



## Linear Actuators for On/Off-Highway Vehicles

# Thomson Actuators Set the Standard in On/Off-Highway Vehicles

We are the original actuator manufacturer. For more than 40 years, our engineers have worked to design actuators to provide the unique features that on/off-highway applications require.

## Changing technologies

On/off-highway vehicle manufacturers are taking a long, hard look at how they use motion control systems. Once dominated by pneumatic and hydraulic systems, equipment is now increasingly equipped with electric actuators for automation of a large number of tasks. Electric linear actuators are easier to control and integrate with modern computer-based control systems, and are smaller, lighter and cleaner than hydraulic systems – all attributes that boost a company's bottom line.

In fact, electric linear actuators eliminate:

- the need for hydraulic pumps, valves and hoses
- the cost and bulk associated with hydraulic systems
- environmentally hazardous oil and risk of leakage
- the high energy consumption of hydraulic systems
- costly hydraulic reliability issues (contamination)
- the cost and hassle associated with fluid maintenance



### ELECTRAK 050

- Small, quiet and lightweight
- Short retracted length
- Low cost
- Corrosion-free plastic housing
- End-of-stroke limit switches



### ELECTRAK 1

- Small
- Withstands harsh environments
- End-of-stroke limit switches or potentiometer feedback
- A variety of DC voltage models



### ELECTRAK 10

- The original on/off-highway actuator
- Robust, strong and reliable
- Withstands harsh environments
- Stainless steel extension tube
- Acme or ball screw models
- A variety of DC voltage models



### ELECTRAK PPA-DC

- Strong and versatile heavy duty actuator
- High duty cycle
- Long stroke lengths
- A variety of DC voltage models
- Large range of options



### Rugged and reliable

Thomson electro-mechanical linear actuators are rugged and reliable, withstanding harsh environments to:

- make manual jobs easier, reducing operator fatigue
- automate tasks, improving efficiency and reducing costs
- provide remote control, increasing production
- remove operators from dangerous places, improving safety

### The largest linear actuator range in the market

In addition to our extensive application and engineering expertise, Thomson also has the largest range of

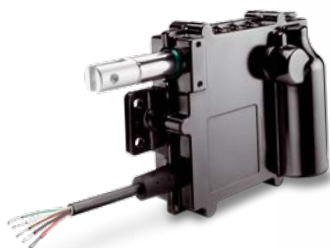
standard and custom electrical linear actuators in the market today. For this reason we are able to provide positioning solutions for a vast array of unique on/off-highway applications for dynamic loads up to 10000 N (2248 lbf).

Our success is driven by:

- understanding the critical needs of the on/off-highway industry
- decades of application and engineering expertise
- robust and reliable products that withstand the harshest environments
- an extensive standard and custom product range
- custom designs for unique on/off-highway applications

### Customization

Thomson is the industry leader in custom actuator design. Our design flexibility and unique customization expertise give us an advantage to quickly provide our customers with cost-effective designs that meet their exact requirements.



#### ELECTRAK THROTTLE

- Specially developed for throttle or other regulation applications
- Withstands very harsh environments
- Analog position feedback sensor, electronic limit switches or J1939 CAN bus options



#### MAX JAC

- Long life and reliability
- Built for harsh temperatures ranges
- Built for high-pressure water jet washdowns
- Built to cope with harsh dust, dirt and muddy environments
- Non-contact analog or digital position feedback options



#### ELECTRAK HD

- Next-generation, heavy duty linear actuator
- Unmatched environmental protection
- Superior performance
- Flexible onboard control options such as J1939 CAN bus, low level switching, end-of-stroke limit switches, and analog or digital position feedback



#### CUSTOMIZATION

- Simple alterations on standard actuators to complete white paper designs
- A vast library of proven custom solutions
- Vast customization experience
- Customization possible for any volume
- Short development lead times

## Why Go Electric?

Replacing hydraulic and pneumatic cylinders with electrical linear actuators means a simpler and smaller installation, easier control, lower energy costs, higher accuracy, less maintenance, less noise and a cleaner, healthier environment.

### Simpler, smaller installation

- Install with just two pins, making installation quick.
- Smaller footprint created over traditional methods.

### Easier control

Electric actuators are easier to integrate and control with computers or programmable controls.

### Lower energy costs

- Electric actuation components cost less than comparable hydraulic and pneumatic systems.
- One electric linear actuator is faster and easier to install than the multiple hydraulic and pneumatic components required to achieve the same function.
- There is no need to upsize the current system to account for any parasitic power draw. Actuators run off a battery.
- There is no need for a pump running continuously or an amp draw to hold the load in position.

### Higher Accuracy

Better controllability means improved accuracy.

### Less maintenance

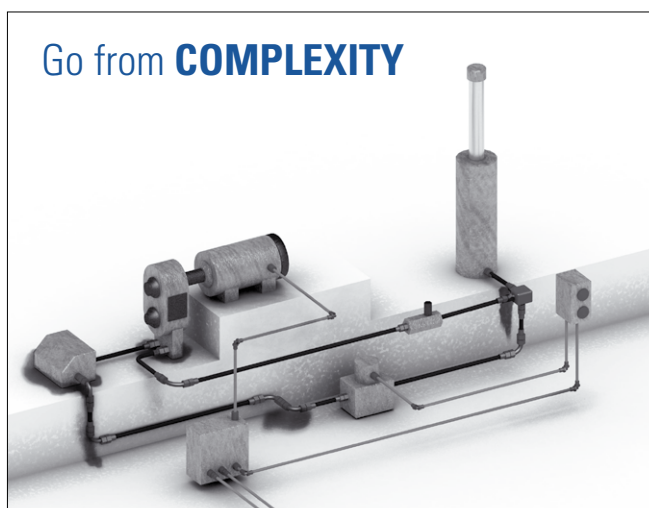
- No need for hydraulic pumps, valves and hoses means fewer parts to malfunction or wear out.
- Self-contained unit eliminates access requirements.
- No need to resize or change out hydraulic components to add new ones.
- Onboard safety functions and operation monitoring reduce costly maintenance and repair.
- Eliminate the cost and hassle associated with fluid maintenance.

### Less noise

The elimination of pumps, air pressure and fluids means smooth, quiet operation.

