

# Elevator Installers and Repairers

(O\*NET 47-4021.00)

## Significant Points

- Most workers belong to a union and enter the occupation through a 4-year apprenticeship program.
- Excellent employment opportunities are expected.
- Elevator installers and repairers are less affected by downturns in the economy and inclement weather than other construction trades workers.

## Nature of the Work

Elevator installers and repairers—also called *elevator constructors* or *elevator mechanics*—assemble, install, and replace elevators, escalators, chairlifts, dumbwaiters, moving walkways, and similar equipment in new and old buildings. Once the equipment is in service, they maintain and repair it as well. They also are responsible for modernizing older equipment.

To install, repair, and maintain modern elevators, which are almost all electronically controlled, elevator installers and repairers must have a thorough knowledge of electronics, electricity, and hydraulics. Many elevators are controlled with microprocessors, which are programmed to analyze traffic conditions in order to dispatch elevators in the most efficient manner. With these controls, it is possible to get the greatest amount of service with the fewest number of cars.

Elevator installers and repairers usually specialize in installation, maintenance, or repair work. Maintenance and repair workers generally need greater knowledge of electricity and electronics than do installers because a large part of maintenance and repair work is troubleshooting.

When installing a new elevator, installers and repairers begin by studying blueprints to determine the equipment needed to install rails, machinery, car enclosures, motors, pumps, cylinders, and plunger foundations. Then, they begin equipment installation. Working on scaffolding or platforms, installers bolt or weld steel rails to the walls of the shaft to guide the elevator.

Elevator installers put in electrical wires and controls by running tubing, called conduit, along a shaft's walls from floor to floor. Once the conduit is in place, mechanics pull plastic-covered electrical wires through it. They then install electrical components and related devices required at each floor and at the main control panel in the machine room.

Installers bolt or weld together the steel frame of an elevator car at the bottom of the shaft; install the car's platform, walls, and doors; and attach guide shoes and rollers to minimize the lateral motion of the car as it travels through the shaft. They also install the outer doors and door frames at the elevator entrances on each floor.

For cabled elevators, these workers install geared or gearless machines with a traction drive wheel that guides and moves heavy steel cables connected to the elevator car and counterweight. (The counterweight moves in the opposite direction from the car and balances most of the weight of the car to reduce the weight that the elevator's motor must lift.) Elevator installers also install elevators in which a car sits on a hydraulic plunger that is driven by a pump. The plunger pushes the eleva-

tor car up from underneath, similar to a lift in an auto service station.

Installers and repairers also install escalators. They place the steel framework, the electrically powered stairs, and the tracks and install associated motors and electrical wiring. In addition to elevators and escalators, installers and repairers also may install devices such as dumbwaiters and material lifts—which are similar to elevators in design—as well as moving walkways, stair lifts, and wheelchair lifts.

Once an elevator is operating properly, it must be maintained and serviced regularly to keep it in safe working condition. Elevator installers and repairers generally do preventive maintenance—such as oiling and greasing moving parts, replacing worn parts, testing equipment with meters and gauges, and adjusting equipment for optimal performance. They insure that the equipment and rooms are clean. They also troubleshoot and may be called to do emergency repairs. Unlike most elevator installers, those who specialize in elevator maintenance are on their own most of the day and typically service the same elevators periodically.

A service crew usually handles major repairs—for example, replacing cables, elevator doors, or machine bearings. This may require the use of cutting torches or rigging equipment—tools that an elevator repairer would not normally carry. Service crews also do major modernization and alteration work, such as moving and replacing electrical motors, hydraulic pumps, and control panels.

The most highly skilled elevator installers and repairers, called “adjusters,” specialize in fine-tuning all the equipment after installation. Adjusters make sure that an elevator works according to specifications and stops correctly at each floor within a specified time. Adjusters need a thorough knowledge of electricity, electronics, and computers to ensure that newly installed elevators operate properly.

**Work environment.** Elevator installers lift and carry heavy equipment and parts, and they may work in cramped spaces or awkward positions. Potential hazards include falls, electrical shock, muscle strains, and other injuries related to handling heavy equipment. Most of their work is performed indoors in existing buildings or buildings under construction.

Most elevator installers and repairers work a 40-hour week. However, overtime is required when essential equipment must be repaired, and some workers are on 24-hour call. Because most of their work is performed indoors in buildings, elevator



Repairers make sure that an elevator operates according to specifications and stops at each floor within a specified time.

## Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-16	
				Number	Percent
Elevator installers and repairers.....	47-4021	22,000	24,000	1,900	9

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

installers and repairers lose less work time due to inclement weather than do other construction trades workers.

### Training, Other Qualifications, and Advancement

Most elevator installers receive their education through an apprenticeship program. High school classes in mathematics, science, and shop may help applicants compete for apprenticeship openings.

**Education and training.** Most elevators installers and repairers learn their trade in an apprenticeship program administered by local joint educational committees representing the employers and the union—the International Union of Elevator Constructors. In nonunion shops, workers may complete training programs sponsored by independent contractors.

Apprenticeship programs teach a range of skills, usually during a 4-year period. Programs combine paid on-the-job training with classroom instruction in blueprint reading, electrical and electronic theory, mathematics, applications of physics, and safety.

Most apprentices assist experienced elevator installers and repairers. Beginners carry materials and tools, bolt rails to walls, and assemble elevator cars. Eventually, apprentices learn more difficult tasks such as wiring.

