

MERIT BADGE SERIES



# FARM MECHANICS



BOY SCOUTS OF AMERICA®

STEM-Based

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*"Enhancing our youths' competitive edge through merit badges"*



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# Requirements

*Always check [www.scouting.org](http://www.scouting.org) for the latest 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 safety data sheet (SDS) is and tell why it is used. Obtain the SDS 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

With your parent's permission, visit the Boy Scouts of America's official retail website, [www.scoutshop.org](http://www.scoutshop.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](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>