Rexnord® High Performance Bucket Elevators

Rexnord Conveying Equipment





Rexnord® Bucket Elevators — more than 4,000 Supplied Worldwide: Handling High Lifts, Large Capacities, Tough Applications.

For more than 100 years, Rexnord has been a primary source for power transmission and conveying products for industries around the globe. Thousands of installations, decades of service and still going strong.

Rexnord® High Performance Bucket Elevators are designed specifically for critical applications handling tough materials such as found in cement, lime, fertilizer, chemical, steel, coal, aluminum and forest products industries.

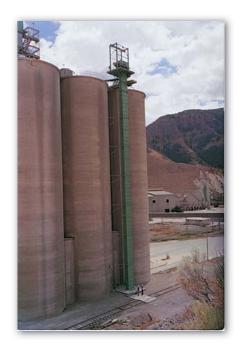
It's important to note that only Rexnord designs and manufactures all critical components used in our elevators. This includes chain, traction wheels, sprockets, bearings, gear reducers and buckets thus assuring single source control and responsibility for manufacturing and service support for the entire elevator.

A worldwide network of field sales and factory support personnel regularly visit customer locations providing application assistance and after-the-sale service. Included are equipment erection services, problem solving, maintenance seminars, chain and other component wear life analysis and other value added services.

Rexnord Bucket Elevators are Available in Both Chain and Belt Types

Inherent characteristics of the material being elevated and the elevator lift requirements determine which type of bucket elevator, chain or belt, to use in a given application. Temperature and standardization are also key factors considered.

Our vast experience and large number of bucket elevators supplied, makes Rexnord highly qualified to provide engineering know-how and recommendations to fulfill the most demanding application requirements.





Rexnord chain elevators offer benefits associated with the consistency and quality of Rexnord chain which gives the user a very predictable and measurable life. Rexnord has supplied chain elevators with lifts in excess of 70 meters

(230 feet) and belt elevators with lifts in excess of 100 meters (328 feet). Capacities over 1,000 metric tons per hour are possible with Rex Bucket Elevators.

A Rexnord professional from one of our worldwide sales offices can discuss both types of elevators with you as well as help with your applications requirements. Or if you prefer, mail or fax your application requirements direct to Rexnord Conveying Equipment Division,
Attention: Customer
Service for an evaluation by Rexnord application engineers. We can quickly



provide a recommendation and proposal with the technical, dimensional and commercial information you require.

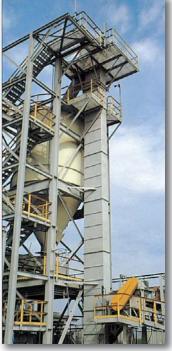
Experience that Leads to Innovation

Since 1905, when Rexnord developed its first bucket elevator, until today, application experience, engineering, research and development have led to an impressive series of new products and product improvements:

- In 1954, Rexnord was the first to develop a line of bucket elevators which used a single strand of high quality Rexnord engineered class steel chain, or central chain as it is sometimes called, as the lifting medium. Capable of operating at higher centrifugal discharge speeds, this allowed for larger capacities handled reliably using fewer components and at lower costs.
- A new generation of bucket elevator chains, the Rexnord Engineered Class 900 Series Chains, resulted in a 30% improvement in fatigue strength over previous designs along with added live load capability.
- Patented centrifugal discharge elevator buckets designed

- and tested to withstand fatigue generated by a bucket
- Special bucket designs for better controlled material discharge when handling non-homogeneous, mixed size materials such as roll press cake and fines.
- Patented maintenance-free belt splice for our Rexnord belt type bucket elevators addresses the concern of belt separation at the splice by eliminating splice fastener fatigue problems.
- Rexnord patented sealed joint elevator chains with a seal
 - that keeps lubrication in and abrasive materials out of the chain joint for a significant improvement in chain life.
- Unique problem solving capabilities to improve both Rexnord and competitors elevators to yield longer wear life, increase capacity and improve overall performance through retrofits, modernizations and upgrades.



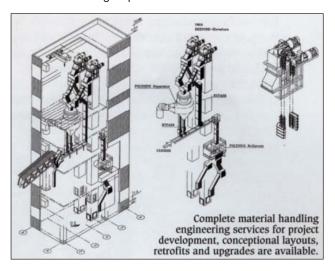




From Rexnord, you get more than just a quotation

Long before the bucket elevator arrives, Rexnord's field sales force and engineers offer in-depth involvement. Some or all of the following considerations are determined early-on to make a project successful:

- Management goals and expectations including funding for the project, timing, etc.
- Material composition: sizes and types of material, flow rates, temperature, etc.
- Operating characteristics: volume, capacities, how the elevator will be fed.
- In an existing plant, are there any component preferences such as sizes of existing elevator chains and other components so we can standardize and minimize inventory.
- 5. Personnel: capabilities, training, maintenance, etc.
- 6. Future requirements for expansion, upgrading or other material handling requirements.



