



# Agriculture Mechanic Technician

Youth Apprenticeship

## AGRICULTURE MECHANIC TECHNICIAN

Agriculture Mechanic Technician youth apprentices gain skills related to the maintenance and repair of agricultural equipment including use of tools, materials, engines, parts, diagnostic tools, welding, hydraulics, electronics, and documentation. Apprentices must adhere to industry safety and security standards.

**Length of Apprenticeship:** One or two years

## COMPETENCIES

Agriculture Mechanic Technician youth apprentices can be complete as a one- or two-year program.

Level One (one year) = Required Technical Skills + 3 Additional Skills

Level Two (two years) = Required Technical Skills + 10 Additional Skills\*

*To Include previously completed Level One Additional Skills*

Agriculture Mechanic Technician Competencies	
Required Technical Skills	Additional Skills
1. Select correct hand tools and light duty power tools required for job	14. Look up parts
2. Operate hand tools, light duty power tools and stationary tools safely	15. Use specific diagnostic tools
3. Maintain a safe work environment	16. Cut metal using an oxyacetylene torch and plasma arc torch
4. Use fasteners correctly	17. Interpret hydraulic symbols and flow on a schematic drawing
5. Handle and store oils, grease, chemicals, cleaners, solvents, etc. according to the Material Safety Data Sheet (MSDS)	18. Maintain and repair basic hydraulic systems
6. Test and maintain engines	19. Inspect hydraulic components
7. Operate, maintain, and repair engines and equipment safely	20. Repair and maintain system components
8. Perform pre-inspection of equipment components	21. Interpret electrical symbols and wiring schematics
9. Setup equipment and machinery	22. Apply basic electrical theory
10. Retrieve diagnostic trouble codes	23. Repair failed components and/or repair of wiring
11. Check fluid levels and lubricate machinery and equipment	24. Inspect and diagnose electrical/electronic components
12. Maintain vehicle and machinery appearance and cleanliness prior to inspection delivery	25. Maintain and repair electrical/electronic components
13. Complete written documentation of work performed, and parts used	26. Troubleshoot and install instrumentation and data acquisition system
	27. Dismantle defective machines and equipment
	28. Reassemble machines and equipment
	29. Calibrate and monitor equipment



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## ON-THE-JOB LEARNING PERFORMANCE STANDARDS GUIDE

### YOUTH APPRENTICE INFORMATION

<b>Youth Apprentice Name</b>	
<b>YA Coordinator</b>	<b>YA Consortium</b>
<b>School District</b>	<b>High School Graduation Date</b>

### REQUIREMENTS

#### Level One Requirements

Youth apprentices must complete ALL the items listed below. Check completed areas.

- Year 1 Competency checklist
- Employability Skills checklist (in this OJL Guide) or the DPI Employability Skills Certificate
- Related instruction equal to 1 high school credit or at least 3 college credits
- Minimum of 450 work hours

#### Level Two Requirements

Youth apprentices must complete ALL the items listed below. Check completed areas.

- Year 2 Competency checklist
- Employability Skills checklist (in this OJL Guide) or the DPI Employability Skills Certificate
- Related instruction equal to 2 high school credits or at least 6 college credits
- Minimum of 900 work hours

### HOURS

Record the hours the youth apprentice worked.

Total Hours Employed	Company Name	Telephone Number

## COMPETENCIES

Agriculture Mechanic Technician youth apprentices must complete the competencies captured below. A one-year apprentice must complete 13 competencies from the Required Technical Skills list and 3 additional skills. Two-year youth apprentices must complete the Required Technical skills and 10 additional skills. Employers can substitute up to **1** competency with another occupationally appropriate skill. Substitutions must be added to the competency list for assessment.

