

# CLIMBING

2-CLIMBING



## CLIMBING STEEL POLES INSTRUCTOR GENERAL LESSON OUTLINE ONLINE/CLASSROOM SESSION

*This lesson describes different steel pole steps and discusses strategies for climbing, descending, and positioning steel poles to reach work locations.*

### **RATIONALE:**

Like wood poles, steel poles cannot always be installed in locations accessible to bucket trucks, so methods must be designed to safely climb and work on them.

### **REQUIRED READING AND VIEWING MATERIALS:**

- The student should review the “Climbing Steel Poles” reading material and watch the training video for this section.

### **COURSE STRUCTURE:**

- The student will watch the video “Climbing Steel Poles.”
  - This can be completed online ([lineman.steel.org](http://lineman.steel.org)) or in a classroom setting (with provided DVD or USB).
- The student will complete an assessment after completing the lesson.
  - This can be completed online ([lineman.steel.org](http://lineman.steel.org)) or in a classroom setting (copies of the provided quiz can be photocopied or orally presented).
- The instructor will present a lecture on climbing steel poles with the provided PowerPoint presentation. This may be completed before or after the quiz.
- *An optional lab session can follow the lesson to reinforce the learning objectives.*
  - *See “Climbing Steel Poles – Lab Session with Skills Assessment” for lesson outline.*

**LEARNING OBJECTIVES:**

After completing this lesson, the student should be able to:

<b>Lesson Objectives</b>	<b>Competency Measures</b>
1. Describe the different types of steps used for climbing steel poles.	1. Students should demonstrate: a. Installation of various types of steps. b. Removal of various types of steps. c. Testing the steps to ensure proper installation.
2. Describe the personal climbing equipment required to climb steel poles.	2. Students should demonstrate: a. Identification and use of the necessary climbing and safety gear used for climbing steel poles. b. Proper inspection of climbing gear.
3. Describe the safety equipment and procedures used when climbing steel poles.	3. Students should demonstrate: a. Proper preparation of the area before climbing. b. Climbing the pole and installing and removing steps during the climbing activity. c. Reaching a work position on the pole and completing a simple task at that position.

## CLIMBING STEEL POLES STUDENT READING MATERIAL

*This reading material covers climbing a steel utility pole in a de-energized setting. Always follow all safety procedures and wear the appropriate safety gear for the job at hand.*

There are several systems used for climbing steel poles. With the exception of climbers, the basic equipment that a line technician needs for a steel pole is identical to that used for a wood pole in a non-energized environment. This equipment includes a non-conductive hard hat, company-approved safety glasses, leather work gloves, a standard line body belt and safety strap or appropriate fall protection, and hard toe climbing boots with good arch support.

As with wood poles, climbing procedures vary from utility to utility. You should always familiarize yourself with all company safety practices before attempting to climb a wood or a steel pole.

For instance, some utility companies require that a climber be secured to a structure from the time he leaves the ground to the time he returns to the ground. In other companies, a line worker can free-climb until he reaches the point where he will do his work, and then safety off at the point where the work is to be done. In our training instruction, the line worker will be belt-secured to the structure at all times of elevated work activity.

The most common systems involve the use of removable steps. Almost all manufacturers offer one or more styles of this type of step, and they all generally work in the same fashion. The step systems mount to a single open hole drilled in the wall of the pole at the desired elevations and circumference positions on the pole. Most utilities design both a climbing pattern and working pattern on the pole. Climbing positions are alternated on opposing sides to ascend and descend the pole. Working positions are multiple-step provisions grouped in a specific elevation on the pole to provide mobility to the line worker while at an elevated work position.

### STEP SYSTEMS

Three commonly used climbing systems are covered here. Each step is specifically designed for steel poles:

- The Hubbell-Chance Step System
- The Senior Step System
- The Valmont Newmark Step System

#### Hubbell-Chance Step System

The system has four components which are attached to the wall of a steel pole:

- Rivnut
- Face plate
- Mounting bolt and a removable slip-on foot step

#### *Installation Instructions for the Hubbell-Chance Step System:*

Drill a hole to pole shaft per manufacturer's size requirement of 13/32 inch. Install the rivnut to the open hole. Place the face plate to the pole wall aligned to the rivnut and install mount bolt through face plate to the rivnut threaded insert. Be sure to align face plate with step tab down, as the tab supports the bottom of the step opening. With a wrench, tighten the bolt to a snug fit with alignment of special bolt head in the vertical position. Install step to ensure proper fit with step opening, completely covering bolt head. Adjust bolt and face plate as needed.

