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Engineering Level 2 Unit 7

Diploma Portfolio Extracts

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Authorised by Nick Kelly
Prepared by Mark Woodcock

Foreword

Welcome to the sample of portfolio guidance extracts for Phase One Principal Learning subjects. We are delighted to continue to add to the range of support materials Edexcel has on offer to further support Consortia in maximising their Principal Learning performance. For our full range of information and guidance across administration, delivery and assessment support please see our website www.edexcel.com/diploma, or contact the DAB delivery team to access our range or training and support.

Purpose

The purpose of these materials is to help practitioners understand the requirements of the Principal Learning unit assessment through review and commentary on extracts of learner work. We have used a selection of learner evidence across a range of learner performance to help improve understanding of how to maximise performance.

This material has been selected and commented on by our Senior Moderation team after the first year of reviewing and setting the standards on the initial cohort of learners. Please ensure to read all of the commentary available as this aims to show how the extracted evidence used is relevant for that mark band and, where possible, what might make it suitable for the other bands.

If you have any feedback or comments regarding these materials, or any of our Diploma services, please contact diplomaops@edexcel.com. Alternatively for further discussion or questions around standards or Principal Learning specifications please use our **Ask The Expert service**, via our website, for a direct response from our Senior team within 2 working days.

Using these materials

The basic principle when awarding marks against the relevant mark grids is that it is 'best fit'. It is not a hurdle approach. Marks may be awarded from the next band if one or more of the items within the marking criteria have been met. With this in mind it is essential when reviewing the enclosed commentaries that you read the comments across all 3 of the marks bands.

All marks awarded on the enclosed sample assignments are for "Marking Grid A" only. The awarding of marks for "Mark Grid B", which is ephemeral, has not been commented on or included in the overall marks awarded.

This work is indicative only, not all learners will approach their assignments in the same way. Similarly, they will not necessarily present their evidence in the same format.

Important note!

The evidence contained within these pages has been extracted from a variety of completed portfolios and not all of the learner's evidence has therefore been included. These extracts are not designed to show you how much work to produce but show different types of evidence that could contribute to a learner's final work.

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Our training events are an ideal opportunity for you to understand the qualification requirements, share experience and learn from emerging practice. The sessions are designed to be practical, stimulating and informative, and are developed each year to reflect the evolving needs of practitioners.

Previewing the Diploma events are Line of Learning specific and designed for practitioners who will be delivering the Principal Learning for the first time, Local authority advisors and Diploma advisors.

Delivery and assessment events cover all of our lines of Principal Learning and are focused on approaches to planning for assessment, writing assignments and assessing learner work.

Developing assignments and assessing learners events cover all of our lines of Principal Learning and will review tutor support materials and will look at developing assignments as well as standardisation exercises.

Online training is an ideal opportunity for you to participate in training without leaving your centre. These events are short in duration, stimulating in content and designed to answer a training need identified by practitioners.

Consortium-based training is for any consortium or group of consortia, working together, who wishes to access our off-the-shelf training, delivered at a time and place of your choice. There is also the option to customise the events to suit your own individual requirements. These events are aimed at consortium managers, assessors and practitioners – in fact, your whole Diploma team!

To book or search for an event visit **www.edexcel.com/training** if you are an Edexcel Online user. If you are not an Edexcel Online user email your request to **trainingbookings@edexcel.com** so our training team can process the booking for you.

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- Administration, procedures and delivery options and requirements
- ASL cross sector model and sector specific model
- Introduction to Diploma planning and roles
- 36 example Delivery Plans across Levels 1 & 2 for Phase I & II Diplomas
- CD-ROM access with practical guidance and useful links

These are available through your local training events or via your DAB Centre Support Officer.

Contact us about this Diploma Sample Portfolio
If you have ideas, comments or suggestions on what went well and what can be improved, please email diplomaops@edexcel.com or call your DAB Centre Support Officer (CSO) on 0844 576 0028.

LO1.1 Examples

Focus
Know about types of maintenance

2

Michael [redacted] LO.1.1 Know about types of maintenance 20/10/[redacted]

Higher L2 diploma. Unit 7

MB1:

Planned: Description: An equipment maintenance strategy based on replacing, overhauling or remanufacturing an item. Plan what you're going to do: service, replace a part, and inspect it. How long it will take to do it so you can tell customer when it will roughly be finished. To know how much it will cost because it's been planned, know whether the garage is empty. What tools are required in the process? For Example: Clean filter on engine.

Corrective: Description: Any maintenance activity which is required to correct a failure that has occurred or is in process of occurring. What you are replacing on the project. How much it will cost: depending on how much the parts cost you. If not carried out it could cause damage to other parts of the project. Example: Urgent repair to car exhaust.

MB2:

Example of **planned maintenance**: car going in for its MOT because you know the exact date when it will be carried out, they know in advance what they are going to check, how much it will cost to carry out, what parts/tools they will need, how much it will cost the customer, how long it will be downtime for.
Example of **corrective maintenance**: Replacing a car exhaust system when it becomes noisy, or when an exhaust leak has been detected. You would have to refer to the car maintenance manual, look in a catalogue for the type of exhaust model.

1

Mark Band 1
Two types of maintenance have been described, however 'corrective' maintenance is not the term used within the specification. Full marks can be awarded from this mark band.

Mark Band 2
Two different types of maintenance have been explained. Although the explanation for the second type is limited the use is appropriate. This means maximum marks can not be awarded from this mark band.

Mark Band 3
'Corrective' maintenance has been justified. This can consolidate the marks awarded from mark band 2 but restricts the total marks that can be awarded from this mark band.

LO1.1 Examples continued

Michael [redacted] LO.1.1 Know about types of maintenance 20/10/[redacted] 3

MB3:

The use of corrective maintenance is because something has broken on a certain project and needs fixing straight away otherwise the project will have to go into downtime (shutdown) until this problem is fixed. When fixed you will need to make sure that it wont break again because the project could be something like a power plant for example which would have to stay in business as long as possible a week. For example: Although you don't except your tyre to pop on a car you would have a spare.

http://www.maintenanceresources.com/referencelibrary/maintenancemanagement/keyterms.htm#C
http://en.wikipedia.org/wiki/Planned_Maintenance_System
http://projgrid.osfc.state.oh.us/download.cgi?F+393
Plant monitoring and maintenance routines R L Timings
Maintenance engineering handbook Lindley R. Higgins R. Keith Mobley

2

Mark Band 1

Two types of maintenance have been described, however 'corrective' maintenance is not the term used within the specification. Full marks can be awarded from this mark band.