**Level One** (one year) = Required Technical Skills + 3 Additional Skills

**Level Two** (two years) = Required Technical Skills + 10 Additional Skills\*

*To Include previously completed Level One Additional Skills*

### Rating Scale

3: Exceeds entry level criteria | Requires minimal supervision | Consistently displays this behavior

2: Meets entry level criteria | Requires some supervision | Often displays this behavior

1: Needs improvement | Requires much assistance and supervision | Rarely displays this behavior

### AGRICULTURE MECHANIC TECHNICIAN – REQUIRED SKILLS

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>1. Select correct hand tools and light duty power tools required for job</b></p> <ul style="list-style-type: none"> <li>• use correct hand tools in a safe and appropriate manner</li> <li>• identify capabilities and limitations of hand tools</li> <li>• identify capabilities and limitations of power tools</li> <li>• identify worn, damaged, or abused tools</li> <li>• verify equipment safety procedures</li> <li>• identify proper Personal Protective Equipment (PPE) needed for tool/equipment use</li> <li>• handle and store tools properly</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>2. Operate hand tools, light duty power tools and stationary tools safely</b></p> <ul style="list-style-type: none"> <li>• operate tool/equipment trained to use</li> <li>• operate tool/equipment with guarding devices in manner required for job task</li> <li>• inspect tool/equipment and work area for safety considerations</li> <li>• demonstrate general safety rules for operating all power tools</li> <li>• follow tool checklist</li> <li>• verify tool/equipment is available for use and in working order</li> <li>• verify tool/equipment is current for preventative maintenance and/or calibration</li> <li>• wear the required Personal Protective Equipment (PPE) at all times as required for the operation of the tool/equipment</li> <li>• monitor tool/equipment for safe operation during use</li> <li>• document use and maintenance as required</li> <li>• shut down tool/equipment according to proper use</li> <li>• report abnormal tool/equipment conditions or failures in operation</li> <li>• perform required preventative maintenance procedures</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>3. Maintain a safe work environment</b></p> <ul style="list-style-type: none"> <li>• inspect tools and work area for safety considerations</li> <li>• comply with posted safety warnings and symbols</li> <li>• identify unsafe conditions and/or work habits and</li> <li>• report unsafe conditions to the worksite professional immediately</li> <li>• help maintain a clean and safe working environment free of debris and obstacles</li> <li>• dispose of waste and recyclable materials properly</li> <li>• store materials and tools properly</li> <li>• follow facility procedures for clean-up and shut down after use</li> <li>• clean light fixtures to ensure proper lighting</li> <li>• store tools and equipment properly</li> <li>• clean and dry floors</li> <li>• follow general shop housekeeping procedures</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>4. Use fasteners correctly</b></p> <ul style="list-style-type: none"> <li>• identify correct fasteners for task (screws, bolts, nuts, washers, keys, snap rings, pins, and studs)</li> <li>• select correct tools/equipment to adjust fasteners</li> <li>• measure bolt and nut length, diameter, and thread types accurately</li> <li>• extract broken bolts properly</li> <li>• restore internal and external threads properly</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>5. Handle and store oils, grease, chemicals, cleaners, solvents, etc. according to the Material Safety Data Sheet (MSDS)</b></p> <ul style="list-style-type: none"> <li>• safely Identify, handles, Store, and uses materials according to company procedure, if applicable</li> <li>• review MSDS sheet to identify hazardous materials</li> <li>• perform the approved storage procedures for flammable materials found in repair facilities</li> <li>• dispose of hazardous materials following safety procedures</li> <li>• wear appropriate personal protective equipment (PPE)</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>6. Test and maintain engines</b></p> <ul style="list-style-type: none"> <li>• determine appropriate inspections and test(s) to perform based on customer concern</li> <li>• assist with repair using parts manual</li> <li>• develop a preventative maintenance schedule for equipment</li> <li>• adjust equipment for safe