### **Senior Step System**

This system has four components which are preassembled by the step manufacturer:

- Foot step bolt
- Face plate
- Star washer
- Locking bolt

This step has an assembled feature that prevents the four components from becoming separated when loosened.

#### *Installation Instructions for the Senior Step System:*

Drill a hole to pole shaft per manufacturer's size requirement of 13/16 inch. Loosen the lock nut completely off the threaded portion of the step assembly, allowing nut, washer and face plate to move freely to the smooth end of step bolt. Position the square, bent end of step bolt into the open hole and position the step bolt to the level position. Holding the step bolt back and against the interior wall of the pole, align the face plate to the exterior wall of the pole with the TOP marking up. Slide the washer and nut onto the threaded surface. With a wrench, tighten locking nut to a snug fit. Confirm the face plate and step assembly are firm to the wall of the pole without any gaps or loose motion.

### **Valmont Newmark Step System**

This system has three components that are preassembled by the step manufacturer:

- Cast step peg
- Step bolt
- Two locking nuts

#### *Installation Instructions for the Valmont Newmark Step System:*

Drill a hole to pole shaft per manufacturer's size requirement of 1-1/8 inch. Do not remove the lock nuts from threaded bolt. Loosen the lock nuts completely to the end of threaded portion of the step bolt assembly, allowing the cast foot step movement to end of the threaded step bolt. Position the round, bent end of step bolt and round end of the cast step into the open hole and position the step bolt to the level position. Holding the step bolt back and against the interior wall of the pole, align the step cast flat portion to the exterior wall of the pole. Spin the inner nut across the threaded surface. With a wrench, tighten nut to a snug fit. Confirm the cast-step assembly is level and firm to the wall of the pole. Slight gaps will exist when the step is mounted to a round pole. Spin the outer nut into its lock position.

### **ADDITIONAL CONSIDERATIONS**

In most cases, the climber should be able to install and remove the Hubbell-Chance temporary steps by hand, but in some cases a hammer may need to be used to tap the step in order to detach it from the steel pole.

When climbing a pole with slip-on "removable" steps, like the Hubbell-Chance type, care should be taken to not loosen them as you climb. Always check your boot soles before climbing. If there is a sticky material on the bottom of the boot, the step may become stuck to it and dislodge from the pole. If this happens, the step may fall to the ground as soon as it is free.

The Hubbell-Chance, Senior and Valmont Newmark type steps built onto the pole may be considered either temporary or permanent. This is a decision made by the utility. Most utilities prefer to use a temporary step type practice for climbing provisions lower on a pole near the ground line in order to protect the poles from unauthorized climbing.

One commonly used fall restraint system is the Buckingham “SuperSqueeze” with a rope auxiliary safety strap. Several other suppliers of climbing equipment offer similar fall restraint systems. Each supplier should be consulted about the equipment and its use for climbing steel poles.

### **PREPARING TO CLIMB A STEEL UTILITY POLE**

Preparing to climb a steel pole is no different than a wood pole. Climbing equipment should be inspected for defects and, if any are found, the equipment should be replaced or repaired before ascending. The area around the pole should be free of equipment and debris. The line technician should visually inspect the pole and choose the climbing route that appears to be the safest. While ascending and descending, care should be taken to remain aware of the surroundings to avoid any climbing hazards.

Always inspect the pole before starting your climb. Keep these and other safety tips in mind when ascending or descending a steel or wood utility pole.

### **USING A WORK PLATFORM**

One of the most common concerns about working on steel poles is the challenge of trying to work at an elevation from a single position. To work around this challenge, a simple work platform can be used. The work platform is easily installed at almost any location along the pole, providing the line worker freedom to move about the pole and work area. A platform option would be used in conjunction with the previously mentioned step attachments to ascend and descend the pole.

*For more information about working with steel utility poles in a de-energized setting, visit [lineman.steel.org](http://lineman.steel.org).*



## CLIMBING STEEL POLES STUDENT QUIZ

1. When climbing steel poles, which item of climbing equipment will not be used?
  - a. Climbers
  - b. Body belt
  - c. Hard toe boots
  - d. Safety strap or fall protection system
  
2. How are steel poles climbed?
  - a. In the same manner as wood poles.
  - b. By attaching strong magnets to the line worker's feet.
  - c. By installing steps into the steel pole.
  - d. By using a scaffolding system.
  
