



INSTITUTE
OF THE MOTOR
INDUSTRY

IMI QUALIFICATION



Assessment Criteria For

IMI Level 2 Diploma in Construction Plant or Machinery Maintenance (Construction)

I.D: 601/3091/X

*To be used in conjunction with Learner Guidance, Candidate
Assessment Summary, Practical Assessments and Written
Assessments*

For assessor use only: Assessor Verifier Guidance



CENTRE INFORMATION

Please be aware that any **legislation** referred to in this qualification may be subject to amendment/s during the life of this qualification. Therefore IMI Approved Centres must ensure they are aware of and comply with any amendments, e.g. to health and safety legislation and employment practices.

Please be aware that **vehicle technologies** referred to in this qualification reflect current practice, but may be subject to amendment/s, updates and replacements during the life of this qualification. Therefore IMI Approved Centres must ensure they are aware of the latest developments and emerging technologies to ensure the currency of this qualification.

Please note: the relevance of the information contained in the **unit content** will vary depending upon the vehicle types being worked upon. The unit content is for guidance only and is not meant to be prescriptive.

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Please complete as appropriate:	
Witness Name:	Witness Name:
Witness Job Title:	Witness Job Title:
Witness Signature:	Witness Signature:
Witness Name:	Witness Name:
Witness Job Title:	Witness Job Title:
Witness Signature:	Witness Signature:
Assessor Name:	Assessor Name:
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Internal Verifier Name:	Internal Verifier Name:
Internal Verifier Signature:	Internal Verifier Signature:

**IMI Level 2 Diploma in Construction Plant or Machinery Maintenance (Construction)****I.D. No: 601/3091/X**

In order to achieve the qualification, learners must achieve a minimum of 91 credits from the following group:

Group A: A minimum of 91 credits must be achieved

Note: Assessments

The assessments for this qualification combine various assessment styles/methodologies in order to suit the levels of units contained within it.

The table below clarifies what IMI assessments are available for each unit.

The key below details the style of assessment/s:

W = Written Assessments

P = Practical Assessments

T = On-line tests

Group A Mandatory Units

Unit Ref:	Unit Title and ID Number	GLH	Unit Level	Credit Value	Assessments		
					P	W	T
CPM01	Workplace Health, Safety And Welfare (L/503/4252)	40	2	4			M (20)
CPM02	Conform To Productive Work Practices (R/503/4253)	40	2	4		M	
CPM03	Move Handle Or Store Resources (K/503/4310)	40	2	4	M	M	
CPM04	Operate Plant Or Machinery For Non-Operational Maintenance Activities (J/505/3849)	20	2	2	M		M (20)
CPM05	Service Plant Or Machinery (F/505/3851)	66	2	7	M		M (20)
CPM06	Remove And Replace Plant Or Machinery Components (J/505/3852)	392	2	40	M	M	M (20)
CPM07	Dismantle And Assemble Plant Or Machinery Components (L/505/3853)	66	2	7	M		M (20)
CPM08	Undertake Functional Diagnostics Of Faults In Plant Or Machinery (R/505/3854)	20	2	2	M		M (20)
CPM09	Inspect Plant Or Machinery For Operational Serviceability (Y/505/3855)	20	2	2	M		M (20)
CPM10	Produce One-Off Components By Bench Fitting Techniques (H/505/3857)	40	2	4	M		M (20)
CPM11	Install Plant Or Machinery (K/505/3858)	20	2	2	M		M (20)
CPM12	Carry Out Specific Tests On Plant Or Machinery (M/505/3859)	40	2	4	M		M (20)
CPM13	Configure And Hand Over Plant Or Machinery (K/505/3861)	30	2	3	M	M	
CPM14	Thermal Cutting And Joining Materials (M/505/3862)	60	2	6	M		M (20)



UNIT REF: CPM01	UNIT TITLE: WORKPLACE HEALTH, SAFETY AND WELFARE
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Level: 2	Credit Value: 4	GLH: 40
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Rationale: This unit is designed to develop the learners understanding of Health, Safety and Welfare in the workplace. It allows the learner to acquire specialist knowledge and understanding in this area whilst also developing practical skills that can be used throughout a range of activities

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Understand health, safety and welfare requirements	1.1. State the role of the Health and Safety Executive 1.2. Give examples of how induction, briefings and application of prior training can avoid risks in the workplace 1.3. Explain why it is important to take individual responsibility for health, safety and welfare 1.4. Explain the impact that behaviour can have on own and others' health and safety 1.5. State the importance of health, safety and control equipment 1.6. Explain why changing circumstances can create hazards
2. Understand the organisation's approach to health, safety and welfare	2.1. Outline the health, safety and welfare legislation that applies to the work area 2.2. Outline the organisational policies and procedures for health, safety and welfare 2.3. List the hazards associated with the work area 2.4. Outline the organisation's requirements for dealing with accidents and emergencies in the work environment 2.5. State procedures for evacuation, including safe exit procedures 2.6. State methods of reporting hazards in the work area 2.7. State procedures for complying with control measures identified by risk assessments 2.8. Outline the security arrangements in the work area



<p>3. Understand risk control in the workplace</p>	<p>3.1. List the notices and warning signs associated with the work environment</p> <p>3.2. List the health and safety control equipment in the work area</p> <p>3.3. State when control equipment should be used</p> <p>3.4. State the purpose of Personal Protective Equipment (PPE)</p> <p>3.5. State work situations where Respiratory Protective Equipment (RPE) is used</p> <p>3.6. State work situations where Local Exhaust Ventilation (LEV) is used</p> <p>3.7. List the different types of fire extinguisher in the workplace</p> <p>3.8. Give examples of situations when different types of fire extinguisher should be used</p>
<p>4. Confirm health and safety requirements in the workplace</p>	<p>4.1. Interpret work instructions to maintain safe systems of work</p> <p>4.2. Take part in discussions with others to identify safe systems of work</p> <p>4.3. Provide feedback on health, safety and welfare policies</p> <p>4.4. Report hazards as they are identified</p>
<p>5. Work in accordance with health and safety requirements</p>	<p>5.1. Store equipment in designated areas</p> <p>5.2. Ensure equipment is secured appropriately when stored</p> <p>5.3. Dispose of waste in required receptacles, including those for reuse or recycling</p> <p>5.4. Use safety control equipment according to instructions, induction and prior training</p> <p>5.5. Follow the requirements of safety notices and warning signs, as directed</p> <p>5.6. Comply with control measures as identified by risk assessments and safe symbols of work</p>

Content:

- 1.1 State the roles and responsibilities of the Health and Safety Executive:**
to include: enforcement, legislation, advice and inspection.
- 1.2 Reasons for induction, briefings and application of prior training:**
to include: safe working environments, staff training, health and safety information, risk assessment, supervision.
- 1.3 Employee's responsibilities under the Health and Safety at Work Act:**
to include: responsibility for themselves, responsibility for others, co-operation, communication, not interfering with health and safety equipment, working safely, reporting defects, hazards, near misses and accidents correctly.
- 1.4 Behavioural impacts:**
the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.
- 1.5 The importance of health, safety and control equipment:**
to include: the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV).
- 1.6 Hazards resulting for changing circumstances:**
to include: the difference between a risk and a hazard; potential risks resulting from; the use and maintenance of plant equipment, the use of materials and substances, accidental breakages and spillages, unsafe behaviour, environmental factors, unauthorised personnel, customers, contractors entering the work premises, working on site.
- 2.1 Health, safety and welfare legislation:**
to include: Health and Safety at Work Act 1974, Control of Substances Hazardous to Health Regulations, Reporting Injuries Diseases and Dangerous Occurrence Regulations, Provision and Use of Work Equipment Regulations, Lifting Operations and Lifting Equipment Regulations, Noise at Work Regulations, Workplace Health, Safety and Welfare (Health, Safety and Welfare) Regulations.
- 2.2 Policies and procedures for health, safety and welfare:**
to include: company health and safety statement, training, accident reporting, hazard reduction, major incident procedure, use of flammable liquids and gases, employees responsibilities, manual handling, abrasive wheels, operating of lifting equipment, operating of access equipment.
- 2.3 Hazards associated with the work area:**
to include: contact with equipment, electricity, machinery collapsing /overturning, use of flammable liquids and gases, fire, explosion, noise, harmful fumes, slips, trips, flying objects, liquids, dust, vehicle movement, working at height, manual handling, accidents whilst completing maintenance tasks.
- 2.4 Methods of dealing with accidents and emergencies in the work place:**
to include: the chain of responsibility (employee, supervisor, managing director), employee responsibility, employer's responsibility, , RIDDOR, HSE, lines of communication, organisational responsibilities (employers, employees, health and safety and other advisers).
- 2.5 Procedures for evacuation:**
to include methods of: raising the alarm, alerting others, clearing exits, leaving the building via escape routes, fire marshals, assembling at the correct assembly point.

Content:

- 2.6 Methods of reporting hazards:**
to include: statutory protocols, organisation's procedures, reporting lines, accident book, near misses.
- 2.7 Procedures for complying with control measures:**
to include: safe systems of work, lone workers, permits to work, training, tool box talks, risk assessments, safety audits, monitoring, consultation with employees, safe plant and equipment, safe handling and use of substances, information, instruction and supervision, competency for tasks and training, accidents.
- 2.8 Security:**
Organisational procedures relating to the workplace, general public, site personnel and resources.
- 3.1 Warning labels and signs:**
to include: colours used for warning signs (red, blue, green), shapes and meaning (round, triangular, square), the meaning of prohibitive warning signs, the meaning of mandatory warning signs, the meaning of warning notices, general design of safe place warning signs.
- 3.2 Health and Safety control equipment:**
to include: machine guards, welding curtains, flash arresters, emergency stop buttons, RCDs, fume extraction units, fire extinguisher, axle stands, wheel chocks, transformers, lifting aids.
- 3.3 State when control equipment should be used:**
to include: risk assessments, method statements, types of equipment available, work situations and general work environment: collective protective measures, personal protective equipment (PPE).
- 3.4 State the purpose of Personal Protective Equipment (PPE):**
identified by the principles of protection for the occupational use, purpose of PPE, work situations and general work environment: collective protective measures.
- 3.5 State work situations where Respiratory Protective Equipment (RPE) is used:**
identified by the principles of protection for the occupational use, types of equipment available.
- 3.6 State work situations where Local Exhaust Ventilation (LEV) is used:**
identified by the principles of protection for the occupational use, types of equipment available.
- 3.7 List the types of fire extinguisher available:**
to include: foam, dry powder, CO2, water, fire blanket.
- 3.8 Give examples of when different types of fire extinguisher should be used:**
to Include: water (organic fires), foam (liquid and organic fires), CO (electrical fires), dry powder (electrical, liquids) fire blanket (smother).



UNIT REF: CPM02	UNIT TITLE: CONFORM TO PRODUCTIVE WORK PRACTICES
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Level: 2	Credit Value: 4	GLH: 40
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Rationale: This unit is designed to develop the learners' knowledge and understanding of the importance of working to laid down practices and procedures. It also develops the learners understanding of the impact of the workplace activities on the environment, the importance of equality and diversity and the importance of effective communication

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to work productively in the workplace	1.1. Explain why it is important to be productive in the workplace 1.2. State the procedures that must be followed in the workplace 1.3. List the documentation that must be maintained by the organisation including job cards, worksheets, material/resources lists and timesheets 1.4. State the importance of maintaining accurate, up to date records
2. Understand low/zero carbon outcomes	2.1. Explain why zero/low carbon production is desirable 2.2. Describe the contribution that the built environment makes to carbon production 2.3. Explain how zero/low carbon production can be achieved in the built environment
3. Understand equality and diversity in the workplace	3.1. State the legislation that protects equality and diversity in the workplace 3.2. Explain why equality and diversity in the workplace is important
4. Know how to communicate with others	4.1. Describe ways of communicating with others that encourages cooperation 4.2. Outline the methods of communication used in the workplace 4.3. State the information needs of the customer, line manager, own occupation and allied trades
5. Work productively in the workplace	5.1. Interpret procedures to plan a productive sequence of work 5.2. Plan a sequence of work which is productive and sets out the use of time and resources 5.3. Communicate with others in the work environment to ensure that work is carried out productively 5.4. Maintain records as required in the workplace and by the organisation

Content:

- 1.1 The importance of working productively:**
organisational procedures to ensure work is planned and carried out productively to include: use of resources for own and other's work requirements, allocating appropriate work to employees , organising the work sequence, reducing carbon emissions.
- 1.2 Workplace procedures:**
to include: work schedules, following work instructions, using safe systems of work, following procedures, using best practice, following manufacturer's instructions, assisting work colleagues.
- 1.3 Record keeping:**
to include: attendance records, shift logs, work sheets, parts sheets, pre-use check sheets, service sheets, inspection sheets, safety inspection certificates, advice notes, despatch notes, contracts, equipment records, daily records, accident books, near misses.
- 1.4 The importance of maintaining accurate, up to date records:**
to include: correct staff payments (overtime), legislative requirements, accurate invoicing, maintenance recording, stock control, re-order level monitoring, audit requirements.
- 2.1 Zero/low carbon production:**
to include: the effects on the environment, climate, cost, why is it desirable.
- 2.2 The contribution that the built environment makes to carbon production:**
to include: poor maintenance, excessive fuel consumption, driving, poor planning, distances travelled, loads.
- 2.3 How zero/low carbon production can be achieved:**
to include: effective maintenance, reduced fuel consumption, fuel efficient driving, effective planning, minimising distances travelled, efficient loads.
- 3.1 Equality and diversity in the workplace legislation:**
to include: age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion and beliefs, sex, sexual orientation.
- 3.2 The importance of equality and diversity in the workplace:**
to include: treating people fairly, accepting diversity, respecting others.
- 4.1 Ways of communicating with others that encourages cooperation:**
to include: formal, informal, verbal, non-verbal communication and encouragement to include: use of language, body language, tone of voice, gestures, listening skills.
- 4.2 Methods of communication used in the workplace:**
to include: verbal, questioning, presentations, meetings, telephone, signalling, written, memos, e-mails, signs and notices, work sheets, notice boards, SMS text messaging, toolbox talks.
- 4.3 The information needs of the end user:**
to include: clarification and advice to the end user, manufacturers technical information, trade organisations, organisational procedures, statutory requirements, environmental considerations.