Mark Band 2

Two different types of maintenance have been explained. Although the explanation for the second type is limited the use is appropriate. This means maximum marks can not be awarded from this mark band.

Mark Band 3

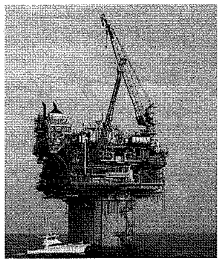
'Corrective' maintenance has been justified. This can consolidate the marks awarded from mark band 2 but restricts the total marks that can be awarded from this mark band.

LO1.2 Examples

Focus
Know about statistical trends

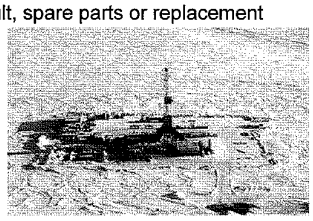
ASSESSMENT TASK **Foundation Diploma Engineering (Level 2)**

Unit: 7 Assignment 1.2 Statistical Analysis

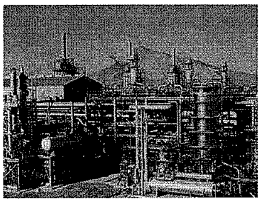


BP has oil drilling facilities in the Middle East, Alaska and the North Atlantic. All their drilling rigs are all fitted with a variable stroke plunger type oil pumps to ensure sufficient lubrication reaches the rotation motor.

When a pump develops a fault, spare parts or replacement parts should be readily available.



It is important to have the correct number of spares in store. If there are too few and several pumps are required at once then oil production would be effected.



On the other hand it would be to expensive to have too many pumps in stock.

To determine the sensible number of spares involves statistical analysis.

Details of pump failures and unscheduled removals from each site over a period of 12 months have been recorded.

Microsoft Excel - Assignment 1.2 Statistics

	A	B	C	D	E	F	G
5		MONTHLY PUMP REMOVALS					
6		Alaska		Middle East		North Atlantic	
7		Uptime hours	Failures	Uptime hours	Failures	Uptime hours	Failures
8	Jan	460	4	600	2	470	4
9	Feb	475	4	600	2	475	3
10	March	520	3	590	3	500	2
11	April	590	2	580	3	525	2
12	May	600	2	595	4	550	2
13	June	600	2	550	4	575	2
14	July	600	3	570	4	570	2
15	August	600	3	595	5	580	2
16	September	590	3	600	3	540	2
17	October	500	4	602	2	500	3
18	November	430	4	590	2	480	4
19	December	430	4	680	1	470	4

Page 2 of 3

Mark Band 1

A statistical method has been used to analyse and evaluate a trend and comments have been made about the relevance. A full range of marks can be awarded from this mark band.

Mark Band 2

Calculations have been included and conclusions drawn so a full range of marks can be awarded from this mark band. The use of a spreadsheet has enhanced the visibility of the trend of failure rates.

Mark Band 3

No discussion has shown how MTTF can act as an aid to determining equipment reliability so no marks can be awarded.

LO1.2 Examples continued

ASSESSMENT TASK **Foundation Diploma Engineering (Level 2)**

Unit: 7 Assignment 1.2 Statistical Analysis

MB1. a. Calculate the Failure Rate for each month at each site in Excel and from the resulting calculations develop a graph for each site indicating the failure rate.

b. Describe how the failure rate trend compares for each site.

c. State what the relevance and value of each trend indicates.

MB2. a. Calculate the MTTF (Mean Time to Failure) of pumps at **each** site in Excel and from the resulting calculations develop a graph for each site indicating the MTTF.

b. Calculate what the average MTTF of pumps across **all** sites would be.

c. Indicate which site would be required to keep most pumps in stock.

d. What is indicated when you compare the three MTTF graph to the Failure Rate graphs?

MB3. a. In Microsoft Word explain what (in this scenario) could be the likely consequences of not observing maintenance statistical data.

b. Describe how statistical data can be used to predict the reliability of a plant, product or piece of equipment and reduce downtime.

Page 3 of 3

Mark Band 1
A statistical method has been used to analyse and evaluate a trend and comments have been made about the relevance. A full range of marks can be awarded from this mark band.

Mark Band 2
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Mark Band 3
No discussion has shown how MTTF can act as an aid to determining equipment reliability so no marks can be awarded.

LO1.2 Examples continued

Michael

LO.1.2 Know about statistical trends

MONTHLY PUMP REMOVALS

	Alaska a:			Middle East a:			North Atlantic a:			
	Uptime Hours	Failure Rate	MTTF	Failures	Uptime Hours	Failure Rate	MTTF	Failures	uptime hours	MTTF	Failure Rate	Failures
Jan	450	0.008	112.5	4	600	0.003	300	2	470	117.5	0.008	4
Feb	475	0.008	112.5	4	600	0.003	300	2	475	158.3	0.006	3
March	520	0.005	173.3	3	590	0.005	196.6	3	500	250	0.004	2
April	590	0.003	295	2	580	0.005	193.3	3	525	262.5	0.003	2
May	600	0.003	300	2	595	0.006	148.75	4	550	280	0.003	2
June	600	0.003	300	2	550	0.007	137.5	4	575	287.5	0.003	2
July	600	0.005	200	3	570	0.007	142.5	4	570	265	0.003	2
August	600	0.005	200	3	595	0.008	119	5	580	290	0.003	2
September	590	0.005	196.6	3	600	0.005	200	3	540	270	0.003	2
October	500	0.008	125	4	602	0.003	301	2	500	166.6	0.006	3
November	430	0.009	107.5	4	590	0.003	295	2	480	120	0.008	4
December	430	0.009	107.5	4	580	0.001	580	1	470	117.5	0.008	4
		MB2. B 185.25				MB2. B 242.80			MB2. B 215.40			

MB1. B I think there will be more failures when it is extremely hot or cold in each site.
MB1. C I think in this senario that alska hasn't been observing maintenance statistical data. Resulting in pumps getting worse.

