

Summary: A Career as an Electrical Line Worker

Source: U.S. Department of Labor, Bureau of Labor Statistics



Line installers and repairers often work in teams to install and fix cables and wires.

Quick Facts: Line Installers and Repairers

<u>2014 Median Pay</u>	\$61,740 per year \$29.68 per hour
<u>Typical Entry-Level Education</u>	High school diploma or equivalent
<u>Work Experience in a Related Occupation</u>	None
<u>On-the-job Training</u>	Long-term on-the-job training
<u>Number of Jobs, 2014</u>	236,600
<u>Job Outlook, 2014-24</u>	6% (As fast as average)
<u>Employment Change, 2014-24</u>	13,700

What Line Installers and Repairers Do

Line installers and repairers, also known as *line workers*, install or repair electrical power systems and telecommunications cables, including fiber optics.

Work Environment

Line workers encounter serious hazards on the job, including working with high-voltage electricity, often at great heights. The work also can be physically demanding. Although most work full time during regular business hours, some work irregular hours on evenings, nights, weekends, and holidays when needed.

How to Become a Line Installer or Repairer

To become proficient, most line installers and repairers require technical instruction and long-term on-the-job training. Apprenticeships are common.

Pay

The median annual wage for line installers and repairers was \$61,740 in May 2014.

Job Outlook

Employment of line installers and repairers is projected to grow 6 percent from 2014 to 2024, about as fast as the average for all occupations. Job opportunities should be best for those with good technical and mechanical skills. Those looking to become electric power-line installers should have the best job prospects.

What Line Installers and Repairers Do



Line installers and repairers use a truck-mounted bucket to access equipment.

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Duties

Electrical power-line installers and repairers typically do the following:

- Install, maintain, or repair the power lines that move electricity
- Identify defective devices, voltage regulators, transformers, and switches
- Inspect and test power lines and auxiliary equipment
- String power lines between poles, towers, and buildings
- Climb poles and transmission towers and use truck-mounted buckets to get to equipment
- Operate power equipment when installing and repairing poles, towers, and lines
- Drive work vehicles to job sites
- Follow safety standards and procedures

Telecommunications line installers and repairers typically do the following:

- Install, maintain, or repair telecommunications equipment
- Inspect or test lines or cables
- Lay underground cable, including fiber optic lines, directly in trenches
- Pull cables in underground conduit
- Install aerial cables, including over lakes or across rivers
- Operate power equipment when installing and repairing poles, towers, and lines
- Drive work vehicles to job sites
- Set up service for customers

A complex network of physical power lines and cables provides consumers with electricity, landline telephone communication, cable television, and Internet access. Line installers and repairers, also known as *line workers*, are responsible for installing and maintaining these networks.

Line installers and repairers can specialize in different areas depending on the type of network and industry in which they work:

Electrical power-line installers and repairers install and maintain the power grid—the network of power lines that moves electricity from generating plants to customers. They routinely work with high-voltage

electricity, which requires extreme caution. The electrical current can range from hundreds of thousands of volts for long-distance transmission lines that make up the power grid to less than 10,000 volts for distribution lines that supply electricity to homes and businesses.

Line workers who maintain the interstate power grid work in crews that travel to locations throughout a large region to service transmission lines and towers. Workers employed by local utilities work mainly with lower voltage distribution lines, maintaining equipment such as transformers, voltage regulators, and switches. They also may work on traffic lights and street lights.

Telecommunications line installers and repairers install and maintain the lines and cables used by network communications companies. Depending on the service provided—local and long-distance telephone, cable television, or Internet—telecommunications companies use different types of cables, including fiber-optic cables. Unlike metallic cables that carry electricity, fiber-optic cables are made of glass and transmit signals using light. Working with fiber optics requires special skills, such as the ability to splice and terminate optical cables. Additionally, workers use specialized equipment to test and troubleshoot cables and networking equipment.

Because these systems are complicated, many line workers also specialize by duty:

Line installers install new cable. They may work for construction contractors, utilities, or telecommunications companies. Workers generally start a new job by digging underground trenches or erecting utility poles and towers to carry the wires and cables. They use a variety of construction equipment, including digger derricks, which are trucks equipped with augers and cranes used to dig holes in the ground and set poles in place. Line installers also use trenchers, cable plows, and directional bore machines, which are used to cut openings in the earth to lay underground cables. Once the poles, towers, tunnels, or trenches are ready, workers install the new cable.

