



CUSTOMIZED ASSESSMENT BLUEPRINT

AGRICULTURE EQUIPMENT TECHNICIAN **APPRENTICESHIP LEVEL 2**

Test Code: 8856

Version: 01

Specific competencies and skills tested in this assessment:

Interpersonal Skills

Demonstrate the ability to log repairs using the "complaint, cause and correction" technique

Engine Systems: 4-Stroke Gasoline

List and describe the operation of a 4-stroke engine

Identify worn out or out-of-specification parts

Demonstrate testing and adjustment for proper performance

Demonstrate the proper selection, use, and calculation of measuring devices needed for the job

Describe general engine repair procedures

Define components of an internal combustion engine

Determine 4-stroke engine specifications

Engine Systems: Diesel

Explain the difference between a gas engine vs diesel

Describe uses of diesel engine components

Identify injectors and pumps of a diesel engine

Identify diesel cold starting aids and describe how they function

Identify and explain the function of a turbocharger

Machinery Systems: Powertrains

Inspect and identify all belts and pulleys that are worn out and replace

Define the purpose of gears, bearings, and seals

Farm Equipment Systems: Planting, Harvesting, Tillage

Select, connect, engage, and operate machinery and power units

Precision Agriculture Systems

Identify the meaning of precision agriculture and its components

Agriculture Equipment Technician Apprenticeship Level 2 (continued)

Material Fabrication and Welding

Identify and select various types of metals

Identify and select various types of welding and cutting equipment

Problem Solving/Critical Thinking

Identify how to manage the problem solving process

Make a decision on options to solve problem

Implement action plan to resolve problem

Communicate effectively with others in figuring out solutions to complex problems

Hydraulic/Hydrostatic (Fluid Power) Systems

Analyze hydraulic/hydrostatic systems by using the proper technical/service information

Identify components of fluid power systems including pumps, valves, and controls

Interpret the systems, diagrams, and schematics, including symbol identification

Identify components of a hydraulic system

Describe the four typical hydraulic systems used in agricultural systems

Electrical Systems

Explain how a relay works in a system

Use wiring diagrams and schematics to troubleshoot and repair an electrical circuit

Test and replace electrical components and wiring using proper tools

Identify parallel and series electrical circuits

Properly test fields, ground, and wiring

Differentiate the relationship among voltage, current, resistance, and power in circuits

Identify the basic components that make up the cranking system

Agriculture Equipment Technician Apprenticeship Level 2 (continued)

Written Assessment:

Administration Time: 2 hours
Number of Questions: 63

Areas covered:

2%	Interpersonal Skills
14%	Engine Systems: 4-Stroke Gasoline
14%	Engine Systems: Diesel
9%	Machinery Systems: Powertrains
3%	Farm Equipment Systems: Planting, Harvesting, Tillage
2%	Precision Agriculture Systems
6%	Material Fabrication and Welding
8%	Problem Solving/Critical Thinking
13%	Hydraulic/Hydrostatic (Fluid Power) Systems
29%	Electrical Systems

Sample Questions:

How should a technician determine if an engine has a cylinder head gasket leak?

- A. use a torque wrench
- B. timing light
- C. fuel rail pressure tester
- D. cooling system pressure tester

In a diesel engine, fuel ignition is created by

- A. compression
- B. cooling
- C. glow plugs
- D. spark plugs

Proper drive of a V-belt comes from the

- A. sides
- B. bottom
- C. top
- D. middle

The _____ transmits power to auxiliary equipment.

- A. auxiliary power source
- B. power take-off
- C. free power source
- D. independent drive order

A weld used to hold parts in their proper place until the final weld is made is a _____ weld.

- A. pass
- B. butt
- C. bevel
- D. tack

Agriculture Equipment Technician Apprenticeship Level 2 (continued)

Performance Assessment:

Administration Time: 1 hour and 5 minutes (4 hours and 40 minutes including instructor preparation and evaluation time)
Number of Jobs: 3

Areas Covered:

23% **Test Electrical Charging System**
Participants will follow proper safety procedures, use the proper tester, and evaluate the charging system provided.

44% **Change a Fuel Filter**
Participants will use appropriate safety equipment, select the proper fuel filter, use the proper tools, and change the fuel filter.

33% **Torque a Cylinder Head**
Participants will follow safety procedures, use the proper torque wrench, and torque the head bolts using the proper torque and sequence.

Sample Job: Torque a Cylinder Head

Maximum Job Time: 30 minutes

Participant Activity: Participants will follow safety procedures and use all necessary protective clothing and safety equipment. Select the proper torque wrench to torque the head bolts using the proper torque and sequence. Participants will have access to the engine's service manual to calculate and convert torque values.