

OHIO CAREER DEVELOPMENT EVENTS
AGRICULTURAL MECHANICS SKILLS
Effective August 1, 2004

Purpose

To assess students' agricultural mechanics skills.

Date-Location

District: Set by the respective district, at least 10 days prior to the state CDE.

State: Set by the Agricultural Education Service.

CDE Rules

NEW FOR 2005-2006 SCHOOL YEAR!!! The top 2 individuals from each district will participate at the state level, even if their teams do not make the top 2 team cut, you must contact the coordinator and give them the results for your district.

1. All district contests will adhere to the state CDE rules.
2. A team will consist of three students.
3. The top two teams from each district will be eligible to compete in the state CDE. It is the responsibility of the winning team to contact the Ohio CDE Coordinator to enter the state event.

CDE Format

The following information is for district and state CDE.

The CDE host will select ten (10) to fifteen (15) specific skills from the master list of skills listed below:

Acetylene burning
Acetylene welding
Arc/wire welding
Armature growler use
Bench grinder use
Caliper measuring
Computer parts search
Dial indicator reading
Drill use
Dynamometer reading
Feeler gauge measuring
Flaring tool use
Hand tachometer reading
Hand tool identification
Hydrometer reading
Identify bolts and nuts
Injector-tester use

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Micrometer reading (English or metric)

Plastic gauge use

Soldering

Timing light use on a small engine

Valve grinding

Valve seat grinding

Volt ohm amp tester use

Specific Skills to Perform

Welding - Not over 15% of score

1. Spark test to identify metal
2. Cut steel using oxyacetylene welder
3. Weld with AC arc/wire welder (shielded metal arc) (stick or wire welder)
4. Braze with oxyacetylene welder
5. Weld steel with oxyacetylene welder

Using Power and Hand Equipment

1. Recondition a chisel
2. Recondition a punch
3. Sharpen a twist drill bit and use the bit
4. Use a tap, die, thread conditioning tool, and thread inserts (helicoil)
5. Grind a valve seat
6. Measure and grind a valve and/or stem (Check valve seat fit)
7. Grind rocker arm

Hand Tool Identification

Students should be able to identify tools as out-lined in John Deere FOS Manual 52B - 3rd Edition . This will be the only official tool source.

Identify Fasteners, Seals, Bearings

The student should be able to identify fasteners, seals and bearings, including grades, English, metric, torque wrench use and the use of liquids, as outlined in John Deere FOS Manual 60 - 2nd Edition and Seals and Bearings FOS Manual.

Cutting, Flaring and Bending Tubing

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1. Cut tubing
2. Single flare tubing
3. Double flare tubing
4. Bend tubing

Testing Electrical Systems and Components

1. Test DC generator armature grounds, opens, and shuts
2. Test brush holders, frames, field coils, and terminals for ground and open circuits
3. Turn a commutator on an armature lathe
4. Undercut mica on an armature lathe
5. Test alternator parts
6. Test a charging output of an alternator systems
7. Test starting systems
8. Test accessories and light systems
9. Connect wires and connectors (soldered and solderless) and wire circuits
10. Identify electrical system parts
11. Check battery condition using volt meters, hydrometers, and load meters) Use

John Deere FOS series as a reference.
Diesel

1. Test injectors for proper operation
2. Adjust injectors
3. Time a diesel fuel system
4. Bleed a diesel fuel system
5. Identify diesel fuel system parts

Use I & T Manual and/or Service Manual.

Measurements and Settings

U.S. and Metric

1. Measure and/or adjust crank shaft end play (dial
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indicator)

2. Measure with an outside micrometer
3. Measure with an inside micrometer
4. Measure with a cylinder bore gauge, depth gauge, telescoping gauge, straight edge, protrusion, small bore gauge and ruler
5. Measure with a feeler gauge - ring gap, cylinder sleeve, valve lash
6. Measure back lash
7. Use a compression gauge
8. Plastic gauge a rod bearing
9. Set engine timing with timing light (static timing)
10. Measure with outside caliper and inside caliper
11. Select and use torque wrench properly
12. Check and adjust clutch and brakes
13. Check horsepower output with a dynamometer
14. Check and adjust free play with dynamometer
15. Check bearing end play and load
16. Engine part identification
17. Radiator - check radiator by use of hydrometer and pressure tester

Use John Deere FOS - 5th Edition.

Hydraulics

1. Test, and adjust systems using
 - a. flow meters
 - b. pressure testers
2. Compute a cylinder's needed power output
3. Identify parts and failure of parts

Use John Deere FOS - 3rd Edition.

Fuels, Filters, Lubricants and Coolants

Selection and identification

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Parts Failure

Use John Deere FOS Identification of Parts

Failure and Slides

Tractor Parts Identification

Safety

1. Identification of personal safety equipment
2. Safety of shop and lab equipment
3. Proper use and selection of cleaning solvents

A SAFETY FACTOR MAYBE INCLUDED IN THE PREVIOUSLY MENTIONED CONTESTS

Scoring Guide

1. All skills are to be scored on a ten (10) point basis at the discretion of a judge. The allotted time per skill will be ten (10) minutes.
2. The host school will have 10 - 15 skill stations each valued at ten (10) points.

Scoring

a. Individual
10-15 stations x 10 points = 100 - 150 points

b. Team
100 - 150 points x 3 individuals= 300 - 450 points

References

1. Power Tool Safety and Operation - Instructor's Packet - Hobar Publications
2. John Deere FOS Manuals - John Deere
Consult the Ohio Agricultural Education Curriculum Materials Service Catalog for possible additional references.