Mark Band 1

A statistical method has been used to analyse and evaluate a trend and comments have been made about the relevance. A full range of marks can be awarded from this mark band.

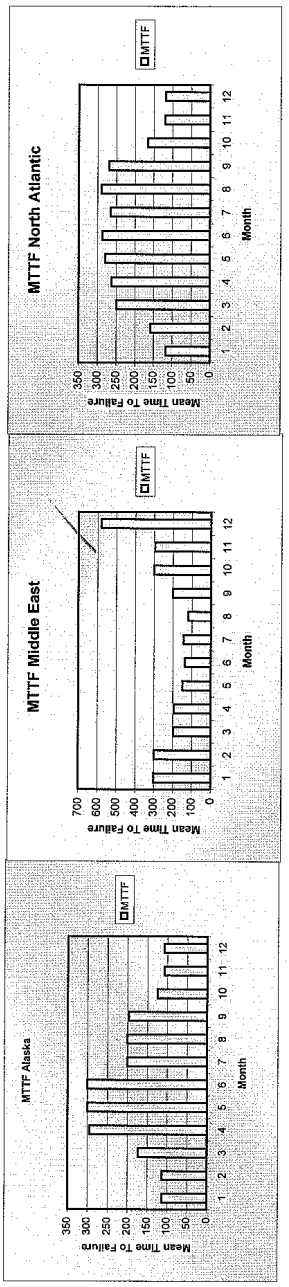
Mark Band 2

Calculations have been included and conclusions drawn so a full range of marks can be awarded from this mark band. The use of a spreadsheet has enhanced the visibility of the trend of failure rates.

Mark Band 3

No discussion has shown how MTTF can act as an aid to determining equipment reliability so no marks can be awarded.

LO1.2 Examples continued



MB2. B Altogether the average MTTF is 214.48

MB2. C I think that the north atlantic would have to have the most pumps in stock as at the start of the year and end it is less MTTF.

MB2. D I think it's the MTTF is the complete opposite to the failure rate in every site.

MB3. B They help because you know when to hire maintenance men and when there not needed.

Michael [redacted]

Mark Band 1
A statistical method has been used to analyse and evaluate a trend and comments have been made about the relevance. A full range of marks can be awarded from this mark band.

Mark Band 2
Calculations have been included and conclusions drawn so a full range of marks can be awarded from this mark band. The use of a spreadsheet has enhanced the visibility of the trend of failure rates.

Mark Band 3
No discussion has shown how MTTF can act as an aid to determining equipment reliability so no marks can be awarded.

LO2.2 Examples

Focus
Be able to devise a maintenance procedure

Assignment LO 2.2

Michael [redacted]

If you want to keep something in full working order, you would have to maintenance schedule the machine by using the instructions manual. There are things on the schedule such as – oiling, greasing, replacing parts, tightening/ loosing parts that may tighten or slacken.
For an engineer to follow the maintenance schedule they would have to follow the instructions manual, but first of all a schedule needs to be created.

They can be created by looking at notes, preserving others schedules, also the engineer would need to make service notes as it is been carried out to place on the finished schedule.

If you needed to follow a maintenance schedule for a plant there would already be a schedule created if anything ever went wrong, the plant would have schedules that there engineers need to follow for the worn down/broken part on the plant to be fixed.

Unlock drill		
Type of model		D32
Location		[redacted] Workshop
Inspection date		20 April [redacted]
Serial number		0706005
Name of engineer		.....
1	Check machine's on/off switch is working.	
2	Check machine's chuck isn't broken/snapped.	
3	Check 4 bolts securing column to base for security.	
4	Check security of screw to hold the ring in position	
5	Check the security of bracket and rack carefully onto the column	
6	Check operation of handle by tightening the set screw if necessary.	
7	Make sure the column lock fits into the table bracket.	
8	Check the three rods are in the feed hub.	
9	Make sure the round knobs are tightened to the end of the rods.	
10	Check the protective guard for cracking etc, replace if required.	

Mark Band 1

The maintenance procedure lacks the required detail as shown in the content of the unit and that required to award marks as outlined in the 'guidance for allocating marks' section of the specification.

Mark Band 2

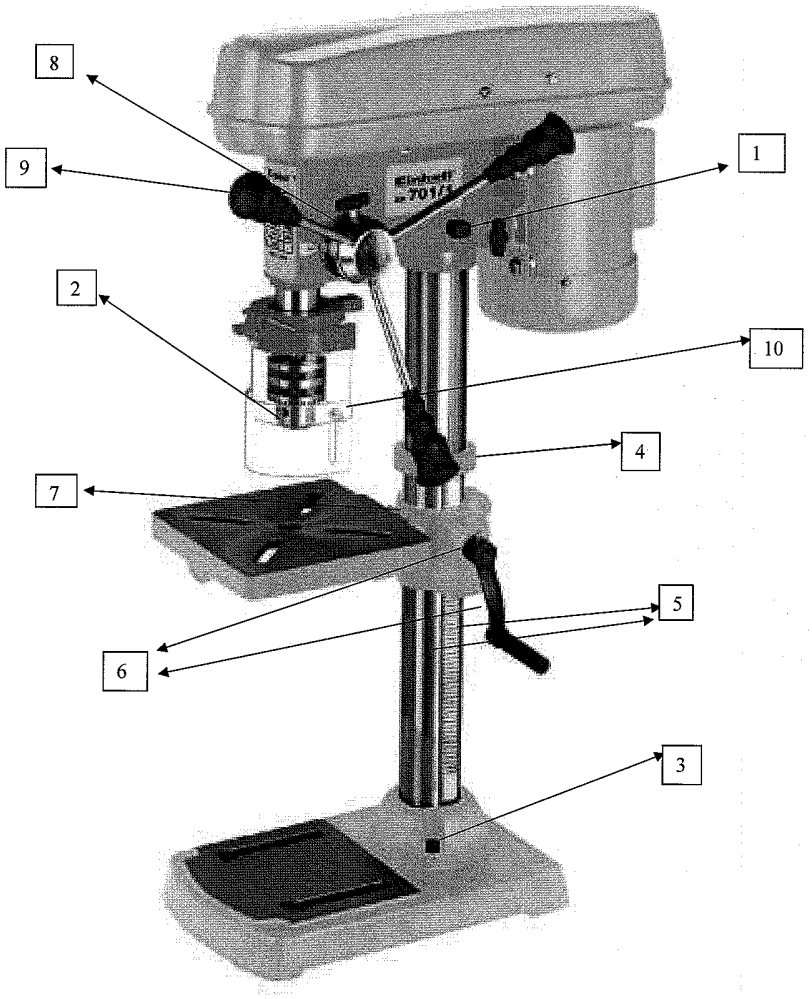
The devised procedure lacks the detail required by this mark band so no marks can be awarded.

