

# Model Curriculum

## Service Engineer- Breakdown Service

**SECTOR:** CAPITAL GOODS  
**SUB-SECTOR:** 1.Machine Tools  
2.Plastics Manufacturing Machinery  
3.Textile Manufacturing Machinery  
4.Process Plant Machinery  
5.Electrical and Power Machinery  
**OCCUPATION:** Service  
**REF ID:** CSC/Q0503, V1.0  
**NSQF LEVEL:** 5



## Certificate

### CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

**CAPITAL GOODS SKILL COUNCIL**

for the

**MODEL CURRICULUM**


Complying to National Occupational Standards of

Job Role/ Qualification Pack: 'Service Engineer - Breakdown Service' QP No. 'CSC/Q 0503, NSQF Level 5'

Date of Issuance: April 24<sup>th</sup>, 2014

Valid up to : August 30<sup>th</sup>, 2016

\*Subject to periodic re-endorsement of the Qualification Pack to the  
body that set the national occupational standards & norms



Authorised Signatory  
Tourism & Hospitality Skill Council

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# Service Engineer – Breakdown Service

## CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Service Engineer- Breakdown Service”, in the “Capital Goods” Sector/Industry and aims at building the following key competencies amongst the learner

<b>Program Name</b>	<b>Service Engineer- Breakdown Service</b>		
<b>Qualification Pack Name &amp; Reference ID. ID</b>	CSC/Q0503, v1.0		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	
<b>Pre-requisites to Training</b>	Diploma – Mechanical Engineering		
<b>Training Outcomes</b>	<p><b>After completing this programme, participants will be able to:</b></p> <ul style="list-style-type: none"> <li>• <b>Install mechanical equipment at site:</b> installing a range of mechanical equipment such as machine tools, process control equipment, rotating mechanical equipment, conveyors, lifting and handling equipment hydraulic press, furnaces, auto / manual welding machines, shot blasting machines and processing plant machinery that have mechanical systems connected to them, in accordance with approved procedures.</li> <li>• <b>Commission mechanical equipment after installation at site:</b> commissioning of a range of mechanical equipment such as machine tools, process control equipment, rotating mechanical equipment, equipment for lifting and handling, hydraulic press, furnaces, auto / manual welding machines, shot blasting machines, process plant equipment, after installation, in accordance with approved procedures.</li> <li>• <b>Deliver breakdown service on mechanical equipment installed and commissioned on site:</b> delivering breakdown service for a range of mechanical equipment installed and commissioned on site such as machine tools, process control equipment, rotating mechanical equipment, conveyors, equipment for lifting and handling, hydraulic press, furnaces, auto / manual welding machines, shot blasting machines, process plant equipment, in accordance with approved procedures.</li> <li>• <b>Basic health and safety practices at the workplace:</b> identify risks and hazards at workplace, use of PPE, and apply good housekeeping practices, etc.,</li> <li>• <b>Work effectively with others:</b> effectively communicate with others and demonstrate good ethical practices and discipline.</li> </ul>		