### Cleaner, healthier environment

- No fluids, chemicals or solvents necessary for operation means there is nothing to leak out or contaminate the environment.
- A compact design means less materials used in production.



## Learn More Online

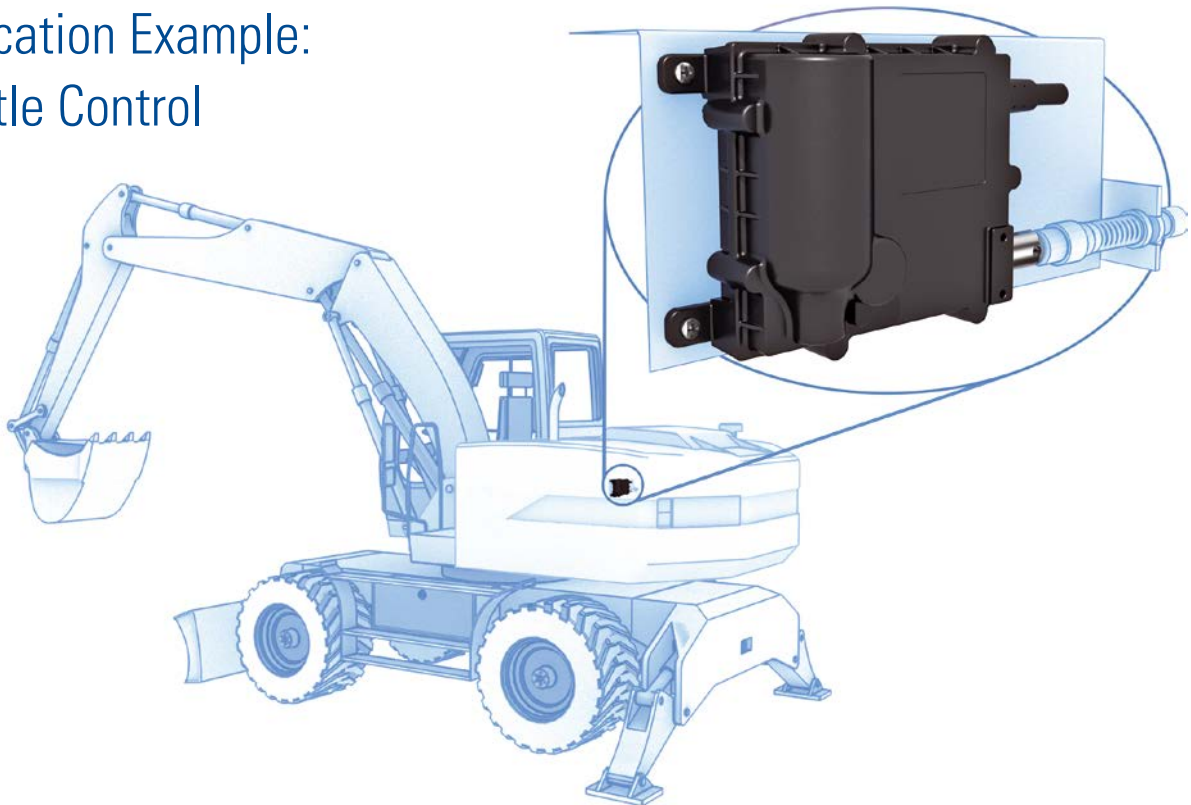
The mobile off-highway product site at [www.thomsonlinear.com/moh](http://www.thomsonlinear.com/moh) showcases electric linear actuator benefits and applications.



Visit the Electrak<sup>®</sup> HD product site at [www.thomsonlinear.com/HD](http://www.thomsonlinear.com/HD) to learn more about what these electric linear actuators offer and how they can be used.



## Application Example: Throttle Control



Throttle actuators allow automatic control of engine speed for reduced noise and emissions, and improved fuel economy.

### Reduces design cost

- Flexible potentiometer models allow easy interface with multiple controls
- Variety of speed options to match application requirements
- Optional mounting brackets for reduced design time
- Multiple feedback options
- Compatible with multiple engine platforms as an add-on

### Reduces installation cost

- Optional mounting brackets for easy installation
- Variety of mounting accessories
- No need to accommodate large bend radius of wire-wound throttle cables
- Allows for placement of actuator to accommodate easy installation – no direct access needed for maintenance

### Reduces working capital

Reduce inventory cost of engines with and without factory controls to one design

### Reduces operating cost

- Maintenance-free – lubricated for life
- Allows automatic return to low speed for economy and emission reduction
- Allows for automatic rapid resumption of operating speed based on demand
- Designed to withstand underhood temperatures, vibrations and moisture (IP66) and high cycle life for maintenance-free operation