Mark Band 3

The illustration included does help and make the devised plan easier to follow, but the plan lacks the detail required limiting the award of a mark from this mark band.

LO2.2 Examples continued

Michael [redacted] 15



Mark Band 1
The maintenance procedure lacks the required detail as shown in the content of the unit and that required to award marks as outlined in the 'guidance for allocating marks' section of the specification.

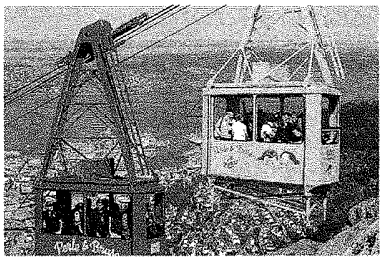
Mark Band 2
The devised procedure lacks the detail required by this mark band so no marks can be awarded.

Mark Band 3
The illustration included does help and make the devised plan easier to follow, but the plan lacks the detail required limiting the award of a mark from this mark band.

LO3.1 Examples

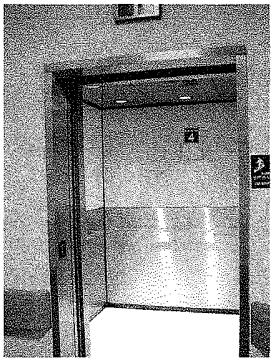
Focus
Understand the implications of improperly maintained products, plant or equipment

A

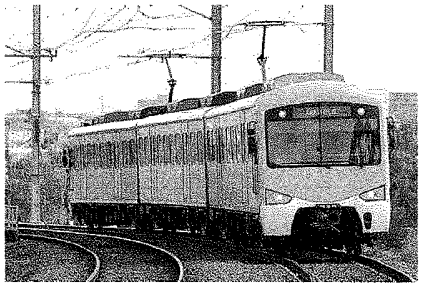


B

C



D



E

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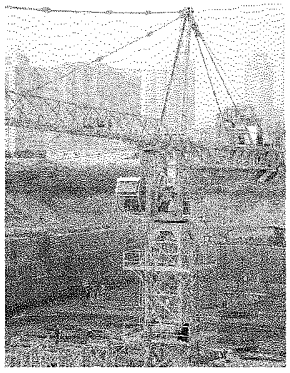


Mark Band 1
Two implications have been described so full marks from this mark band can be awarded.

Mark Band 2
The method chosen to reduce the impact of improper maintenance is simple applications but can be awarded a mark from this mark band.

Mark Band 3
The justifications given are in response to the simple applications and are not detailed enough so no marks can be awarded a mark from this mark band.

LO3.1 Examples continued

LO.3.1

MB1: 1) The brakes could fail because they might corrode. Could result in an accident, the driver could injure himself and others around him, he could cause damage to council property so he would have to pay to fix it, for example school gates. Also if the brakes failed then the digger wouldn't no longer be able to operate for about 3 days as it would have to go to a specialist so they could take the wheel off and replace the brakes, it would be a very big job.

2) The scoop could corrode because it may not have been checked regularly. He could be for example driving on a busy motorway or congested road, and if it fell off other drivers could easily be injured as well. Also jobs that the specific digger would have been assigned for the past week, his boss would have to cancel as it would be in for repair. This is costing the business money when it could be out on the job.

MB2: 1) Check the brakes regularly to make sure there are no leaks or that the brakes aren't corroding. If they are again either replace them or try to fix them. Introduce a schedule that would check the brakes regularly, every so often. Or put a note on the vehicle saying you must check the brakes before starting or even moving the vehicle.
2) Check the scoop regularly to make sure it isn't corroding etc. If it is either replace the scoop or try and fix it using correct equipment. Also introduce a maintenance schedule so that specialists can look at the scoop and investigate how such a big piece of machinery corroded and plan on how they are going to fix it, also replace it.

MB3: 1) If you didn't replace or even check the brakes it would end up being very dangerous. The brakes would end up failing resulting in people being majorly injured.
2) Also if you don't check the scoop or replace it when it may have been corroding that may not be as dangerous as the brakes failing but it can hurt people, as this vehicle could be used on a work site etc, people could be around the vehicle could be injured.

Michael [redacted]

Mark Band 1
Two implications have been described so full marks from this mark band can be awarded.

Mark Band 2
The method chosen to reduce the impact of improper maintenance is simple applications but can be awarded a mark from this mark band.

Mark Band 3
The justifications given are in response to the simple applications and are not detailed enough so no marks can be awarded a mark from this mark band.