3. Which of the following step systems require the use of a rivnut?
  - a. Hubbell-Chance Step System
  - b. Senior Step System
  - c. Valmont Newmark Step System
  - d. All of these answers.
  
4. What should be done before ascending a steel pole?
  - a. Inspect the pole for hazards.
  - b. Clear the area around the pole of tools, material and debris.
  - c. Inspect climbing equipment for defects.
  - d. All of these answers.
  
5. Steps that are installed on steel poles are permanent fixtures on the pole.
  - a. True
  - b. False
  
6. The holes drilled in a steel pole to accommodate steps are the same diameter regardless of which pole step system is used.
  - a. True
  - b. False



7. Which of the following options can make working aloft on a steel pole more comfortable and easier to reach the work?
- a. Place steps strategically.
  - b. Attach a work platform.
  - c. Install a steel collar to the pole.
  - d. Only A & B
  - e. None of these answers.
8. If the utility decides to leave pole steps in permanently, what precaution should be considered?
- a. Make sure the steps are installed securely.
  - b. Remove lower steps to prevent unauthorized persons from climbing the pole.
  - c. Be sure to charge the steps to the proper work order.
  - d. Steps should never be permanently installed on steel poles.

**CLIMBING STEEL POLES  
STUDENT QUIZ  
ANSWER KEY**

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## CLIMBING STEEL POLES

Working with Steel Utility Poles

# CLIMBING STEEL POLES

- **Safety First**
  - Hard Hat
  - Safety Glasses
  - Leather Gloves
  - Proper Clothing



# CLIMBING STEEL POLES

- **Overview**
- **Inspections**
  - Pole
  - Surrounding area
  - Climbing equipment
- **Follow Company Safety Practices**



# CLIMBING STEEL POLES

- **Pole Steps**
  - Typically removable
- **Types of Steps**
  - Hubbell-Chance Step
  - Senior Step
  - Valmont Newmark Step



# CLIMBING STEEL POLES

- **Hole is Required**
  - Each step system requires a certain diameter hole.
- **Hubbell-Chance Step**
  - 13/32 inch (for rivnut)
- **Senior Step**
  - 13/16 inch
- **Valmont Newmark Step**
  - 1-1/8 inch





