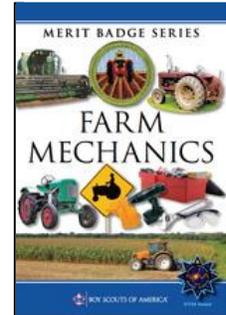


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From the mattock and hoe to the horse and mule, the cotton gin and reaper, the tractor and air seeder — this is the story of farm equipment. Today, most farms are mechanized, and farmers can do most of their own maintenance work and make the adjustments needed on their many intricate farm implements.

Requirements

1. Do the following:
 - a. Discuss with your counselor the safety equipment, tools, and clothing used while checking or repairing farm equipment. Use this equipment, tools, and/or clothing (when needed or called for) in meeting the requirements for this merit badge.
 - b. Draw a plan showing a well-equipped farm shop. Point out the shop's mandatory safety devices and features.
 - c. Find all the universal warning and safety symbols on a piece of equipment and explain what they mean.
 - d. Describe what a material safety data sheet (MSDS) is, and tell why it is used. Obtain the MSDS for any engine coolant, oil, grease, fuel, hydraulic or transmission fluid, or other flammable or hazardous materials you use in meeting the requirements for this merit badge.
2. Explain how power is produced or transferred in a:
 - a. Diesel engine
 - b. Hydraulic system
 - c. Transmission or any other power system
3. Do TWO of the following:
 - a. Replace the handle of any tool found on the farm.
 - b. Organize a tool rack or a storage system for nails, bolts, nuts, and washers.
 - c. Using a hand file, properly dress the mushroomed head of a chisel or punch.
 - d. Using a hand file, correctly dress a screwdriver tip.
4. Do ONE of the following:
 - a. On an engine-powered machine: Grease all fittings, change the oil and oil filter, clean the air filter, clean the radiator fins, and replace the fuel filters.
 - b. For any engine-powered machine, create a preoperational checklist; include checking the engine coolant, engine oil, hydraulic and/or transmission fluid, and battery voltage (using a voltmeter). Using your checklist, conduct a preoperational check of that machinery or equipment.
 - c. Prepare any farm machine for winter storage.
5. Visit an implement dealer. Interview the dealer technician or service manager for hints on good preventive maintenance. Ask why it is important, the costs, and what causes wear or damage. Report what you learn.
6. Explain each step in ONE of the following maintenance procedures:
 - a. Tightening hydraulic fittings
 - b. Checking the air filter
 - c. Cleaning a work piece with a wire-brush wheel
7. Find out about three career opportunities in farm mechanics. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



Farm Mechanics
BSA Supply No. 35894

Resources

Scouting Literature

Automotive Maintenance, Composite Materials, Electricity, Electronics, Energy, Engineering, Environmental Science, Fire Safety, First Aid, Forestry, Plant Science, Soil and Water Conservation, and Woodwork merit badge pamphlets

Visit the Boy Scouts of America's official retail website (with your parent's permission) at <http://www.scoutstuff.org> for a complete listing of all merit badge pamphlets and other helpful Scouting materials and supplies.

Books

- 📖 Bell, Brian. *Farm Machinery*. Old Pond Publishing, 2005.
- 📖 Ertel, P. W. *The American Tractor: A Century of Legendary Machines*. MBI Publishing, 2001.
- 📖 *Farm and Ranch Safety Management*. John Deere Publishing, 2009.
- 📖 *Fuels, Lubricants, Coolants and Filters*. John Deere Publishing, 2008.
- 📖 Goering, Carroll E., and Alan C. Hansen. *Engine and Tractor Power*. American Society of Agricultural and Biological Engineers, 2004.
- 📖 Halberstadt, April, and Hans Halberstadt. *Farm Tractors*. Barnes & Noble Books, 1998.
- 📖 Halberstadt, Hans. *Combines and Harvesters*. MBI Publishing, 1994.
- 📖 Hansen, Ann Larkin. *Farm Machinery*. ABDO Publishing, 1998.
- 📖 Herren, Ray. *Agricultural Mechanics: Fundamentals and Applications*. Delmar, 2009.
- 📖 Hunt, Donnell. *Farm Power and Machinery Management*. Waveland Press, 2007.
- 📖 Kubik, Rick. *How to Keep Your Tractor Running*. MBI Publishing, 2005.
- 📖 ----- . *How to Set Up Your Farm Workshop*. Voyageur Press, 2007.

- ↳ Leffingwell, Randy. *John Deere: A History of the Tractor*. MBI Publishing, 2006.
- ↳ *Preventive Maintenance*. John Deere Publishing, 2007.
- ↳ Pripps, Robert N. *The Big Book of Farm Tractors: The Complete History of the Tractor 1855 to Present*. Voyageur Press, 2002.
- ↳ *Shop Tools*. John Deere Publishing, 2012.
- ↳ Stone, Lynn M. *Farm Machinery*. Rourke, 2002.
- ↳ *Welding*. John Deere Publishing, 2008.

Multimedia

Centers for Disease Control and Prevention. National Ag Safety Database: Videos. Website:
<http://www.nasdonline.org/browse/video/1/topic.html>

Organizations and Websites

American Society of Agricultural and Biological Engineers

2950 Niles Road
 St. Joseph, MI 49085
 Telephone: 269-429-0300
 Website: <http://www.asabe.org>

Associated Equipment Distributors

600 22nd St., Suite 220
 Oak Brook, IL 60523
 Telephone: 630-574-0650
 Website: <http://www.aedcareers.com>

Association of Diesel Specialists

400 Admiral Blvd.
 Kansas City, MO 64106
 Telephone: 816-285-0810
 Website: <http://www.diesel.org>

Case IH

621 State St.
 Racine, WI 53404
 Telephone: 877-422-7344
 Website: <http://www.caseih.com>

Deere & Company World Headquarters

One John Deere Place
 Moline, IL 61265
 Telephone: 309-765-8000
 Website: <http://www.deere.com>

Discover Biological and Agricultural Engineering

Website: <https://www.asabe.org/media/96141/discoverbaerev.ppt>

National Farm Machinery Show

P.O. Box 37130
 Louisville, KY 40233-7130
 Telephone: 502-367-5200
 Website: <http://www.farmmachineryshow.org>

National FFA Organization

6060 FFA Drive
 P.O. Box 68960
 Indianapolis, IN 46268-0960
 Telephone: 317-802-6060
 Website: <http://www.ffa.org>

National Institute for Automotive Service Excellence

101 Blue Seal Drive SE, Suite 101
 Leesburg, VA 20175
 Telephone: 703-669-6600
 Toll-free information line: 888-ASE-TEST
 Website: <http://www.asecert.org>

National Safety Council

Agricultural Safety
 1121 Spring Lake Drive
 Itasca, IL 60143-3201

Telephone: 800-621-7615

Fact sheets: http://www.nsc.org/news_resources/Resources/Pages/SafetyHealthFactSheets.aspx

Planning Farm Shops for Work and Energy Efficiency

Purdue University Cooperative Extension Service

Website: <http://www.extension.purdue.edu/extmedia/ae/ae-104.html>