

071506T4MTM

MECHANICAL TECHNOLOGY AND MAINTENANCE TECHNICIAN LEVEL 6

ENG/OS/MEM/CR/08/6

Maintain Pumps and Air Compressors

July/August 2025



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

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PRACTICAL ASSESSMENT

INSTRUCTIONS TO ASSESSOR

1. You are required to guide the candidate on duration as per the department's practical assessment schedule for this unit as the assessment is to be done continuously during training.
2. Assess the candidate as the practical progresses observing the critical areas
3. You are required to mark the practical as the candidate perform the tasks
4. You are required to take video clips at critical points
5. Ensure the candidate has a name tag and registration code at the back and front

OBSERVATION CHECKLIST

Candidate's Name & Registration Code			
Assessor's Name & Registration Code			
Venue of Assessment			
Date of Assessment			
Items to be evaluated: <i>Please award marks as appropriate. Give a brief comment on your observation</i>	Marks Available	Marks Obtained	Comments
TASK 1: INSPECTED THE CONDITION OF THE FOLLOWING PARTS OF THE CENTRIFUGAL PUMP			
1. Wore appropriate PPE as per the job requirements <ul style="list-style-type: none"> • Overall/dust coats • Safety boots • Appropriate Gloves • Safety goggles <i>(Award 1 mark or zero for each safety gear)</i>	1 1 1 1		
2. Prepared the maintenance site as per the standards: <ul style="list-style-type: none"> • Cleaned the workplace area • Used the barricade tape to secure the working area • Used the maintenance tag to secure the machine for maintenance (LOTO) <i>(Award 1 or 0 mark for each activity)</i>	1 1 1		

<p>3. Isolated the centrifugal pump:</p> <ul style="list-style-type: none"> • Disconnected the centrifugal pump from its power supply. • Closed the suction and discharge valves to isolate the centrifugal pump from the system. <p><i>(Award 2 or 0 mark for each activity)</i></p>	<p style="text-align: center;">2</p> <p style="text-align: center;">2</p>		
<p>4. Disassembled the pump:</p> <ul style="list-style-type: none"> • Separated the pump from the motor. • Removed the bolts securing the pump casing using the assorted tools. <p><i>(Award 2 or 0 mark for each activity)</i></p>	<p style="text-align: center;">2</p> <p style="text-align: center;">2</p>		
<p>5. Removed the Impeller:</p> <ul style="list-style-type: none"> • Secured the pump shaft to prevent it from rotating. • Removed the impeller nut and washer. • Slid the impeller off the shaft. <p><i>(Award 2 or 0 mark for each activity)</i></p>	<p style="text-align: center;">2</p> <p style="text-align: center;">2</p> <p style="text-align: center;">2</p>		
<p>6. The shaft bearing;</p> <ul style="list-style-type: none"> • Removed the bearing guide behind the impeller. • Removed the bearing lock ring. • Used the bearing puller to remove the bearing. <p><i>(Award full marks or zero for each activity)</i></p>	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">2</p>		

<p>7. Mechanical Seal:</p> <ul style="list-style-type: none"> • Removed the seal housing. • Extracted the old mechanical seal components from the shaft and seal housing. <p><i>(Award 1 or 0 mark for each activity)</i></p>	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p>		
<p>8. Cleaned the Components using cotton cloth and isopropyl alcohol.</p> <ul style="list-style-type: none"> • Shaft • Seal housing • Bearing house • Impeller <p><i>(Award 1 or 0 mark for each activity)</i></p>	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>		
<p>9. Inspected the condition of the parts and recorded in the inspection checklist appendix 2 provided in the candidate tool:</p> <p>i. Impeller was found with:</p> <ul style="list-style-type: none"> • Scratches/no scratches • Rust/no rust <p>ii. Seal chamber was found with:</p> <ul style="list-style-type: none"> • Rust/no rust • Leakages/no leakages <p>iii. Shaft was found with:</p> <ul style="list-style-type: none"> • Bend/straight • Wear/no wear <p>iv. Bearing house was found with:</p> <ul style="list-style-type: none"> • Wear/no wear • Lubrication/no lubrication <p><i>(Award 2 or 0 marks for each activity)</i></p>	<p style="text-align: center;">2</p>		
Sub Total 1	47		

TASK 2: REPLACED THE SHAFT SEAL AND BEARING			
<p>10. Replaced the new shaft seal:</p> <ul style="list-style-type: none"> • Applied a small amount of lubricant/grease to the shaft and the sealing surfaces to ease installation. • Slid the new stationary seal component into the seal housing. • Installed the new seal component onto the shaft, ensuring it is properly aligned and seated. <p><i>(Award 2 or 0 mark for each activity)</i></p>	<p style="text-align: center;">2</p> <p style="text-align: center;">2</p> <p style="text-align: center;">2</p>		
<p>11. Replaced the old bearing with the new bearing.</p> <ul style="list-style-type: none"> • Apply a thin layer of lubricant to the bearing housing and shaft. • Install the new bearing into the bearing housing. • Apply a small axial load on the bearing to ensure it's properly seated. • Secure the bearing using the lock ring. <p><i>(Award 1 or 0 mark for each activity)</i></p>	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>		
<p>12. Reassembled the pump:</p> <ul style="list-style-type: none"> • Reinstalled the seal housing and ensured it is securely fastened. • Refitted the impeller onto the shaft and secured it with the 	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p>		

washer and nut. <ul style="list-style-type: none"> Aligned the impeller properly. Reassembled the pump casing and ensured all bolts are tightened evenly and securely. (Award 1 or 0 mark for each activity)	1 1		
Sub Total 2	14		

TASK 3: TEST RUN THE CENTRIFUGAL PUMP.

13. Checked and Tested the Pump: <ul style="list-style-type: none"> Rotated the pump shaft by hand to ensure there is no binding and the components move smoothly. Reconnected the pump to the system and open the suction and discharge valves. Re-energized the pump and motor. Checked for leakage around the mechanical seal area. Monitored the pump for a short period to ensure it operates correctly. Monitored the discharge pressure. Tested for vibration levels (Award 1 or 0 mark for each activity)	1 1 1 1 1 1		
Sub Total 3	07		

TASK 4: UPDATED MAINTENANCE RECORDS ON THE MAINTENANCE LOG IN APPENDIX 1:

14. Updated Maintenance Record:			
<ul style="list-style-type: none"> • Date of maintenance. • Name of the equipment. • Task performed (service/repair). • Task number. • Item replaced. • Observation Insights. <p><i>(Award 2 or 0 mark for each activity)</i></p>	2		
	2		
	2		
	2		
	2		
Sub Total 4	12		
GRAND TOTAL	80		
CANDIDATE'S SCORE $\frac{X}{80} \times 100$	100%		
ASSESSMENT OUTCOME			
<p>The candidate was found to be:</p> <p style="text-align: center;">Competent <input type="checkbox"/> Not yet Competent <input type="checkbox"/></p> <p style="text-align: center;"><i>(Please tick as appropriate)</i></p> <p style="text-align: center;"><i>(The candidate is competent if the candidate obtains at least 50%)</i></p>			
Feedback from candidate:			
Feedback to candidate:			
Candidate's Signature		Date	
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Assessor's Signature		Date	
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