This course encompasses 5 out of 5 National Occupational Standards (NOS) of “Service Engineer- Breakdown service” Qualification Pack issued by “Capital Goods Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p><b>Install mechanical equipment at site</b></p> <p><b>Theory Duration</b> (hh:mm) 30:00</p> <p><b>Practical Duration</b> (hh:mm) 90:00</p> <p><b>Corresponding NOS Code</b> <b>CSC/N0501</b></p>	<ul style="list-style-type: none"> <li>• List and explain common terms used in installation</li> <li>• Explain various systems of measurement</li> <li>• Perform numerical calculations</li> <li>• Define the following terms and indicate their units               <ul style="list-style-type: none"> <li>○ Work</li> <li>○ Power</li> <li>○ Energy</li> <li>○ Force</li> <li>○ Friction</li> <li>○ Moment</li> <li>○ Couple</li> <li>○ Torque</li> <li>○ Temperature</li> </ul> </li> <li>• Read First angle and third angle drawings</li> <li>• Interpret assembly drawing, layout drawing, manufacturer’s guidelines etc.</li> <li>• Read and interpret information correctly from various job specifications</li> <li>• List common tools and equipment used in the installation               <ul style="list-style-type: none"> <li>○ Spanners</li> <li>○ Wrenches</li> <li>○ Crow bars</li> <li>○ Torque wrenches</li> <li>○ Engineer’s level</li> <li>○ Alignment telescope</li> <li>○ Laser devices etc.</li> </ul> </li> <li>• Mark the position of equipment at the site</li> <li>• Distinguish between permanent fastening and temporary fastening</li> <li>• Define torque and state its importance</li> <li>• Explain the necessity for a drilling machines and identify various types of drill bits</li> <li>• Compare various positioning, aligning, levelling and adjustment techniques</li> <li>• List various power transmission methods and explain their applicability               <ul style="list-style-type: none"> <li>○ Belt drive</li> <li>○ Chain drive</li> <li>○ Coupling</li> </ul> </li> </ul>	<p>Training kit (Trainer guide, PowerPoint), Spanners, wrenches, crow bars, torque wrenches, engineer’s level, alignment telescope, laser devices etc. straight edges, feeler gauges, spirit level, mandrels, dial test indicator (DTI), meter tape, vernier calliper, micrometer, depth gauge, plump lines, taut wires, tension meters, customized gauges, multimeter, autocollimator, Personal Protective Equipment (PPE)</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> <li>○ Clutch and brakes</li> <li>● Describe method to connect equipment to service supply</li> <li>● List various instruments used in the installation               <ul style="list-style-type: none"> <li>○ Straight edges</li> <li>○ Feeler gauges</li> <li>○ Spirit level</li> <li>○ Mandrels</li> <li>○ Dial Test Indicator (DTI)</li> <li>○ Meter tape</li> <li>○ Vernier calliper</li> <li>○ Micrometer</li> <li>○ Depth gauge</li> <li>○ Plump lines</li> <li>○ Taut wires</li> <li>○ Tension meters</li> <li>○ Customized gauges</li> <li>○ Multimeter</li> <li>○ Autocollimator</li> <li>○ Laser interferometer</li> <li>○ Square block</li> </ul> </li> <li>● List various installation defects               <ul style="list-style-type: none"> <li>○ Leaks</li> <li>○ Poor seals</li> <li>○ Misalignment</li> <li>○ Ineffective fasteners</li> <li>○ Equipment damage</li> <li>○ Contamination</li> <li>○ Vibration</li> <li>○ Etc.</li> </ul> </li> <li>● Explain the necessity of calibration</li> <li>● Carry out preliminary investigation for the following               <ul style="list-style-type: none"> <li>○ Accessibility to the site</li> <li>○ Obstructions or hazards</li> <li>○ Site preparation for the mechanical equipment installation</li> <li>○ Conduct load test</li> </ul> </li> <li>● Check for the availability of utilities</li> <li>● Obtain necessary permits to carry out the work</li> <li>● Read job specification documents</li> <li>● Observe for physical damage to the machine and inform concerned authority</li> <li>● Install machine as per manufacturer's recommendation and site specifications</li> <li>● Apply installation techniques like levelling, aligning, coupling and connecting as per job specification</li> <li>● Top up coolants, lubricating oil and other fluids as per the manufacturer's</li> </ul>	