UNIT REF: CPM03	UNIT TITLE: MOVE HANDLE OR STORE RESOURCES
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Level: 2	Credit Value: 4	GLH: 40
<p>Rationale: This unit is designed to develop the learners' knowledge, skills and understanding when working with heavy loads. It enhances the learners understanding of safe working practices and how to select and use the correct equipment where appropriate.</p>		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Understand the requirements for working safely	1.1. Outline the health and safety legislation concerned with moving and handling loads 1.2. State current legislation for adopting safe working practices in a range of situations including confined spaces, below ground level, at height, with tools and equipment, with materials and substances, with movements/storage of materials by manual handling and mechanical lifting 1.3. Give examples of procedures for storing workplace resources 1.4. Describe the circumstances under which health and safety control equipment should be used 1.5. Explain the importance of using health and safety control equipment according to given information 1.6. State the workplace procedures for responding to emergencies
2. Know how to move and handle resources safely	2.1. List the lifting aids and equipment available in the work area 2.2. State who is authorised to operate lifting equipment 2.3. List the workplace resources for moving occupational resources including sheet materials, loose material, bagged or wrapped material, fragile material, tools and equipment, components, liquids 2.4. State the information required to use and store lifting aids correctly 2.5. Identify the sources of information on safe working practices required of operatives, including methods of work, safe use of health and safety control equipment, safe use of lifting aids, protection of the environment 2.6. State the security procedures for storing tools, equipment and personal belongings 2.7. List the procedures for reporting accidents in the work area 2.8. Explain own responsibilities in relation to potential hazards to be encountered in a range of work situations



3. Know how to deal with problems and defects in the workplace	3.1. State the procedures for rectifying inappropriate information and unsuitable resources 3.2. Explain the importance of using the correct resources 3.3. State the procedures for dealing with defects in resources 3.4. Describe how to report defects with resources 3.5. Explain the importance of having in place procedures for selecting and using resources 3.6. Explain why it is important to protect the work area from damage 3.7. Give examples of methods and procedures for protecting the work area from damage 3.8. Explain why waste should be disposed of safely
4. Move, handle or store occupational resources	4.1. Follow procedures for using lifting aids and equipment 4.2. Use lifting aids according to instructions / given information 4.3. Carry out the work according to the given occupational resource information 4.4. Store lifting aids and equipment in the appropriate place and condition

Content:	
1.1	Legislation concerned with moving and handling of loads: Health and Safety at Work Act 1974 Provision and Use of Work Equipment Regulations 1992. Noise at Work Regulations 1989. Manual Handling Operations Regulations 1992. Lifting Operations and Lifting Equipment Regulations 1998 Working at Height Regulations 2005.
1.2	Legislation, Approved Codes of Practice and official guidance: this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
1.3	Procedures for storing: to include: components, equipment, types, quantity, lifting accessories, fastening, consumables, oils, hand tools, portable powered tools and equipment.

Content:

- 1.4 Workplace processes requiring the use of PPE:**
to include: welding, grinding, filling, drilling, cutting, chiselling, removal of glass, servicing activities, site repairs, working at height, handling chemicals, flying particles.
- 1.5 Health and Safety control equipment:**
identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV).
- 1.6 Emergencies:**
responsibilities for reporting situations in accordance with organisational policies and procedures and personal skills when involved with: fire, spillage. Injury, emergencies relating to occupational activities, inappropriate information, lack of resources.
- 2.1 Types of lifting aids:**
to include: winches, hoists, pulley and chain blocks, skids, mechanical/hydraulic jacks, wire/fabric ropes, powered manual cranes (not requiring operator certification), pull lifts, pry bars, rollers, pallet trucks, sack trucks, trollies.
- 2.2 Authorised to operate lifting equipment:**
competency to operate lifting equipment, POWER, LOLER.
- 2.3 Types of resources for moving:**
to include: sheet materials, loose material, bagged or wrapped material, fragile material, tools, equipment, components, liquids and consumables.
- 2.4 Methods of storing lifting aids:**
the storage, care and control of lifting aids.
- 2.5 Sources of information relating to safe working practices:**
drawings, specifications, method statements, risk assessments, user manuals, manufacturers' information, current regulations governing the operation of lifting aids.
- 2.6 Security procedures:**
of tools, equipment and personal belongings, on site and in the workplace.
- 2.7 Accidents:**
procedures for reporting accidents when involved with: fire, spillage, injury, emergencies relating to occupational activities, inappropriate information.
- 2.8 Responsibilities to potential hazards encountered in a work situation:**
risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training, interpreting safety information, seeking advice, seeking assistance, reporting unsafe equipment, using PPE.
- 3.1 Rectifying inappropriate information and unsuitable resources:**
responsibilities for reporting situations in accordance with organisational policies and procedures and personal skills when involved with: inappropriate information and a lack of or unsuitable resources.
- 3.2 The correct use of resources:**
the importance of using resources correctly, to include: PPE, lifting aids, workshop equipment, consumables, fluids, fuels, lubricants, coolants, hand tools, portable powered tools.

**Content:**

- 3.3 Dealing with defective resources:**
in accordance with organisational procedures and personal skills.
- 3.4 Reporting defective resources:**
in accordance with organisational procedures and personal skills.
- 3.5 Selecting resources:**
organisational procedures for the selection and use of resources relating to the occupational area.
- 3.6 The importance of protection:**
how to protect the work and surrounding area against damage from general workplace activities, other occupations and contamination.
- 3.7 Methods and procedures for protection:**
of the work and surrounding area against damage from general workplace activities, other occupations and contamination.
- 3.8 Hazardous and non-hazardous waste:**
the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.

CPM03 Evidence Required

You must be observed by your assessor successfully completing **all 3 of the tasks listed** on **at least 1 occasion**

Task Number	Task Description	Observation
1	Move and Store Resources	
2	Use Lifting Aids	
3	Lift and Support	

CPM03 Evidence Required

You must be observed by your assessor successfully carrying out **all 4 of the specific tasks listed** on **at least 1 occasion**

Specific Tasks to Cover	Observation
Follow procedures for using lifting aids and equipment	
Use lifting aids according to instructions/given information	
Carry out the work according to the given occupational resource information	
Store lifting aids and equipment in the appropriate place and condition	



UNIT REF: CPM04	UNIT TITLE: OPERATE PLANT OR MACHINERY FOR NON-OPERATIONAL MAINTENANCE ACTIVITIES
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Level: 2	Credit Value: 2	GLH: 20
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Mapping: This unit is mapped to COSVR659 – Operate plant or machinery for non-operational activities

Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to operate plant or machinery for non-operational maintenance activities. Learners will undertake preparation activities before operating plant or machinery.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for operating plant or machinery for non-operational maintenance activities	1.1 Identify the specific plant or machinery to be operated from drawings, specifications, schedules, method statements, user manuals, manufacturers' information, current regulations 1.2 Outline the human resources and skills required for the work 1.3 Outline procedures for liaising with others when assistance is required 1.4 Outline relevant current legislation, Approved Codes of Practice and official guidance relating to safely operating plant or machinery for non-operational maintenance activities 1.5 List the health and safety control equipment, materials, components, consumables and equipment required 1.6 Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.7 Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.8 Outline the procedures and safety precautions relating to the specific plant or machinery being operated 1.9 Identify capabilities, characteristics and limitations of different types of plant and machinery



<p>2. Be able to prepare for operating plant or machinery for non-operational maintenance activities</p>	<p>2.1 Liaise and plan the work with others</p> <p>2.2 Select the health and safety control equipment, materials, components, consumables and equipment required</p> <p>2.3 Protect the work and surrounding area from damage/contamination</p> <p>2.4 Confirm the plant or machinery to be operated from the information provided</p>
<p>3. Know how to operate plant or machinery for non-operational maintenance activities</p>	<p>3.1 Describe pre-use, pre-start and pre-movement checks to plant or machinery</p> <p>3.2 Describe how to manoeuvre and position the following types of plant or machinery:</p> <ul style="list-style-type: none">a. trackedb. wheeledc. self-propelled roller <p>3.3 Outline methods and procedures for operating plant or machinery within operational limitations</p> <p>3.4 Identify the British Standards signals and instructions to follow when operating plant or machinery</p> <p>3.5 Describe how to prepare plant or machinery for transportation</p> <p>3.6 Outline procedures for reporting and recording findings</p>
<p>4. Be able to operate plant or machinery for non-operational maintenance activities</p>	<p>4.1 Complete pre-use, pre-start and pre-movement checks on plant or machinery</p> <p>4.2 Manoeuvre and position plant or machinery</p> <p>4.3 Operate plant or machinery within operational limitations and to given working instructions</p> <p>4.4 Follow British Standards signals and instructions</p> <p>4.5 Shut down, park and secure plant or machinery after completing the task</p> <p>4.6 Prepare plant or machinery for transportation</p> <p>4.7 Complete the operation in accordance with safe working practices and within the allocated time</p> <p>4.8 Record findings in the appropriate format and report to the relevant individual(s)</p>

Content:

- 1.1 Sources of information relating to operational requirements:**
drawings, specifications, method statements, risk assessments, user manuals, manufacturers' information, current regulations governing the operation of plant and machinery
- 1.2 Resources and skills requirement:**
the characteristics, quality, uses, sustainability and limitations associated with plant resources and how the resources should be used; the organisational procedures to select resources. The skills required to operate plant equipment.
- 1.3 Liaising with others:**
this relates to team work, communication, meeting the needs of other occupations associated with operating plant and machinery for non-operational activities, problem solving arising from information, resources and methods of work, own authority.
- 1.4 Legislation, Approved Codes of Practice and official guidance:**
this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
- 1.5 Health and Safety control equipment:**
identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV)
Resources:
materials, components and equipment relating to types. quantity, quality, sizes and the sustainability of standard and/or specialist; consumables, fluids, fuels, lubricants, coolants, drive belts, bulbs, fuses, fastenings, nuts, bolts, pins, clips, hand tools, portable powered tools and equipment.
- 1.6 Emergencies:**
responsibilities for reporting situations in accordance with organisational authorisation and personal skills when involved with: fire, spillage. Injury, emergencies relating to occupational activities, inappropriate information, lack of resources.
- 1.7 The purpose of protection:**
how to protect the work and surrounding area against damage from general workplace activities, other occupations and contamination.
- 1.8 Safety procedures and precautions:**
risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.
- 1.9 Capabilities, characteristics and limitations:**
identify capabilities, characteristic and limitations of plant equipment (ride on and remote control) including hand-operated power tools, static machinery, pedestrian controlled equipment. wheeled and tracked plant, rollers.
- 3.1 Prepare plant equipment for operation:**
methods of completing, pre-use, pre-start and pre-movement checks, consider the area available for the movements required (height restrictions, obstructions, overhead and underground obstructions, services, ventilation and point loading).

**Content:****3.2 Manoeuvre and position plant and machine:**

methods of manoeuvring plant equipment (tracked, wheeled and self-propelled rollers) on slopes and inclines, uneven terrain, rough terrain, un-compacted ground. areas with restricted clearances and areas where there is other vehicle and pedestrian traffic , shut down, park, secure and immobilise.

3.3 Procedures for operating plant equipment:

procedures for operating plant equipment (tracked, wheeled and self-propelled rollers) on slopes and inclines, uneven terrain, rough terrain, un-compacted ground. areas with restricted clearances and areas where there is other vehicle and pedestrian traffic, shut down, park, secure and immobilise.

3.4 British Standards signals:

HSE document hsg144 paragraph 52 or BS ISO 23853:2004

3.5 Preparing for transportation:

Organisational procedure for transporting plant equipment, fluid levels, attachments, additional buckets, safety locking devices and compliance with the road traffic act.

3.6 Record keeping:

organisational procedures and statutory requirements relating to recording and processing information.

CPM04 Evidence Required

You must be observed by your assessor successfully operating **at least 1 item** of plant or machinery on **at least 1 occasion**.

Task Number	Task Description	Observation
1	Operate Tracked Plant	
2	Operate Wheeled Plant	
3	Operate A Self-Propelled Roller	

CPM04 Evidence Required

You must be observed by your assessor successfully carrying out **all 8** of the specific tasks listed on **at least 1 occasion**.