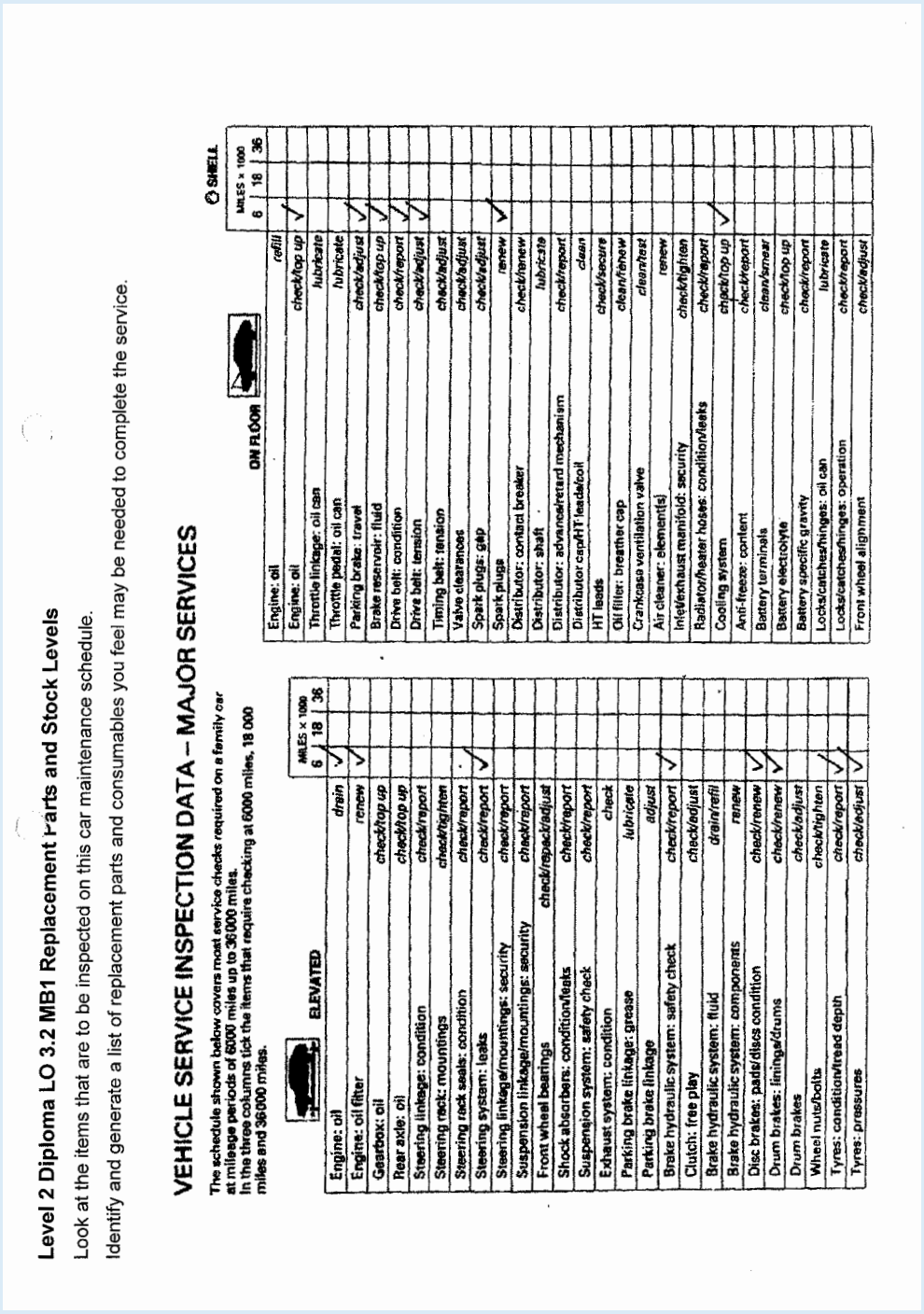
LO3.2 Examples

Focus
Range of spares, replacement parts and stock levels

Level 2 Diploma LO 3.2 MB1 Replacement Parts and Stock Levels

Look at the items that are to be inspected on this car maintenance schedule.

Identify and generate a list of replacement parts and consumables you feel may be needed to complete the service.



VEHICLE SERVICE INSPECTION DATA – MAJOR SERVICES

The schedule shown below covers most service checks required on a family car at mileage periods of 6000 miles up to 36000 miles.
In the three columns tick the items that require checking at 6000 miles, 18 000 miles and 36000 miles.

ELEVATED		MILES × 1000 6	18	36
Engine: oil	drain	✓		
Engine: oil filter	renew	✓		
Gearbox: oil	check/top up			
Rear axle: oil	check/top up			
Steering linkage: condition	check/report			
Steering rack: mountings	check/tighten			
Steering rack seals: condition	check/report			
Steering system: leaks	check/report	✓		
Steering linkage/mountings: security	check/report			
Suspension linkage/mountings: security	check/report			
Front wheel bearings	check/repack/adjust			
Shock absorbers: condition/leaks	check/report			
Suspension system: safety check	check/report			
Exhaust system: condition	check			
Parking brake linkage: grease	lubricate			
Parking brake linkage	adjust			
Brake hydraulic system: safety check	check/report	✓		
Clutch: free play	check/adjust			
Brake hydraulic system: fluid	drain/refill			
Brake hydraulic system: components	renew			
Disc brakes: pads/discs condition	check/renew	✓		
Drum brakes: linings/drums	check/renew	✓		
Drum brakes	check/adjust			
Wheel nuts/bolts	check/tighten			
Tyres: condition/tread depth	check/report	✓		
Tyres: pressures	check/adjust	✓		

ON FLOOR		MILES × 1000 6	18	36
Engine: oil	refill			
Engine: oil	check/top up	✓		
Throttle linkage: oil can	lubricate			
Throttle pedal: oil can	lubricate			
Parking brake: travel	check/adjust	✓		
Brake reservoir: fluid	check/top up	✓		
Drive belt: condition	check/report	✓		
Drive belt: tension	check/adjust	✓		
Timing belt: tension	check/adjust			
Valve clearances	check/adjust			
Spark plugs: gap	check/adjust			
Spark plugs	renew	✓		
Distributor: contact breaker	check/renew			
Distributor: shaft	lubricate			
Distributor: advance/retard mechanism	check/report			
Distributor cap/HT leads/coil	clean			
HT leads	check/secure			
Oil filler: breather cap	clean/renew			
Crankcase ventilation valve	clean/test			
Air cleaner: element[s]	renew			
Inlet/exhaust manifold: security	check/tighten			
Radiator/heater hoses: condition/leaks	check/report			
Cooling system	check/top up	✓		
Anti-freeze: content	check/report			
Battery terminals	clean/smear			
Battery electrolyte	check/top up			
Battery specific gravity	check/report			
Locks/catches/hinges: oil can	lubricate			
Locks/catches/hinges: operation	check/report			
Front wheel alignment	check/adjust			

Mark Band 1

Spares have been identified for a routine maintenance task on a car. Full marks can be awarded from this mark band.

Mark Band 2

There is a description of a variety of consequences of running out of stack of spares or replacements so full marks can be awarded from this mark band.

