



Farm Mechanics

Scouts BSA · Trades

Name

Started

Completed

Farm Mechanics is about keeping the tools and machines that grow our food running safely. You'll learn how engines and hydraulics deliver power, do real maintenance, and visit people who keep farm equipment in top shape.

Requirements

Every official requirement, in plain language. Check the official wording when you sign off (scouting.org/merit-badges/farm-mechanics/). Tips and examples are ideas, not extra requirements.

1 Farm shop safety

Tips for this section: Visit a farm shop and notice how tools are organized and what safety signs are posted. Look up a safety data sheet for something like motor oil.

Example for this section: Sketch a farm shop layout: a clear walkway, a welding area away from fuel, a flammables cabinet, fire extinguishers by the doors, and eye wash near the workbench. Then find every warning symbol on one machine, like a lawn tractor, explain each, and get the safety data sheet for the oil you'll use.

- ☐ **1a** Talk with your counselor about the safety gear, tools, and clothing used when checking or fixing farm equipment, and use them as needed while working on this badge

- ☐ **1b** Draw a plan of a well-equipped farm shop and point out the safety devices and features it must have

- ☐ **1c** Locate every universal warning and safety symbol on one machine and tell what each one means

- ☐ **1d** Explain what an SDS (safety data sheet) is and why people use one. Get the SDS for every fluid or hazardous material you use for this badge, such as oil, grease, fuel, coolant, or hydraulic or transmission fluid

2 How power is made and moved

Tips for this section: Ask a mechanic or farmer to show you the hydraulic lines and transmission on a tractor and explain how power moves through them.

Example for this section: Explain power flow on a tractor: the diesel engine compresses air until it's hot enough to ignite fuel, the transmission sends that power to the wheels, and a hydraulic pump pushes fluid through hoses to lift a loader or plow.

- ☐ **2a** Explain how a diesel engine produces or transfers power

- ☐ **2b** Explain how a hydraulic system produces or transfers power

- ☐ **2c** Explain how a transmission, or any other power system, produces or transfers power

3 Tool care projects: Choose 2 of 4

Tips for this section: Choose two tasks, like putting a new handle on a shovel or building a rack to organize tools. Wear gloves and eye protection, and work with an adult.

Example for this section: Two tasks: replace a cracked shovel handle, then use a hand file to dress the mushroomed head of a cold chisel back to a clean edge. Or build a sorted storage box for nuts, bolts, and washers. Wear gloves and safety glasses.

- ☐ **3a** Put a new handle on any farm tool

- ☐ **3b** Organize a tool rack, or build a storage system that keeps nails, nuts, bolts, and washers sorted

- ☐ **3c** Use a hand file to dress a chisel or punch whose head has mushroomed

- ☐ **3d** Use a hand file to correctly dress the tip of a screwdriver

4 Machine service: Choose 1 of 3

Tips for this section: Work alongside an experienced adult using the machine's manual. Never service equipment while it's running.

Example for this section: Winterize a lawn tractor with an adult using the manual: disconnect the spark plug wire, change the oil, clean or replace the air filter, check tire pressure, add fuel stabilizer, and grease the fittings.

- ☐ **4a** On an engine-powered machine, grease every fitting, replace the oil and the oil filter, clean the air filter and radiator fins, and put in new fuel filters

- ☐ **4b** Make a pre-operation checklist for an engine-powered machine covering engine oil, coolant, hydraulic and/or transmission fluid, and the battery's voltage (checked with a voltmeter). Use it to check that machine

- ☐ **4c** Get any farm machine ready for winter storage

- ☐ **5** Visit an implement dealer and interview the service technician or service manager about preventive maintenance: why it matters, how much it costs, and what wears out or damages machines. Report back

Tip: Call ahead to a farm implement dealer and ask to talk with a service technician about preventive maintenance.

6 Maintenance procedure: Choose 1 of 3

Tips for this section: Pick one procedure you've done and explain each step and why it matters, as if you were teaching a friend.

Example for this section: Teach one procedure step by step, like checking an air filter: shut off the engine and let it cool, open the housing, lift the filter out without dropping dirt into the intake, hold it up to a light, tap it clean or replace it, and explain why each step matters.

- ☐ **6a** Explain each step of tightening hydraulic fittings

- ☐ **6b** Explain each step of checking an air filter

- ☐ **6c** Explain each step of using a wire-brush wheel to clean a work piece

- ☐ **7** Learn about three careers in farm mechanics. Pick one, find out the education, training, and experience it requires, discuss it with your counselor, and explain why it might interest you

Tip: Ask the dealer or a farmer about careers like diesel technician, equipment sales, or agricultural engineer.