Specific Tasks to Cover	Observation
Complete pre-use check	
Complete pre-start check	
Complete pre-movement check	
Manoeuvre and position plant or machinery	
Operate plant or machinery within operational limitations	
Follow British Standard signals and instructions	
Shut down, park and secure plant or machinery	
Prepare plant or machinery for transportation	



UNIT REF: CPM05	UNIT TITLE: SERVICE PLANT OR MACHINERY
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Level: 2	Credit Value: 7	GLH: 66
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Mapping: This unit is mapped to COSVR660 – Service plant or machinery

Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to service plant or machinery. Learners will undertake preparation activities before servicing and carry out completion activities on conclusion of the work

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for servicing plant or machinery	1.1. Identify servicing requirements for specific plant or machinery from drawings, specifications, schedules, procedures, method statements, manufacturers' information, current regulations 1.2. Outline relevant current legislation, Approved Codes of Practice and official guidance relating to safely servicing plant or machinery 1.3. List the health and safety control equipment, materials, components, consumables and equipment required 1.4. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.5. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.6. Outline the procedures and safety precautions relating to servicing specific plant or machinery 1.7. Describe how to use information found in workshop manuals, parts manuals, guides, technical service bulletins and electronic data
2. Be able to prepare for servicing plant or machinery	2.1. Confirm the servicing requirements for specific plant or machinery based on the information provided 2.2. Select the health and safety control equipment, materials, components, consumables and equipment required 2.3. Protect the work and surrounding area from damage/contamination



<p>3. Know how to service plant or machinery</p>	<p>3.1. Describe the importance of servicing requirements for specific systems</p> <p>3.2. Describe methods, procedures and the purpose of replacing different types of service items including fluids, spark plugs, filters, drive belts, brake components, bulbs, fuses, gaskets, seals</p> <p>3.3. Describe methods, procedures and the purpose of carrying out routine adjustments</p> <p>3.4. Describe how to check for defects by sight, touch, smell and sound</p> <p>3.5. Outline the functional, operational and safety checks to complete after servicing plant or machinery</p>
<p>4. Be able to service plant or machinery</p>	<p>4.1. Check or replace service items</p> <p>4.2. Perform routine adjustments</p> <p>4.3. Lubricate parts, components, linkages, cables</p> <p>4.4. Clean parts and components</p> <p>4.5. Check security of fastenings including nuts and bolts as required</p> <p>4.6. Where appropriate check for defects by sight, touch, smell and sound</p> <p>4.7. Use hand tools, portable powered tools and equipment and access equipment as required</p> <p>4.8. Complete servicing in accordance with safe working practices and within the allocated time</p> <p>4.9. Complete functional, operational and safety checks</p>
<p>5. Know how to complete activities after servicing plant or machinery</p>	<p>5.1. Outline procedures for reporting and recording findings</p> <p>5.2. Outline procedures for cleaning the work area</p> <p>5.3. Outline how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance</p>
<p>6. Be able to complete activities after servicing plant or machinery</p>	<p>6.1. Clean the work area and dispose of waste in accordance with relevant documentation</p> <p>6.2. Record findings in the appropriate format</p> <p>6.3. Report findings to the relevant individual(s)</p>

Content:

- 1.1 Sources of information relating to service requirements:**
drawings, specifications, schedules, workshop manuals, parts manuals, service bulletins, electronic data and cross reference information, method statements, risk assessments, manufacturer's information and current regulations associated with the servicing of plant equipment.
- 1.2 legislation and official guidance:**
this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height. with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting
- 1.3 Health and Safety control equipment:**
identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV),
Resources:
materials, components and equipment relating to types. quantity, quality, sizes and the sustainability of standard and/or specialist: consumables, fluids, fuels, lubricants, coolants, filters, drive belts, brake components, bulbs, fuses, gaskets, seals, fastenings, nuts and bolts, pins, clips, hand tools, portable powered tools and equipment
- 1.4 Emergencies:**
responsibilities for reporting situations in accordance with organisational authorisation and personal skills when involved with: fire, spillage, injury, emergencies relating to occupational activities, inappropriate information, lack of resources
- 1.5 The purpose of protection:**
how to protect the work and surrounding area against damage from general workplace activities, other occupations, contamination and environmental responsibilities.
- 1.6 Safety procedures and precautions:**
risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.
- 1.7 How to apply information relating to service requirements:**
how to relate information gained from drawings, specifications, schedules, workshop manuals, parts manuals, service bulletins, electronic data and cross reference information, method statements, risk assessments, manufacturers information and current regulations associated with the servicing of plant equipment.
- 3.1 The importance of servicing:**
periodic, scheduled, safety, conformity, longevity, residual value and event based servicing methods, apply routine and non-routine maintenance service methods and procedures required by the manufacturer and owner.
- 3.2 Methods and procedures:**
for replacing service items to include: filters, drive belts, brake components. bulbs, fuses, gaskets, seals, lubricate parts, components, linkages, cables, flush through cooling, lubrication and fluid systems, cleaning parts and components, secure fastenings, nuts, bolts etc. work on high temperature and high pressure components and systems.
- 3.3 Routine adjustments:**
the types of routine adjustments, and the methods and procedures to carry them out on plant equipment: belts, chains, cables, linkages, clearances, brakes, clutches.



Content:

- 3.4 Methods of checking:**
for defects e.g. sight, touch, smell and sound.
- 3.5 Functional, operational and safety checks:**
methods used to carry out functional, operational and safety checks on plant equipment related to the service activities that have been performed; acceleration and / or deceleration, power, pressure, flow, maximum speed, idle speed, selection of gears, engagement and or disengagement, starting performance, leak tests.
- 5.1 Record keeping:**
organisational procedures and statutory requirements relating to recording and processing servicing and maintenance information.
- 5.2 Cleaning the work area:**
cleaning tools and equipment to maximise workplace efficiency, how to carry out housekeeping activities safely and in a way that minimises inconvenience to customers and staff, risks involved when using solvents and detergents, advantages of good housekeeping.
- 5.3 Hazardous and non-hazardous waste:**
the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.

CPM05 Evidence Required

You must be observed by your assessor successfully carrying out a service which includes completing **at least 5** of the 6 tasks listed on **at least 1 occasion**

Task Number	Task Description	Observation
1	Replenish or replace fluids	
2	Replace service items	
3	Lubricate parts	
4	Flush through cooling, lubrication or fluid systems	
5	Clean parts and components	
6	Secure fastenings	

CPM05 Evidence Required

You must be observed by your assessor successfully carrying out **all 6** of the specific tasks listed on **at least 1 occasion**.

Specific Tasks to Cover	Observation
Check or replace service items	
Lubricate parts, components, linkages, cables	
Clean parts and components	
Check security of fastenings including nuts and bolts	
Check for defects	
Perform routine adjustments	



UNIT REF: CPM06	UNIT TITLE: REMOVE AND REPLACE PLANT OR MACHINERY COMPONENTS
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Level: 2	Credit Value: 40	GLH: 392
Mapping: This unit is mapped to COSVR661 – Remove and replace plant or machinery components to restore operational use		
Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to remove and replace plant or machinery components. Learners will undertake preparation activities before removing and replacing components and carrying out completion activities on conclusion of the work.		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for removing and replacing plant or machinery components	1.1. Identify the components to be removed and replaced from drawings, specifications, schedules, method statements, workshop manuals, parts manuals, manufacturers' information, current regulations 1.2. Outline relevant current legislation and official guidance relating to safely removing and replacing components in plant or machinery 1.3. List the health and safety control equipment, materials, components, consumables and equipment required 1.4. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.5. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.6. Outline the procedures and safety precautions relating to removing and replacing specific plant or machinery components 1.7. Describe how to prepare and isolate plant or machinery
2. Be able to prepare for removing and replacing plant or machinery components	2.1. Confirm from the information provided the components to be removed and replaced 2.2. Select the health and safety control equipment, materials, components, consumables and equipment required 2.3. Protect the work and surrounding area from damage/contamination 2.4. Identify requirements for removing components 2.5. Notify others of the removal process 2.6. Prepare and isolate plant or machinery



<p>3. Know how to remove and replace plant or machinery components</p>	<p>3.1. Describe procedures for marking components prior to removal</p> <p>3.2. Outline methods and procedures for releasing stored energy</p> <p>3.3. Outline methods and procedures for supporting and protecting components</p> <p>3.4. Describe techniques for removing specific plant or machinery components</p> <p>3.5. Describe how to replace specific components to given working instructions</p> <p>3.6. Outline methods and procedures for positioning, aligning and connecting components</p> <p>3.7. Describe how to adjust settings to given parameters</p> <p>3.8. Describe the functional, operational and safety checks to complete after replacing components</p>
<p>4. Be able to remove and replace plant or machinery components</p>	<p>4.1. Mark components prior to removal</p> <p>4.2. Release stored energy</p> <p>4.3. Support and protect components</p> <p>4.4. Remove specific plant or machinery components to given working instructions</p> <p>4.5. Replace specific components to given working instructions</p> <p>4.6. Position, align and connect components</p> <p>4.7. Adjust settings to given parameters</p> <p>4.8. Perform functional, operational and safety checks</p> <p>4.9. Use hand tools, portable powered tools, specialist tools and equipment and access equipment as required</p> <p>4.10. Remove and replace components in accordance with safe working practices and within the allocated time</p>



<p>5. Understand the principles of power units</p>	<p>5.1 Describe how different power units operate including two and four-stroke, petrol, diesel and gas</p> <p>5.2 Describe how to calculate volumes and compression ratios</p> <p>5.3 List the component parts of:</p> <ul style="list-style-type: none">a. lubrication systemsb. cooling systemsc. fuel systemsd. air systemse. electrical/electronic ignition systems <p>5.4 Describe how the following systems operate:</p> <ul style="list-style-type: none">a. lubrication systemsb. cooling systemsc. fuel systemsd. air systemse. electrical/electronic ignition systems <p>5.5 Describe how to adjust clearances</p>
<p>6. Understand the principles of transmissions</p>	<p>6.1 Describe different layouts of wheeled and tracked transmissions</p> <p>6.2 List track assemblies and components</p> <p>6.3 Describe the key features of different types of wheels and tyres</p> <p>6.4 Describe how different types of transmission units operate including hydraulic, gearbox, clutch, shaft, coupling, multiple drive units, chain and belt</p> <p>6.5 Outline procedures for the complete removal and replacement of transmissions including calculating ratios</p>
<p>7. Understand the principles of braking systems</p>	<p>7.1 Describe different layouts of wheeled and tracked braking systems</p> <p>7.2 Describe how different types of braking systems operate including mechanical, hydraulic, air, combined</p> <p>7.3 Describe how to remove and replace braking system components</p> <p>7.4 Describe how to make different types of adjustments to braking systems</p>
<p>8. Understand the principles of steering and suspension systems</p>	<p>8.1 Describe different layouts of wheeled and tracked steering and suspension systems</p> <p>8.2 Describe how different types of steering and suspension systems operate</p>



<p>9. Understand the principles of hydraulic and pneumatic systems</p>	<p>9.1 Describe different layouts of wheeled and tracked hydraulic and pneumatic systems</p> <p>9.2 Describe how different types of hydraulic and pneumatic systems operate</p> <p>9.3 Outline methods for calculating force, pressure and area</p> <p>9.4 Describe how to remove and replace hydraulic and pneumatic system components</p>
<p>10. Understand the principles of electrical systems</p>	<p>10.1 Describe different layouts of plant or machinery low and high voltage electrical systems</p> <p>10.2 Describe how different plant or machinery electrical systems operate including charging systems, lighting systems, starting systems, auxiliary systems</p> <p>10.3 Outline the importance of calculations for electrical systems</p> <p>10.4 Outline maintenance requirements of electrical system components</p> <p>10.5 Describe how to remove, replace and test electrical system components</p>
<p>11. Understand the principles of small plant, tools and equipment</p>	<p>11.1 Describe different layouts of small plant, tools and equipment</p> <p>11.2 Describe how different small plant, tools and equipment operate including generators, pneumatic and electric tools, cleaning equipment</p> <p>11.3 Outline the uses of different types of ancillary equipment including connections, extension leads, transformers, water pipes</p> <p>11.4 Describe how to remove and replace small plant, tools and equipment components</p>
<p>12. Know how to complete activities after removing and replacing plant or machinery components</p>	<p>12.1 Outline procedures for completing and maintaining records of the work</p> <p>12.2 Outline how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance</p>
<p>13. Be able to complete activities after removing and replacing plant or machinery components</p>	<p>13.1 Complete and maintain records of the work in the appropriate format</p> <p>13.2 Dispose of hazardous and non-hazardous waste in accordance with relevant documentation</p>

Content:

- 1.1 Sources of information relating to the removal and replacement requirements:**
drawings, specifications, schedules, workshop manuals, parts manuals, service bulletins, electronic data and cross reference information, method statements, risk assessments, manufacturer's information and current regulations associated with the removal and replacement of plant equipment components.
- 1.2 Legislation and official guidance:**
this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
- 1.3 Health and Safety control equipment:**
identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV).
Resources:
materials, components and equipment relating to types, quantity, quality, sizes and the sustainability of standard and/or specialist: consumables, fluids, fuels, lubricants, coolants, fastenings, nuts, bolts, pins, clips, hand tools, portable powered tools, specialist tools and equipment.
- 1.4 Emergencies:**
responsibilities for reporting situations in accordance with organisational policies/ procedures and personal skills when involved with: fire, spillage, injury, emergencies relating to occupational activities, inappropriate information, lack of resources
- 1.5 The purpose of protection:**
how to protect the work and surrounding area against damage from general workplace activities, other occupations and contamination.
- 1.6 Safety procedures and precautions:**
risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.
- 1.7 Prepare and isolate plant equipment:**
the safety requirements required before removing components and assemblies: safety strut/bar, releasing residual pressures, isolating electrical supplies, draining fluids, dust.
- 3.1 Methods of marking components:**
the procedure for marking component parts prior to removal: punch, paint, chalk, pen, scribe, label, cable ties and tape.
- 3.2 Procedures for releasing stored energy:**
how to safely release residual energy; electric, pressure (sprung, hydraulic, pneumatic) and fluid (fuels, coolants and lubricants) and confirm that the plant equipment is safe.
- 3.3 Component protection:**
how to protect components and sub-assemblies, threads, keyways, seals, faces, wires, links and connections.
- 3.4 Methods and procedures for removing components:**
how to remove the following components: housing, transmission, steering, track or running gear, hydraulics, pump, brakes, electrics, electronics, ancillaries (blade, wear pads, boom, cab).