and efficient operation</li> <li>• determine the cost of routine equipment maintenance</li> <li>• apply service-related information, including service bulletins, manuals, and parts catalogues</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<p><b>7. Operate, maintain, and repair engines and equipment safely</b></p> <ul style="list-style-type: none"> <li>• assist with follow up on repaired equipment to ensure that corrective action solved the problem</li> <li>• assist with the investigation of abnormal equipment conditions in a timely manner</li> <li>• follow tool/equipment repair manual</li> <li>• follow safety precautions when operating, servicing, and maintaining machines and equipment</li> <li>• research vehicle and service information, vehicle service history, service precautions, and technical service bulletins</li> <li>• verify operation of the instrument panel engine warning indicators</li> <li>• review equipment quality measures for trends and problems</li> <li>• compare current equipment performance to optimal equipment operations</li> <li>• report noted deviations from expected performance</li> <li>• document all monitoring activities</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>8. Perform pre-inspection of equipment components</b></p> <ul style="list-style-type: none"> <li>• complete a visual inspection</li> <li>• determine appropriate inspections and test(s) to perform based on customer concern</li> <li>• check for operation and leaks of hoses, lines, valves, and nozzles</li> <li>• identify information needed and the service requested on a repair order</li> <li>• locate repair parts, using catalogs, microfiche, and computers.</li> <li>• review vehicle service history</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>9. Setup equipment and machinery</b></p> <ul style="list-style-type: none"> <li>• organize workspace</li> <li>• verify equipment is available for use and in working order</li> <li>• verify equipment is current for preventative maintenance and/or calibration</li> <li>• stage pieces and materials for assembly</li> <li>• assemble and adjust tools and equipment as required</li> <li>• document service completed</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<b>10. Retrieve diagnostic trouble codes</b> <ul style="list-style-type: none"> <li>• connect diagnostic software to equipment</li> <li>• operate different types of service software</li> <li>• verify connection to software and equipment using manual</li> <li>• use general computer skills</li> <li>• toggle between screens using software</li> <li>• interpret readings to icons</li> <li>• verify math and make conversions when appropriate</li> <li>• perform procedures as indicated by the service software</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>11. Check fluid levels and lubricate machinery and equipment</b> <ul style="list-style-type: none"> <li>• review manufacturer safety and service procedures</li> <li>• determine the type of lubricant recommended based on original equipment manufacturer (OEM) requirements</li> <li>• identify importance of oil analysis as a management tool</li> <li>• replace torn or missing seals</li> <li>• apply grease to each fitting and wipe away excess</li> <li>• inspect fluid levels using dipstick</li> <li>• change oil filters</li> <li>• verify work and adjust</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>12. Maintain vehicle and machinery appearance and cleanliness prior to inspection delivery</b> <ul style="list-style-type: none"> <li>• install shields and hoods</li> <li>• verify machinery is washed and prepped</li> <li>• inspect cleanliness of the cab</li> <li>• assure windows are clean</li> <li>• verify that there are no external leaks from the machinery/equipment</li> <li>• follow any company procedures condition Report</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>13. Complete written documentation of work performed, and parts used</b> <ul style="list-style-type: none"> <li>• identify the purpose and importance of keeping records</li> <li>• demonstrate procedures for keeping records of equipment maintenance and services</li> <li>• document customer concern on repair order</li> <li>• verify work orders, service invoices, and requisitions</li> <li>• prepare a written cost estimate of repair work</li> <li>• document parts used for service repair</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<b>Competency Substitute</b> (if you replaced a competency above, note the competency and rating)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			