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>recommendation</p> <ul style="list-style-type: none"> <li>• Dispose of waste as per the standard procedure</li> <li>• Carryout required documentation as per the company policy</li> <li>• Inform the users regarding he do's and don'ts</li> <li>• Switch ON the equipment and check for the proper functioning</li> <li>• Make adjustments if required</li> <li>• Use basic office applications like spread sheet, word and presentations</li> <li>• Communicate using various modes- oral, written, and e-mail</li> <li>• Demonstrate problem solving abilities</li> <li>• Plan and organize activities as per the task</li> <li>• Work in a team</li> <li>• Utilize time effectively</li> <li>• Interact politely with customers and colleagues</li> <li>• Think critically to solve a complex problem</li> </ul>	
2	<p><b>Commission mechanical equipment after installation at site</b></p> <p><b>Theory Duration</b> (hh:mm) 30:00</p> <p><b>Practical Duration</b> (hh:mm) 90:00</p> <p><b>Corresponding NOS Code</b> <b>CSC/N0502</b></p>	<ul style="list-style-type: none"> <li>• Explain common terminologies used in the commissioning procedure</li> <li>• Explain various systems of measurement</li> <li>• Perform numerical calculations</li> <li>• Define the following terms and indicate their units <ul style="list-style-type: none"> <li>○ Work</li> <li>○ Power</li> <li>○ Energy</li> <li>○ Force</li> <li>○ Friction</li> <li>○ Moment</li> <li>○ Couple</li> <li>○ Torque</li> <li>○ Temperature</li> </ul> </li> <li>• List common Personal Protective Equipment (PPE) used in the commissioning</li> <li>• Explain the commissioning procedure</li> <li>• List preliminary check activities to be undertaken before commissioning <ul style="list-style-type: none"> <li>○ Setting level</li> <li>○ Setting backlash in gears</li> <li>○ Setting working clearances</li> <li>○ Adjusting tension</li> </ul> </li> </ul>	<p>Training kit (Trainer guide, PowerPoint), Linear measuring instruments, Speed measuring devices, Multimeter, Continuity tester, Pressure testing devices, Flow testing devices, Linear measuring instruments, Personal Protective Equipment (PPE)</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> <li>○ Topping up fluid /oil reservoir</li> <li>○ Electricals and interlocks</li> <li>○ Sensory checks</li> <li>○ Proper location of locking devices and fasteners</li> <li>○ Correct fitment of guards for moving parts</li> <li>● List various PLC /CNC systems and their application</li> <li>● Explain the importance of idle running</li> <li>● List various devices, tools and equipment used in the commissioning               <ul style="list-style-type: none"> <li>○ Linear measuring instruments</li> <li>○ Speed measuring devices</li> <li>○ Multimeter</li> <li>○ Continuity tester</li> <li>○ Pressure testing devices</li> <li>○ Flow testing devices</li> </ul> </li> <li>● Explain safe practices to be followed while commissioning</li> <li>● Identify potential hazards and take corrective measures to eliminate such hazards</li> <li>● Plan commissioning activities correctly</li> <li>● Obtain required permissions to undertake commissioning work</li> <li>● Prepare the work area for commissioning</li> <li>● Carry out start-up procedure and confirm that the functioning meets specifications</li> <li>● Run the equipment at recommended initial settings</li> <li>● Conduct primary checks and sensory checks – sight, smell, sound and touch</li> <li>● Run the equipment on full load and check for the proper functioning and any misalignments</li> <li>● Carry out required documentation as per the company policy</li> <li>● Use basic office applications like spread sheet, word and presentations</li> <li>● Use recommended ERP to feed in the required data</li> <li>● Communicate using various modes- oral, written, and e-mail</li> <li>● Demonstrate problem solving abilities</li> </ul>	



Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> <li>• Plan and organize activities as per the task</li> <li>• Work in a team</li> <li>• Utilize time effectively</li> <li>• Interact politely with customers and colleagues</li> <li>• Think critically to solve a complex problem</li> </ul>	
3	<p><b>Deliver break down service on mechanical equipment installed and commissioned on site</b></p> <p><b>Theory Duration</b> (hh:mm) 30:00</p> <p><b>Practical Duration</b> (hh:mm) 90:00</p> <p><b>Corresponding NOS Code</b> <b>CSC/N0503</b></p>	<ul style="list-style-type: none"> <li>• Read first angle and third angle component and assembly drawings</li> <li>• List various systems of measurement</li> <li>• Convert units from one system of measurement to another</li> <li>• Interpret diagnostic aids like manufacturer's manual, physical layout diagram, flow chart, reports, fault analysis charts, troubleshooting guides etc.</li> <li>• Extract information from engineering drawings</li> <li>• Describe the use of various test equipment               <ul style="list-style-type: none"> <li>○ Measuring instruments/devices</li> <li>○ Thermal indicators</li> <li>○ Dial test indicator</li> <li>○ Audio test devices</li> <li>○ Torque measuring devices</li> <li>○ Self-diagnostic equipment</li> </ul> </li> <li>• Explain the importance of 'off-load' checks</li> <li>• Explain various fault diagnostic techniques               <ul style="list-style-type: none"> <li>○ Half split technique</li> <li>○ Emergent sequence</li> <li>○ Unit substitution</li> <li>○ Input/output</li> <li>○ Function/performance testing</li> <li>○ Six point testing</li> <li>○ Injection and sampling</li> <li>○ Equipment self diagnostics</li> </ul> </li> <li>• Explain the methods and techniques to dismantle mechanical components</li> <li>• Describe the types of problems associated with the breakdown servicing activity</li> <li>• Explain the method to dispose wastes safely</li> <li>• Adhere to safety norms while attending the breakdown service</li> <li>• List some of the machine operating parameters</li> </ul>	<p>Training kit (Trainer guide, PowerPoint), straight edges, feeler gauge, spirit levels, mandrels, dial test indicator, meter tape, vernier calliper, micrometer, depth gauge, plumb line, taut wires, tension meter, customized gauges, pressure testing device, flow testing device, multimeter, continuity tester, PLC/PC equipment, Spanners, wrenches, crow bars, autocollimator, gearbox, machine tools, engine, pump, process control valves, compressor, work holding devices, Personal Protective Equipment (PPE)</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> <li>○ Speed</li> <li>○ Feed</li> <li>○ Pressure</li> <li>○ Flow</li> <li>○ Timing</li> <li>○ Sequence etc.</li> <li>● Collect evidence regarding the fault from the sources               <ul style="list-style-type: none"> <li>○ Operator</li> <li>○ Sensory input</li> <li>○ Monitoring equipment or gauges</li> <li>○ Plant/machinery records</li> <li>○ Recording devices</li> </ul> </li> <li>● Apply monitoring or testing procedures to help in fault diagnosis               <ul style="list-style-type: none"> <li>○ Level and alignment checks</li> <li>○ Force/pressure checks</li> <li>○ Leakage</li> <li>○ Vibration</li> <li>○ Thermal checks</li> <li>○ Movement checks</li> <li>○ Setting travel</li> <li>○ Setting backlash in gears</li> <li>○ Set working clearances</li> <li>○ Tensioning</li> <li>○ Topping up fluid/ oil reservoir</li> <li>○ Off-load checks</li> <li>○ Switching and checking all electrical and interlocks</li> <li>○ Sensory checks</li> <li>○ Torque settings</li> <li>○ Ensure that locking devices are fitted to fasteners</li> </ul> </li> <li>● Analyse various types of information available for fault diagnosis</li> <li>● Review life cycle of the mechanical equipment               <ul style="list-style-type: none"> <li>○ Gearboxes</li> <li>○ Machine tools</li> <li>○ Lifting and handling equipment</li> <li>○ Processing plant</li> <li>○ Engines</li> <li>○ Pumps</li> <li>○ Process control valves</li> <li>○ Compressor</li> <li>○ Transfer equipment</li> <li>○ Mechanical structures</li> <li>○ Work holding devices</li> </ul> </li> <li>● Decide on the repair or replacement based on the equipment condition and service life</li> <li>● List material, components, process, tools, equipment to perform</li> </ul>	