Content:

- 3.5 Methods and procedures for replacing components:**
 how to replace the following components: housing, transmission, steering, track or running gear, hydraulics, pump, brakes, electrics, electronics, ancillaries (blade, wear pads, boom, cab).
- 3.6 Methods and procedures for positioning and connecting:**
 position, align and connect components with push and press fit, soldering, locking pins, threaded devices, dips and specialist retaining devices and by applying torque loadings.
- 3.7 Adjust settings to given parameters:**
 methods of establishing clearances and pre-load, how to set and use torque wrenches, rolling torque gauges, pressure gauges, multi-meters, electronic diagnostic equipment.
- 3.8 Functional, operational and safety checks:**
 methods used to carry out functional, operational and safety checks on plant equipment related to the service activities that have been performed; acceleration and/or deceleration, power, pressure, flow, maximum speed, idle speed, selection of gears, engagement and or disengagement, starting performance, leak tests.
- 5.1 The operation of power units:**
 to include: two stroke, four stroke, spark ignition, compression ignition; the advantages and disadvantages of different engine types and configurations; inline, inclined, horizontal, vee, multi and single cylinder.
- 5.2 Volumes and compression ratios:**
 methods of calculating; engine compression ratios, cylinder and swept volumes.
- 5.3 Component parts of a power unit:**
 to include: ignition systems, spark plugs, injection pumps, primer/lift pumps, injectors, governors, cold start aids, air filtration systems, exhaust systems, turbo chargers, superchargers, carburettors, cooling systems, air and water.
- 5.4 The operation of systems**
 to include: lubrication systems, cooling systems, fuel systems, induction systems, electrical/electronic ignition systems
- 5.5 Adjusting clearances**
 to include: valve timing, valve rock, valve lead and lag, the methods and procedures for adjusting valve clearances on multi and single cylinder power units.
- 6.1 Layouts of wheeled and tracked transmissions:**
 and their components from the point of entry to its point of exit, to include: sliding mesh, constant mesh, synchro mesh, power shuttle, power shift, hydrostatic, selectors, detents, interlocks, dry clutch, oil immersed clutch, differentials, front and rear drive axles, reduction units, drive shaft assemblies, constant velocity joints, belt drive assemblies, friction drives.
- 6.2 Track assemblies and components:**
 to include: motors, brakes, gearbox, sprockets, chains, pins, bushes, links, pads, grouser, rollers, idlers, master pins, SALT tracks.
- 6.3 Key features of wheels and tyres:**
 to include: split and solid wheel rims, cross ply, radial, solid, foam filled, pneumatic, non-marking, treads.
- 6.4 Operating principles of transmissions:**
 to include: sliding mesh, constant mesh, synchro mesh, power shuttle, power shift, hydrostatic, selectors, dry clutch, oil immersed clutch, differentials, front and rear drive axles, reduction units, drive shaft assemblies, constant velocity joints, belt drive assemblies, friction drives.

Content:

- 6.5 The procedures for removal and replacement of transmissions:**
to include: the preparation use of tools and equipment, safety precautions, logical and systematic processes, the preparation of replacement units for re-fitting, checking replacement unit ratios (calculating ratios).
- 7.1 Layouts of wheeled and tracked braking systems:**
to include: dry disc, oil immersed, drum and band brakes, hydraulic, hydro pneumatic, pneumatic, power, and mechanical engaging systems, over-run brakes.
- 7.2 Operating principles of braking systems:**
to include: dry disc, oil immersed, drum and band brakes, hydraulic, hydro pneumatic, pneumatic, power, and mechanical engaging systems, over-run brakes.
- 7.3 The procedures for removal and replacement of braking system components:**
to include: the preparation use of tools and equipment, safety precautions, logical and systematic processes, the preparation of replacement components for re-fitting.
- 7.4 Methods of adjustments:**
to include: the preparation use of tools and equipment, safety precautions, manufacturers adjustment methods, procedures for bleeding brake systems.
- 8.1 Layouts of wheeled and tracked steering and suspension systems:**
to include: manual, power assisted, hydrostatic, 2/4 wheel, crab, centre pivot and skid steering; polymer, coil/leaf springs, hydraulic, pneumatic, torsion bar and independent suspension.
- 8.2 Operating principles of steering and suspension systems:**
to include: steering box, rack and pinion, linkage, orbital units, Ackerman angle, toe in/out, castor, camber and king pin inclination; polymer, coil/leaf springs, hydraulic, pneumatic, torsion bar and independent suspension.
- 9.1 Layouts of wheeled and tracked hydraulic and pneumatic systems:**
to include: pumps and motors (fixed and variable displacement), valves (pressure maintaining, relief, auxiliary relief, counter balance, directional flow, double acting, single acting, motor, priority, pressure differential and pilot operated), solenoid, rams (single and double acting multi stage displacement balanced), cylinder cushioning, flow dividers, restrictors, reservoirs, accumulators, filters (suction, high pressure and strainers); compressors, pressure regulators, relief valves, dump valves, control valves, hand and foot brake valves, diaphragm operated valves, air activated cylinders, air receivers and dryers.
- 9.2 Operating principles of hydraulic and pneumatic systems:**
to include: pumps and motors (fixed and variable displacement), valves (pressure maintaining, relief, auxiliary relief, counter balance, directional flow, double acting, single acting, motor, priority, pressure differential and pilot operated), solenoid, rams (single and double acting multi stage displacement balanced), cylinder cushioning, flow dividers, restrictors, reservoirs, accumulators, filters (suction, high pressure and strainers); compressors, pressure regulators, relief valves, dump valves, control valves, hand and foot brake valves, diaphragm operated valves, air activated cylinders, air receivers and dryers.
- 9.3 Methods for calculating force, pressure and area:**
carrying out calculations using force, pressure and area formulae.
- 9.4 The procedures for removal and replacement of hydraulic and pneumatic systems:**
to include: the preparation use of tools and equipment, safety precautions, releasing of pressure, cleanliness, logical and systematic processes, the preparation of replacement components for re-fitting.

Content:

- 10.1 Layouts of low and high voltage electrical systems:**
to include: low voltage electrics (starting and charging, lighting and auxiliary systems); high voltage electrics (generators, centre tapped transformers).
- 10.2 Operating principles of electrical systems:**
starter circuits (inertia and pre engaged, heat start and safety start switching) charging circuits (alternators, diode packs, rectifiers, stators & rotors) lighting circuits (indicators, brake lights, side, head, marker & work lights) instrumentation (fuel, temperature, tachometer & hour meter) spark ignition systems (spark generation, coil packs, distributors, switching & leads) ancillary circuits (wiper motors, stop circuits, ventilation & horn) isolation (battery isolation & safety isolation) circuit protection (fuses and fusible links, thermal switches, over/under voltage & Residual Current Device (RCD) general (switches, relays, actuators, earth bonding, double insulation & printed circuits).
- 10.3 Electrical calculations:**
to include: Ohm's law and its application and principles, power, resistance, voltage drop, cable selection.
- 10.4 Maintenance requirements of electrical system components:**
to include: the preparation and use of tools and equipment for the maintenance of components, applying appropriate safety precautions.
- 10.5 The procedures for removal and replacement and testing of electrical system components:**
to include: the preparation and use of tools and equipment for the removal, replacement and testing of components, applying appropriate safety precautions, the importance of logical and systematic processes, the testing of systems and components, the preparation of replacement units for re-fitting or replacement.
- 11.1 Layouts of small plant, tools and equipment:**
to include: water pumps, generators, compressors, vibrating pickers, electric tools, cleaning equipment, mixers, floor saws, cut off saws, power floats, pneumatic tools, extension leads, transformers.
- 11.2 Operating principles of small plant, tools and equipment:**
to include: water pumps, generators, compressors, vibrating pickers, electric tools, cleaning equipment, mixers, floor saws, cut off saws, power floats, pneumatic tools, extension leads, transformers.
- 11.3 The uses of ancillary equipment:**
to include: extension leads, transformers, splitters, Residual Current Device (RCD), air hoses, air oilers, water pipes, water suppression kits.
- 11.4 The procedures for removal and replacement of small plant, tools and equipment components:**
to include: the preparation and use of tools and equipment for the removal and replacement of components, applying appropriate safety precautions, the importance of logical and systematic processes, the testing of systems and components, the preparation of replacement components for re-fitting or replacement.
- 12.1 Record keeping:**
organisational procedures and statutory requirements relating to recording and processing maintenance information.
- 12.2 Hazardous and non-hazardous waste:**
the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.



CPM06 Evidence Required			
You must be observed by your assessor successfully removing and replacing plant or machinery components from at least 4 different systems listed			
Task Number	Task Description	Systems	Observation
1	Remove and Replace a Housing	Power Unit	
2	Remove and Replace a Transmission	Transmission	
3	Remove and Replace a Steering Component	Steering	
4	Remove and Replace a Component from a Tracked Undercarriage	Tracked Vehicle	
5	Remove and Replace a Hydraulic Component	Hydraulic	
6	Remove and Replace a Component from a Pump	Pumping	
7	Remove and Replace a Brake Component	Brakes	
8	Remove and Replace an Electrical Component	Electrical	
9	Remove and Replace an Electronic Component	Electronic	
10	Remove and Replace Auxiliary Components	Auxiliary	

CPM06 Evidence Required	
You must be observed by your assessor successfully carrying out all 8 of the specific tasks listed on at least 1 occasion .	
Specific Tasks to Cover	Observation
Mark components prior to removal	
Release stored energy	
Support and protect components	
Position and align components	
Connect components	
Adjust settings to given parameters	
Perform a functional/operational check	
Perform a safety check	



UNIT REF: CPM07	UNIT TITLE: DISMANTLE AND ASSEMBLE PLANT OR MACHINERY COMPONENTS
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Level: 2	Credit Value: 7	GLH: 66
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Mapping: This unit is mapped to COSVR662 – Dismantle and assemble plant or machinery components to replace worn, damaged or faulty parts

Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to dismantle and assemble plant or machinery components. Learners will undertake preparation activities, inspect components and carry out the dismantling and assembling procedures, before carrying out completion activities on conclusion of the work.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for dismantling and assembling plant or machinery components	1.1. Identify the activity to be completed from drawings, specifications, schedules, method statements, workshop manuals, technical service bulletins, parts manuals, manufacturers' information, current regulations 1.2. Outline relevant current legislation, and official guidance relating to safely dismantling and assembling plant or machinery components 1.3. List the health and safety control equipment, materials, components, consumables and equipment required 1.4. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.5. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.6. Outline procedures for preparing and isolating plant or machinery and notifying others 1.7. Outline the procedures and safety precautions relating to dismantling and assembling specific plant or machinery components
2. Be able to prepare for dismantling and assembling plant or machinery components	2.1. Confirm the requirements for dismantling and assembling plant or machinery components based on the information provided 2.2. Select the health and safety control equipment, components, consumables and equipment required 2.3. Protect the work and surrounding area from damage/contamination 2.4. Prepare and isolate plant or machinery 2.5. Notify others of the work being carried out



<p>3. Know how to inspect plant or machinery components for wear, damage and serviceability</p>	<p>3.1. Identify components and tag or label</p> <p>3.2. Outline procedures for releasing stored energy</p> <p>3.3. Describe the information to mark on components prior to dismantling</p> <p>3.4. Outline methods and procedures for measuring and inspecting component parts and sub-assemblies for serviceability against given specifications</p>
<p>4. Be able to inspect plant or machinery components for wear, damage and serviceability</p>	<p>4.1 Release stored energy</p> <p>4.2 Mark components prior to dismantling</p> <p>4.3 Measure and inspect component parts and sub-assemblies for serviceability against given specifications</p>
<p>5. Know how to dismantle and assemble plant or machinery components</p>	<p>5.1 Outline methods and procedures for supporting and protecting components and sub-assemblies</p> <p>5.2 Outline methods and procedures for dismantling and assembling components on the following systems to given working instructions:</p> <ul style="list-style-type: none"> a. hydraulic b. electrical c. pneumatic d. mechanical <p>5.3 Describe how to replace worn, damaged or faulty parts</p> <p>5.4 Outline methods and procedures for positioning and connecting component parts and sub-assemblies</p> <p>5.5 Describe how to adjust settings to given parameters</p>
<p>6. Be able to dismantle and assemble plant or machinery components</p>	<p>6.1. Support and protect components and sub-assemblies</p> <p>6.2. Dismantle and assemble components on plant or machinery systems to given working instructions</p> <p>6.3. Replace worn, damaged or faulty parts</p> <p>6.4. Position and connect component parts and sub-assemblies</p> <p>6.5. Adjust settings to given parameters</p> <p>6.6. Use hand tools, portable power tools, specialist tools and equipment and access equipment as required</p> <p>6.7. Complete the reassembly in accordance with safe working practices and within the allocated time</p>

<p>7. Know how to carry out completion activities after dismantling and assembling plant or machinery components</p>	<p>7.1. Outline the functional and operational checks to complete on reassembled components</p> <p>7.2. Outline procedures for completing and maintaining records</p> <p>7.3. Outline how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance</p>
<p>8. Be able to carry out completion activities after dismantling and assembling plant or machinery components</p>	<p>8.1. Complete functional and operational checks on reassembled components</p> <p>8.2. Complete and maintain records of the work in the appropriate format</p> <p>8.3. Dispose of hazardous and non-hazardous waste in accordance with relevant documentation</p>

Content:

1.1 Sources of information relating to the dismantling and assembling requirements:

drawings, specifications, schedules, workshop manuals, parts manuals, service bulletins, electronic data and cross reference information, method statements, risk assessments, manufacturer's information and current regulations associated with the dismantling and assembling of plant equipment components.