Mark Band 3

There are some statements about minimum stock levels etc but none of this justifies appropriate levels. It does however help consolidate the award of marks from mark band 1 and 2.

LO3.2 Examples continued

Michael [redacted]

3.2

2(

MB1:

Elevated:

1 5

Engine oil: Round about 5 litres of oil.
Engine oil filter: New oil filter to renew it, Torch to see what you are doing.
Steering system leaks: New oil to top it up, welder to fix the leak.
Brake hydraulic system safety check: Hydraulic fluid
Disk brakes pads/disk condition: Get new brake pads, also new brake callipers.
Tyres condition/Tread depth: New tyre.

MB2:

1·5

If the parts aren't in then the customer will be unsatisfied making the business lose money, for example people go in expecting a service to their car, if that service cannot be done then that customer will be unhappy and the business would lose custom, also this problem will cause a knock on affect as that one person would tell people not to rely on them as they don't have the parts in to service the car, even though the mechanic isn't doing any work as they don't have the parts in to do it they would still be getting paid.

MB3:

A) The MSL (Maximum Stock Level) should be 64 over 8 days, by servicing 8 oil filters a day and they have to wait another 8 days for the manufacturer to deliver more.
B) The SSL (Safety Stock Level) is 120 as you calculate MHDU by MHLT which is 12 x (10-8) = 24
C) The RSL (Re-Order Stock Level) is 64 = 24 = 88

2.

5.

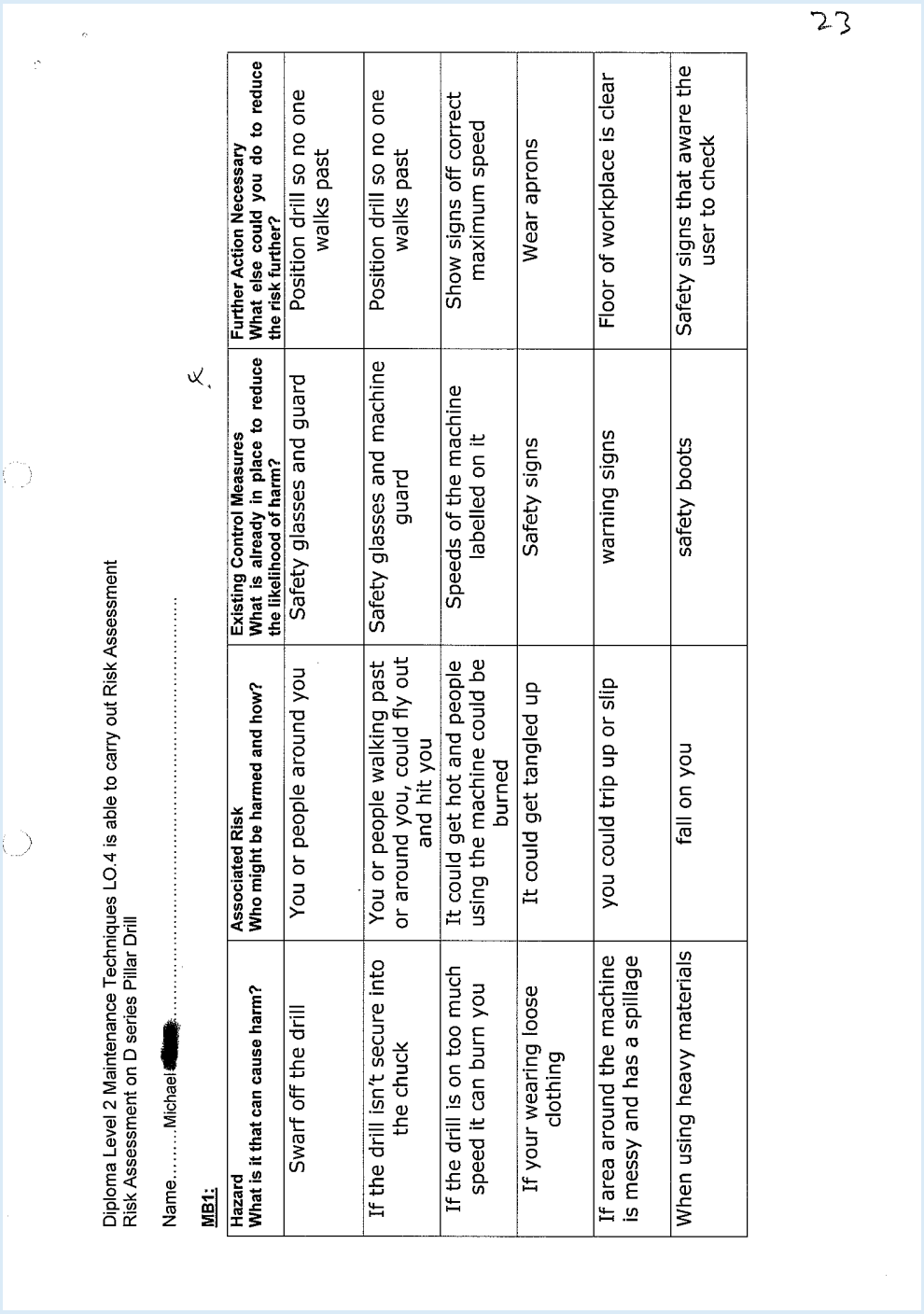
Mark Band 1
Spares have been identified for a routine maintenance task on a car. Full marks can be awarded from this mark band.

Mark Band 2
There is a description of a variety of consequences of running out of stack of spares or replacements so full marks can be awarded from this mark band.

Mark Band 3
There are some statements about minimum stock levels etc but none of this justifies appropriate levels. It does however help consolidate the award of marks from mark band 1 and 2.

LO4 Examples

Focus
Be able to carry out a risk assessment in a maintenance environment



Diploma Level 2 Maintenance Techniques LO.4 is able to carry out Risk Assessment
Risk Assessment on D series Pillar Drill

Name.....Michael[redacted].....

