involved with this job and can be life changing. I will now go other the risks I have discovered from the possibilities of what could be causing the problem.

The risks will be from low to high on a scale of 1-9 this scale will be found above the risks.

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7-9 there your highest risks, ones that can change peoples lives or if not worse. These risks are to be avoided at all costs.

Risk	Risk level	Justification
Lose objects	Level 7/ high	This can be caught when the machine is in use. Or lose objects on the machine can fly off so it is best to check machine first
Incorrect ppe	Level 9/ high	Without the correct PPE you can injure yourself badly. Its always best to wear to much PPE than to little and always look for signs that will tell you what PPE is required
Not cleaning the machine down	Level 6/ medium risk	This can be as simple as a little dust or whole workpieces left on the machine. This is key before working on the machine assess and clean the machine to make sure that there is no chance of injury
Incorrect parts	Level 8/ high	This could cause the machine to malfunction due to the machine not being used correctly
Cuts, scrapes and bruises	Level 2/ low	This can become a higher risk but if it is treated correctly and is not left shall be a minimal risk. It can also become a higher risk if not logged. (I can also be prone to getting my fingers caught in the belts of the pulley which can pull at the skin and cause pinches)
Trip hazards	Level 7/ high	This can be a dangerous risk as if leaving tools or loose wires about others or I may trip over this and can cause serious injuries depending on what they land on or knock in to (I shall also make sure that the floor is clean from any forms of metal shavings or anything as they can cause trips or injury if landing on them)
Liquid spills/ splashes	Level 6/ medium	This is a medium risk if this is cleaned correctly then the risk is minimal. With splashes again it is a medium risk due to if wearing correct ppe you will be protected from any spills or splashes (If using things such as brake cleaner

		you should use eye protection and gloves as it is irritant to eyes and to the skin.)
Electrocution	Level 9 / high	This is an elevated risk due to with working on the motor its electric. This can be safe to work on as long as no power is going into the machine and has been locked out tagged out. (If the machine cannot be locked out or tagged out I will remove the power cable from machine and wall and put it in a safe place until ready to use again)
Fire	Level 9/ high	This is a dangerous risk as if the motor catches fire from it being faulty and sparking up a fire or if the machine is not lubricated enough, it will cause a lot of heat and friction which can cause a fire (This is also a high risk as if cleaning the machine the brake cleaner is a highly flammable chemical. This shouldn't be overused or left laying about as if a fire starts this will ignite and cause larger fires)
Parts/ tools falling	Level 5/ medium	With this one the risks of tools not being placed correctly or parts and them falling can be high. To reduce this risk, you could have a tool trolley or table by the workplace, and this will be able to allow safe storage of tools and parts when they are not needed.

These are all the risks that are involved with the repair of the machine and how to avoid them and what to look for.

Tools required for the work carrying out.

For this I will be going over what tools are needed for the repair and maintenance and why they are needed. This will give an idea of what the tool Is and why my purpose for needing it for the repair.

Tool	justification
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Socket set	This will be needed to remove nuts and bolts that I cannot remove and will need extra support on reaching.

Bearing puller	This is to remove the bearings from the pulley and to be able to assess the pulleys and bearings
Allen keys	To remove screws with hexagon shapes bolts (I can also use these to tighten the ring which holds the teeth in place to help move up and down the table)
screwdriver	This is to be able to remove any screws on the machine such as the pulley housing as they are screwed into the machine.
Spanner	To remove any bolts with the socket set and use for easier to reach bolts (I can also use ratchet spanners to help with the repair on the machine)
Needle nose pliers	To remove any clips that are holding in bearings and to remove any small fine parts
voltmeter	To be able to check that the motor is receiving the correct voltage and that it is running smoothly
Impact drive	To remove the bolt holding the chuck in to begin with.

These are what tools are needed for the job and task.

With this I will also need ppe, these will be safety shoes to make sure that any falling objects will not hurt my foot, overalls to create an extra barrier between myself and any possible liquid spills or if anything rips it. Safety goggles, these are important especially working with liquids as these protect your eyes if anything splashes.

