Focus on Construction
Improving ergonomics is easy

Control panel
Height adjustment of the control panel is a good way for the driver to change their working position between sit and stand for a less straining, and more comfortable working environment.
Focus on ergonomics within construction - and why neglecting it can cost you

There is no other industry where employees suffer more from ergonomics-related injuries and pains than within construction.

The construction industry is among the most dangerous jobs in the United States and has one of the highest rates for nonfatal injuries resulting in time off. According to the Center for Construction Research and Training, the rate of work related musculoskeletal disorders is 16% higher than the average for all other industries.

In many cases, poor ergonomics is the root cause. The culprits seem to be vibration, bending, twisting or poor work postures while operating a machine or a vehicle or when entering/exiting a large vehicle.

Demographic trends drive numbers up
Researchers at Construction Research and Training (CPWR), USA, concludes that aging is one of the global trends playing a negative influence on the MSD statistics too. People generally postpone retirement and stay longer at work. If that include sitting inside a construction vehicle for years, you have the recipe for ailments like pains, strains, and fatigue in the neck or in the back.

Meet the challenges with simple adjustments
Solutions, however, do exist to meet these negative effects. Various electric adjustment options can minimize physical stress of prolonged sitting, and will help personalize settings, for instance reposition control panels or lower pedals. This also allows any driver to change posture from time to time.

Drivers of construction vehicles deserve a good working environment too.

5 obvious benefits of ergonomics:
- Reduces costs
- Improves productivity
- Improves quality
- Improves employee engagement
- Creates a better safety culture
What LINAK® actuators do for the wheel loader

TECHLINE® actuator systems already provide movement and adjustments in a number of different construction applications.

In heavy machinery, electric actuators provide advanced motion control with superior position feedback for hoodlifts, steps and footboards, throttle adjustment, ergonomic positioning of steering wheel and seat, electric operation of ventilation hatches, mirrors etc.

The list of possible actuator solutions to improve ergonomics, comfort and productivity is virtually endless.
Cabin tilt
For easy access under the cabin if maintenance is needed

Automatic parking brake
Promotes safe environment with automatic parking brake when vehicle comes to a stop

Hood lift
Easy access for maintenance and routine service

Ladder
Moving access ladder up and down

Protection plates
Easy access for maintenance and routine service on ground level
Ladder adjustment
Extending and retracting ladders ensure a strain-free climb aboard larger construction machinery, and extending a ladder closer to the ground helps the operator get safely off the machinery.
Improve ergonomics with adjustable ladders
- safety from entry to exit

When designing large construction machinery, integrating an adjustable ladder is worth taking into consideration. The most prominent win is that it significantly improves the level of safety for the operator, when entering or exiting the cab.

Powered retractable access systems provide a strain-free climb on board larger machinery, as ladders can be lowered close to ground level. This is a significant improvement as the first step up these ladders is usually quite a leap. The same principle also helps the operator get safely off the machine, avoiding painful and costly fall accidents when failing the last tall step down.

Comply with standards using electric actuators
To ensure maximum safety, the standard IOS 2867:2011 states that an adjustable ladder must be activated and fully extended before the operator is allowed to access it. Using electric actuators from LINAK® makes it is easier to comply with this standard. Traditional adjustment systems are often powered by the machine’s main engine. However, with electric actuators moving the ladder, the operator depends only on the battery to get safely in or out. Also, actuators with ICTM can integrate smoothly with any CAN bus control system, for instance, making it impossible to open the doors before the stairs are extended. Safety first!

Improve performance and prevent theft
Another benefit gained by adjustable ladders is the sheer fact, that retracting the ladder while operating the machinery, gets the ladder out of the way and prevents damage to the equipment when working in rough terrain. In fact, a damaged ladder is a safety risk – both to the operator and to the machine itself.

Ultimately, automatic retraction of the ladder at the end of the working day, leaves a machine less prone to break-in, vandalism, or theft, as it becomes virtually impossible to enter.
Linear actuators - tough enough for construction work

The main concerns when considering an electric actuator solution for heavy-duty construction machinery and equipment are durability and reliability.

These machines must work relentlessly in all kinds of weather and withstand dust, dirt and rough handling. Any failure could put both people and values at risk. Not to mention the often costly delays caused by failing equipment.

