

Farm Mechanics

Merit Badge Workbook



Merit badges are earned by doing: reading the pamphlet, practicing the skills, and showing your counselor what you have learned.
This workbook gives you a place to organize your notes and track your progress along the way.
Merit badge counselors may not require the use of this or any similar workbook.
You still must satisfy your counselor that you can demonstrate each skill and have learned the information.
Use the space under each requirement to note what you have done and what you want to talk about, not to write out full answers.
When a requirement says discuss, show, tell, explain, or demonstrate, that is what you must do.
No one may add to or subtract from the official requirements found on scouting.org (Guide to Advancement 7.0.4.8).
Scouting America last updated this badge's requirements page on September 26, 2025.
Requirements change from time to time. Double-check scouting.org before you start.

Scout's name: _____ Unit: _____ Date started: _____

Counselor's name: _____ Phone no.: _____ Email: _____

Links marked "Scouting America resources" are the ones Scouting America shares on its official badge page.
This workbook is unofficial and not endorsed by Scouting America.

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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.

Scouting America resources: Farm Equipment Dangers —Staying Safe Around Farm Machinery (video)
The Comprehensive Guide to PPE for Farmers: Safety From Head to Toe (website) · Safety on the Farm: General Safety (video)
Working Safely With Hand Tools Around the Farm (video) · Personal Protective Equipment in the Farm (PPE) (video)

What I discussed with my counselor

Type	Items I discussed	When I used them for this badge
Safety equipment		
Tools		
Clothing		

(b) Draw a plan showing a well-equipped farm shop. Point out the shop's mandatory safety devices and features.

Scouting America resources: Playlist of Top Shops (playlist)
Farmer's Dream Shop Features Rolling Carts, In-Floor Tie Downs | Top Shops® | Successful Farming (video)
The Largest Farm Shop We've Ever Seen | Top Shops® | Successful Farming (video)

My plan of a well-equipped farm shop (draw here or attach)

Mandatory safety devices and features in my plan

Safety device or feature	Where it is in my plan

(c) Find all the universal warning and safety symbols on a piece of equipment and explain what they mean.

Scouting America resources: Caterpillar Warning Symbols/Icons Detailed Guide (video)
Agricultural Equipment Symbol Standards (website)

Piece of equipment I checked _____ Date _____

Warning and safety symbols I found

Symbol (name or sketch)	What it means

(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.

Scouting America resources: Safety Data Sheets (video) · Where to Find Safety Data Sheets (SDS): A Complete Guide (website)

What a safety data sheet (SDS) is, and why it is used

SDS I obtained for materials I used

Material (coolant, oil, grease, fuel, fluid...)	Product name	Where I got the SDS

Requirement 1 completed on _____ counselor initials _____

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2. Explain how power is produced or transferred in a:

(a) Diesel engine

Scouting America resources: How a Diesel Engine Works (video) · How Diesel Engine Actually Works? (Animation) (video)

How power is produced or transferred in a diesel engine

(b) Hydraulic system

Scouting America resources: How Does a Hydraulic Cylinder Work? (video)

How power is produced or transferred in a hydraulic system

(c) Transmission or any other power system

Scouting America resources: Tractor Transmission System: Common Methods (video)

System I picked

How power is produced or transferred in it

Requirement 2 completed on counselor initials

3. Do TWO of the following:

☐ **(a)** Replace the handle of any tool found on the farm.

Scouting America resources: How To Replace a Garden Tool Handle (video)
Axe & Hammer Handle Replacement—How To Do It Old School (video)

Date Tool With whom

Steps I followed

☐ **(b)** Organize a tool rack or a storage system for nails, bolts, nuts, and washers.

Scouting America resources: Adam Savage's Hardware Logjam Sorting Challenge! (video) · Easy Bolt Sorter (video)
How To Organise Screws, Nails, Bolts & Nuts (video) · How To Organize Your Loose Screws and Nails (video)

Date Where Tool rack or storage system

How I organized it

☐ **(c)** Using a hand file, properly dress the mushroomed head of a chisel or punch.

Scouting America resources: 4 Tools You Can Use To Dress a Chisel (video)
Dressing Hammers and Punches—Basic Blacksmithing (video)

Date | Chisel or punch | With whom

Steps I followed

☐ **(d)** Using a hand file, correctly dress a screwdriver tip.

Scouting America resources: Sharpening and Reshaping Your Screwdriver With a File (video)

Date | Screwdriver type | With whom

Steps I followed

Requirement 3 completed on | counselor initials

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.

Scouting America resources: Do This Every Two Weeks and Your Tractor Will Never Break Down (video)

Date | Machine | With whom

- ☐ Greased all fittings
- ☐ Changed the oil and oil filter
- ☐ Cleaned the air filter
- ☐ Cleaned the radiator fins
- ☐ Replaced 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.

Scouting America resources: Download Equipment and Machine Safety Checklist (PDF)

Machine | Date of my preoperational check

My preoperational checklist

Item to check	What to look for	What I found
Engine coolant		
Engine oil		
Hydraulic and/or transmission fluid		
Battery voltage (using a voltmeter)		

☐ **(c)** Prepare any farm machine for winter storage.

Scouting America resources: Winterizing Your Tractor and Equipment: 10 Essential Steps (video)
Preparing the Combine for Winter Storage (video)

Date _____ Machine _____ With whom _____

How I prepared it for winter storage

Step	What I did
1	
2	
3	
4	
5	
6	

Requirement 4 completed on _____ counselor initials _____

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.

Implement dealer _____ Person I interviewed _____ Date _____

What I learned in my interview

Topic	What I learned
Hints on good preventive maintenance	
Why it is important	
The costs	
What causes wear or damage	

Notes for my report

Requirement 5 completed on _____ counselor initials _____

6. Explain each step in ONE of the following maintenance procedures:

☐ **(a)** Tightening hydraulic fittings

Scouting America resources: Avoid Leaks! How To Tighten Hydraulic Fittings the Right Way (website)

Steps for tightening hydraulic fittings

Step	What to do, and why
1	
2	
3	
4	
5	

☐ **(b)** Checking the air filter

Scouting America resources: Maintaining Your Tractor—Changing the Air Filter (video)

Steps for checking the air filter

Step	What to do, and why
1	
2	
3	
4	
5	

☐ **(c)** Cleaning a work piece with a wire-brush wheel

Scouting America resources: Cleaning Up Rusted Metal Finds (video)

Steps for cleaning a work piece with a wire-brush wheel

Step	What to do, and why
1	
2	
3	
4	
5	

Requirement 6 completed on _____ counselor initials _____

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.

Scouting America resources: Agricultural Engineering (video) · Agriculture Careers: Agriculture Equipment Technician (video) Careers in Agriculture—Management (video) · Careers in Agriculture—Technology (video) · Agricultural Equipment Technician (video)

Three careers in farm mechanics

Career	What the work involves

The one I picked

What it takes	What I found out
Education	
Training	
Experience	

Why this profession might interest me

Requirement 7 completed on counselor initials

Counselor sign-off

Your counselor signs your blue card or approves the badge in Scoutbook, and your unit records it. This line is for your own records.

Counselor's signature Date completed

Official Scouting America resources

Scouting America resources: Farm Mechanics merit badge page (requirements and resources) Farm Mechanics merit badge pamphlet (free PDF) · All merit badges

Made by Cole at ScoutSmarts.com, an Eagle Scout who loves helping Scouts.
Spot an error or a requirement change? Tell me at scoutsmarts.com/contact.
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