And safety gloves these are to protect your hands from any corrosive oils or greases that may be harmful to skin they create an extra barrier to your hands.

And ear defenders. This may be needed if the machine emits a higher volume of sound or if using the impact drill, it gets to loud.

Responsibilities

As part of this there are many responsibilities. We have me the mechanical maintenance engineer who will be conducting the work.

We have my supervisor who I will be reporting to on what has been happening and having him sign off on the work or letting me know if things I have missed and need to go back and do.

There is also a health and safety officer who would have checked to make sure that it was safe for me to conduct this work and make sure that I am safe while doing the job.

However, it is also still my job as the engineer to look out for any risks as part of this and eliminate then to the best of my ability. (It is also part of my job to when disposing any materials or dirt to dispose of them in there correct bins. This reduces contaminated waste as some parts of rubbish can be melted down and re used)

And then there is also the customer who I will be reporting to on what work I have conducted on their machine and when there next annual service for the machine will be.

What steps will be completed to find the problem.

Firstly, (I will make sure that the machine is clean and able to be worked on as without a clean surface and work. This means that when clean I can find the problems within the machine easier and makes a safe working space. Once completed...) the annual maintenance will be completed. This will be checking the machine over making sure that everything is working correctly and that the machine is greased up and is completely clean and ready for use. Once we have completed this we can move onto the next steps to find the fault on the chuck for an irregular speed.

With this I discovered three different possibilities and will go through them in detail and how I can find the true fault.

Firstly, we can check the voltage of the motor, I will do this by getting a voltmeter and checking that when the power is on that the motor is getting the correct voltage it needs.

Once we have done this if the voltage is not to the correct voltage, I will fault find till I find the fault and fix it. If the voltage is at the correct voltage and is maintaining this voltage I will move onto the next possible problem.

We will check the belts to make sure that they are tight and not slipping on the pulleys. (At the same time I can check to see if all the pulleys have the correct bearings in and that there is no foreign objects in the pulley housing) We can do this by looking at how much tension is on the belts this can be visual or physical by giving a tug on the belts. If the belts are moving quite a lot without me having to pull on them this can be a cause for concern as this means that they are not sitting properly on the pulleys and are slipping and moving. To fix this we can either see if the tensioner on the pulleys is in or replace the belts and see what happens when you replace them (I can also check to see if the tensioner lock is on the machine. If not then the belts will not sit and will loosen so the lock will hold them in place while then machine runs).

Upon checking the belts, if they are fine are third and final check will be to make sure that the machine is oiled and greased up correctly. If they are not this can cause friction and heat which can warp the metal parts and could cause the chuck to be slipping so you would need to lubricate these up to stop this. However with the third one there is a chance that the chuck or pulleys are over lubricated meaning they can also either stick for being to lubricated and this drying up or that there is so much it will constantly slip as there isn't a good point for grip, if this is the case then you will need to clean up the machine (From any rust or dirt. You can use brake cleaner to clean the machine and WD40 to make sure everything is cleaned and smoothly running) and make sure that there is no excess oils or grease on the machine and then refit and re lubricate.

For all these the best tests to begin with will be to run the machine and find out what this could be if it is the motor I will remove all power from the machine. I will then use 12mm-14mm sized sockets and spanners to be able to remove the motor. I will then use

screwdrivers to open it up and find the fault within. This could be something simple as dirt build up in the motor has caused it to fail as connections have gotten to dirty.

Once I have found the fault and fixed it, I will put the motor back on and perform testing which will be observed by my supervisor to make sure that I have gotten everything correct.

Emergency procedures

In the event of a fire, I will leave all the work that I am doing in a safe manner and go to my nearest fire exit. Upon doing that I will report to my nearest muster point (And inform them of what has been happening in the room of where I work so they know whats been happening and what chemicals could be out. Eg brake cleaner, grease, pressured air) and wait for further instruction. As part of the emergency procedures, I will make sure that all access to the room from all doors are always clear making it an easy escape from anywhere within the room.