MB1:

Hazard What is it that can cause harm?	Associated Risk Who might be harmed and how?	Existing Control Measures What is already in place to reduce the likelihood of harm?	Further Action Necessary What else could you do to reduce the risk further?
Swarf off the drill	You or people around you	Safety glasses and guard	Position drill so no one walks past
If the drill isn't secure into the chuck	You or people walking past or around you, could fly out and hit you	Safety glasses and machine guard	Position drill so no one walks past
If the drill is on too much speed it can burn you	It could get hot and people using the machine could be burned	Speeds of the machine labelled on it	Show signs off correct maximum speed
If your wearing loose clothing	It could get tangled up	Safety signs	Wear aprons
If area around the machine is messy and has a spillage	you could trip up or slip	warning signs	Floor of workplace is clear
When using heavy materials	fall on you	safety boots	Safety signs that aware the user to check

Mark Band 1

There is a form of Risk Assessment, albeit difficult to see where it is applied. It is difficult to see where all the parts of the Risk Assessment, as identified in the guidance for allocating marks section of the unit specification, have been met. In the main three of these have been covered, the hazards present, who might get harmed and precautions to take. This does mean that 3 marks can be awarded from this mark band. There are however other aspects of PPE use etc from the rest of the learner response which enables the full range of marks from this mark band to be awarded. It is unclear what documentation was given and used.

Mark Band 2

The storage suggested for the PPE is basic but this can consolidate the marks awarded from mark band 1 as this was not mentioned in the risk assessment.

Mark Band 3

Again the mention of regulations and warning signs is limited but may be taken as consolidation of mark band 1 performance.

LO4 Examples continued

Michael [redacted]

Candidates Signature: Date:

MB2:

For all of the Hazards above you should always use PPE (personal protective equipment), also for all hazards you must wear safety gloves, safety goggles and safety boots. You must not disobey these PPE rules as if not followed correctly you could really hurt yourselves. These should be used and stored in environments were people wont trip over them and the safety goggles get stored where they won't get scratched. Won't get damaged.

MB3:

There are many rules and regulations in place to protect people at work. For example Health and Safety at Work Act. This act has many regulations that businesses need to follow to make sure that they stay in place. For both of this PPE the Health and Safety regulations 1981 covers them.

Mark Band 1
There is a form of Risk Assessment, albeit difficult to see where it is applied. It is difficult to see where all the parts of the Risk Assessment, as identified in the guidance for allocating marks section of the unit specification, have been met. In the main three of these have been covered, the hazards present, who might get harmed and precautions to take. This does mean that 3 marks can be awarded from this mark band. There are however other aspects of PPE use etc from the rest of the learner response which enables the full range of marks from this mark band to be awarded. It is unclear what documentation was given and used.

Mark Band 2
The storage suggested for the PPE is basic but this can consolidate the marks awarded from mark band 1 as this was not mentioned in the risk assessment.

Mark Band 3
Again the mention of regulations and warning signs is limited but may be taken as consolidation of mark band 1 performance.

Marking Grid B
LO2.1 Examples

Focus
Be able to carry out routine maintenance tasks

Unit 7 LO 2.1 Carry out Maintenance Tasks

PREVETATIVE MAINTENANCE SCHEDULE FOR HARRIESON M300 CENTRE LATHE

OPERATIVES NAME: [redacted] **NUMBER OF LATHE BEING MAINTAINED:**

ITEM OR LOCATION BEING MAINTAINED (REFER TO CENTRE LATHE DIAGRAM)	PHOTO CHART REF	LUBRICATION CHART REF	LUBRICATION CARRIED OUT	ADJUST REPAIR	ATTENTION REQUIRED
UNLOCK POWER SUPPLY	23		✓		
LUB TOP OF TAILSTOCK 13	2	2	✓		
LUB TOP OF CROSSLIDE 10	1	1	✓		
LUB TOP OF COMPOUND SLIDE 12	4	1	✓		
LUB CROSSLIDE DIAL 10	5	1	✓		
LUB DRIVESCREW HOUSING 16	6/29	4	✓		
LUB TAILSTOCK DIAL 13	7	2	✓		
LUB CROSSLIDE PLATE 10	8	5	✓		
CHECK FEED GEAR BOX OIL LEVELS 4	11	6	✓		
CHECK HEADSTOCK OIL LEVELS 7	9	7	✓		
CHECK APRON OIL LEVELS 1	10	8	✓		
IF NECESSARY TOP UP THRO FILLER PLUG 1	12	9	✓		
ADJUST KNURLED SCREW ON COOLANT DELIVERY PIPE	14	N/A	✓		
ADJUST HEXAGONAL PIVOT SCREW ON COOLANT DELIVERY PIPE	14	N/A	✓		
RESET FEED RATE TO "A" "T" "8" "X"	16	N/A	✓		
RESET SPEED RATE TO 560 RPM	16	N/A	✓		
LUBRICATE THREADED FEED DRIVE SHAFT	19	19	✓		
IDENTIFY 3 JAW CHUCK	24	N/A	✓		
FIT PROTECTIVE BOARD	22	N/A	✓		
ROTATE 3 CAMLOCKS ANTI-CLOCKWISE UNTIL MARKS ALIGHN	13	N/A	✓		
REMOVE CHUCK	22	N/A	✓		

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Mark Band 1

There is evidence of what the learner has been asked to carry out. There may be a question over whether the adjustment to speeds and feeds is in fact a maintenance routine adjustment or an operational feature of a centre lathe.

Mark Band 2

The Assessor has stated in an observation record that the learner has carried out routine adjustments and replenished consumables. Photographic evidence also shows routine task being carried out. Full marks from this mark band can be awarded.

Mark Band 3

There is no evidence to support any aspects of this mark band.