1.2 Legislation and official guidance:

this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.

1.3 Health and Safety control equipment:

identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV).

Resources:

materials, components and equipment relating to types, quantity, quality, sizes and the sustainability of standard and/or specialist: consumables, fluids, fuels, lubricants, coolants, fastenings, nuts, bolts, pins, clips, hand tools, portable powered tools and equipment.

1.4 Emergencies:

responsibilities for reporting situations in accordance with organisational authorisation and personal skills when involved with: fire, spillage, injury, emergencies relating to occupational activities, inappropriate information, lack of resources.

1.5 The purpose of protection:

how to protect the work and surrounding area against damage from general workplace activities, other occupations, contamination and environmental responsibilities.

1.6 Methods and procedures for preparing and isolating:

how to position, prepare and isolate plant equipment, chain of responsibility (employee, supervisor, managing director), employee responsibility, employer's responsibility.

1.7 Safety procedures and precautions:

risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.

Content:
3.1 Identify specified component:

recognise component: power units two and four-stroke, transmission, sliding mesh and constant mesh, clutches, axles, prop shafts, final drives, steering, hydraulics, pump, brakes, electrics, electronics, ancillaries (blade, boom, cab, drives), shafts, bearings, gears, spacers, seals, cylinders, bores, shims, belts, electrical devices etc. Methods of marking, labelling and tagging before dismantling.

3.2 Procedures for releasing stored energy:

how to safely release residual energy, electric, pressure (sprung, hydraulic, pneumatic) and fluid (fuels, coolants and lubricants) and confirm that the plant equipment is safe.

3.3 Methods of marking components:

the procedure for mark component parts prior to dismantling; punch, paint, chalk, pen, scribe, label, cable ties and tape.

3.4 Methods and procedures for measuring components:

how to measure and inspect component parts and sub-assemblies for serviceability, the different tools and their uses for measuring and comparing component parts; micrometre, Vernier callipers, rules, bore gauges, dial gauges, feeler gauges, plug gauges, ring gauges, new component parts. The methods and techniques for using measuring tools and equipment and the calculations required to evaluate measurement results, the meaning and calculation of limits, fits and tolerances.

5.1 Component protection:

how to protect components and sub-assemblies, threads, keyways, seals, faces, wires, links and connections.

5.2 Methods and procedures for dismantling and assembling components:

how to dismantle and assemble: power units two and four-stroke, transmission, sliding mesh and constant mesh, clutches, axles, prop shafts, final drives, steering, hydraulics, pump, brakes, electrics, electronics, ancillaries (blade, boom, cab, drives), shafts, bearings, gears, spacers, seals, cylinders, belts, electrical devices.

5.3 Replace worn, damaged or faulty components:

methods use to replace parts: power units two and four-stroke, transmission, sliding mesh and constant mesh, clutches, axles, prop shafts, final drives, steering, hydraulics, pump, brakes, electrics, electronics, ancillaries (blade, boom, cab, drives), shafts, bearings, gears, spacers, seals, cylinders, belts, electrical devices.

5.4 Methods and procedures for positioning and connecting:

how to position, align and connect component parts and sub-assemblies with push and press fit, soldering, locking pins, threaded devices, clips and specialist retaining devices, checking assembled component parts function, during and after assembly has been completed.

5.5 Adjust settings to given parameters:

methods of establishing end float, backlash, clearances and pre-load, how to set and use torque wrenches, rolling torque gauges, pressure gauges, multi-meters, electronic diagnostic equipment.

7.1 Functional, operational and safety checks:

methods used to carry out functional, operational and safety checks on plant equipment related to the service activities that have been performed; acceleration and / or deceleration, power, pressure, flow, maximum speed, idle speed, selection of gears, engagement and or disengagement, starting performance, leak tests.

**Content:****7.2 Record keeping:**

organisational procedures and statutory requirements relating to recording and processing maintenance information.

7.3 Cleaning the work area:

cleaning tools and equipment to maximise workplace efficiency, how to carry out housekeeping activities safely and in a way that minimises inconvenience to customers and staff, risks involved when using solvents and detergents, advantages of good housekeeping.

7.4 Hazardous and non-hazardous waste:

the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.

CPM07 Evidence Required

You must be observed by your assessor successfully dismantling and assembling components/units from **at least 4** of the 8 systems on **at least 1 occasion**

Task Number	Task Description	Systems	Observation
1	Dismantle and Assemble a Power Unit	Power Unit	
2	Dismantle and Assemble a Transmission	Transmission	
3	Dismantle and Assemble a Steering System	Steering	
4	Dismantle and Assemble a Hydraulic Component	Hydraulic	
5	Dismantle and Assemble a Pump	Pumping	
6	Dismantle and Assemble a Braking System	Brakes	
7	Dismantle and Assemble an Electrical Unit	Electrical	
8	Dismantle and Assemble an Electronic Unit	Electronic	

CPM07 Evidence Required

You must be observed by your assessor successfully carrying out **all 9** of the specific tasks listed on **at least 1 occasion**.

Specific Tasks to Cover	Observation
Release stored energy	
Mark components prior to dismantling	
Measure and inspect component parts for serviceability	
Support and protect components and sub-assemblies	
Replace worn, damaged or faulty parts	
Position and connect component parts and sub-assemblies	
Adjust settings to given parameters	
Complete a functional and operational check following assembly	
Correctly dispose of hazardous and non-hazardous waste	



UNIT REF: CPM08	UNIT TITLE: UNDERTAKE FUNCTIONAL DIAGNOSTICS OF FAULTS IN PLANT OR MACHINERY
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Level: 2	Credit Value: 2	GLH: 20
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Mapping: This unit is mapped to COSVR664 – Diagnose faults in plant or machinery systems or components

Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to undertake functional diagnostics of faults in plant or machinery. Learners will undertake preparation activities before undertaking functional diagnoses. They will then carry out completion activities on conclusion of the work.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for undertaking functional diagnostics of faults in plant or machinery	1.1. Identify functional diagnostic requirements from drawings, specifications, schedules, method statements, workshop manuals, technical service bulletins, parts manuals, manufacturers' information, current regulations 1.2. Outline relevant current legislation and official guidance relating to safely undertaking functional diagnostics of faults in plant or machinery 1.3. List the health and safety control equipment, materials, components, consumables and equipment required 1.4. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.5. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.6. Outline the procedures and safety precautions relating to the specific plant or machinery being diagnosed 1.7. Identify information required to define the functional diagnosis start point 1.8. Describe different types and causes of faults and defects which affect plant or machinery
2. Be able to prepare for undertaking functional diagnostics of faults in plant or machinery	2.1. Confirm the functional diagnostic requirements from the information provided 2.2. Select the health and safety control equipment, materials, consumables, components and equipment required 2.3. Protect the work and surrounding area from damage/contamination 2.4. Interpret information on symptoms and problems to define the diagnosis start point

<p>3. Know how to undertake functional diagnostics of faults in plant or machinery</p>	<p>3.1. Outline how the following techniques can be used to diagnose faults on plant or machinery:</p> <ul style="list-style-type: none"> a. observing operational functions b. interpreting sounds and smells c. applying awareness of the situation <p>3.2. Outline methods and procedures for diagnosing faults on specific plant or machinery to given working instructions</p> <p>3.3. Describe how to collect and analyse data</p>
<p>4. Be able to undertake functional diagnostics of faults in plant or machinery</p>	<p>4.1. Select appropriate techniques for diagnosing faults on plant or machinery to given working instructions</p> <p>4.2. Collect and analyse data</p> <p>4.3. Use hand tools, diagnostic equipment, and access equipment as required</p> <p>4.4. Complete the diagnosis in accordance with safe working practices and within the allocated time</p>
<p>5. Know how to complete activities after undertaking functional diagnostics of faults in plant or machinery</p>	<p>5.1 Describe the implications of faults for other work and the operational safety of plant or machinery</p> <p>5.2 Outline procedures for reporting and recording findings</p> <p>5.3 Outline procedures for marking plant or machinery as hazardous</p> <p>5.4 Outline how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance</p>
<p>6. Be able to complete activities after undertaking functional diagnostics of faults in plant or machinery</p>	<p>6.1 Record and report findings of the diagnoses in the appropriate format including implications for other work and operational safety</p> <p>6.2 Clearly mark any plant or machinery defined as hazardous</p> <p>6.3 Dispose of hazardous and non-hazardous waste in accordance with relevant documentation</p>

Content:

- 1.1 Sources of information relating to functional diagnostic requirements:**
drawings, specifications, schedules, method statements, risk assessments, manufacturers information and current regulations associated with functional diagnostics on plant equipment.
- 1.2 Legislation and official guidance:**
this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height; with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
- 1.3 Health and Safety control equipment:**
identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV).
Resources:
materials, components and equipment relating to types; quantity, quality, sizes and the sustainability of standard and/or specialist; consumables, fluids, fuels, lubricants, coolants, fastenings, nuts, bolts, pins, clips, hand tools, portable powered tools and equipment.
- 1.4 Emergencies:**
responsibilities for reporting situations in accordance with organisational authorisation and personal skills when involved with: fire, spillage, injury, emergencies relating to occupational activities, inappropriate information, lack of resources.
- 1.5 The purpose of protection:**
how to protect the work and surrounding area against damage from general workplace activities, other occupations, contamination and environmental responsibilities.
- 1.6 Safety procedures and precautions:**
risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.
- 1.7 How to identify information relating to fault diagnostics:**
drawings, specifications, schedules, workshop manuals, parts manuals, service bulletins, electronic data and cross reference information, method statements, risk assessments, manufacturers information and current regulations associated with the fault diagnostics of plant equipment.
- 1.8 Types and causes of faults and defects:**
to include: continual, intermittent, breakdowns and common defects, deterioration, damage, fair wear and tear, leaks, excessive wear, critical defects e.g. safety problems, safety defects etc. non-critical defects e.g. minor defects, adjustments etc.
- 3.1 Techniques for diagnosing faults:**
methods and techniques used to diagnose faults on plant equipment: situational awareness, sight, smell, touch, hearing.
- 3.2 Methods and procedures for diagnosing faults:**
investigate and establish the most likely causes of the faults by gaining information from operators and users on symptoms and problems, consider information from existing records, analyse information to define the diagnosis start point, observe the operational functions of plant and machinery components and systems. Recommendations and suggestions for repair requirements in power units, transmissions, steering, hydraulic systems, pumps, brakes, pneumatic systems, electrical systems, electronic components and operating ancillaries and attachments.

Content:

3.3 Collect and analyse data:

collect data from diagnostic aids; multi-meters, pressure and flow gauges, computers, test lamps, portable appliance testing equipment and other specialist tools and equipment, analyse the data against manufacturers specifications.

5.1 The implications of faults:

What are the implications of faults for other work and the operational safety of the plant equipment?

5.2 Record keeping:

organisational procedures and statutory requirements relating to recording and processing diagnostic information.

5.3 Methods of marking equipment as hazardous:

how to mark, tag and place notices on plant equipment and components deemed hazardous.

5.4 Hazardous and non-hazardous waste:

the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.

CPM08 Evidence Required

You must be observed by your assessor successfully carrying out diagnostic testing to **at least 5** of the 10 systems on **at least 1 occasion**

Task Number	Task Description	Systems	Observation
1	Carry Out Diagnostic Testing to a Power Unit	Power Unit	
2	Carry Out Diagnostic Testing to a Transmission	Transmission	
3	Carry Out Diagnostic Testing to Steering	Steering	
4	Carry Out Diagnostic Testing to Hydraulics	Hydraulics	
5	Carry Out Diagnostic Testing to a Pump	Pumping	
6	Carry out Diagnostic Testing to Brakes	Brakes	
7	Carry Out Diagnostic Testing to Pneumatics	Pneumatics	
8	Carry Out Diagnostic Testing to Electrics	Electrical	
9	Carry Out Diagnostic Testing to Electronics	Electronics	
10	Carry Out Diagnostic Testing to Auxiliaries and Attachments	Auxiliaries	

CPM08 Evidence Required

You must be observed by your assessor successfully carrying out **all 4** of the specific tasks listed on **at least 1 occasion**.