Service and maintenance.

With the service and maintenance, I will be checking that the machine is working in full order after the repair has been carried out. This means that I will be checking that the belts are not cracking or wearing down (or making sure that they are not slipping), checking that the vice hasn't got drill holes through and is still safe to use and hold things, checking that its oiled correctly and got enough grease within it and (And also checking that the machine hasn't been over greased as this can also cause problems for the machine) that correct ones are or have been used. This will also be checking for damage to the machine such as dents cracks holes and other. If any of these do arise it will be repaired.

The maintenance will also check that all the interlocks are working perfectly and that they stop the machine when they are triggered such as opening the pulley housing or not putting the guard on properly.

This will also involve cleaning the machine (And making sure that the area around the machine is clean and there is space all round the machine) to make it safer and easier to spot any damage or cracks happening to the machine.

Conclusion

In conclusion I believe that the chuck has got irregular speeds due to a lack of power in the motor. This is mainly due to the fact that the motor will be able to keep it at a constant speed. I will however check other ideas I have brought up as it may not be the motor, but I will check them to make sure that I have managed to fault find and possibly stop something else breaking down on the machine fully.

Sign off.

Engineer name- <candidate>

Engineer signature- <candidate>

Supervisor name- _____

Supervisor signature- _____

Task 2 - Updated Maintenance Schedule

8712-311 Mechanical - 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	JS	• no faults or repairs required. • system functionality as per specification.	J Smith
02	04/10/2023	fault/repair	JS	• snapped drive belt. Replaced, re-tensioned and tested. • greased all grease nipples and lubricated necessary components.	J Smith
03	28/5/2024		AB	• drilling table set perpendicular to shaft and spindle	A Bloggs

		scheduled/routine, fault/repair		• greased all grease nipples and lubricated necessary components. • stepped pulley incorrectly/loose fitted (spindle) – refitted the stepped pulley to the spindle.	
04		**Repair**	**XX**	• **Repaired the pully** • **Cleaned the machine** • **Replaced tension lock**	**<candidate>**
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	D Jones	J Smith
02	2023	fault/repair	annual - scheduled/routine, fault/repair	D Jones	A Bloggs
03	2024	scheduled/routine and fault/repair	annual - schedule/routine + fault/repair	D Jones	A Bloggs
04	2025	scheduled/routine and fault/repair			
05	**2026**	**Schedule and repair**	**schedule**		

Commentary	
Service No	Recommendations for future maintenance activity
04	Machine was cleaned best as possible look at the pulley on Next service.

Task 2 - Practical Observation Form

8712-312 Maintenance Engineering Technologies: Mechatronic - 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
Maintenance activities	• decommissioning and inspection of the system • disassembly and reassembly of the system • diagnosis and recording of faults within the system, including carrying out appropriate tests • repairing the faults and replacing components • use of tools and equipment • recommissioning of the system • demonstration of machine functionality to the supervisor • re-instating the work area.	• Health and Safety • Planning and Preparation • Systems and Components

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: Candidate first started with cleaning of m/c with a paint brush, then swept the area around the machine, collected all the rubbish and disposed of the rubbish correctly, metal swarf to recycle bin, the rest to landfill rubbish. They started dismantling the machine before they remembered to put barriers around the machine.

Service and maintenance activities:

- 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.