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>breakdown service</p> <ul style="list-style-type: none"> <li>• Provide detailed cost and time estimation to the customer or any relevant authority</li> <li>• Appraise customer of relevant authority regarding the expected outcome</li> <li>• Plan and schedule the breakdown service and make all necessary arrangements</li> <li>• Communicate schedule of the breakdown service to the concerned authority and seek their approval</li> <li>• Appraise the team members about the activities to be performed and allocate the work</li> <li>• Dismantle mechanical equipment to replace defective components</li> <li>• Carryout servicing or maintenance as per the requirement</li> <li>• Re-assemble the removed components and adjust them to meet the operating specification</li> <li>• Conduct a trail run and check for the proper functioning</li> <li>• Carry out the documentation as per the company policy</li> </ul>	
4	<p><b>Health and safety</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 08:00</p> <p><b>Corresponding NOS Code</b> CSC/N1335</p>	<ul style="list-style-type: none"> <li>• Explain the importance of personal protective equipment (PPE) required for gas cutting operation</li> <li>• State the causes for accidents</li> <li>• Identify job site hazardous work and state possible causes of risk or accident at the workplace</li> <li>• Explain the importance of '5S' at the workplace</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Leather gloves, leather apron, welding screen – helmet types, hand screen welding and safety shoes</p>
5	<p><b>Fire Safety</b></p> <p><b>Theory Duration</b> (hh:mm) 05:00</p> <p><b>Practical Duration</b> (hh:mm) 25:00</p> <p><b>Corresponding NOS Code</b> CSC/N1335</p>	<ul style="list-style-type: none"> <li>• Explain types of fires - Class A, B, C and D</li> <li>• Select appropriate fire extinguisher to control fire</li> <li>• Use PASS method to operate a fire extinguisher</li> <li>• Follow fire safety signs and safe evacuation method in case of a fire</li> <li>• Identify the location of assembly point, fire exit, fire alarm</li> <li>• Follow reporting procedure in case of a fire</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Class A, B, C, D and K fire extinguishers</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
6	<p><b>Emergencies, rescue and first aid procedure</b></p> <p><b>Theory Duration</b> (hh:mm) 09:00</p> <p><b>Practical Duration</b> (hh:mm) 13:00</p> <p><b>Corresponding NOS Code</b> CSC/N1335</p>	<ul style="list-style-type: none"> <li>Follow electrical safety procedures</li> <li>Use approved method to rescue a person from electrocution</li> <li>State the importance of first aid</li> <li>Identify the contents of a first aid kit and their application</li> <li>Administer first aid in case of bleeding, burns, choking, electrical shock, poisoning, etc.</li> <li>Use of CPR process</li> <li>Bandage wounds</li> <li>Explain stages of crisis and crisis management</li> <li>Prepare an incident report</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>First aid kit with all contents</p>
7	<p><b>Work effectively with others</b></p> <p><b>Theory Duration</b> (hh:mm) 20:00</p> <p><b>Practical Duration</b> (hh:mm) 50:00</p> <p><b>Corresponding NOS Code</b> CSC/N1336</p>	<ul style="list-style-type: none"> <li>Explain the importance of team work and team dynamics</li> <li>State 4Cs of working in a team</li> <li>Explain types of communication</li> <li>Apply effective communication technique</li> <li>Overcome barriers to effective communication</li> <li>Demonstrate active listening skills</li> <li>Demonstrate good customer service skills</li> <li>Explain the importance of ethical behaviour in your day-to-day work</li> <li>State the importance of discipline in life and apply the same at workplace</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p>
	<p><b>Total Duration</b></p> <p><b>Theory Duration</b> <b>134:00</b></p> <p><b>Practical Duration</b> <b>366:00</b></p>	<p><b>Unique Equipment Required:</b></p> <p>Straight edges, feeler gauge, spirit levels, mandrels, dial test indicator, meter tape, vernier calliper, micrometer, depth gauge, plumb line, taut wires, tension meter, customized gauges, pressure testing device, flow testing device, multimeter, continuity tester, PLC/PC equipment, Spanners, wrenches, crow bars, autocollimator, gearbox, machine tools, engine, pump, process control valves, compressor, work holding devices, apron, gloves, safety boots, overalls, eye shields, goggles, ear plugs, measuring instruments,, Class A, B, C, D and K fire extinguishers, PPE, First aid kit with all contents</p>	

Grand Total Course Duration: **500 Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by [Capital Goods Skill Council](#))

## Trainer Prerequisites for Job role: “Service Engineer- Breakdown Service” mapped to Qualification Pack: “CSC/Q0503 v1.0”

Sr. No.	Area	Details
1	<b>Description</b>	Perform breakdown service for a range of mechanical equipment such as machine tools, process control equipment, rotating mechanical equipment, conveyors, equipment for lifting and handling, hydraulic press, furnaces, auto / manual welding machines, shot blasting machines, process plant equipment, in accordance with approved procedures.
2	<b>Personal Attributes</b>	Basic communication, numerical and computational abilities. Openness to learning, ability to plan and organize own work and identify and solve problems in the course of working. Understanding the need to take initiative and manage self and work to improve efficiency and effectiveness
3	<b>Minimum Educational Qualifications</b>	Diploma /Degree in Mechanical Engineering
4a	<b>Domain Certification</b>	Certified for Job Role: “ <u>Service Engineer- Breakdown Service</u> ” mapped to QP: “ <u>CSC/Q0503, v1.0</u> ”. Minimum accepted score is 80%
4b	<b>Platform Certification</b>	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102”. Minimum accepted as per respective SSC guidelines is 80%.
5	<b>Experience</b>	<ul style="list-style-type: none"> <li>3-4 years of industry experience in the relevant field</li> <li>3-4 years of teaching experience</li> </ul>