From harvesters and tractors to spreaders, sprayers, planters and balers, LINAK delivers:

- Reliable products designed for harsh outdoor conditions
- Excellent alternative to many light-duty hydraulic applications
- Turn-key supplier of complete motion-control solutions
- Cutting-edge technology when more sophisticated controls and precise motion is required
- Close collaboration between your team and our application engineers, represented in over 30 countries

From small, light and compact actuators for space savings, to powerful robust systems able to lift up to 15,000 N, LINAK electric actuators are built for long-lasting durability. Our actuators are tested to the highest standards and can be delivered in protection classes up to IP66 and IP69K – water, dust and dirt proof and tested for high pressure cleaning.

Go electric and spot the difference

Customers demand safe, reliable and cost effective operation, without the headaches of oil leaks, costly maintenance, spares, and loss of productivity associated with downtime.

With fewer components required to design a system, you can replace an entire fluid system with one electric actuator providing:

- Fewer components and less cost
- Less labor cost
- Quick assembly since there are no hoses, clamps or pumps to install and test
- Expedited time to market

LINAK offers optional built-in positioning feedback, synchronous parallel operation and accurate positioning. This allows you to design innovative and flexible solutions for your customers.

Our controls can easily connect to the existing power supply or control systems, offering a simple plug and play solution.

LINAK electric actuators work on low voltage DC, provide high self-locking ability and optional manual operation, creating a safer work environment for the operator. A wired solution is not only more energy efficient but also eliminates the risk of hazardous oil leaks, providing a greener alternative.

Additionally, an electric linear system requires no maintenance, reducing total cost of ownership and improving ROI on your capital investment.
Hydraulic system

- Complex system of oil tanks, pumps, filters and hoses
- Per default no integrated positioning
- Requires routine maintenance
- High energy consumption
- Risk of fluid leaks

Electric actuator system

- Simple system of actuator, control and power connection
- Integrated positioning
- Maintenance-free
- Low energy consumption
- No fluids
What LINAK® actuators do for the construction industry

Use a LINAK® actuator to replace manual operations or even gas springs and hydraulics. Our products provide movement for a myriad of applications within the construction and off-highway industry.

Lifting device
Easily lifting and handling glass and window panes for optimized ergonomics

Skid steer
Effortless lifting of heavy hatches

Skid steer
Bucket quick attachment for easy exchange of mounted tools

Asphalt Paver
Raise and lower the deck to release the amount of asphalt being laid down

Folding Lights
Swivel as well as fold lights down
Traffic sign
Remotely controlling traffic signs for safe operation

Concrete Saw
Raise and lower the guide wheel on a concrete saw cutter

Lifts
Extend and retract the deck on an aerial work platform

Dust suppression system
Promotes safe environment with automatic parking brake when vehicle comes to a stop.
Move for the Future

Enhance your competitive edge and step into the future world of movement.

Cost-effective performance

When we claim that we can make your application more cost-effective, we base it on our ability to help you ensure less downtime, less time spent on maintenance, easier and faster set-up, more intelligent control and more accuracy in your application. All in all this can ensure a more cost-effective use of your application.

Ready for the future

To be ready for the future can mean different things. In our terminology it means being able to ensure that your application has the most up-to-date and intelligent features for performing at its best in regards to control, accuracy and speed.

Competitive edge

Cost-effective performance and innovative technology is exactly what you need in your application to make sure that you always keep your competitive edge and your ability to survive as a company in a highly competitive world.

Do you want cost-effective performance, innovative technology and a competitive edge? Go for LINAK actuators with integrated controller, and Move for the Future.
IC - Integrated Controller

IC is the range of integrated control options for TECHLINE® actuators that present you with almost unlimited possibilities for superior control and monitoring, to enhance the value and performance of your application.

Choose between four IC variants:

**IC BASIC**
The plug and play option that comes pre-configured to meet your exact requirements.

**IC ADVANCED**
The customizable option with enhanced monitoring and read-out of actuator information.

**PARALLEL**
The smart and self-configurable option that allows for parallel drive of up to 8 actuators.

**BUS**
The BUS communication option for intelligent controls.

**CAN bus, LIN bus, MOD bus**

For more information on IC go to LINAK-US.COM/SEGMENTS/TECHLINE/TECH-AND-TRENDS/INTEGRATED-CONTROL
Actuators for construction machinery

**LA37 actuator - solid and powerful**

Tough applications require equally tough actuator solutions. Thus the LA37 is specifically developed for heavy-duty applications where there is a need for more lifting capacity and holding force. This solid and powerful actuator also lives up to the well-known LINAK quality, so you can expect a minimum of maintenance and a long lifetime.