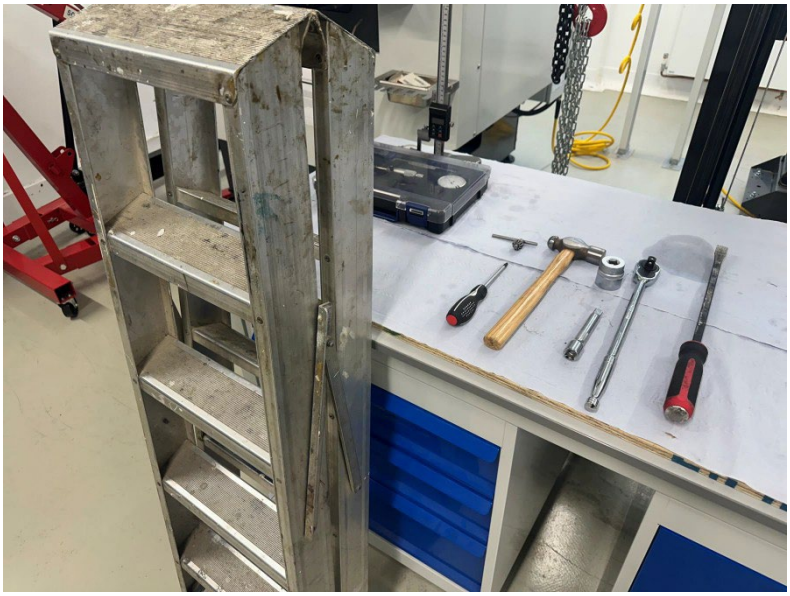
Candidate was very quick in decommissioning and performed the inspection of the pillar drill as if on a pit stop challenge. They used the appropriate tools safely.
During an initial check, they spotted the first fault and quickly repaired it.
Eventually they found all the faults and repaired them as quickly as they had started.

The candidate used their selection of appropriate tools safely.

When all the tasks were done, they demonstrated the functionality of the pillar drill to me.
The work area was re-instated as safe as expected.

Internal assessor signature	Date

Task 2 – Photographic evidence



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

The purpose of this work was to carry out maintenance and repair on the pillar drill and to make sure that it was able to be running without any problems.

I used different methods to find the faults and to make sure that this was able to find the main fault and to be able to repair the machine.

Table of contents

In this section I will give a very brief description of what happened and what different parts of work was done to the machine.

Task	description
repair	In this I repaired the machine so it was back to working order
Service/maintenance	I made sure that the machine wasn't damaged anywhere else and made sure that the machine was functioning properly
cleaning	I made sure to clean up the machine of any dirt and that it was in pristine condition for working.
Stock levels and waste	What stock I used and where I put waste.

Methodology

In this section I will go into detail with everything step by step. I will be going off the table of contents to make sure that it is all correct to the machine I have been working on.

To begin with I made sure that the machine was clean and ready to use before starting any work on the machine. This was to stop any injuries and to also make sure that I could see clearly what was happening with the machine. Once I had done that I discovered that the chuck wouldn't rotate properly when entering a material. I first isolated all power before starting any work, after this I found this fault to be with the pulleys not having a bearing I got to work on repairing them and making sure that the pulleys had bearings in and that they would run smoothly.

Once I had done this it was fitting it all back to the machine and then performing tests to make sure that the problem I had seen had been rectified. Upon fitting everything back and reinstating power to the machine I found that this was all fixed and was running smoothly.

I then went onto completing the maintenance for the machine checking that everything was working correctly and was as it should be. This included checking the pulleys for no cracks the belts for no cracks. Once I had done this I checked all the different speeds of the pulley to make sure that it worked and that there was a change in the speeds. I also made sure that the table moved freely without any problems and that it could move side to side as well as up and down. I made sure that the vice was in good order but had quite a few drill holes in so further maintenance will be needed on that.

With all of this health and safety was the main priority. So before entering the workshop I made sure that I had the correct PPE on and was making sure that it is all up to standard and wasn't damaged. Once I had done this I had entered the workshop with overalls, safety boots, gloves and goggles and started working on the machines.

Stock levels and waste. With this I made sure that all of our waste went into the correct bins so they could be sent off safely and made sure that they were being dealt with correctly. This meant that no waste was being contaminated and being disposed of incorrectly.

With stock levels I managed to make sure that I had the correct levels for things and that there was no shortage. I also made a log of every tool and part that was used to stop me forgetting them but to also know what to order for next maintenance.

Results

In this section I will be going over what I found and how they differed from when I started the project before starting any work.