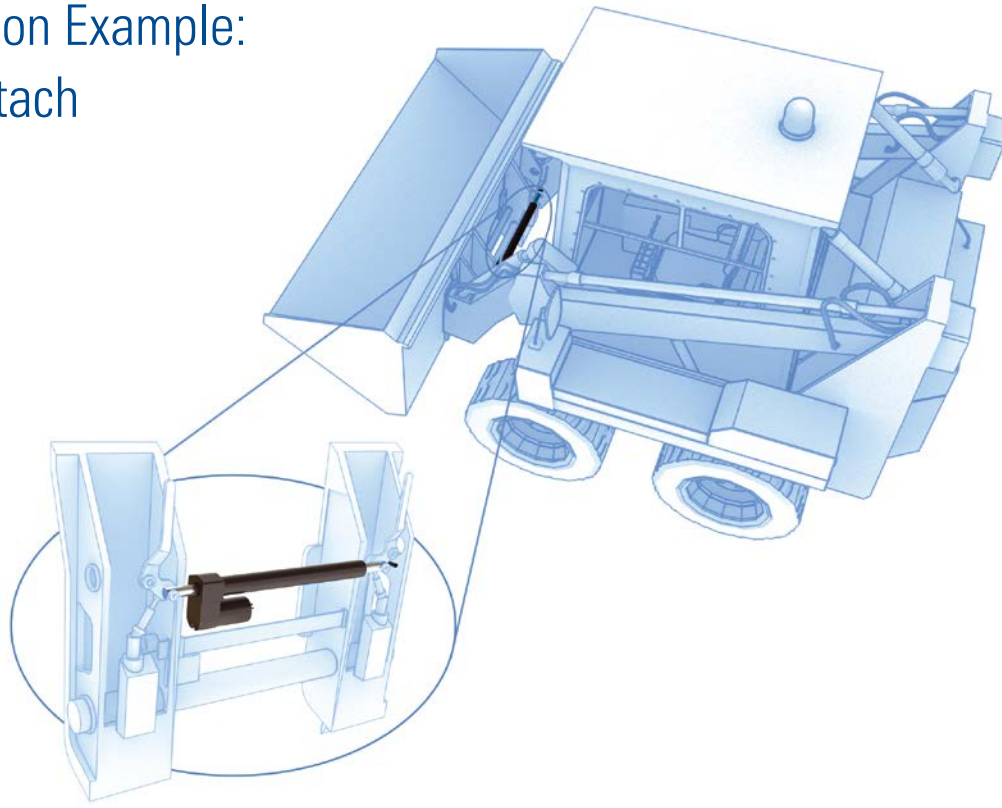
### Increases safety

- Easy interface with seat interlock and other sensors for automatic shut-off or speed reduction
- Noise management through engine RPM control
- Reduced operator fatigue with lower noise levels
- Speed controls can be placed in ergonomic positions rather than positions required by wire-wound throttle cables

### Increases productivity

- More operator up-time with fewer refueling stops leads to lower fuel consumption
- Automatic and immediate return to working speeds upon demand
- Automatic speed adjustments reduces the workload on the operator

## Application Example: Quick Attach



Quick-attach actuators allow the operator to change implements on the loader or skid steer without leaving the seat for improved productivity and safety.

### Reduces design cost

- Easy interface with multiple electronic controls
- Can be operated by a simple switch
- No need to accommodate large-bend radius of hoses
- No need to design system of hoses, valves, controls, filters and switches

### Reduces installation cost

- Easy interface with multiple electronic controls
- Easy to retrofit into existing applications
- No need to accommodate large-bend radius of hoses
- Fewer parts to install – two wires and a switch instead of valve, valve operator, hoses and filter
- Reduce installation labor and materials by eliminating hoses, valves and cylinders

### Reduces working capital

- Fewer parts to inventory
- Can easily be added to existing vehicle at the factory or dealer

### Reduces operating cost

- Maintenance-free – lubricated for life
- Replace costly, complicated hydraulic systems and long runs of hydraulic hoses
- No hoses to fatigue and rupture and no filters to change
- No chance to introduce debris into the main hydraulic operating system
- Holds position with power off – no parasitic drain on the hydraulic system
- Connection with simple wiring is easier to protect from damage than hydraulic hoses

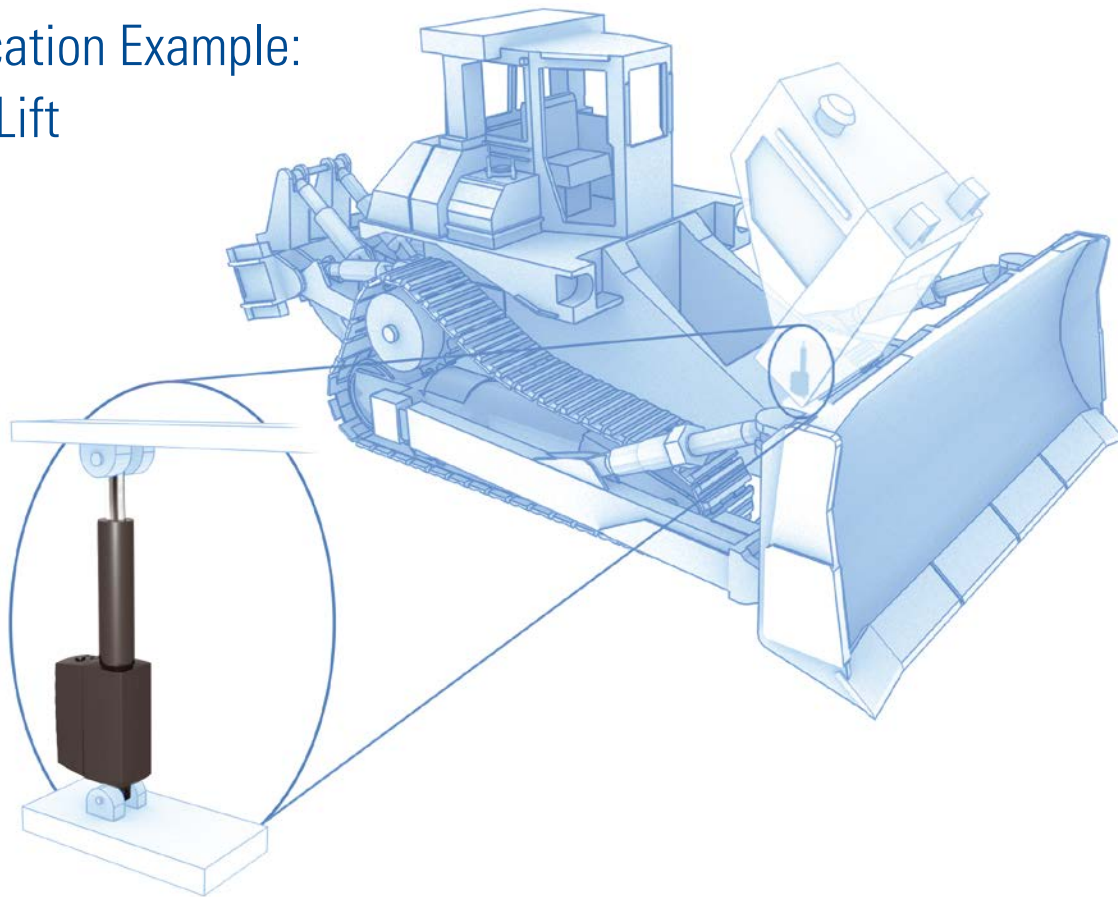
### Increases safety

- Allows operators to change implements without leaving their seat
- Eliminates a pair of high-pressure hoses from the operator cab
- No extra operator required to change implements
- Provide the potential for position interlock to ensure safe operation

### Increases productivity

- Faster change of implements
- Single operator can change implements without leaving the seat

## Application Example: Hood Lift



Hood lift actuators provide easy and safe access to engines for maintenance and repair work.

