

MERIT BADGE SERIES



FARM MECHANICS



BOY SCOUTS OF AMERICA®

STEM-Based

BOY SCOUTS OF AMERICA
MERIT BADGE SERIES

FARM MECHANICS



"Enhancing our youths' competitive edge through merit badges"



BOY SCOUTS OF AMERICA®

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 pre-operational 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 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>

Proper Use and Care of Hand Tools

Website: <http://www.kleintools.com/content/handbooks-booklets>