The tests went smoothly without any fail. I ran a few tests to makes sure that once I had completed the repair that the machine ran smoothly. The first test I checked was that when it went into a material the chuck wouldn't stop. This was successful as the drill piece started to cut through the workpiece.

After this I changed the speeds on the drill to see if changing speeds worked. This was also successful as they changed speeds and responded well to the change on the drill speeds.

I also tested the table and vice to make sure that the vice opened and closed smoothly which it did and checked that the table moved freely without having to put any force into it. This was successful however the table had to be sprayed with WD-40 for it to loosen up a bit and to move more freely.

Conclusion

In conclusion the main and key findings are that the pulleys had been tampered with as they didn't have the correct bearings in them. They also had problems with the chuck allowing it to go through the workpiece which was fixed.

Other main findings are that the table can become very stiff raising if it isn't used or cleaned properly. This can be to previous poor maintenance or just not good upkeep of the machine.

In meantime, customer should be checking regularly that the belts are not cracking, fraying or snapped and should also keep up with good Housekeeping on the machine and making sure that it is clean and in a good state to use without injuries or anything else.

If this is kept up to date I believe that the next review of the machine should only be a service.

In saying that I will create below a maintenance sheet and what next steps for the next annual maintenance should have and any notes for it.

Red is from task 2, the rest is task 3 with justification

Service no	year	Detailed inspection	Recommended planned maintenance for future	Maintenance head engineer signature	Maintenance engineer signature	Justification
1	2025	Scheduled routine and repair	Annual routine/ scheduled	xx	<candidate>	N/A
2	2026	Scheduled maintenance	Annual routine/ fault and repair	N/A	N/A	I believe that this can be just scheduled maintenance as everything from, 2025 is in perfect order and doesn't seem to be needing any replacement any time soon. My justification is if the customer keeps care of the machine then It wont need repair in 2026

3	2027	Annual routine/ fault and repair	Annual routine/ scheduled maintenance	N/A	N/A	I believe that repair will be needed in 2027 as if there is no repair in 2026 then parts will wear down especially if nothing is changed in 2026. However, if things are repaired in 2026 then 2027 could just need a annual maintenance instead of repair to. This is based though on how the machine is used and for how long each use.

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 Forms Amended risk assessment
Date submitted by candidate	dd/mm/yy

Task 3B

Assessment themes:

- Reviewing and reporting

You must:

- carry out a peer review on two 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
8712-311	
Candidate name	**Candidate number**
<candidate>	ABC1234
Provider name	**Provider number**
<provider>	
Date	**Series**
dd/mm/yy	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 shows the key to safe working by having a box with how to manage the risks
How appropriate are the recommended control measure and why?	The control measures are appropriate as they go over some of the main injuries caused by the pillar drill
What are the implications to the business of the proposed control measures?	Depending what they are they could slow down the process of the repair.
How could the risk assessment be optimised/improved?	It can be improved on 2 parts 1) create a more details RA with more verios risks to show what coulld happen 2) have a sub heading so theres a better understanding when it starts

Task 3B - Peer Review Form 2

Assessment ID	Qualification number
8712-311	
Candidate name	**Candidate number**
<candidate>	ABC1234
Provider name	**Provider number**
<provider>	
Date	**Series**
dd/mm/yy	Summer 2025

Question	Feedback
How well does the risk assessment enable safe working practices for the planned maintenance activities to be performed?	It provides multiple different hazards that could affect saftey to personel
How appropriate are the recommended control measure and why?	They are appropriete as they give a result of what could happen but also a prevention to protect yourself
What are the implications to the business of the proposed control measures?	Theres alot to look through for a pillar drill would be better if shortened.
How could the risk assessment be optimised/improved?	It's a very detailed and good risk assessment but needs to be shortened or layed out better as theres to many pages

Task 3B – Amended risk assessment

Risk assessment

With this work there are many risks that are involved with this job and can be life changing. I will now go other the risks I have discovered from the possibilities of what could be causing the problem.