### Reduces design cost

- Easy interface with multiple electronic controls and interlocks
- Needs only a switch to operate
- Built-in clutch or limit switches for end-of-stroke protection
- Fewer components than hydraulic systems
- Compatible with multiple chassis platforms as an add-on
- Wide temperature range for reliable operation in all conditions

### Reduces installation cost

- Easy interface with multiple electronic controls
- Variety of mounting accessories
- Built-in clutch or limit switches for end-of-stroke protection
- Fewer components than hydraulic systems

### Reduces operating cost

- Maintenance free – lubricated for life
- High resistance to underhood temperatures, shock and vibration
- Reliable operation – won't weaken with age or low temperatures
- Provides controllable clamping force, preventing overstressing of hood materials

### Increases safety

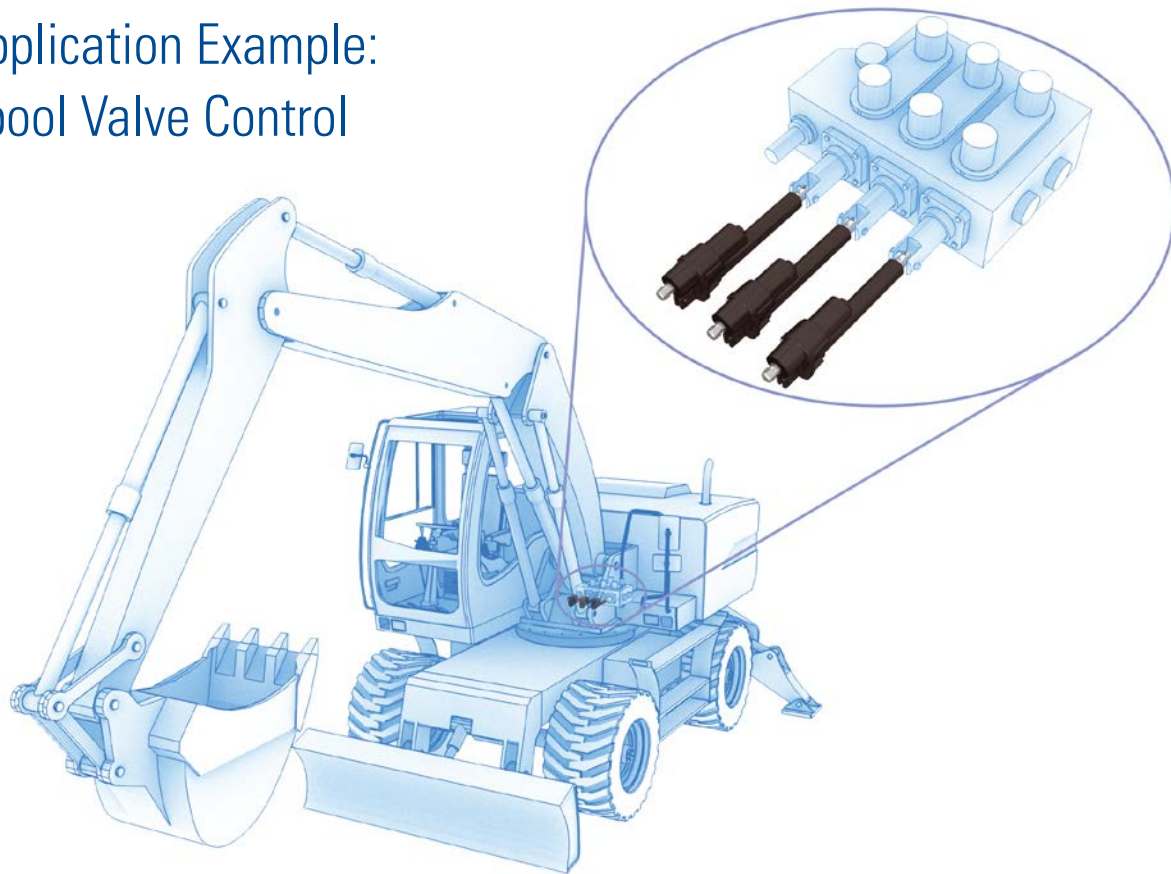
- Easy interface with interlock to prevent inadvertent operation
- Holds position with power off – no drifting or backdriving in the wind
- Reduced exposure of operator to awkward lifting positions with heavy loads
- Manual override allows operation with dead or no battery
- Will not leak hydraulic fluid, reducing the environmental hazards and expense of clean up

### Increases productivity

- Allows one person to lift the hood or access panels
- Includes a manual override function, allowing engine access even with vehicle battery failure or removal



## Application Example: Spool Valve Control



Actuators replace mechanical linkage for spool valve control of boom and tilt cylinders for front end loaders.

### Reduces design cost

- Easy interface with multiple electronic controls
- Multiple speed and feedback options
- Wires and switch can be placed anywhere, not limited by hose bend radius and can be located near operator

### Reduces installation cost

- Easy interface with multiple electronic controls
- Variety of mounting accessories
- No need to accommodate large hydraulic hoses
- Actuators allow for more flexible positioning of spool valves in the machine for reduced installation cost and easier maintenance

### Reduces operating cost

- Maintenance free - lubricated for life
- High resistance to temperatures, shock and vibration