Specific Tasks to Cover	Observation
Collect and analyse data	
Record and report findings	
Clearly mark any plant or machinery defined as hazardous	
Correctly dispose of hazardous and non-hazardous waste	



UNIT REF: CPM09	UNIT TITLE: INSPECT PLANT OR MACHINERY FOR OPERATIONAL SERVICEABILITY
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Level: 2	Credit Value: 2	GLH: 20
Mapping: This unit is mapped to COSVR663 – Inspect plant or machinery for operational serviceability		
Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to inspect plant or machinery. Learners will undertake preparation activities before inspecting plant or machinery. They will then carry out completion activities on conclusion of the work.		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for inspecting plant or machinery for operational serviceability	1.1. Identify inspection requirements from drawings, specifications, schedules, method statements, workshop manuals, technical service bulletins, parts manuals, manufacturers' information, current regulations 1.2. Outline relevant current legislation and official guidance relating to safely inspecting plant or machinery 1.3. List the health and safety control equipment, materials, components, consumables and equipment required 1.4. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.5. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.6. Outline the procedures and safety precautions relating to the specific plant or machinery being inspected 1.7. Identify information required to define the inspection start point
2. Be able to prepare for inspecting plant or machinery for operational serviceability	2.1. Confirm the inspection requirements from the information provided 2.2. Select the health and safety control equipment, materials, consumables, components and equipment required 2.3. Protect the work and surrounding area from damage/contamination 2.4. Interpret information to define the inspection start point



<p>3. Know how to inspect plant or machinery for operational serviceability</p>	<p>3.1. Describe the types of functional inspections which can be carried out</p> <p>3.2. Outline how the following techniques can be used to inspect plant or machinery:</p> <ul style="list-style-type: none"> a. observing operational functions b. interpreting sounds and smells c. applying awareness of the situation <p>3.3. Describe how to use inspection equipment to identify:</p> <ul style="list-style-type: none"> a. deterioration, damage, excess wear and leaks b. non-critical defects c. critical defects
<p>4. Be able to inspect plant or machinery for operational serviceability</p>	<p>4.1. Conduct inspections to given working instructions</p> <p>4.2. Use inspection equipment to identify different types of defects</p> <p>4.3. Use hand tools, equipment and access equipment as required</p> <p>4.4. Complete the inspection in accordance with safe working practices and within the allocated time</p>
<p>5. Know how to complete activities after inspecting plant or machinery for operational serviceability</p>	<p>5.1. Outline classifications for the serviceability of plant or machinery</p> <p>5.2. State the life expectancy of the specific plant or machinery inspected</p> <p>5.3. Outline procedures for reporting and recording findings</p> <p>5.4. Outline how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance</p>
<p>6. Be able to complete activities after inspecting plant or machinery for operational serviceability</p>	<p>6.1. Record and report findings in the appropriate format</p> <p>6.2. Dispose of hazardous and non-hazardous waste in accordance with relevant documentation</p>

Content:

1.1 Sources of information relating to inspection requirements:

drawings, specifications, schedules, workshop manuals, parts manuals, service bulletins, electronic data and cross reference information, method statements, risk assessments, manufacturer's information and current regulations associated with the inspection of plant equipment.

1.2 Legislation and official guidance:

this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height. with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.

Content:

- 1.3 Health and Safety control equipment:**
 identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV).
Resources:
 materials, components and equipment relating to types. quantity, quality, sizes and the sustainability of standard and/or specialist: consumables, fluids, fuels, lubricants, coolants, bulbs, fuses, fastenings, nuts, bolts, pins, clips, hand tools, portable powered tools and equipment.
- 1.4 Emergencies:**
 responsibilities for reporting situations in accordance with organisational authorisation and personal skills when involved with: fire, spillage, injury, emergencies relating to occupational activities, inappropriate information, lack of resources.
- 1.5 The purpose of protection:**
 how to protect the work and surrounding area against damage from general workplace activities, other occupations, contamination and environmental responsibilities.
- 1.6 Safety procedures and precautions:**
 risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.
- 1.7 How to identify information relating to inspection requirements:**
 how to obtain relevant information from, drawings, specifications, schedules, workshop manuals, parts manuals, service bulletins, electronic data and cross reference information, method statements, risk assessments, manufacturers information and current regulations associated with the servicing of plant equipment.
- 3.1 Types of inspections:**
 daily/weekly, periodic (monthly, annual, number and hours run), pre-use, post-use, returned items post-repair, functional, safety, conformity and event based inspections.
- 3.2 Techniques for inspecting plant equipment:**
 methods and techniques used to complete inspections on plant equipment: situational awareness, operational functions, sight, smell, touch, hearing.
- 3.3 Use of inspection equipment:**
 equipment used to carry out inspections in order to identify; deterioration, damage, excess wear, leaks, non-critical and critical defects.
- 5.1 Post inspection classification:**
 criteria for classifying the serviceability of plant and machinery.
- 5.2 Life expectancy of plant inspected:**
 methods used to analyse reports, results and recommendations, requirements to achieve compliance, cost implications, statutory and safety requirements.
- 5.3 Record keeping:**
 organisational procedures and statutory requirements relating to recording and processing inspection information.
- 5.4 Hazardous and non-hazardous waste:**
 the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.



CPM09 Evidence Required		
You must be observed by your assessor successfully carrying out at least 2 of the 3 inspections on at least 1 occasion		
Task Number	Task Description	Observation
1	Pre Delivery Inspection	
2	Post Hire Inspection	
3	Annual Inspection	

CPM09 Evidence Required	
You must be observed by your assessor successfully carrying out all 4 of the specific tasks listed on at least 1 occasion .	
Specific Tasks to Cover	Observation
Confirm the inspection requirements from provided information	
Use inspection equipment to identify defects	
Record and report findings in the appropriate format	
Correctly dispose of hazardous and non-hazardous waste	



UNIT REF: CPM10	UNIT TITLE: PRODUCE ONE-OFF COMPONENTS BY BENCH FITTING TECHNIQUES
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Level: 2	Credit Value: 4	GLH: 40
Mapping: This unit is mapped to COSVR666 – Produce one-off components to restore or maintain the operational functions of plant or machinery		
Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to produce one-off components by bench fitting techniques. Learners will undertake preparation activities before producing one-off components and carrying out completion activities on conclusion of the work.		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for producing one-off components by bench fitting techniques	1.1. Identify the one-off components required from drawings, specifications, schedules, method statements, workshop manuals, parts manuals, manufacturers' information, current regulations 1.2. Outline relevant current legislation and official guidance relating to safely producing one-off components by bench fitting techniques 1.3. List the health and safety control equipment, materials, components, consumables and equipment required 1.4. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.5. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.6. Outline the procedures and safety precautions relating to the specific components being produced 1.7. Describe how to identify requirements for one-off components and how the work should be carried out
2. Be able to prepare for producing one-off components by bench fitting techniques	2.1. Confirm the one-off components required from the information provided 2.2. Select the health and safety control equipment, components, consumables and equipment required 2.3. Protect the work and surrounding area from damage/contamination 2.4. Identify requirements for one-off components 2.5. Confirm how the work will be carried out



<p>3. Know the procedures for producing one-off components by bench fitting techniques</p>	<p>3.1. Describe how to:</p> <ul style="list-style-type: none">a. transfer dimensions and measurementsb. produce templatesc. work from representative work pieces and components <p>3.2. Describe the characteristics of materials and differing mating surfaces</p> <p>3.3. Describe the appropriate bench fitting techniques for producing one-off components to given working instructions</p>
<p>4. Be able to follow procedures to produce one-off components by bench fitting techniques</p>	<p>4.1. Transfer dimensions and measurements</p> <p>4.2. Work from templates/drawings, representative work pieces and components</p> <p>4.3. Confirm the characteristics of materials and differing mating surfaces</p> <p>4.4. Produce one-off components to given working instructions using bench fitting techniques</p>
<p>5. Know how to complete activities after producing one-off components by bench fitting techniques</p>	<p>5.1. Outline procedures for recovering and storing reusable materials and components</p> <p>5.2. Outline procedures for completing and maintaining records of the work</p> <p>5.3. Describe how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance</p>
<p>6. Be able to complete activities after producing one-off components by bench fitting techniques</p>	<p>6.1. Recover and store reusable materials and components</p> <p>6.2. Complete and maintain records of the work in the appropriate format</p> <p>6.3. Dispose of hazardous and non-hazardous waste in accordance with relevant documentation</p>

Content:

- 1.1 Sources of information relating to the production of one off components:**
drawings, specifications, method statements, risk assessments, user manuals, manufacturers' information, current regulations governing the production of one off components for plant equipment.
- 1.2 Legislation, Approved Codes of Practice and official guidance:**
this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
- 1.3 Health and Safety control equipment:**
identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment; collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV)
Resources:
materials, components and equipment relating to; types, quantity, quality, sizes and the sustainability of standard and/or specialist; lifting accessories, fastening, fixings, consumables, hand tools, portable powered tools and equipment.
- 1.4 Emergencies:**
responsibilities for reporting situations in accordance with organisational policies and procedures and personal skills when involved with: fire, spillage, injury, emergencies relating to occupational activities, inappropriate information, lack of resources.
- 1.5 The purpose of protection:**
how to protect the work and surrounding area against damage from general workplace activities, other occupations and contamination.
- 1.6 Safety procedures and precautions:**
risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.
- 1.7 Identify the requirements for one-off components:**
assess requirements for repair or maintenance, validate appropriate ways in which the work should be carried out, maintain the principles of minimum intervention and reversible alteration, determine the durability of the one off component (temporary or permanent).
- 3.1 How to interpret engineering drawings:**
to include; different views and projections, symbols, scales, datum points, line types. How to transfer dimensions, measurements (hole location and spacing), fits and tolerance, produce templates, work from patterns, components and their representative work pieces, tools for marking components to include; engineers blue, templates, jigs, surface table, Vernier height gauge, angle block, scribe, centre punch, datum lines, squares.
- 3.2 Characteristics of materials:**
to include; metallic, non-metallic, ferrous metals, non-ferrous metals, strength, ductility, malleability, hardness, toughness, brittleness', elasticity, plasticity, conductivity, cast iron, steel, alloy, plastic.
- 3.3 Bench fitting techniques:**
to include; shaping, cutting, drilling, filing, cutting threads (internal and external), fabrication, welding, machining, grinding, hot and cold bending, cutting to pattern. Methods of securing to include; bolts, screws, clamps, rivets, joints (thermal and adhesive) and specialist retaining devices (circlips, cotter pins, woodruff keys).

**Content:****5.1 Recover and store materials:**

methods of recovering materials, off cuts, reusing, recycling and how to store reusable materials and components, suitability of racking, manual handling.

5.2 Record keeping:

organisational procedures and statutory requirements relating to recording and processing information.

5.3 Hazardous and non-hazardous waste:

the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.

CPM10 Evidence Required

You must be observed by your assessor successfully carrying out **both** component tasks on **at least 1 occasion**

Task Number	Task Description	Observation
1	Produce a Component	
2	Repair a Component	

CPM10 Evidence Required

You must be observed by your assessor successfully carrying out **all 5** of the specific tasks listed on **at least 1 occasion**.

Specific Tasks to Cover	Observation
Work from templates/drawings	
Select appropriate materials with the required characteristics	
Recover and store reusable materials and components	
Correctly dispose of hazardous and non-hazardous waste	



UNIT REF: CPM11	UNIT TITLE: INSTALL PLANT OR MACHINERY
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Level: 2	Credit Value: 2	GLH: 20
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Mapping: This unit is mapped to COSVR667 – Install plant or machinery for operational activities

Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to install plant or machinery. Learners will undertake preparation activities before installing plant or machinery. They will then carry out completion activities on conclusion of the work.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for installing plant or machinery	1.1. Identify the installation required from drawings, specifications, schedules, method statements, installation manuals, manufacturers' information, current regulations 1.2. Outline relevant current legislation and official guidance relating to safely installing plant or machinery 1.3. List the health and safety control equipment, materials, components consumables and equipment required 1.4. List the parts, components, attachments and accessories required to complete the installation 1.5. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.6. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.7. Outline the procedures and safety precautions relating to the specific plant or machinery being installed
2. Be able to prepare for installing plant or machinery	2.1. Confirm the plant or machinery to be installed from the information provided 2.2. Select the health and safety control equipment, materials, components, consumables and equipment required 2.3. Select the parts, components, attachments and accessories required to complete the installation 2.4. Protect the work and surrounding area from damage/contamination



<p>3. Know how to install plant or machinery</p>	<p>3.1. Describe methods of installing plant or machinery to given working instructions using the following as required:</p> <ul style="list-style-type: none">a. winchesb. hoistsc. pulley and chain blocksd. skidse. mechanical/hydraulic jacksf. wire/fabric ropesg. powered manual cranes (not requiring operator certification)h. pull lifts <p>3.2. Describe how to operate and control lifting equipment and lifting aids (not requiring operator certification)</p> <p>3.3. Outline methods and procedures for completing the installation</p> <p>3.4. Describe how to make adjustments to ensure optimum operational performance</p> <p>3.5. Outline methods and procedures for dealing with damage or defects occurring during installation</p> <p>3.6. Outline the functional and safety checks to complete to ensure the installation meets quality expectations</p>
<p>4. Be able to install plant or machinery</p>	<p>4.1. Install plant or machinery to given working instructions</p> <p>4.2. Operate and control lifting equipment and lifting aids (not requiring operator certification)</p> <p>4.3. Complete the installation using appropriate methods and procedures</p> <p>4.4. Make adjustments to ensure optimum operational performance</p> <p>4.5. Deal with damage or defects occurring during installation</p> <p>4.6. Perform functional and safety checks to ensure the installation meets quality expectations</p> <p>4.7. Use hand tools, portable powered tools, powered tools and equipment and access equipment as required</p> <p>4.8. Install plant or machinery in accordance with safe working practices and within the allocated time</p>