# CLIMBING STEEL POLES

- **Hubbell-Chance**

## **Step – 13/32” hole**

- Rivnut threaded insert
- Face plate
- Mounting bolt



# CLIMBING STEEL POLES



- **Hubbell-Chance Step**
- Removable slip-on foot step



# CLIMBING STEEL POLES

- **Senior Step – 13/16” hole**

- Foot step bolt

- Face plate



# CLIMBING STEEL POLES

- **Senior Step**

- Star washer
- Locking bolt

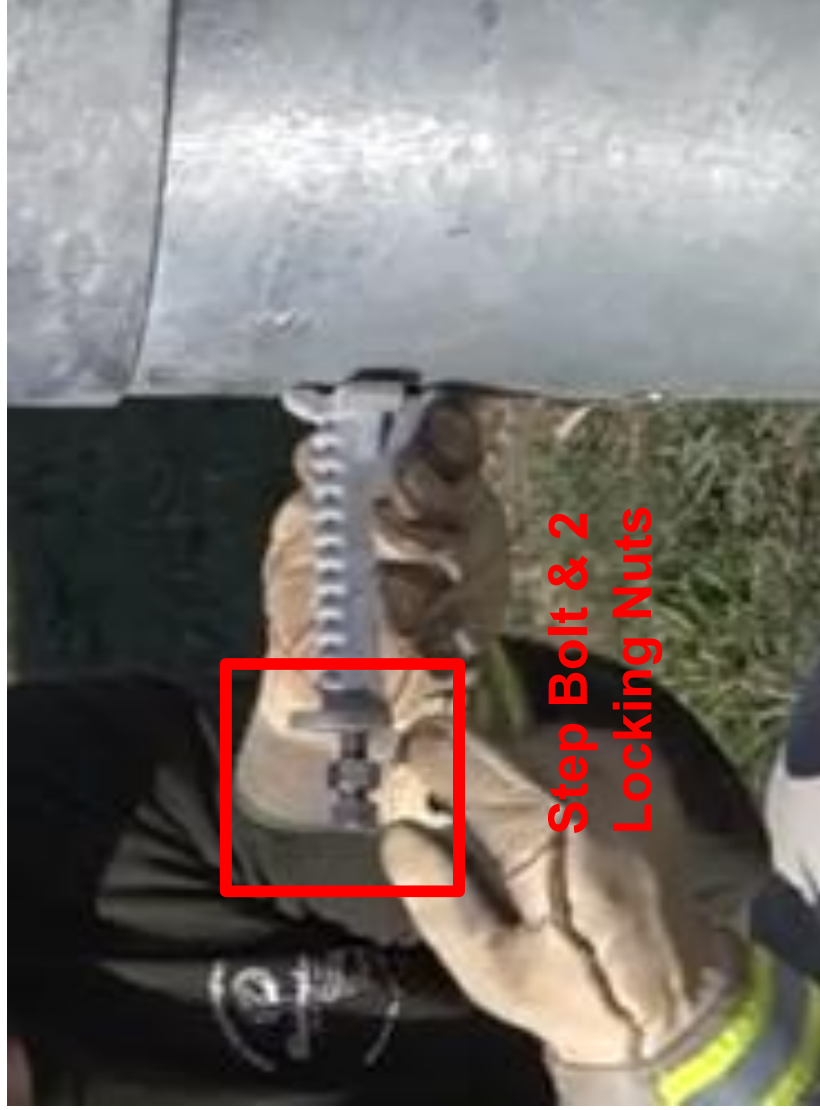


# CLIMBING STEEL POLES



- Valmont Newmark
- Step – 1-1/8” hole
- Cast step peg

# CLIMBING STEEL POLES



**Step Bolt & 2  
Locking Nuts**

- **Valmont**

## **Newmark Step**

- Step bolt
- 2 locking nuts

# CLIMBING STEEL POLES

- **Climbing Equipment**
  - Standard body belt
  - Fall protection system
  - Auxiliary safety strap
  - Hard toe boots with good arch support



# CLIMBING STEEL POLES

- Linemen with proper fall protection





# CLIMBING STEEL POLES

- **Working Aloft**
  - Step placement
  - Work platforms



# CLIMBING STEEL POLES

- **Review**
  - Steel poles can be climbed by installing temporary or permanent steps.
  - A hole is required to be drilled to accommodate the step.
  - There are three step systems and the hole diameters are:
    - Hubbell-Chance Step System – 13/32”
    - Senior Step System – 13/16”
    - Valmont Newmark Step System – 1-1/8”
  - Climbing equipment required by your company can be used to climb steel poles.
  - Always inspect the pole and area around the pole before climbing.
  - Pole steps can be strategically arranged at the elevated work location for comfort and ease of work.
  - Work platforms can be used at elevated positions.



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## CLIMBING STEEL POLES INSTRUCTOR TRAINING GUIDE LAB SESSION WITH SKILLS ASSESSMENT

### LEARNING OBJECTIVES

- Students will demonstrate installing and removing steps while ascending and descending the steel pole.
- Students will complete a simple job at the top of the steel pole.

### INSTRUCTOR REFERENCE

- Video on “Climbing Steel Poles” - this can be viewed online ([lineman.steel.org](http://lineman.steel.org)) or via the provided DVD or USB.
- Additional general material provided at [lineman.steel.org](http://lineman.steel.org).

### MATERIALS

- Pre-drilled steel pole set with crossarm installed
- Steps of instructor’s choosing (if you need complimentary steps, please contact SMDI at 202-452-7100 or [dsnyder@steel.org](mailto:dsnyder@steel.org))
  - The Hubbell-Chance Step System
  - The Senior Step System
  - The Valmont Newmark Step System Climbing Gear
  - Personal Protective Equipment
  - Pin and insulator

### STUDENT PREPARATION

- Complete the online or classroom lesson on climbing steel poles (video, lecture, and quiz).
- Have experience in general field activities - deployment, joining, drilling, framing and installing a pole (wood or another material).

### TRAINING ACTIVITY

- A job briefing (tailgate) will be led by the instructor and cover the following subjects:
  - Job site and equipment inspections
  - Description of the job to be completed
  - Open discussion on safety considerations
- Students will practice installing and removing steps before climbing.
- Students will ascend the pole, installing steps as they climb.
- Students will secure the handline to the crossarm.
- Students will install and remove a pin and insulator on the crossarm.
- Students will descend the pole, removing steps as they climb down.
- Instructor will lead a short debriefing of the activity and answer questions.

## **STUDENT ASSESSMENT**

If the instructor wishes to assign a grade to the student on the activity, the following guidelines are suggested for assessing the student's work:

- Active participation in the activity
- Attention to detail and safety
- Climbing ability
- Ability to work at the crossarm location
- Ability to complete the activity