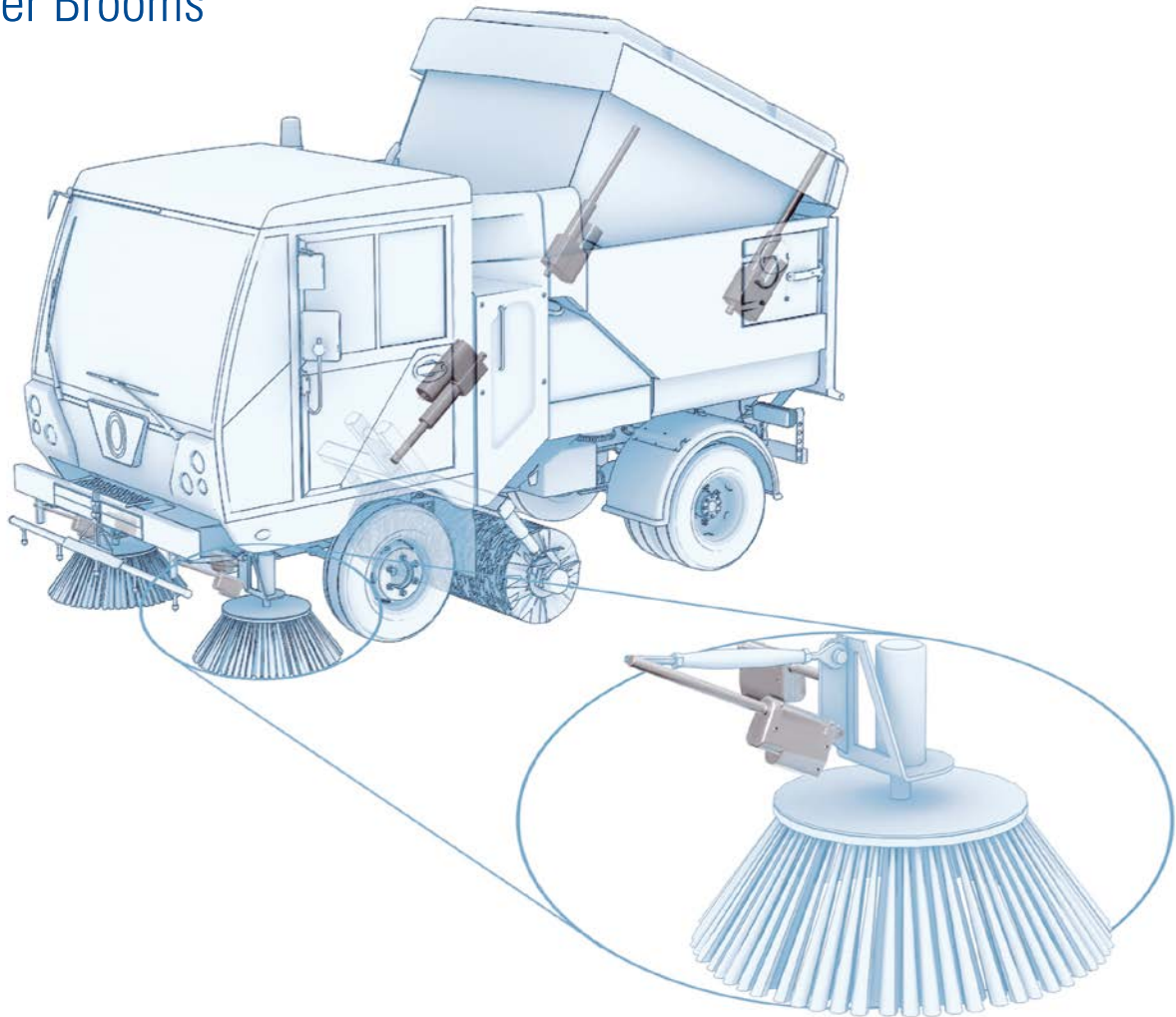
### Increases safety

- Easy interface with seat interlock, other sensors for automatic shut off or speed reduction
- Valves and hoses can be placed outside of the cab, eliminating a source of heat and high pressure hydraulics
- Reduced operator fatigue with lower noise levels when valves and hoses are out of the cab
- Programmable motions can reduce the chance of repetitive motion injuries
- Removing multiple levers from the cab can increase operator comfort and visibility

### Increases productivity

- Higher accuracy means better controllability allowing for faster and more precise boom and tilt operation
- Maintenance free - less time and costs on overall maintenance

## Application Example: Positioning of Sweeper Brooms



Actuators replace hydraulic and pneumatic cylinders for better controllability, smaller installations and eliminating the need of maintenance.

### **Reduces design cost**

- Needs only a switch to operate
- Built in clutch or limit switches for end of stroke protection
- Fewer components than hydraulic systems
- Smaller installations means increased flexibility in the overall design of the sweeper

### **Reduces installation cost**

- Easy interface with multiple electronic controls
- Variety of mounting accessories
- Built in clutch or limit switches for end of stroke protection
- Fewer components than hydraulic systems

### **Reduces operating cost**

- Maintenance free - lubricated for life
- Resistant to shock and vibration
- Wide temperature range and high sealing degree for reliable operation in all weather conditions
- Reliable operation - won't weaken with age or low temperatures

### **Increases safety**

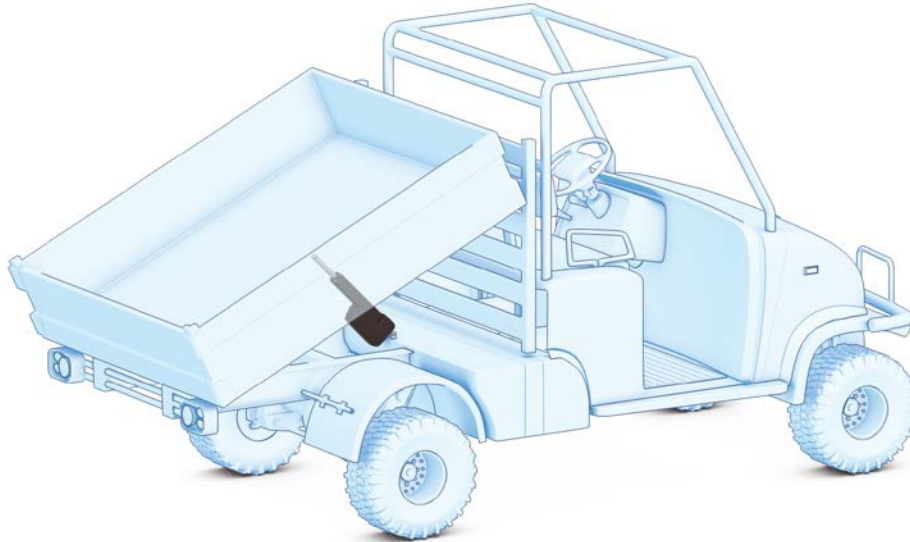
Will not leak hydraulic fluid reducing the environmental hazards and expense of clean up