<p>5. Know how to complete activities after installing plant or machinery</p>	<p>5.1 Outline procedures for completing and maintaining records</p> <p>5.2 Describe how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance</p>
<p>6. Be able to complete activities after installing plant or machinery</p>	<p>6.1 Complete and maintain records of the work in the appropriate format</p> <p>6.2 Dispose of hazardous and non-hazardous waste in accordance with relevant documentation</p>

Content:

- 1.1 Sources of information relating to installation requirements:**
drawings, specifications, method statements, risk assessments, user manuals, manufacturers' information, current regulations governing the installation of plant and machinery.
- 1.2 Legislation, Approved Codes of Practice and official guidance:**
this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
- 1.3 Health and Safety control equipment:**
identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV)
Resources:
materials, components and equipment relating to; types, quantity, quality, sizes and the sustainability of standard and/or specialist; lifting accessories, fastening, ties, anchors, fixings, consumables, measuring, levelling, hand tools, portable powered tools and equipment.
- 1.4 Components required for installation:**
types of equipment and components: passenger and goods hoists, piling and drilling rigs, excavation plant or machinery, batching plants, crushing and screening plants, power generation equipment, pumps, climate management machines; fastening, ties, anchors, fixings, consumables, measuring, levelling, hand tools, portable powered tools and equipment.
- 1.5 Emergencies:**
responsibilities for reporting situations in accordance with organisational policies and procedures and personal skills when involved with: fire, spillage. Injury, emergencies relating to occupational activities, inappropriate information, lack of resources.
- 1.6 The purpose of protection:**
how to protect the work and surrounding area against damage from general workplace activities, other occupations and contamination.
- 1.7 Safety procedures and precautions:**
risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.

Content:
3.1 Site and equipment requirements:

to include: assessing the suitability of site conditions: site layout, location, availability of space, levels, prevailing weather, conditions, power supplies, Health and Safety. How to install using; winches, hoists, pulley and chain blocks, skids, mechanical/hydraulic jacks, wire/fabric ropes, powered manual cranes (not requiring operator certification), pull lifts.

3.2 Operate and control lifting aids:

the area available for the lift, movements required (height restrictions, obstructions, overhead and underground obstructions, services, ventilation and point loading), completing, pre-use, pre-start checks on equipment to include; winches, hoists, pulley and chain blocks, skids, mechanical/hydraulic jacks, wire/fabric ropes, powered manual cranes (not requiring operator certification), pull lifts.

3.3 Methods of installing plant equipment:

the resources required for the installation task, confirm parts; components, attachments, accessories are available to complete the installation, secure components for: movement, lifting, align, attach (tied in, pinned, damped, bolted and screwed), fixing equipment to load bearing structures, install and test anchors and ties, route, lay, connect and secure cables, pipes and hoses, connect power supplies.

3.4 Procedures for making adjustments:

to ensure optimum operational function.

3.5 Procedures for deal with damages and defects:

unexpected issues arising from; misaligned components, cracked casings and housings, leaks, scoring, marking of components and breakages, liaise with client, customer or their representatives.

3.6 Functional and safety checks:

methods to confirm installation functionality and safety meets expectations, compare and confirm operational outcome with given specifications, make comparisons with other plant equipment, consider previous knowledge, apply sensory abilities, (visual, audible, touch and smell) consult manufacturers' information.

5.1 Record keeping:

organisational procedures and statutory requirements relating to recording and processing installation information.

5.2 Hazardous and non-hazardous waste:

the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.



CPM11 Evidence Required		
You must be observed by your assessor successfully installing plant or machinery on at least 1 occasion		
Task Number	Task Description	Observation
1	Install Plant or Machinery	

CPM11 Evidence Required	
You must be observed by your assessor successfully carrying out all 6 of the specific tasks listed on at least 1 occasion .	
Specific Tasks to Cover	Observation
Select the required parts, components, consumables and equipment	
Operate and control lifting equipment and lifting aids	
Make adjustments to ensure optimum operational performance	
Perform a functional check	
Perform a safety check	
Correctly dispose of hazardous and non-hazardous waste	



UNIT REF: CPM12	UNIT TITLE: CARRY OUT SPECIFIC TESTS ON PLANT OR MACHINERY
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Level: 2	Credit Value: 4	GLH: 40
Mapping: This unit is mapped to COSVR668 – Carry out specific tests on plant or machinery to determine operational serviceability		
Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to carry out specific tests on plant or machinery. Learners will undertake preparation activities before carrying out specific tests and completion activities on conclusion of the work.		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for carrying out specific tests on plant or machinery	1.1. Identify the specific tests to be undertaken from drawings, specifications, schedules, method statements, workshop manuals, technical service bulletins, parts manuals, manufacturers' information current regulations 1.2. Outline relevant current legislation and official guidance relating to safely carrying out specific tests on plant or machinery 1.3. List the health and safety control equipment, materials, components, consumables and equipment required 1.4. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.5. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.6. Outline the procedures and safety precautions relating to the specific plant or machinery being tested 1.7. Describe how to isolate plant, machinery and components 1.8. Describe how to confirm calibration of test equipment
2. Be able to prepare for carrying out specific tests on plant or machinery	2.1. Confirm the specific test requirements from the information provided 2.2. Select the health and safety control equipment, materials, components, consumables and equipment required 2.3. Protect the work and surrounding area from damage/contamination 2.4. Isolate plant, machinery and components 2.5. Confirm calibration of test equipment



<p>3. Know how to carry out specific tests on plant or machinery</p>	<p>3.1. Describe how to conduct specific tests on plant or machinery systems:</p> <ul style="list-style-type: none">a. hydraulicb. electricalc. pneumaticd. mechanical <p>3.2. Describe how to collect measurements, readings, input and output data, working cycle times and tolerances</p> <p>3.3. Explain how to ensure consistent data</p> <p>3.4. Outline methods and procedures for operating the test equipment required for the plant or machinery being worked on</p> <p>3.5. Explain how to analyse the information collected against given specifications</p>
<p>4. Be able to carry out specific tests on plant or machinery</p>	<p>4.1. Conduct specific tests to given working instructions on plant or machinery systems</p> <ul style="list-style-type: none">a. hydraulicb. electricalc. pneumaticd. mechanical <p>4.2. Collect measurements, readings, input and output data, working cycle times and tolerances</p> <p>4.3. Ensure data collected are consistent</p> <p>4.4. Operate test equipment for the plant or machinery systems being worked on</p> <p>4.5. Analyse the information collected against given specifications</p> <p>4.6. Use hand tools, portable power tools, test equipment and access equipment as required</p> <p>4.7. Complete the specific tests in accordance with safe working practices and within the allocated time</p>
<p>5. Know how to complete activities after carrying out specific tests on plant or machinery</p>	<p>5.1. Outline procedures for completing and maintaining records and reporting findings</p> <p>5.2. Outline how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance</p>

<p>6. Be able to complete activities after carrying out specific tests on plant or machinery</p>	<p>6.1. Complete and maintain records of the work in the appropriate format</p> <p>6.2. Report findings to the relevant individual(s)</p> <p>6.3. Dispose of hazardous and non-hazardous waste in accordance with e.g. environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance</p>
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<p>Content:</p>	
<p>1.1</p>	<p>Sources of information relating to test requirements: drawings, specifications, schedules, method statements, risk assessments, manufacturers information and current regulations associated with functional diagnostics on plant equipment.</p>
<p>1.2</p>	<p>Legislation and official guidance: this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height; with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.</p>
<p>1.3</p>	<p>Health and Safety control equipment: identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV). Resources: materials, components and equipment relating to types; quantity, quality, sizes and the sustainability of standard and/or specialist; consumables, fluids, fuels, lubricants, coolants, fastenings, nuts, bolts, pins, clips, hand tools, portable powered tools and equipment.</p>
<p>1.4</p>	<p>Emergencies: responsibilities for reporting situations in accordance with organisational authorisation and personal skills when involved with: fire, spillage, injury, emergencies relating to occupational activities, inappropriate information, lack of resources.</p>
<p>1.5</p>	<p>The purpose of protection: how to protect the work and surrounding area against damage from general workplace activities, other occupations, contamination and environmental responsibilities.</p>
<p>1.6</p>	<p>Safety procedures and precautions: risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.</p>
<p>1.7</p>	<p>Methods and procedures for preparing and isolating: how to position, prepare and isolate plant equipment, chain of responsibility (employee, supervisor, managing director), employee responsibility, employer's responsibility.</p>
<p>1.8</p>	<p>Methods and procedures for calibrating test equipment: policies and procedures, zeroing, daily/weekly, periodic (monthly, annual), pre-use, conformity of test equipment.</p>

Content:
3.1 How to conduct specific tests:

for statutory requirements, compliance with policies and procedures and operational efficiency (speeds, flow rates, consumption, emissions, output) to include: engines, hydraulics, pneumatics, electrical, brakes and steering, chassis, suspension and transmissions, hand operated power tools, static machinery, pedestrian controlled plant equipment, tracked plant, wheeled plant and rollers.

3.2 How to collect data:

collect measurements, readings, input and output data, working, cycle times and tolerances by using test equipment to include: pressure gauges, flow gauges, multi-meters, portable appliance testing equipment, computer aided diagnostic software, test lamps, compression measurement equipment and timing devices.

3.3 Ensure data is consistent:

the validity, accuracy, usability and integrity of the data collected, the relevance of inconsistent data, make allowances for situation, environment and atmospheric conditions.

3.4 Procedures for operating test equipment:

policies and procedures, zeroing, security of equipment to include; pressure gauges, flow gauges, multi-meters, portable appliance testing equipment, computer aided diagnostic software, test lamps, compression measurement equipment and timing devices.

3.5 Analyse data:

compare and confirm test outcome with given specifications, make comparisons with other plant equipment, consider previous knowledge, apply sensory abilities, (visual, audible, touch and smell) consult manufacturers' information and results of other tests.

5.1 Record keeping:

organisational procedures and statutory requirements relating to recording and processing test information.

5.2 Hazardous and non-hazardous waste:

the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.



CPM12 Evidence Required			
You must be observed by your assessor successfully carrying out testing on at least 3 of the 4 systems on at least 1 occasion			
Task Number	Task Description	Systems	Observation
1	Carry Out Testing to a Hydraulic System	Hydraulic	
2	Carry Out Testing to an Electrical System	Electrical	
3	Carry Out Testing to a Compressor	Pneumatic	
4	Carry Out Testing to a Power Unit	Power Unit	

CPM12 Evidence Required	
You must be observed by your assessor successfully carrying out all 7 of the specific tasks listed on at least 1 occasion .	
Specific Tasks to Cover	Observation
Isolate plant, machinery and components	
Confirm calibration of test equipment	
Collect measurements, readings, input and output data	
Collect working cycles times and tolerances	
Operate test equipment	
Analyse the information collected against given specification	
Correctly dispose of hazardous and non-hazardous waste	



UNIT REF: CPM13

UNIT TITLE: CONFIGURE AND HAND OVER PLANT OR MACHINERY

Level: 2

Credit Value: 3

GLH: 30

Mapping: This unit is mapped to COSVR669 – Configure plant or machinery for specific operational activities and COSVR672 – Hand over plant or machinery to the control of others

Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to configure and hand over plant or machinery. Learners will undertake preparation activities before configuring and handing over plant or machinery.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<p>The Learner will:</p>	<p>The Learner can:</p>
<p>1. Know how to prepare for configuring and handing over plant or machinery</p>	<p>1.1. Identify the configuration required and handover procedures from drawings, specifications, schedules, method statements, risk assessments, workshop manuals, technical service bulletins, parts manuals, manufacturers' information, current regulations</p> <p>1.2. Outline relevant current legislation and official guidance relating to safely configuring and handing over plant or machinery</p> <p>1.3. List the health and safety control equipment, materials, components, consumables and equipment required</p> <p>1.4. Outline the documentation required to complete the hand over</p> <p>1.5. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents</p> <p>1.6. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination</p> <p>1.7. Outline the procedures and safety precautions relating to the materials, components and equipment being used and the specific plant or machinery being configured and handed over</p>



2. Be able to prepare for configuring and handing over plant or machinery	2.1. Confirm the plant or machinery to be configured and handed over from the information provided 2.2. Select the health and safety control equipment, materials, components, consumables, equipment and documentation required 2.3. Protect the work and surrounding area from damage/contamination
3. Know how to configure and hand over plant or machinery	3.1. Describe how to configure plant or machinery to given working instructions 3.2. Describe required parameters for plant or machinery 3.3. Describe the functional, operational and safety checks to complete on configured plant or machinery 3.4. Describe how to assess the suitability of conditions for handing over 3.5. Outline procedures for assessing and confirming the condition of plant or machinery 3.6. Outline the supporting information available to operators and users 3.7. Define the moment of transferred responsibility 3.8. Describe how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance
4. Be able to configure plant or machinery	4.1. Configure plant or machinery to given working instructions 4.2. Use hand tools, portable power tools and ancillary equipment and access equipment as required 4.3. Check the required parameters for plant or machinery are achieved 4.4. Complete functional, operational and safety checks on configured plant or machinery 4.5. Assess and confirm the condition of plant or machinery 4.6. Complete the configuration and hand over in accordance with safe working practices and within the allocated time

5. Be able to hand over plant or machinery	5.1 Assess the suitability of conditions for hand over 5.2 Explain and demonstrate the operation of plant or machinery to others to given working instructions 5.3 Use hand tools, portable power tools and ancillary equipment and access equipment as required 5.4 Communicate the moment of transferred responsibility 5.5 Complete the hand over by completing relevant documentation 5.6 Provide details of the supporting information available 5.7 Complete the hand over in accordance with safe working practices and within the allocated time 5.8 Dispose of hazardous and non-hazardous waste in accordance with relevant documentation
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Content:
1.1 Sources of information relating to the configuration and handover requirements:

drawings, specifications, schedules, workshop manuals, parts manuals, service bulletins, electronic data, method statements, risk assessments, manufacturer's information and current regulations associated with the configuration and handover of plant equipment components.