## AGRICULTURE MECHANIC TECHNICIAN – ADDITIONAL SKILLS

Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
<b>14. Look up parts</b> <ul style="list-style-type: none"> <li>• locate repair parts, using catalogs, microfiche, and computers</li> <li>• collect necessary information to determine part requirements</li> <li>• locate and accesses serial numbers</li> <li>• identify section and component location on machinery/equipment</li> <li>• review previous repair orders</li> <li>• perform basic computer operation</li> <li>• write up request for parts order</li> <li>• maintain agriculture mechanics business records</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>15. Use specific diagnostic tools</b> <ul style="list-style-type: none"> <li>• verify the causes of concerns with stored or active diagnostic trouble codes</li> <li>• obtain, graph, and interpret scan tool data</li> <li>• determine necessary action</li> <li>• inspect computerized engine control system sensors</li> <li>• test computerized engine control system sensors</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



<p><b>16. Cut metal using an oxyacetylene torch and plasma arc torch</b></p> <ul style="list-style-type: none"> <li>• operate all welding and cutting equipment safely</li> <li>• interpret drawings and welding symbols</li> <li>• select appropriate welding and cutting tips for specific applications</li> <li>• diagnose equipment failure</li> <li>• set up, adjust, operate, and shut down oxy-fuel, welding and brazing equipment for a given job</li> <li>• lay out and prepare metals for welding</li> <li>• cut metal to specifications</li> <li>• heat metal parts to assist removal</li> <li>• perform start up and shut down of equipment</li> <li>• weld basic joints in various positions</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>17. Interpret hydraulic symbols and flow on a schematic drawing</b></p> <ul style="list-style-type: none"> <li>• identify basic hydraulic components</li> <li>• inspect operation of hydraulic circuit</li> <li>• verify basic hydraulic component functions</li> <li>• identify essential safety practices related to the operation of agriculture equipment using hydraulics</li> <li>• perform routine service and maintenance using appropriate service manuals</li> <li>• reference the service manual for correct schematic of component</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>18. Maintain and repair basic hydraulic systems</b></p> <ul style="list-style-type: none"> <li>• review equipment specifications (relief valve pressures, pump output, engine revolutions per minute (rpm), and operating temperature) to accurately test the system</li> <li>• comply with personal safety practices concerning clothing, tool usage, proper ventilation of fumes and securing machining</li> <li>• inspect system for temperature, pump flow, pressure tests, leakage etc.</li> <li>• use a pressure and flow tester in diagnosing malfunctions and repairing hydraulic system</li> <li>• perform all procedures according to manufacturing requirements</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<p><b>19. Inspect hydraulic components</b></p> <ul style="list-style-type: none"> <li>• complete visual inspection to identify customer complaint based on how the system is supposed to operate</li> <li>• consult with worksite professional to determine appropriate inspection and test(s) to perform based on customer concern</li> <li>• compare test to manufacturer specifications</li> <li>• perform tests according to manual procedures</li> <li>• verify an accurate diagnosis of the problem</li> <li>• wear appropriate personal protective equipment (PPE) when checking for leaks</li> <li>• properly uses safety equipment appropriate to working conditions</li> <li>• adjust pressure control and relief valves</li> <li>• measure pressure within hydraulic system</li> <li>• measure flow within hydraulic system</li> <li>• diagnose hydraulic failure</li> <li>• prepare for service or cleanup work area, return tools to proper location</li> <li>• complete appropriate documentation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>20. Repair and maintain system components</b></p> <ul style="list-style-type: none"> <li>• consult with worksite professional to determine appropriate inspection and test(s) to perform based on customer concern</li> <li>• retrieve shop manuals and/or electronic retrieval systems</li> <li>• change filters and drain, flush, and refill the hydraulic system</li> <li>• repair and replace parts of the system according to manufacturing procedures and specifications</li> <li>• verify service and adjust the system for proper operation</li> <li>• check fluid levels and condition</li> <li>• change hydraulic fluids</li> <li>• inspect system for external leaks and correct where necessary</li> <li>• clean and flush system based on MFG specifications and recommendations</li> <li>• maintain cleanliness during repair</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<p><b>21. Interpret electrical symbols and wiring schematics</b></p> <ul style="list-style-type: none"> <li>• locate and inspect sensors and monitoring systems</li> <li>• examine electrical circuits</li> <li>• interpret drawings and symbols in service manuals</li> <li>• apply information from schematics to identify flow through circuit current</li> <li>• test and troubleshoot electrical systems and components</li> </ul>	□	□	□
<p><b>22. Apply basic electrical theory</b></p> <ul style="list-style-type: none"> <li>• identify components in machinery that use electrical components</li> <li>• examine machines that use DC currents</li> <li>• operate tools and equipment to measure electrical output</li> </ul>	□	□	□
<p><b>23. Repair failed components and/or repair of wiring</b></p> <ul style="list-style-type: none"> <li>• interpret a circuit diagram to trouble shoot an electrical problem</li> <li>• test electrical and electronic sensing devices</li> <li>• locate the parts to be tested for electrical problems</li> <li>• use instruments to measure Ohms, amps, and volts</li> </ul>	□	□	□
<p><b>24. Inspect and diagnose electrical/electronic components</b></p> <ul style="list-style-type: none"> <li>• complete visual inspection to identify customer complaint based on how the system is supposed to operate</li> <li>• consult with worksite professional to determine appropriate inspection and test(s) to perform based on customer concern</li> <li>• compare test to manufacturer specifications</li> <li>• perform tests according to manual procedures</li> <li>• verify an accurate diagnosis of the problem</li> <li>• wear appropriate personal protective equipment (PPE) when checking for leaks.</li> <li>• use safety equipment appropriate to working conditions</li> <li>• prepare for service or cleanup work area, returns tools to proper location</li> <li>• complete appropriate documentation</li> </ul>	□	□	□