### **Increases productivity**

More precise control means faster and better sweeping

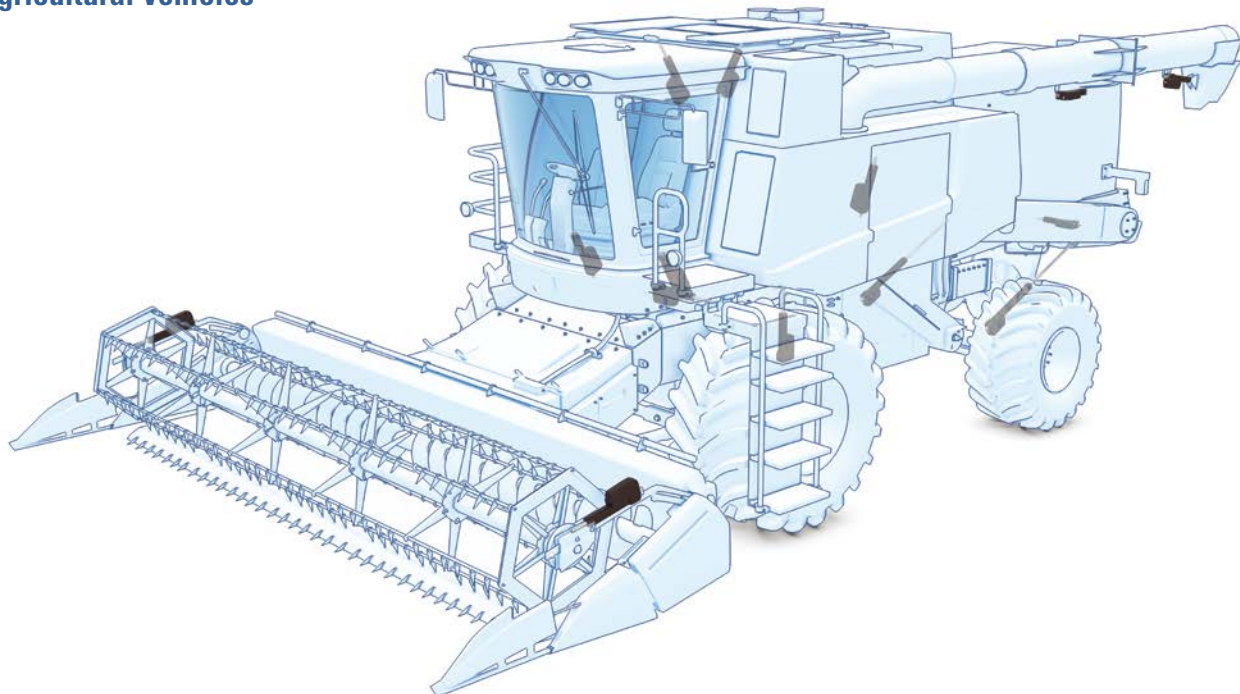
## More Application Examples

### Utility Vehicles



Electric linear actuators provide the rugged, efficiently controlled performance required by garden, construction and service vehicles.

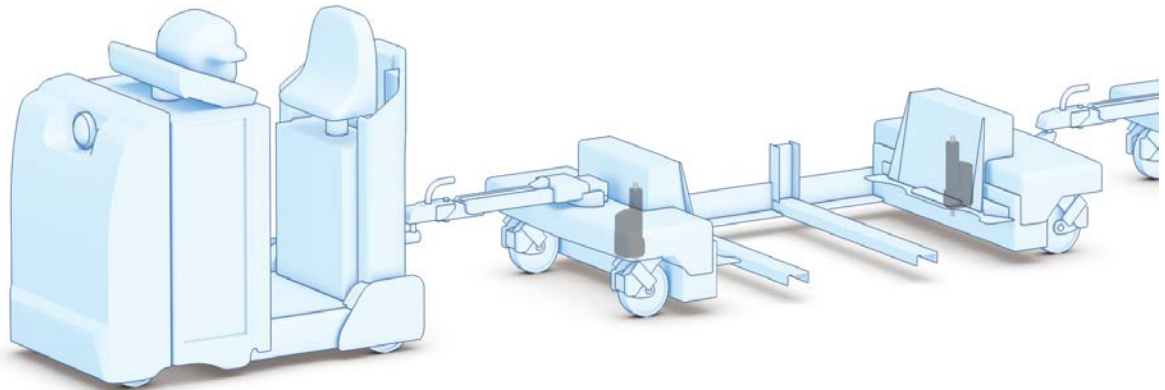
### Agricultural Vehicles



Electric linear actuators are an excellent choice for wide array of tasks within agricultural vehicles to increase productivity and quality, improve safety and ergonomics, and reduce both fuel and maintenance costs.

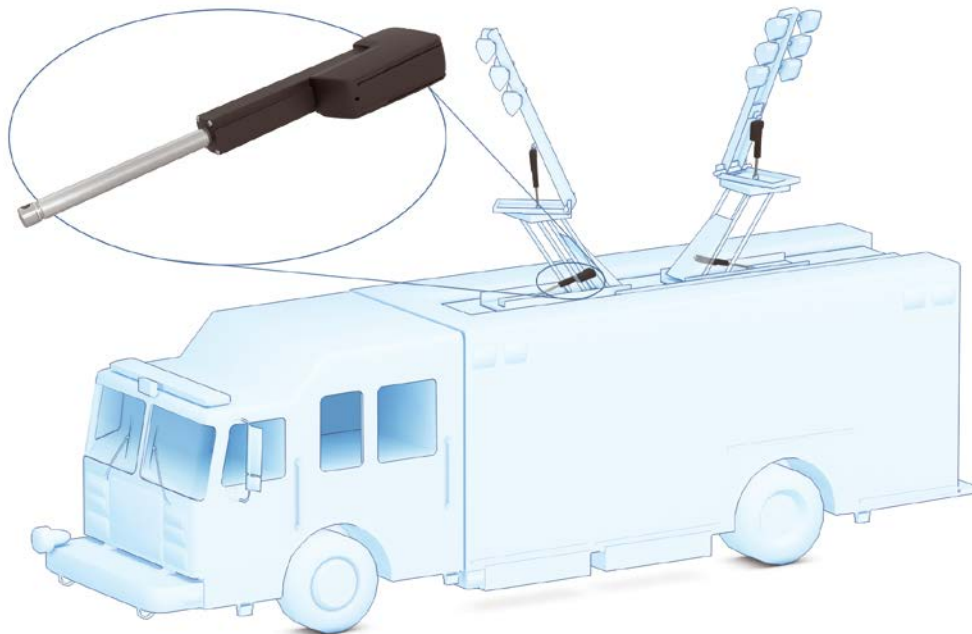
## More Application Examples

### Logistic Systems



Actuators can be used to control a large variety of functions in logistic systems. The actuators pictured above are used to power a forklift in a logistic train.