### Annexure: Assessment Criteria

<b>Assessment Criteria</b>	
<b>Job Role</b>	<b>Service Engineer- Breakdown Service</b>
<b>Qualification Pack</b>	<b>CSC/Q0503, v1.0</b>
<b>Sector Skill Council</b>	<b>Capital Goods Skill Council</b>

<b>Sr. No.</b>	<b>Guidelines for Assessment</b>
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5	To pass the Qualification Pack , every trainee should score a minimum of 70% in every NOS
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
1.CSC/N0501 Install mechanical equipment site at	PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work	100	3	1	2
	PC2.adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing fabrication and fitting operations		4	1	3
	PC3.ensure work area is clean and safe from Hazards		2	0	2
	PC4.ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition		2	0	2
	PC5.obtain clearance to carry out the installation activities		2	0	2
	PC6.provide safe access and working arrangements for the installation area		3	0	3
	PC7.ensure safe isolation of services during the Installation		2	0	2
	PC8.dispose of waste items in a safe and environmentally acceptable manner		2	1	1
	PC9.leave the work area in a safe condition and free from foreign object debris		2	0	2
	PC10. plan the installation activities in an efficient and appropriate manner		3	1	2
	PC11.survey and inspect the site and foundation		3	0	3
	PC12.ensure that appropriate utilities are available (eg. gas, water, air, electricity)		2	0	2
	PC13.ensure that required installation consumables are available		2	0	2
	PC14.ensure that safety and environmental conditions can be met		3	1	2
	PC15.obtain necessary permits to carry out the required work		2	0	2
	PC16.check the installation job specification documentation are available and correct		2	0	2
	PC17.instruct and supervise marking out of positioning and layouts		2	0	2
	PC18.check and record for any physical damages to the machine/equipment		2	0	2
	PC19.compare received product and accessories with product order specifications		3	1	2
	PC20.take appropriate action in lieu with manufacturer and customer, in case of any Deviations		3	0	3
	PC21.instruct and supervise use of grouting and adhesives after conducting foundation/site Inspection		3	0	3
	PC22.instruct and supervise drilling holes for rig		3	0	3



Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	and anchor bolts				
	PC23.instruct and supervise the movement and positioning of equipment, using cranes or forklifts as per the layout		3	1	2
	PC24.remove moisture absorbent bags, rust preventive, locking devices		2	0	2
	PC25.fill oils for lubrication, hydraulic and other special oils		2	0	2
	PC26.ensure the machine is clean		1	0	1
	PC27.install the machine in accordance with manufacturers' and site specifications		4	1	3
	PC28.perform routine modifications/alterations as per standard operating procedures or in consultation with manufacturer and customer, where required		5	2	3
	PC29.use the various installation tools and equipment as required		2	0	2
	PC30.apply installation techniques like leveling, aligning, coupling and connecting in accordance with specifications		4	1	3
	PC31.fill coolants, oil and other fluids as per Specifications		3	1	2
	PC32.ensure the site is cleaned and clear of all debris and left in safe state		1	0	1
	PC33.all reports and documentation are completed correctly to required specifications		3	1	2
	PC34.produce installations which comply with the equipment manufacturer's operation specification/range		4	1	3
	PC35.deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved		2	0	2
	PC36.complete the relevant paperwork, and pass to the appropriate people		2	0	2
	PC37.give a brief to the customer staff on do's and don'ts of the operation and maintenance of the machine		2	0	2
	PC38.switch on product equipment and carry out check for proper functioning without load		2	0	2
	PC39.make adjustments, appropriate to the equipment being installed		3	0	3
	<b>Total</b>		<b>100</b>	<b>14</b>	<b>86</b>
<b>2.CSC/N0502 Commission mechanical equipment after installation at site</b>	PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work	<b>100</b>	3	1	2
	PC2.adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing fabrication and fitting operations		3	1	2



Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC3.work following laid down procedures and Instructions		2	1	1
	PC4.ensure work area is clean and safe from Hazards		2	0	2
	PC5.ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition		2	0	2
	PC6.follow all relevant setting up and operating specifications for the products or mechanical equipment being commissioned		2	1	1
	PC7.follow the defined procedures and set up the equipment correctly ensuring that all operating parameters are achieved		3	1	2
	PC8.plan the commissioning activities so as to minimize disruption to normal working		2	0	2
	PC9.ensure that all tools and equipment used are within current calibration dates		2	0	2
	PC10.obtain clearance to carry out the commissioning activities		2	0	2
	PC11.isolate equipment from electricity, gas or fluids during commissioning		3	0	3
	PC12.prepare the work area for the commissioning operations as per procedure or operational specification		5	2	3
	PC13.ensure that the site is accessible, free from obstructions or hazards		2	0	2
	PC14.obtain relevant information required to undertake the commissioning		3	0	3
	PC15.carry out start-up procedures, and confirm that the functioning meets specifications		3	0	3
	PC16.run equipment at the recommended initial settings (eg. reduced power / speed/ flow)		3	0	3
	PC17.check for leaks during operations, make sensory checks (sight, sound, smell, touch)		2	0	2
	PC18.run through the operating sequence, and check for correct functioning		2	0	2
	PC19.load the system incrementally, and make any necessary adjustments to settings to achieve the specification parameters		2	0	2
	PC20.conduct a trial run of the equipment at full power/speed/flow		2	0	2
	PC21.confirm that the final product/process outcomes meet specifications		3	0	3
	PC22.monitor and record measurements and Observations		3	0	3
	PC23.shut down and/or isolate the installed equipment to a safe condition		4	1	3
	PC24.deal with equipment malfunction and rectify faults during the commissioning process as Appropriate		2	0	2

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC25.dismantle mechanical equipment in order to replace defective components (eg. release of pressures/force, proof-marking of components, removal of components by extraction or pressing)		3	0	3
	PC26.re-assemble the removed components, and adjust them to meet the operating specification		3	1	2
	PC27.ensure that the commissioned equipment complies with specified standards		1	0	1
	PC28.complete the machine related documentation like backups, manuals, logs, etc. and hand over to the appropriate people		2	0	2
	<b>Total</b>		<b>100</b>	<b>21</b>	<b>79</b>
<b>3.CSC/N0503 Deliver breakdown service on mechanical equipment commissioned on site</b>	PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work	<b>100</b>	3	1	2
	PC2.adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing fabrication and fitting operations		3	1	2
	PC3.work following laid down procedures and Instructions		2	1	1
	PC4.ensure work area is clean and safe from Hazards		2	0	2
	PC5.ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition		2	0	2
	PC6.follow all relevant setting up and operating specifications for the products or mechanical equipment being commissioned		2	1	1
	PC7.follow the defined procedures and set up the equipment correctly ensuring that all operating parameters are achieved		3	1	2
	PC8.identify customer requirements from verbal or written communication		2	0	2
	PC9.check and clarify understanding about the fault from the customer or customer representative		2	0	2
	PC10.collect evidence regarding the fault from the sources		2	0	2
	PC11.use a range of fault diagnostic equipment to investigate the problem		3	0	3
	PC12.apply monitoring or testing procedures to help in the fault diagnosis		5	2	3
	PC13.use various testing equipment to carry out relevant tests		2	0	2
	PC14.evaluate various types of information available for fault diagnosis		3	0	3
	PC15.evaluate sensory information to assess Faults		3	0	3
	PC16.evaluate preventative maintenance system		3	0	3