<p><b>25. Maintain and repair electrical/electronic components</b></p> <ul style="list-style-type: none"> <li>• repair common failures related to electrical components</li> <li>• obtain equipment and materials needed</li> <li>• repair switches, connectors, relays, solenoid devices for proper operation as needed</li> <li>• repair the wires to ensure proper connection and wearing, rubbing, or fraying</li> <li>• inspect devices and wires during maintenance and repairs</li> <li>• clean-up work area and return tools to proper location</li> <li>• complete appropriate documentation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>26. Troubleshoot and install instrumentation and data acquisition system</b></p> <ul style="list-style-type: none"> <li>• complete visual inspection to identify customer complaint based on how the system is supposed to operate</li> <li>• connect equipment to diagnostic software to evaluate potential errors</li> <li>• consult with worksite professional to determine appropriate inspection and test(s) to perform based on customer concern</li> <li>• compare test to manufacturer specifications</li> <li>• perform tests according to manual procedures</li> <li>• verify an accurate diagnosis of the problem</li> <li>• wear appropriate personal protective equipment (PPE) when checking for leaks.</li> <li>• uses safety equipment appropriate to working conditions</li> <li>• clean-up work area and return tools to proper location</li> <li>• complete appropriate documentation</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>27. Dismantle defective machines and equipment</b></p> <ul style="list-style-type: none"> <li>• examine assembled product for visual and/or dimensional specification prior to tear down</li> <li>• prepare work area to lay out parts after disassembly</li> <li>• remove parts according to proper procedure</li> <li>• examine parts for defects, such as breakage or excessive wear</li> <li>• document part orientation and location</li> <li>• maintain organization and Clean work environment</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<p><b>28. Reassemble machines and equipment</b></p> <ul style="list-style-type: none"> <li>• gather equipment required to reassemble machinery and equipment</li> <li>• study blueprints or manufacturers' manuals to determine correct installation or operation of machinery</li> <li>• assemble and adjust agricultural equipment, following manufacturer's direction</li> <li>• repair or replace broken or malfunctioning components of machinery or equipment</li> <li>• record parts or materials used and orders or requisition new parts or materials as necessary</li> <li>• maintain organized and clean work environment</li> <li>• verify set up meets assembly requirements and product specifications</li> <li>• operate newly repaired machinery or equipment to verify the adequacy of repairs</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>29. Calibrate and monitor equipment</b></p> <ul style="list-style-type: none"> <li>• perform calibrations of metering equipment</li> <li>• assist a worksite professional with set up prior to calibration</li> <li>• prepare tractors and/or equipment prior to calibration</li> <li>• verify tractor calibrations</li> <li>• assist with diagnosing monitoring systems with onboard vehicle diagnostics</li> <li>• perform calibration and no error codes in the software once calibration is completed</li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Competency Substitute</b> (if you replaced a competency above, note the competency and rating)</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Comments:</b></p>			