Applicants for apprenticeship positions must have a high school diploma or the equivalent. High school courses in electricity, mathematics, and physics provide a useful background. As elevators become increasingly sophisticated, workers may need to get more advanced education—for example, a certificate or associate degree in electronics. Workers with education beyond high school usually advance more quickly than their counterparts without a degree.

Many elevator installers and repairers receive additional training in their particular company's equipment.

**Licensure.** Most cities and States require elevator installers and repairers to pass a licensing examination. Other requirements for licensure vary.

**Certification and other qualifications.** Workers who also complete an apprenticeship registered by the U.S. Department of Labor or their State board earn a journeyworker certificate recognized Nationwide. Applicants for apprenticeship positions must be at least 18 years old, have a high school diploma or equivalent, and pass a drug test and an aptitude test. Good physical condition and mechanical aptitude also are important.

Jobs with many employers require membership in the union. To be considered fully qualified by the union, workers must complete an apprenticeship and pass a standard exam administered by the National Elevator Industry Educational Program.

The National Association of Elevator Contractors also offers certification as a Certified Elevator Technician or Certified Accessibility and Private Residence Lift Technician.

**Advancement.** Ongoing training is very important if a worker is to keep up with technological developments in elevator repair. In fact, union elevator installers and repairers typically receive training throughout their careers, through correspondence courses, seminars, or formal classes. This training greatly improves one's chances for promotion and retention.

Some installers may receive further training in specialized areas and advance to the position of mechanic-in-charge, adjuster, supervisor, or elevator inspector. Adjusters, for example, may be picked for their position because they possess particular skills or are electronically inclined. Other workers may move into management, sales, or product design jobs.

### Employment

Elevator installers and repairers held about 22,000 jobs in 2006. Most were employed by specialty trades contractors, particularly elevator maintenance and repair contractors. Others were employed by field offices of elevator manufacturers, machinery wholesalers, government agencies, or businesses that do their own elevator maintenance and repair.

### Job Outlook

Even with average job growth, excellent job opportunities are expected in this occupation.

**Employment change.** Employment of elevator installers and repairers is expected to increase 9 percent during the 2006-16 decade, about as fast as the average for all occupations. Demand for additional elevator installers depends greatly on growth in nonresidential construction, such as commercial office buildings and stores that have elevators and escalators. This sector of the construction industry is expected to grow during the decade as the economy expands. In addition, the need to continually update and repair old equipment, provide access to the disabled, and install increasingly sophisticated equipment and controls should add to the demand for elevator installers and repairers. The demand for elevator installers and repairers will also increase as a growing number of the elderly require easier access to their homes through stair lifts and residential elevators.

**Job prospects.** Workers should have excellent opportunities when seeking to enter this occupation. Elevator installer and repairer jobs have relatively high earnings and good benefits. However, the dangerous and physically challenging nature of this occupation and the significant training it requires reduces the number of applicants and creates better opportunities for those who apply. Job prospects should be best for those with postsecondary education in electronics or experience in the military.

Elevators, escalators, lifts, moving walkways, and related equipment need to be kept in good working condition year round, so employment of elevator repairers is less affected by economic downturns and seasonality than other construction trades.

### Earnings

Earnings of elevator installers and repairers are among the highest of all construction trades. Median hourly earnings of wage and salary elevator installers and repairers were \$30.59 in May 2006. The middle 50 percent earned between \$23.90 and \$35.76. The lowest 10 percent earned less than \$17.79, and the top 10 percent earned more than \$42.14. Median hourly earnings in the building equipment contractors industry were \$30.74.

Earnings for members of the International Union of Elevator Constructors vary based on the local and specialty. Check with a local in your area for exact wages.

About three out of four elevator installers and repairers were members of unions or covered by a union contract, one of the highest proportions of all occupations. The largest numbers were members of the International Union of Elevator Constructors. In addition to free continuing education, elevator installers and repairers receive basic benefits enjoyed by most other workers.

### Related Occupations

Elevator installers and repairers combine electrical and mechanical skills with construction skills, such as welding, rigging, measuring, and blueprint reading. Other occupations that require many of these skills are boilermakers; electricians; electrical and electronics installers and repairers; industrial

machinery mechanics and maintenance workers; millwrights; sheet metal workers; and structural and reinforcing iron and metal workers.

### Sources of Additional Information

For information about apprenticeships or job opportunities as an elevator mechanic, contact local contractors, a local chapter of the International Union of Elevator Constructors, a local joint union-management apprenticeship committee, or the nearest office of your State employment service or apprenticeship agency. You can also find information on the registered apprenticeship system with links to State apprenticeship programs on the U.S. Department of Labor's Web site: [http://www.doleta.gov/atels\\_bat](http://www.doleta.gov/atels_bat) Apprenticeship information is also available from the U.S. Department of Labor's toll free helpline: (877) 872-5627.

For further information on opportunities as an elevator installer and repairer, contact:

► International Union of Elevator Constructors, 7154 Columbia Gateway Dr., Columbia, MD 21046.

Internet: <http://www.iuec.org>

For additional information about the Certified Elevator Technician (CET) program or the Certified Accessibility and Private Residence Lift Technician (CAT) program, contact:

► National Association of Elevator Contractors, 1298 Wellbrook Circle, Suite A, Conyers, GA 30012.

Internet: <http://www.naec.org>

For general information on apprenticeships and how to get them, see the *Occupational Outlook Quarterly* article "Apprenticeships: Career training, credentials—and a paycheck in your pocket," online at <http://www.bls.gov/opub/ooq/2002/summer/art01.pdf> and in print at many libraries and career centers.