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	Requirements				
	PC17.review equipment or component condition analysis reports, including the results of any required NDT		2	0	2
	PC18.review life cycle of the mechanical Equipment		2	0	2
	PC19.decide if repair, replacement or modification is appropriate		2	0	2
	PC20.seek any necessary approvals		2	0	2
	PC21.assess the need for technical and professional assistance		3	0	3
	PC22.determine materials, components, maintenance processes, equipment and tools required to implement corrective action		3	0	3
	PC23.create adequate and accurate calculations, preliminary graphics and maintain process records, including use of software, as appropriate		4	1	3
	PC24.communicate to the customer the degree to which requirements can be met including details such as cost, delivery date, quantity or quality		2	0	2
	PC25.propose alternatives for any inability to completely satisfy customer requirements		3	0	3
	PC26.plan, schedule and coordinate the repair or modification task ensure that the service or maintenance activities are carried in the specified sequence and in an agreed timescale		3	1	2
	PC27.communicate the service or maintenance activities to the team		1	0	1
	PC28.allocate specific activities to each team Member		2	0	2
	PC29.monitor and support the repair or modification activities within the limits of their personal authority		2	0	2
	PC30.dismantle mechanical equipment in order to replace defective components (eg. release of pressures/force, proof marking of components, removal of components by extraction or pressing)		3	0	3
	PC31.re-assemble the removed components, and adjust them to meet the operating specification		4	1	3
	PC32.carry out servicing and maintenance techniques as applicable		4	1	3
	PC33.conduct a trial run of the equipment at full power/speed/flow		2	0	2
	PC34.confirm that the final product/process outcomes meet specifications		3	1	2
	PC35.monitor and record measurements and Observations		2	0	2
	PC36.deal with equipment malfunction and rectify faults during the breakdown servicing process as appropriate		3	0	3

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC37.ensure that the commissioned equipment complies with specified standards		3	1	2
	PC38.complete the relevant paperwork, and pass to the appropriate people		1	0	1
	PC39. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		2	0	2
	<b>Total</b>		<b>100</b>	<b>13</b>	<b>87</b>
<b>4.CSC/N1335 Use basic health and safety practices at the workplace</b>	PC1.use protective clothing/equipment for specific tasks and work conditions	<b>100</b>	5	2	3
	PC2.state the name and location of people responsible for health and safety in the workplace		3	1	2
	PC3.state the names and location of documents that refer to health and safety in the workplace		3	1	2
	PC4.identify job-site hazardous work and state possible causes of risk or accident in the workplace		5	2	3
	PC5.carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		4	2	2
	PC6.state location of general health and safety equipment in the workplace		3	2	1
	PC7.inspect for faults, set up and safely use steps and ladders in general use		5	2	3
	PC8.work safely in and around trenches, elevated places and confined areas		5	2	3
	PC9.lift heavy objects safely using correct procedures		5	2	3
	PC10.apply good housekeeping practices at all times		4	2	2
	PC11.identify common hazard signs displayed in various areas		5	2	3
	PC12.retrieve and/or point out documents that refer to health and safety in the workplace		3	1	2
	PC13.use the various appropriate fire extinguishers on different types of fires correctly		4	1	3
	PC14.demonstrate rescue techniques applied during fire hazard		4	1	3
	PC15.demonstrate good housekeeping in order to prevent fire hazards		3	1	2
	PC16.demonstrate the correct use of a		4	1	3

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	fire extinguisher				
	PC17.demonstrate how to free a person from electrocution		4	1	3
	PC18.administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.		4	1	3
	PC19.demonstrate basic techniques of bandaging		3	1	2
	PC20.respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		4	1	3
	PC21.perform and organize loss minimization or rescue activity during an accident in real or simulated environments		3	1	2
	PC22.administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		3	1	2
	PC23.demonstrate the artificial respiration and the CPR Process		3	1	2
	PC24.participate in emergency procedures		3	2	1
	PC25.complete a written accident/incident report or dictate a report to another person, and send report to person responsible		4	1	3
	PC26.demonstrate correct method to move injured people and others during an emergency		4	1	3
	<b>Total</b>		<b>100</b>	<b>36</b>	<b>64</b>
<b>5.CSC/N1336 Work effectively with others</b>	PC1.accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	<b>100</b>	10	3	7
	PC2.accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC3.give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7
	PC4.display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC5.consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7
	PC6.display appropriate communication etiquette while working		10	3	7
	PC7.display active listening skills while interacting		10	3	7

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	with others at work				
	PC8.use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC9.demonstrate responsible and disciplined behaviors at the workplace		10	3	7
	PC10.escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
	<b>Total</b>		<b>100</b>	<b>30</b>	<b>70</b>
	<b>Grand Total</b>		<b>500</b>	<b>114</b>	<b>386</b>
	<b>Percentage Weightage:</b>			<b>23</b>	<b>77</b>
	<b>Minimum Pass% to qualify (aggregate):</b>			<b>70</b>	