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CUSTOMIZED ASSESSMENT BLUEPRINT

AGRICULTURE EQUIPMENT TECHNICIAN APPRENTICESHIP LEVEL 3

Test Code: 8857
Version: 01

Specific competencies and skills tested in this assessment:

Basic Skills
Record details of repairs made

Engine Systems: 4-Stroke Gasoline
Define mechanical power, work, torque, and horsepower
Analyze, evaluate, and troubleshoot engine and internal engine components
Demonstrate proper engine disassemble and re-assemble to working order
Describe general engine repair procedures

Engine Systems: Diesel
List fuel components for diesel engines with mechanical injection pumps
List fuel components for diesel engines with common rail injection systems
Demonstrate troubleshooting and engine maintenance procedures
Describe the different after-treatment systems and their operations
Describe the electronic control systems of current engines and their theory of operation
Describe general engine repair procedures

Machinery Systems: Powertrains
Describe the transfer of power from engine to equipment (PTO)
Repair a slip clutch, a wet clutch, and a dry clutch
Identify and locate components of a braking system
Describe and identify power shift, CVT, hydrostat, and manual gear
Analyze, evaluate, and troubleshoot transmission (fault codes if applicable)

HVAC
Analyze, evaluate, troubleshoot, and properly repair HVAC systems
Describe, identify, and practice application of mobile HVAC systems

Agriculture Equipment Technician Apprenticeship Level 3 (continued)

Farm Equipment Systems: Planting, Harvesting, Tillage
Adjust or set mechanical controls or components on equipment

Hydraulic/Hydrostatic (Fluid Power) Systems
Describe the application and operation of major components, including pumps and motors
Test and diagnose hydraulic systems
Test and diagnose hydrostatic systems
Identify applications, and the benefits of hydraulic/hydrostatic systems
Repair different types of hydraulic systems
Properly test a hydraulic system (flowrate, main relief, operating temperature) to diagnose an issue

Electrical Systems
Define electrical components

Written Assessment:

Administration Time: 2 hours
Number of Questions: 54

Areas covered:

2%	Basic Skills
17%	Engine Systems: 4-Stroke Gasoline
30%	Engine Systems: Diesel
22%	Machinery Systems: Powertrains
3%	HVAC
2%	Farm Equipment Systems: Planting, Harvesting, Tillage
17%	Hydraulic/Hydrostatic (Fluid Power) Systems
7%	Electrical Systems

Sample Questions:

A restricted exhaust system will cause a/an

A. lean running condition
B. low power condition
C. engine to run cooler
D. engine to have higher compression

The engine is in a derate condition. The diagnostics tool shows 12 error codes. What should the technician do?

A. review and prioritize codes
B. check the sensor
C. clear codes
D. check engine wiring harness

The number of splines on a 540 RPM PTO shaft is

A. 6
B. 12
C. 20
D. 21

What AC component is located inside the cab?

A. condenser
B. evaporator
C. AC compressor
D. filter dryer

When driving a machine with a hydraulically released parking brake, the parking brake comes on. What is the possible cause?

A. hydraulic oil is cold
B. park break spring is broken
C. the system pressure is high
D. low charge pressure

Performance Assessment:

Administration Time: 1 hour and 15 minutes (3 hours and 15 minutes including preparation and evaluation time)
Number of Jobs: 2

Areas Covered:

64% **Troubleshoot Agricultural Tractor Hydraulic Issue**
Participants will use appropriate safety equipment, look up proper specs, hook up flow meter, and record all findings and determine issue(s).

36% **Diagnose an Engine**
Participants will determine proper connection point and cabling, hook up engine diagnostic tool.

Sample Job: Diagnose an Engine

Maximum Job Time: 30 minutes

Participant Activity: Participants will determine proper connection point and cabling. Participant will hook up engine diagnostic tool and perform cylinder cut out test, collect and save engine data, determine rail pressure, and NOx efficiency.