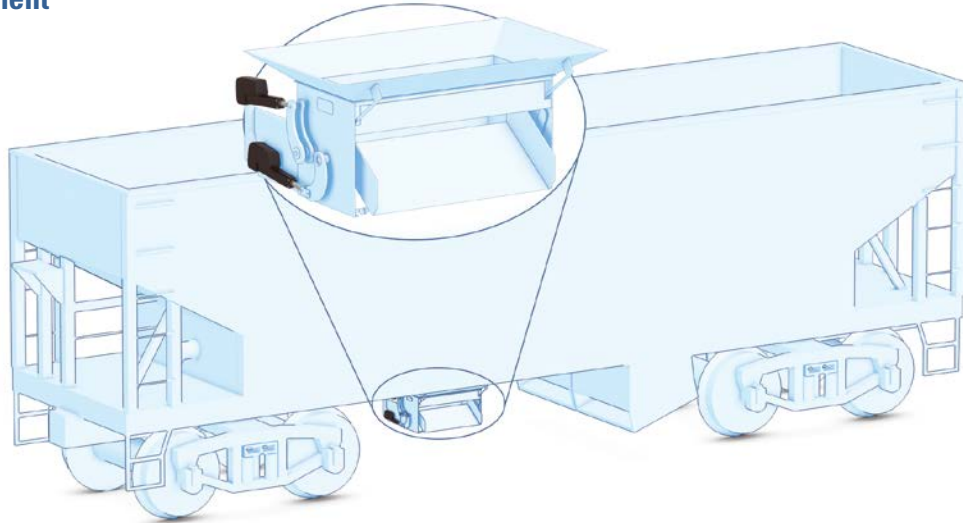
### Emergency and Rescue Vehicles



The reliability offered by Thomson actuators make them a perfect fit in emergency vehicles, helping responders perform their jobs safely.

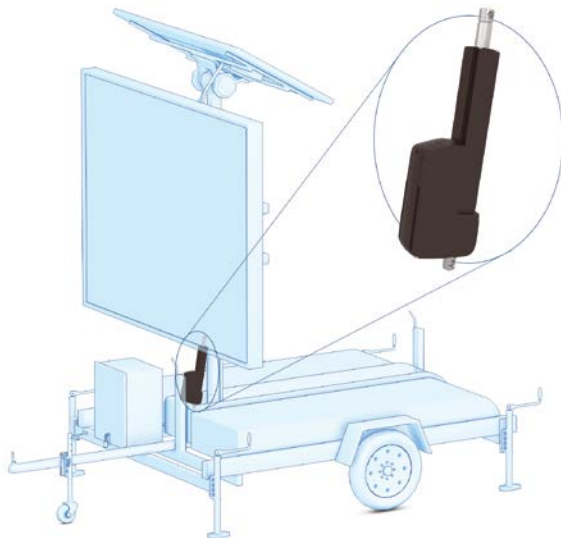
## More Application Examples

### Railroad Equipment



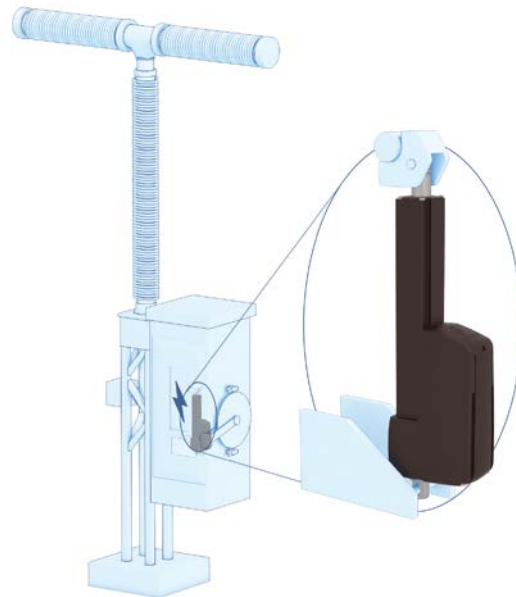
Railroad equipment experiences some of the toughest conditions imaginable. Actuators can provide both the toughness, controllability and power required.

### Roadwork and Construction Site Equipment



Long stroke, protection against harsh environments and high load rating makes linear actuators a great fit for this roadside construction sign.

### Switch Gears



Electrical switch gears are often placed in remote locations. It is critical that power switching is executed and confirmed without fail and electric linear actuators are ideal for this task.

## Employ Superior Thomson Components

Leading-edge on/off-highway vehicles technology is built on leading-edge motion components, starting with minute engineering details we've mastered over decades of intense work. From patented anti-backlash technology for lead nuts to proprietary processing for roll-forming to the Lube-for-Life™ technology we invented, our components are built to deliver beyond your expectations.



### OPTIONAL

- Stainless Steel Protection
- Wash-Down or/and Chemical Protection
- Customization

### PROFILE RAIL

With sizes ranging from our ultra-compact 5 mm MicroGuide™ to the robust 65 mm 500 Series roller, as well as compliancy ranging from our self-aligning T-Series (transport profile rail) to the extremely rigid, machine-tool-grade roller profile rail, Thomson is your one-stop source for all profile rail.

### ROUNDRAIL LINEAR GUIDES & COMPONENTS

While shafts may appear the same, there are significant performance differences due to the manufacturer's selected standards and the manufacturing processes used to achieve them. Combine Thomson's unique design advantages with our tremendous on-hand stock and you will have the tools to deliver the difference.

### LEAD, BALL & GLIDE SCREWS

Thomson lead screws are the "just right" solution for many applications, and the patented zero-backlash nut technology provides excellent repeatability with high stiffness and extremely low drag torque.

For the more demanding applications, we offer the most complete line of industrial ball screws in the industry. Our broad product offering and years of application expertise allow us to provide the right solution to meet your unique application requirements.

Part linear bearing, part lead screw, the unique Glide Screw™ combines the best features of these products into an easy to install, one-part solution. In addition, the Glide Screw eliminates alignment issues and comes standard with Thomson's patented Lube-for-Life technology for zero maintenance.