**LA37 features:**

- Max. thrust up to 15,000 N (3,372 lbs)
- Max. speed up to 3.5 mm/s (.13 in/s)
- Standard stroke 100-600 mm (3.93–23.62 in)
- Protection class IP66 / IP69K
- Voltage 12 or 24V DC
- Heavy-duty aluminum housing for harsh conditions
- Integrated brake, high self-locking ability
- Hall sensors or potentiometer for relative or absolute feedback, regardless of the stroke length
- Built-in endstop
- Solid metal construction
- Hand crank for manual operation
- Salt spray and chemical tested
- High-pressure cleaning resistant
- **Available with ICTM™ and CAN bus SAE J1939**
LA36 actuator - reliable and tough

The LA36 actuator is a solid and powerful actuator designed to operate under extreme conditions. A very strong alternative to hydraulic solutions.

LA36 features:

- Max thrust up to 10,000 N (2,248 lbs)
- Max speed up to 160 mm/s (6.29 in/s)
- Standard stroke 100-999 mm (3.93–39.33 in)
- Protection class IP66 / IP69K
- Voltage 12, 24 or 36 V DC
- Heavy-duty aluminum housing for harsh conditions
- Integrated brake, high self-locking ability
- Hall sensors or potentiometer for relative or absolute feedback, regardless of the stroke length
- End stops: slip clutch or built-in limit switches
- Solid metal construction
- Hand crank for manual operation
- Salt and chemical tested
- High pressure cleaning resistant
- Available with ICM™ and CAN bus SAE J1939
Actuators for construction machinery

LA35 actuator - flexible and powerful

The LA35 actuator is characterized by its robust design allowing the actuator to be used in harsh and extreme conditions for a wide range of applications. The LA35 is a powerful actuator with high flexibility.

LA35 features:

- Max thrust up to 6,000 N (1,349 lbs) in push and up to 4,000 N (899 lbs) in pull
- Stroke up to 600 mm (23.62 in)
- Protection class IP66 dynamic / IP69K static
- Voltage 12 or 24 V DC
- Heavy-duty aluminum housing for harsh conditions
- Easy to use interface – with integrated power electronics for direct connection to control system
- Potential free limit switches as an option
- Hall sensors or potentiometer for relative or absolute feedback, regardless of the stroke length
- Built-in limit switches and brake
- Available with IC™
LA33 actuator - compact and powerful

The actuator LA33 is a true mid-size actuator that combines compact design and high power in one solution, fit for use in the most extreme environments. A thorough and demanding testing program forms the basis for the maintenance-free and long lasting performance of this solid and high-quality actuator.

LA33 Features:

- Max thrust up to 5,000 N (1,124 lbs)
- Max. speed up to 30 mm/s (1.18 in/s)
- Stroke up to 600 mm (3.93-23.62 in)
- Protection class IP66 dynamic / IP69K static
- Voltage 12 or 24 V DC
- Heavy-duty aluminum housing for harsh conditions
- Integrated brake, high self-locking ability
- Solid metal construction
- Hand crank for manual operation
- Built-in limit switches
- Available with IC™ and CAN bus SAE J1939

Options:

- Hall effect sensor
- Endstop signals
- Possible IC options for LA33: IC Basic, IC Advanced, Proportional control, LINbus and CANbus
Actuators for construction machinery

LA31 actuator - reliable and compact

The LA31 actuator is a very quiet and powerful actuator designed for a variety of applications. Due to its high capacity, design and protection class up to IPX6 the actuator is ideal for industrial applications. The various combinations of motor, spindle pitch, back fixture and piston rod eye make it a good candidate for a number of solutions.

LA31 features:

- Max. thrust up to 6,000 N (1,347 lbs) in push and 4,000 N (898 lbs) in pull
- Stroke up to 50–600 mm (1.97–23.62 in)
- Voltage 12 or 24 V DC
- Analog or digital feedback
- IPX6 housing
- Signal switches
- Safety nut in push
- Built-in limit switches
LA23 actuator - small and strong

The LA23 actuator is a small and strong push or pull actuator. The LA23 actuator can be used in various applications where size is important.

LA23 features:

- Max thrust up to 2,500 N (561 lbs)
- Max speed 9.4 mm/s (.37 in/s)
- Standard stroke 20-300 mm (.79-11.81 in)
- Protection class IPX6
- Voltage 12 or 24 V DC
- Electrical and mechanical end stop
- Available with IC™

LA25 actuator - compact and robust

With its robust design, high IP degree and aluminium housing, the LA25 is ideal for harsh environments where operation under extreme conditions is required. Furthermore, the compact dimensions of the LA25 make it applicable for confined spaces.