The risks will be from low to high on a scale of 1-9 this scale will be found above the risks.

x	1	2	3	4
3	3	6	9	12
2	2	4	6	8
1	1	2	3	4

With this 1-3 is low risk there colours go from light green to a more darker to indicate that as the numbers go up they become a higher risk.

4-6 these are more serious risks and again they change in colour as they progress up.

7-9 there your highest risks, ones that can change peoples lives or if not worse. These risks are to be avoided at all costs.

Risk	Risk level	Justification
Lose objects	Level 7/ high	This can be caught when the machine is in use. Or lose objects on the machine can fly off so it is best to check machine first
Incorrect PPE	Level 9/ high	Without the correct PPE you can injure yourself badly. Its always best to wear to much PPE than to little and always look for signs that will tell you what PPE is required

Not cleaning the machine down	Level 6/ medium risk	This can be as simple as a little dust or whole workpieces left on the machine. This is key before working on the machine assess and clean the machine to make sure that there is no chance of injury
Incorrect parts	Level 8/ high	This could cause the machine to malfunction due to the machine not being used correctly
Cuts, scrapes and bruises	Level 2/ low	This can become a higher risk but if it is treated correctly and is not left shall be a minimal risk. It can also become a higher risk if not logged.
Trip hazards	Level 7/ high	This can be a dangerous risk as if leaving tools or loose wires about others or I may trip over this and can cause serious injuries depending on what they land on or knock in to
Liquid spills/ splashes	Level 6/ medium	This is a medium risk if this is cleaned correctly then the risk is minimal. With splashes again it is a medium risk due to if wearing correct PPE you will be protected from any spills or splashes
Electrocution	Level 9 / high	This is an elevated risk due to with working on the motor its electric. This can be safe to work on as long as no power is going into the machine and has been locked out tagged out.
Fire	Level 12/ high	This is a dangerous risk as if the motor catches fire from it being faulty and sparking up a fire or if the machine is not lubricated enough, it will cause a lot of heat and friction which can cause a fire
Public safety	Level 8/ medium	This can be notifying members of the public that there is work being carried out on the machine and barriers to stop people where they shouldn't go.
Parts/ tools falling	Level 5/ medium	With this one the risks of tools not being placed correctly or parts and them falling can be high. To reduce this risk, you could have a tool trolley or table by the workplace, and this will be able to allow safe storage of tools and parts when they are not needed.

These are all the risks that are involved with the repair of the machine and how to avoid them and what to look for.

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 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 Handover

Handover

in this handover I will be going over all the work I have completed on the pillar drill.
I will go over the main things that I worked on and will describe them in detail.
I will start with the risks that can come with this work that was completed.

The main risks involved with this are that ppe must be worn at all times when you are working on this machine. This is to make sure that you have a protective barrier from your skin

Upon finishing with this I will go onto what I completed on the machine. I will speak on how I fixed the pulley and how I fixed the belt tensioner. I will speak on also cleaning the machine and and making sure that it was ready to be handed over.

I will also speak on the documents produced such as the test record sheets and maintenance sheets and what they are and why there usefull for future.

I will go into detail what with the maintenance sheets and explain what is what to get the best use out of the machine so it doesn't break again

Below is the new risk assessment that has been updated from the peer review. There is some newer risks in there and has been touched up slightly to make sure that everything is within accordance to the machine.

Other appropriate documentation can be provided upon request and should be stored safely away to make sure no risk of loss of documents have happened.

Risk assessment

With this work there are many risks that are involved with this job and can be life changing. I will now go other the risks I have discovered from the possibilities of what could be causing the problem.

The risks will be from low to high on a scale of 1-9 this scale will be found above the risks.

x	1	2	3	4
3	3	6	9	12
2	2	4	6	8

1	1	2	3	4

With this 1-3 is low risk there colours go from light green to a more darker to indicate that as the numbers go up they become a higher risk.

4-6 these are more serious risks and again they change in colour as they progress up.

7-9 there your highest risks, ones that can change peoples lives or if not worse. These risks are to be avoided at all costs.