Line repairers are employed by utilities and telecommunications companies that maintain existing power and telecommunications lines. Maintenance needs may be identified in a variety of ways, including remote monitoring, aerial inspections, and by customer reports of service outages. Line repairers often must replace aging or outdated equipment, so many of these workers have installation duties in addition to their repair duties.

When a problem is reported, line repairers must identify the cause and fix it. This usually involves diagnostic testing using specialized equipment and repair work. To work on poles, line installers usually use bucket trucks to raise themselves to the top of the structure, although all line workers must be adept at climbing poles and towers when necessary. Workers use special safety equipment to keep them from falling when climbing utility poles and towers.

Storms and other natural disasters can cause extensive damage to power lines. When power is lost, line repairers must work quickly to restore service to customers.

Work Environment

Line installers and repairers may be required to work at great heights.

Line installers and repairers held about 236,600 jobs in 2014. The industries that employed the most line installers and repairers were as follows:

Wired telecommunications carriers	26%
Electric power generation, transmission and distribution	24%
Utility system construction	20%
Electrical contractors and other wiring installation contractors	12%
Local government, excluding education and hospitals	7%



The work of line installers and repairers can be physically demanding. Line installers must be comfortable working at great heights and in confined spaces. Despite the help of bucket trucks, all line workers must be able to climb utility poles and transmission towers and balance while working on them.

Their work often requires that they drive utility vehicles, travel long distances, and work outdoors.

Line installers and repairers often must work under challenging weather conditions, such as in snow, wind, rain, and extreme heat and cold, in order to keep electricity flowing.

Injuries and Illnesses

Line workers encounter serious hazards on their jobs and must follow safety procedures to minimize danger. For example, workers must wear safety equipment when entering underground manholes and test for the presence of gas before going underground.

Specifically, electric power-line workers have hazardous jobs. A worker can be electrocuted if he or she comes in contact with a live cable on a high-voltage power line. When workers engage live wires, they use electrically insulated protective devices and tools to minimize their risk.

Power lines are typically higher than telephone lines, increasing the risk of severe injury from a fall. To prevent injuries, line installers use fall-protection equipment when working on poles or towers. Safety procedures and training have significantly reduced the danger for line workers. However, the occupation

is still among the most dangerous. As a result, telecommunications and electrical line workers have a rate of injuries and illnesses that is higher than the national average.

Work Schedules

Although most work full time during regular business hours, some line installers and repairers must work evenings and weekends. In emergencies or after storms and other natural disasters, workers may have to work long hours for several days in a row.

How to Become a Line Installer or Repairer

Most installers and repairers have a high school diploma and receive long-term on-the-job training.

A high school diploma or equivalent is typically required for entry-level positions, but most line installers and repairers need technical instruction and long-term on-the-job training to become proficient. Apprenticeships are also common.



Education

Most companies require line installers and repairers to have a high school diploma or equivalent. Employers prefer candidates with basic knowledge of algebra and trigonometry. In addition, technical knowledge of electricity or electronics obtained through military service, vocational programs, or community colleges can also be helpful.

Many community colleges offer programs in telecommunications, electronics, or electricity. Some programs work with local companies to offer 1-year certificates that emphasize hands-on field work.

More advanced 2-year associate's degree programs provide students with a broad knowledge of the technology used in telecommunications and electrical utilities. These programs offer courses in electricity, electronics, fiber optics, and microwave transmission.

Training

Electrical line installers and repairers often must complete apprenticeships or other employer training programs. These programs, which can last up to 3 years, combine on-the-job training with technical instruction and are sometimes administered jointly by the employer and the union representing the workers. For example, the Electrical Training Alliance offers apprenticeship programs in four specialty areas. The basic qualifications to enter an apprenticeship program are as follows:

- Minimum age of 18
- High school education or equivalent

- One year of algebra
- Qualifying score on an aptitude test
- Pass substance abuse screening

Line installers and repairers who work for telecommunications companies typically receive several years of on-the-job training. They also may be encouraged to attend training from equipment manufacturers, schools, unions, or industry training organizations.

Licenses, Certifications, and Registrations

Although not mandatory, certification for line installers and repairers is also available from several associations. For example, the Electrical Training ALLIANCE offers certification for line installers and repairers in several specialty areas.

In addition, The Fiber Optic Association (FOA) offers two levels of fiber optic certification for telecommunications line installers and repairers.

Workers who drive heavy company vehicles usually need a commercial driver's license.