1.2 Legislation and official guidance:

this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.

1.3 Health and Safety control equipment:

identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment, collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV).

Resources:

materials, components and equipment relating to types, quantity, quality, sizes and the sustainability of standard and/or specialist; consumables, fluids, fuels, lubricants, coolants, bulbs, fuses, fastenings, nuts, bolts, pins, clips, hand tools, portable powered tools and equipment.

1.4 Documentation requirements:

types of documentation used including statutory requirements; contract of hire, drawings, specifications, operators manuals, safety bulletins, safety leaflets, electronic data, manufacturers information, current regulations associated with the handover of plant equipment.

1.5 Emergencies:

responsibilities for reporting situations in accordance with organisational policies, procedures and personal skills when involved with: fire, spillage, injury, emergencies relating to occupational activities, inappropriate information, lack of resources.

1.6 The purpose of protection:

how to protect the work and surrounding area against damage from general workplace activities, other occupations, contamination and environmental responsibilities.

Content:

- 1.7 Safety procedures and precautions:**
risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.
- 3.1 Methods of configuring plant equipment:**
validate appropriate ways in which the work should be carried out, configure equipment to include; attachments, ancillaries, fire prevention (spark arrestors), structural support (anchors and ties), safety (restricted movement, passage or access, warning alarms, notices, lights), contaminant reduction (noise, gases, fluids), carriage of ancillaries or additional equipment, rail and trackside work, cutting equipment (blade or teeth angles, coatings, dressings and aspects). additions (publicity boards, notices, lights), machine control (laser measurement and guidance, global positioning system), productivity measurement (weigh load sensors, compaction sensors).
- 3.2 Parameter requirements:**
methods to ensure that the equipment configuration meets the required parameters for the specific operational activity.
- 3.3 Functional and safety checks:**
methods to confirm configuration functionality and safety meets expectations, compare and confirm operational outcome with given specifications, make comparisons with other plant equipment, consider previous knowledge, apply sensory abilities, (visual, audible, touch and smell) consult manufacturers' information.
- 3.4 Assess the suitability for handover:**
type of information necessary to ensure that the user is not exposed to any risk or danger when operating using the equipment, information given when completing a familiarisation to include: equipment specific, weight, height, width, length and complexity, warnings, control functions, safety devices, emergency procedures and manufacturer's instructions.
- 3.5 Assess the condition of plant equipment:**
daily/weekly, periodic (monthly, annual, number and hours run), pre-use, post-use, returned items post-repair, functional, safety, conformity and event based inspections.
- 3.6 Operators support information:**
types of support information; contact information (phone numbers, e-mail addresses), contract of hire, drawings, specifications, operators manuals, safety bulletins, safety leaflets, electronic data, World Wide Web, manufacturers information.
- 3.7 Transfer of responsibilities:**
Condition of hire, responsibilities to include; security, operational, competency, legislation, health and safety.
- 3.8 Hazardous and non-hazardous waste:**
the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.



CPM13 Evidence Required		
You must be observed by your assessor successfully configuring and handing over an item of plant or machinery on at least 1 occasion		
Task Number	Task Description	Observation
1	Configure and Hand Over a Machine	

CPM13 Evidence Required	
You must be observed by your assessor successfully carrying out all 10 of the specific tasks listed on at least 1 occasion .	
Specific Tasks to Cover	Observation
Configure plant or machinery to given work instructions	
Check the required parameters for plant or machinery are achieved	
Complete a functional and operational check	
Complete a safety check	
Assess and confirm the condition of plant or machinery	
Assess the suitability of conditions for hand over	
Explain and demonstrate the operation of the plant or machinery	
Communicate the moment of transferred responsibility	
Complete relevant hand over documentation	
Correctly dispose of hazardous and non-hazardous waste	



UNIT REF: CPM14	UNIT TITLE: THERMAL CUTTING AND JOINING MATERIALS
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Level: 2	Credit Value: 6	GLH: 60
Mapping: This unit is mapped to COSVR665 – Install, repair or modify construction resources by heating, welding, brazing, soldering and thermal cutting		
Rationale: This unit illustrates the skills, knowledge and understanding required to be deemed trained to cut and join materials using a variety of techniques. Learners will undertake preparation activities before cutting and joining materials using appropriate techniques. They will then carry out completion activities on conclusion of the work.		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Know how to prepare for thermal cutting and joining materials	1.1. Identify the materials to be cut and joined from drawings, specifications, schedules, method statements, manufacturers' information and current regulations 1.2. Outline relevant current legislation and official guidance relating to safely cutting and joining materials 1.3. List the health and safety control equipment, materials, components, consumables and equipment required 1.4. Outline organisational procedures for reporting inappropriate information and resources, emergencies and accidents 1.5. Describe the purpose of protection and how to protect the work and surrounding area from damage/contamination 1.6. Describe the procedures and safety precautions relating to the materials, components and equipment being used and the specific materials being cut and joined
2. Be able to prepare for thermal cutting and joining materials	2.1. Confirm from the information provided the materials to be cut and joined 2.2. Select the health and safety control equipment, materials, components, consumables and equipment required 2.3. Protect the work and surrounding area from damage/contamination



<p>3. Know how to modify and cut materials by heating and thermal cutting</p>	<p>3.1 Describe how to prepare to modify and cut materials by heating and thermal cutting</p> <p>3.2 Outline the principles and techniques for heating and thermal cutting materials including ferrous and non-ferrous materials</p> <p>3.3 Describe how to heat materials to achieve:</p> <ul style="list-style-type: none">a. heat treatb. reduce or remove corrosionc. adjust (localised/spot)d. expansion and contraction fit <p>3.4 Describe how to cut materials by thermal cutting using:</p> <ul style="list-style-type: none">a. oxygen fuel gas arcb. plasma arc
<p>4. Know how to join materials by welding, brazing and soldering</p>	<p>4.1. Describe principles of joining ferrous and non-ferrous materials</p> <p>4.2. Outline procedures and techniques for joining materials by welding, brazing and soldering including:</p> <ul style="list-style-type: none">a. gas weldingb. manual metal arc (MMA) weldingc. metal inert gas (MIG/MAG) welding <p>4.3. Describe different joint types including:</p> <ul style="list-style-type: none">a. buttb. lapc. fillet <p>4.4. Describe procedures for inspecting and conducting non-destructive and destructive testing</p> <p>4.5. Outline how to finish and dress joints</p>
<p>5. Be able to produce components by thermal cutting and joining materials</p>	<p>5.1 Prepare the materials to be heated, cut, welded, brazed or soldered</p> <p>5.2 Produce components to given working instructions using a variety of techniques</p> <p>5.3 Finish and dress joints as required</p> <p>5.4 Use hand tools, portable power tools, power tools and equipment as required</p> <p>5.5 Produce components in accordance with safe working practices and within the allocated time</p>

6. Know how to complete activities after thermal cutting and joining materials	6.1. Describe procedures for storing gases 6.2. Describe how to dispose of hazardous and non-hazardous waste in accordance with environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations, official guidance
7. Be able to complete activities after thermal cutting and joining materials	7.1. Store gases as appropriate 7.2. Dispose of hazardous and non-hazardous waste in accordance with relevant documentation

Content:

- 1.1 Sources of information relating to the cutting and joining of materials:**
to include: drawings, specifications, schedules, method statements, risk assessments, manufacturers' information and current regulations associated with heating, welding, brazing, soldering and thermal cutting.
- 1.2 Legislation and official guidance:**
this relates to the operative's responsibilities regarding potential accidents and health hazards whilst working in the workplace, below ground level, in confined spaces, at height; with tools and equipment, with materials and substances, with movement/storage of materials and by manual handling and mechanical lifting.
- 1.3 Health and Safety control equipment:**
identified by the principles of protection for occupational use, types and purpose of each type, work situations and general work environment: collective protective measures, personal protective equipment (PPE), respiratory protective equipment (RPE), local exhaust ventilation (LEV), fire extinguishers (water, CO₂, foam, powder) and their uses.
Resources:
materials, components and equipment relating to types; quantity, quality, sizes and the sustainability of standard and/or specialist; consumables, fluids, fuels, lubricants, coolants, fastenings, nuts, bolts, pins, clips, hand tools, portable powered tools and equipment.
- 1.4 Emergencies:**
responsibilities for reporting situations in accordance with organisational and statutory policies and procedures, personal skills when involved with: fire, spillage, injury, emergencies relating to occupational activities, fire extinguishers (water, CO₂, foam, powder) and their uses, inappropriate information, lack of resources.
- 1.5 The purpose of protection:**
how to protect the work and surrounding area against damage from general workplace activities, other occupations, contamination and environmental responsibilities.
- 1.6 Safety procedures and precautions:**
risk assessments, leaflets, the health and safety culture e.g. human factors; attitude, motivation, perception, competence, health and safety training.
- 3.1 Prepare to modify and cut materials:**
to include: health and safety requirements, risk assessments, method statements, pre-use inspection, setting up of heating and cutting equipment, work area preparation, PPE requirements, hot work permit.
- 3.2 The principles and techniques for heating and thermal cutting:**
to include: identification of gas cylinders and equipment, methods of assembly, change gas cylinders, safely setting up equipment, gas pressures, the types of flame, the correct techniques, clean nozzles.

Content:

- 3.3 Methods of heating materials:**
to include: the effects of heat to metal (distortion, heat affected zone), heat treat (normalising), reduce or remove corrosion, adjust (localised/spot), expansion and contraction fit, health and safety.
- 3.4 Methods of cutting materials by thermal cutting:**
to include: gases, equipment (to include plasma), gas pressures, nozzle size, the cutting process (molten pool, the reaction, temperature), aids to cutting, kerf, top plate melting, slag, PPE, health and safety.
- 4.1 Principles of joining ferrous and non-ferrous materials:**
to include: fusion, adhesion, penetration, heat affected zones.
- 4.2 Procedures and techniques for joining materials:**
to include: temperatures, angles, arc length, settings (voltage, open circuit voltage, amps, wire speed) brazing, soldering, gas, manual metal arc (MMA) and metal inert gas (MIG) welding (AC and DC), equipment types, filler rods, flux, gases.
- 4.3 Joint types:**
to include: butt, lap, corner and fillet, positional (flat, vertical and overhead), preparation, thickness, gaps, measuring, cleaning, position, tacks, pre-treatment, parameters, nozzle, voltage, amperes, wire speed, flow rates, restarts, post-treatment).
- 4.4 Methods of inspecting and conducting non-destructive and destructive testing:**
to include: non-destructive testing (visual, x-ray, dye penetrates, ultraviolet and ultrasonic), destructive testing (bend, tensile, nick break test and weld etch), imperfections (cracks, lack of penetration, lack of fusion, slag inclusion, porosity, undercut or profile imperfections, unequal leg lengths, depth of throat).
- 4.5 Methods of finish and dress joints:**
to include: grinding, polishing, buffing, brushing, abrasive types (backing material, grit size, shape, hardness, flap, fibre and abrasive discs, Scotch-Brite™ pads), equipment, types of power supply, coverings (paint, powdered coating, galvafruid, oil, grease).
- 6.1 Methods of storing gases:**
to include: handling, transportation, lifting using mechanical aids. Storage: time scale, stock rotation, suitable area, sources of ignition, security, full and empty cylinders, signage. Health and Safety: INDG327.
- 6.2 Hazardous and non-hazardous waste:**
the environmental responsibilities, organisational procedures, manufacturers' understanding information, statutory regulations and official guidance relating to disposal.



CPM14 Evidence Required		
You must be observed by your assessor successfully thermally joining materials using at least 2 of the 6 different methods on at least 1 occasion		
Task Number	Task Description	Observation
1	Oxygen and Acetylene Welding	
2	MMA Welding	
3	MIG/MAG Welding	
4	Plastic Welding	
5	Brazing	
6	Soldering	
You must be observed by your assessor successfully using thermal cutting equipment and techniques on at least 1 occasion		
7	Thermal Cutting	

CPM14 Evidence Required	
You must be observed by your assessor successfully carrying out all 6 of the specific tasks listed on at least 1 occasion .	
Specific Tasks to Cover	Observation
Confirm the materials to be cut and joined	
Prepare the materials to be cut or joined	
Produce components to given working instructions using a variety of techniques	
Finish and dress joints	
Store gases as appropriate	
Correctly dispose of hazardous and non-hazardous waste	