Risk	Risk level	Justification
Lose objects	Level 7/ high	This can be caught when the machine is in use. Or lose objects on the machine can fly off so it is best to check machine first
Incorrect PPE	Level 9/ high	Without the correct PPE you can injure yourself badly. Its always best to wear to much PPE than to little and always look for signs that will tell you what PPE is required
Not cleaning the machine down	Level 6/ medium risk	This can be as simple as a little dust or whole workpieces left on the machine. This is key before working on the machine assess and clean the machine to make sure that there is no chance of injury
Incorrect parts	Level 8/ high	This could cause the machine to malfunction due to the machine not being used correctly
Cuts, scrapes and bruises	Level 2/ low	This can become a higher risk but if it is treated correctly and is not left shall be a minimal risk. It can also become a higher risk if not logged.
Trip hazards	Level 7/ high	This can be a dangerous risk as if leaving tools or loose wires about others or I may trip over this and can cause serious injuries depending on what they land on or knock in to
Liquid spills/ splashes	Level 6/ medium	This is a medium risk if this is cleaned correctly then the risk is minimal. With splashes again it is a medium risk due to if wearing correct PPE you will be protected from any spills or splashes

Electrocution	Level 9 / high	This is an elevated risk due to with working on the motor its electric. This can be safe to work on as long as no power is going into the machine and has been locked out tagged out.
Fire	Level 12/ high	This is a dangerous risk as if the motor catches fire from it being faulty and sparking up a fire or if the machine is not lubricated enough, it will cause a lot of heat and friction which can cause a fire
Public safety	Level 8/ medium	This can be notifying members of the public that there is work being carried out on the machine and barriers to stop people where they shouldn't go.
Parts/ tools falling	Level 5/ medium	With this one the risks of tools not being placed correctly or parts and them falling can be high. To reduce this risk, you could have a tool trolley or table by the workplace, and this will be able to allow safe storage of tools and parts when they are not needed.

These are all the risks that are involved with the repair of the machine and how to avoid them and what to look for.

Task 4 Practical observation form

8712-312 Maintenance Engineering Technologies: Mechatronic - 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
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 was quite conversant with the terminologies during the handover. They demonstrated how they were able to find the faults and how they were able to fix them safely and successfully.

Internal assessor signature	Date
X _____	dd/mm/yyyy

Principal Moderator Commentary

The candidate has included a risk assessment which identifies some relevant hazards, but it is not well-structured and does not follow a fully standardised approach. Likelihood and severity ratings are inconsistently applied, and some justifications are missing. Nevertheless, there is evidence of basic consideration of safety issues and inclusion of safe isolation procedures, showing a suitable level of awareness.

The candidate's resource list is limited, containing some relevant items and technical documentation, but their justifications are brief and not comprehensive. The list is sufficient to enable the activity to be completed.

The candidate has interpreted technical information to an acceptable standard, applying their practical skills to meet the requirements of the brief. Tasks were completed in a way that was sufficiently systematic and safe, although there were opportunities for greater efficiency and detail.

The working area was adequately prepared with potential risks acknowledged and mitigated to an acceptable level. Basic housekeeping techniques were applied throughout, supporting a reasonably safe and workable environment.

The candidate has demonstrated basic technical skills for diagnosing components, assemblies and sub-assemblies, and has completed maintenance, installation and repair activities in line with the brief. Safe isolation was carried out appropriately, and removal and replacement of components was achieved, though with limited evidence of precision.

The candidate shows a basic understanding of mechanical principles and processes, managing to disassemble, repair, configure, and reassemble mechanical systems with most tolerances and tightening torques applied close to specification.

The candidate's technical report provides a basic summary of the maintenance tasks, techniques and methods used, with some technical terminology applied. In order to improve, more accuracy and depth were needed, as well as more comprehensive evaluation of the process.

Overall, the candidate's evidence shows that they can work safely, apply basic technical skills, and complete the tasks required by the brief to an acceptable standard, meeting the minimum expectations for a pass grade. To achieve a higher-level outcome, more detail, depth, and critical reflection was needed.

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:

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