Advancement

Entry-level line workers generally begin with an apprenticeship, which includes both classroom training and hands-on work experience. As they learn additional skills from more experienced workers, they may advance to more complex tasks. In time, experienced line workers advance to more sophisticated maintenance and repair positions in which they are responsible for increasingly large portions of the network.

After 3 to 4 years of working, qualified line workers reach the journey level. A journey-level line worker is no longer considered an apprentice and can perform most tasks without supervision. Journey-level line workers also may qualify for positions at other companies. Workers with many years of experience may become first-line supervisors or trainers.

Important Qualities

Color vision. Workers who handle electrical wires and cables must be able to distinguish colors because the wires and cables are often color coded.

Mechanical skills. Line installers and repairers must have the knowledge and skills to repair or replace complex electrical and telecommunications lines and equipment.

Physical stamina. Line installers and repairers often must climb poles and work at great heights with heavy tools and equipment. Therefore, installers and repairers should be able to work for long periods without tiring easily.

Physical strength. Line installers and repairers must be strong enough to lift heavy tools, cables, and equipment on a regular basis.

Teamwork. Because workers often rely on their fellow crew members for their safety, teamwork is critical.

Technical skills. Line installers use sophisticated diagnostic equipment on circuit breakers, switches, and transformers. They must be familiar with electrical systems and the appropriate tools needed to fix and maintain them.

Troubleshooting skills. Line installers and repairers must be able to diagnose problems in increasingly complex electrical systems and telecommunication lines.

Pay

Median annual wages, May 2014

Electrical power-line installers and repairers

\$65,930

Line installers and repairers

\$61,740

Telecommunications line installers and repairers

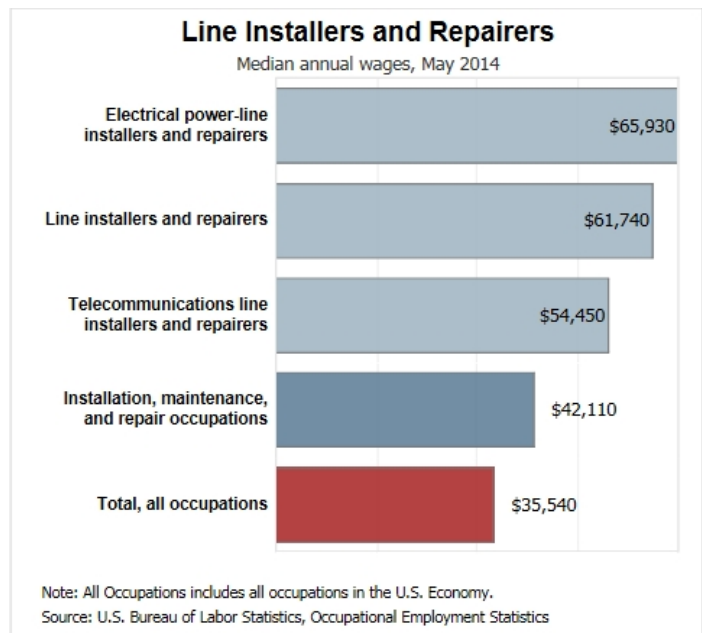
\$54,450

Installation, maintenance, and repair occupations

\$42,110

Total, all occupations

\$35,540



Note: All Occupations includes all occupations in the U.S. Economy.

Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics

The median annual wage for electrical power-line installers and repairers was \$65,930 in May 2014. The median wage is the wage at which half the workers in an occupation earned more than that amount and half earned less. The lowest 10 percent earned less than \$36,090, and the highest 10 percent earned more than \$94,030.

The median annual wage for telecommunications line installers and repairers was \$54,450 in May 2014. The lowest 10 percent earned less than \$28,530, and the highest 10 percent earned more than \$81,160.

In May 2014, the median annual wages for line installers and repairers in the top industries in which they worked were as follows:

Electric power generation, transmission and distribution	\$69,250
Wired telecommunications carriers	\$65,440
Local government, excluding education and hospitals	\$61,930
Utility system construction	\$49,020
Electrical contractors and other wiring installation contractors	\$45,210

Although most work full time during regular business hours, some line installers and repairers may work evenings and weekends. In emergencies or after storms and other natural disasters, they may have to work long hours for several days in a row.

Union Membership

Compared with workers in all occupations, line installers and repairers had a higher percentage of workers who belonged to a union in 2014.