LO2.1 Examples continued

Unit 7 LO 2.1 Carry out Maintenance Tasks

PREVENTATIVE MAINTENANCE SCHEDULE FOR HARRISON M300 CENTRE LATHE

OPERATIVES NAME: **NUMBER OF LATHE BEING MAINTAINED:**

ITEM OR LOCATION BEING MAINTAINED (REFER TO CENTRE LATHE DIAGRAM)	PHOTO CHART REF	LUBRICATION CHART REF	LUBRICATION CARRIED OUT	ADJUST REPAIR	ATTENTION REQUIRED
CLEAN INSIDE BORE & FACE OF HEADSTOCK SPINDLE	25	N/A	/		
CLEAN INSIDE BORE & FACE OF CHUCK	28	N/A	/		
REFIT CHUCK ENSURING BALANCE MARKS ALIGHN	26	N/A	/		
ROTATE 3 CAMLOCKS CLOCKWISE UNTIL MARKS IS BETWEEN "V"s	13	N/A	/		
PULL APRON OIL PLUNGER 4 X TO RELEASE OIL TO BED	30	N/A	/		
OPERATE CHUCK AND CHECK EMERGENCY STOP OPERATES	21	N/A	/		
OPERATE CHUCK AND CHECK EMERGENCY FOOTBRAKES OPERATES	21	N/A	/		
REFILL COOLANT RESERVIOUR (3 PARTS HYSOL EXCEL TO 40 PARTS WATER)	3	N/A	/		
CHECK COOLANT SUPPLY TAP OPERATES	14	N/A	/		
LOCK OFF POWER SUPPLY UPON COMPLETION	23	N/A	/		

Details of any faults found and actions carried out including quantities of lubricants' used:

Inspection carried out by sign: .....

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LO2.1 Examples continued

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/2

Diploma Learner Observation Record

Qualification:	Diploma in Engineering (L2)	**Centre Number:**	[redacted]
Unit number & title:	Unit 7 – Maintenance Techniques / Be able to carry out routine maintenance tasks	**Location of observation:**	[redacted]workshop/~~classroom~~.
Learner's UCI:	[redacted]	**Dates:**	09/12/[redacted]
Learner's name:	**Michael** [redacted]	**Observer Name:**	[redacted]
Learner's signature:	[redacted]	**Observer signature:**	[redacted]

Description of activity undertaken (please be as specific as possible)

MB1. Carry out maintenance procedure in line with preventative maintenance schedule for Harrison M300 centre lathe. Including adjustments to coolant delivery pipes and speed and feed rates.

MB2 Correctly remove 3 Jaw Chuck and re-install after cleaning spindle, in addition to replenishing coolant and oil levels.

MB3 Refer to supplied maintenance procedure **"Align, Adjust and Set Lathe Tailstock with Headstock"** Diagnose the degree of lathe tailstock misalignment Using a DTI and alignment bar, adjust and reset the tailstock centrally to an accuracy of +/_.02 mm.

Ensure to attach the brief given to the learner or any other instructions on the activity

Describe how the learner met each criteria and the qualitative aspects of their performance

Michael met part MB1&2, by working independently to follow the attached maintenance schedule To correctly carry out routine adjustments to speeds and feeds in addition to replenishment of consumables.

Refer also to Photos attached

Ensure to reference to the mark band criteria being assessed by the activity to ensure marks which are awarded can be clearly supported

Total Mark: 7

Diploma Learner Observation Record

Mark Band 1

There is evidence of what the learner has been asked to carry out. There may be a question over whether the adjustment to speeds and feeds is in fact a maintenance routine adjustment or an operational feature of a centre lathe.

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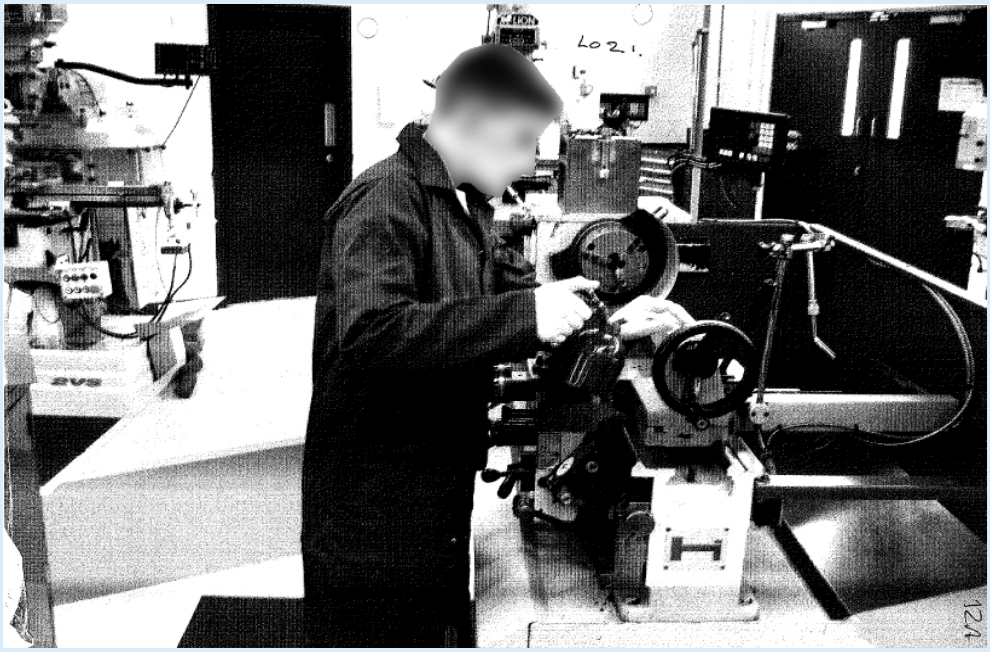
LO2.1 Examples continued



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Mark Band 3
There is no evidence to support any aspects of this mark band.

The activities given to the learner are not always appropriate, spoilt by the fact that each task targets evidence to 'prove' the descriptors in each of the separate mark bands. A more holistic approach is encouraged. Often there has been confusion between normal engineering practices and maintenance requirements. Examples of this includes whether adjusting speeds and feeds are operational tasks and not maintenance tasks and whether a risk assessment for the use of a Pillar Drill is again an operational task and not a maintenance task.

It would be expected that the centre should support the achievement of process type activities by the use of well produced witness statements that in this case needed to show how the learner was able to carry out routine maintenance for assessment focus LO.2.1. This form of evidence should also be supplemented by annotated photographs and annotated service manuals and say flow charts of routines carried out.

Centres are encouraged to use the teacher resource disc "Engineering Level 2 Higher Diploma Assessment and Delivery Resource with CD-ROM ISBN 978-0-435756-21-5, and the student book "Edexcel Engineering Level 2 Higher Diploma" ISBN 978-0-435756-20-8.