LA25 features:

- Max thrust up to 2,500 N (561 lbs)
- Max speed 13 mm/s (.39 in/s)
- Standard stroke 20-300 mm (.79-11.81 in)
- Protection class IP66 and IP69K
- Voltage 12 or 24 V DC
- Heavy duty aluminium housing for harsh conditions
- Available with IC™ and CAN bus SAE J1939

LA23 - small and strong

The LA23 actuator is a small and strong push or pull actuator. The LA23 actuator can be used in various applications where size is important.

LA23 features:

- Max thrust up to 2,500 N (561 lbs)
- Max speed 9.4 mm/s (.37 in/s)
- Standard stroke 20-300 mm (.79-11.81 in)
- Protection class IPX6
- Voltage 12 or 24 V DC
- Electrical and mechanical end stop
- Available with IC™
Actuators for construction machinery

LA14 actuator - robust and reliable

The LA14 is a very tough and reliable actuator ideal for use in harsh and demanding environments. With its small size the LA14 actuator is well-suited for applications that require short linear movements.

LA14 features:

- Max thrust up to 750 N (169 lbs)
- Max speed up to 45 mm/s (1.77 in/s)
- Standard stroke 40-130 mm (1.57–5.11 in)
- Protection class IP66 dynamic / IP69K static
- Stainless steel inner tube and piston rod
- Voltage 12 or 24 V DC
- Heavy-duty aluminum housing for harsh conditions
- Built-in limit switches
- Wide range of customized feedback options
- Operation temperature from -40°C to 85°C
- Available with IC™ and CAN bus SAE J1939

LA12 actuator - light and compact

Thanks to its small size and outstanding performance, the LA12 actuator provides a practical and cost-effective alternative to traditional hydraulic systems. The LA12 actuator is ideal for applications requiring short linear movements. After many years on the market, the LA12 actuator has shown that it is a very reliable and robust actuator that can handle almost any situation and condition.

LA12 features:

- Max thrust up to 750 N (169 lbs)
- Max speed up to 50 mm/s (1.96 in/s)
- Standard stroke 40-130 mm (1.57–5.11 in)
- Protection class IP66
- Voltage 12 or 24 V DC
- High quality reinforced plastic housing protects motor and gear
- Built-in limit switches and EOP
- Hall sensors or potentiometer for relative or absolute feedback, regardless of the stroke length
- Available with IC™
Switch Mode Power Supply and Bluetooth/RF Solution

TECHLINE® system solutions improve functionality and add value to your application. Our systems offer:

- Simple Plug & Play functionality
- Easy integration into your application
- Time saving installation
- Significant minimization of installation failures
- Signal cable with open leads enables you to connect your own control along with an RF or Bluetooth solution. These can be run at the same time.

The cable(s) between the SMPS-T160 and the actuator(s) can be either 300mm or 1500mm
100% function tests

In each application, the actuator is just one component of many, but at TECHLINE® we fully appreciate that it is of utmost importance to you and your customers. Not a single actuator leaves LINAK until it has undergone a 100% function test.

Depending on the actuator type, various tests have been carried through. Please consult your local LINAK office or take a look at the actuator data sheet in question to get a thorough test overview.

This is your guarantee that a solution based on LINAK TECHLINE electric actuator systems is a solution that will work reliably for years and years.*

Electrical tests:

All electrical parts are tested i.e. power supply, power and signals cables, control signals etc. Electrical immunity is tested according to industrial standards i.e. for radio noise, electrical discharge and burst.

Climatic tests:

In the climatic test the actuators are tested to operate in extreme temperatures as well as to endure rapid changes in temperature. In some tests, the actuator has to withstand going from a +100°C environment to -30°C repeatedly and still maintain full functionality.

Mechanical tests:

**Vibration:** The actuator must withstand continuous vibration in three directions.

**Shock:** The shock test puts the actuator through 3 shocks of up to 100 G in each of 6 directions.

**Bump:** The actuator receives bumps of up to 40 G in each of six directions several hundred times.

(*) These tests do not apply to third party products!
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Global presence

LINAK has a well-developed sales and service organization in Europe, America, Asia and Australia. Therefore, we can assist you and your customers locally, under the global sales concept idea: Be global, act local.

For further information, please visit our website:
LINAK-US.COM/TECHLINE

TERMS OF USE

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