### LINEAR ACTUATORS & MOTORIZED LEAD SCREWS

Our linear actuators are designed for rugged, reliable linear motion applications. Numerous choices in stroke, load, motor type, feedback, limits and control options make these components versatile. If you can't find the actuator to meet your application needs, call us for an actuator built to your specifications. We build more custom actuators than anyone in the world.

Our motorized lead screws combine a hybrid stepper motor and a precision lead screw together in one compact envelope. Patent-pending Taper-Lock technology allows quick decoupling and secure, properly aligned connections. The result is a smaller, simpler and more precise overall design.

### Leverage Our Ability to Modify or Customize Products

Our application expertise is deep and our product portfolio is broad. The result: Our breadth of standard products can provide a custom fit and we can modify easily standard products as needed. Similarly, we have the design engineering expertise and application knowledge to deliver white sheet solutions for virtually any need – quickly. From standard products to modified standard to custom products, we can deliver the optimal motion solution for your design need.



#### CLUTCHES AND BRAKES

Our brake and clutch products are working in a wide range of applications specific to the food and beverage packaging industries. These products set the solid foundation for the broad range of standard and custom products currently available to our customers.

#### GEARHEADS

Planetary gearheads are used on high-precision motion control applications that require a high torque-to-volume ratio, high torsional stiffness and low backlash. Thomson offers these precision planetary gearheads for all duty cycles, and all with RediMount-compliant mounting systems. Web-based sizing, selection, pricing and 3D models of Micron gearheads are available at [www.micronmotionengineering.com](http://www.micronmotionengineering.com).

#### PRECISION LINEAR ACTUATORS

The compact design and high load, accuracy and speed capacities of our precision linear actuators make them ideal for flexible integration in tight areas. These high performance actuators come in several models and sizes with a broad range of options and accessories to meet the requirements of your application.

The EC- and ECT-Series are designed for heavier loads and are perfect for hydraulic replacement in the toughest environments.

The smaller PC-Series is designed for drop-in replacement of pneumatic cylinders, making the shift to electrical actuation and control easy and fast.

#### LINEAR MOTION SYSTEMS & LIFTING COLUMNS

Our linear motion systems can be used virtually anywhere. They can support and move a range of loads and provide high precision and tight tolerances. Pre-engineered, pre-assembled and ready to install, our systems support loads with ball, slide or wheel guides and actuation with either ball or lead screws, or belt drives. Easy-to-use sizing and selection tools as well as 3D models are available at [www.linearmotionengineering.com](http://www.linearmotionengineering.com).

Thomson lifting columns provide modern design, high performance and safe operation. Along with maintenance-free life, easy installation and light weight, these lifting columns are a first choice for domestic, medical and work-place applications.

## **USA, CANADA and MEXICO**

Thomson  
203A West Rock Road  
Radford, VA 24141, USA  
Phone: 1-540-633-3549  
Fax: 1-540-633-0294  
E-mail: thomson@thomsonlinear.com  
Literature: literature.thomsonlinear.com

## **EUROPE**

### **United Kingdom**

Thomson  
Office 9, The Barns  
Caddsdow Business Park  
Bideford, Devon, EX39 3BT  
Phone: +44 (0) 1271 334 500  
E-mail: sales.uk@thomsonlinear.com

### **Germany**

Thomson  
Nürtinger Straße 70  
72649 Wolfschlugen  
Phone: +49 (0) 7022 504 0  
Fax: +49 (0) 7022 504 405  
E-mail: sales.germany@thomsonlinear.com

### **France**

Thomson  
Phone: +33 (0) 243 50 03 30  
Fax: +33 (0) 243 50 03 39  
E-mail: sales.france@thomsonlinear.com

### **Italy**

Thomson  
Largo Brughetti  
20030 Bovisio Masciago  
Phone: +39 0362 594260  
Fax: +39 0362 594263  
E-mail: sales.italy@thomsonlinear.com

### **Spain**

Thomson  
E-mail: sales.esm@thomsonlinear.com

### **Sweden**

Thomson  
Estridsväg 10  
29109 Kristianstad  
Phone: +46 (0) 44 24 67 00  
Fax: +46 (0) 44 24 40 85  
E-mail: sales.scandinavia@thomsonlinear.com

## **ASIA**

### **Asia Pacific**

Thomson  
E-mail: sales.apac@thomsonlinear.com

### **China**

Thomson  
Rm 2205, Scitech Tower  
22 Jianguomen Wai Street  
Beijing 100004  
Phone: +86 400 6661 802  
Fax: +86 10 6515 0263  
E-mail: sales.china@thomsonlinear.com

### **India**

Thomson  
c/o Fluke Technologies Pvt. Ltd.  
#424, Deodhar Center,  
Marol Maroshi Road,  
Andheri - E, Mumbai – 400059  
Phone: +91 22 29207641  
E-mail: sales.india@thomsonlinear.com

### **Japan**

Thomson  
Minami-Kaneden 2-12-23, Suita  
Osaka 564-0044 Japan  
Phone: +81-6-6386-8001  
Fax: +81-6-6386-5022  
E-mail: csjapan@scgap.com

### **South Korea**

Thomson  
F12 Ilsong Bldg, 157-37  
Samsung-dong, Kangnam-gu,  
Seoul, South Korea (135-090)  
Phone: +82 2 6917 5049  
Fax: +82 2 6917 5007  
E-mail: sales.korea@thomsonlinear.com

## **SOUTH AMERICA**

### **Brasil**

Thomson  
Av. Tamboré, 1077  
Barueri, SP - 06460-000  
Phone: +55 11 3616-0191  
Fax: +55 11 3611 1982  
E-mail: sales.brasil@thomsonlinear.com

[www.thomsonlinear.com](http://www.thomsonlinear.com)

Linear\_Actuators\_On-Off\_Highway\_Vehicles\_CPEN-0005-01A | 20161202TJ

Specifications are subject to change without notice. It is the responsibility of the product user to determine the suitability of this product for a specific application. All trademarks property of their respective owners. © Thomson Industries, Inc. 2016

 **THOMSON**<sup>®</sup>

*Linear Motion. Optimized.<sup>™</sup>*