The Mechanics of Problem Solving

On-site inspection and discussions with Rexnord engineers reveal the expertise Rexnord has developed over the years at numerous installations. Knowing what to look for and not overlooking anything is as critical as having the right equipment. Detailed bucket elevator operating data is collected, computerized, analyzed and recommendations made.

Equipment recommendations

can sometimes be simple and straight-forward. Frequently, modifications and adjustments will be the answer. Other situations may call or specialized equipment: sealed joint chain, unique bucket design



An ample stock of replacement components are readily available.

or a solution still in the creative minds of Rexnord engineers ready to apply the knowledge associated with over 4,000 elevator installations worldwide.

Installation, training and start-up rely on many years of experience within Rexnord. And, because we are dealing with proven Rexnord components, we know their precise performance capabilities. Maintenance seminars can be provided to assure a program that will yield maximum service life, minimum downtime and productivity.

Service plus is also called after-sale service. Quite simply, Rexnord is there when you need us. We'll provide chain wear life analysis, keep you informed of new products and existing product improvements, recommend maintenance schedules and routines, maintain replacement components and provide people who can help, should problems ever develop. Rexnord doesn't just supply the elevators, we work with our customers throughout the life cycle of the elevator. Service that you can rely on from Rexnord since Rexnord elevators are a total Rexnord product.



After-the-sale services are aimed at providing the highest productivity rates for your bucket elevators.

Nobody Knows Chain Better than Rexnord

Since 1892, we've made more chain than anyone in the world. Since 1905, Rexnord has supplied chain bucket elevators to many industries. Over the years, Rexnord has concentrated on continually improving chain manufacturing techniques to provide the following benefits by way of a "balanced design":

Greatest fatigue strength available for maximum chain performance.

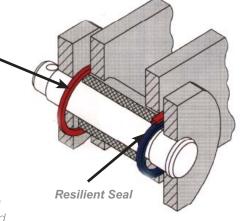


Deep carburizing and induction heat treatment of a traction wheel provides extended wear life over heat treatment methods used in most other competitive components

- Induction hardening and deep case carburizing give Rexnord chains the hardest wear surfaces, greatest case depths and consistency of chain manufacture and quality for the best wear life.
- Controlled interference fit of precise components to yield maximum fatigue life without concern over chain breakage

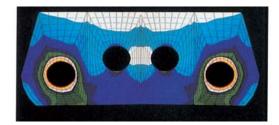
Hardened Steel Retaining Ring

Rexnord's patented seal keeps a special, factory installed lubricant in and abrasive materials out of the sealed chain joint to significantly improve chain life. Standard seal is limited



to 121° C (250° F) A higher temperature seal material is available cited is limited to 252°C (405° F).

Finite element analysis of a Rexnord® elevator chain aids in the design of chain by showing Rexnord development engineers how to improve fatigue



strength for longer, trouble-free life.

800 Series and 900 Series Elevator Chains

Rexnord 800 series elevator chains have been running strong since the 1950s and are continually improved through advanced manufacturing techniques. Computer-controlled heat treat furnaces, advanced computer controlled grinding equipment and on-going research and development programs are all aimed at increasing chain performance.

Our latest generation 900 series elevator chains have larger components and improved manufacturing processes and provide 30% greater fatigue strength which helps resist chain breakage. A unique series of lightening holes in the chain sidebar help lighten the weight of the chain without loss in strength so the chain uses its strength to carry more live load. Upgrading from 800 series chain to a 900 series chain may be as simple as changing chain. Consult Rexnord for details.

The Rexnord Technical Services (RTS) Center is dedicated to a continuous program of product development, improvement and testing of new products for a wide variety of industries. The knowledge available at RTS is offered to Rexnord's customers with a goal of increasing product performance.

Here, a fatigue testing machine is used to evaluate Rexnord chain under the same cyclical loading conditions as found inside an elevator. Both Rexnord and



competitive chains are continually tested to insure Rexnord remains the leader in chain performance technology.



Rexnord® Chain Elevators are known for dependable and efficient operation

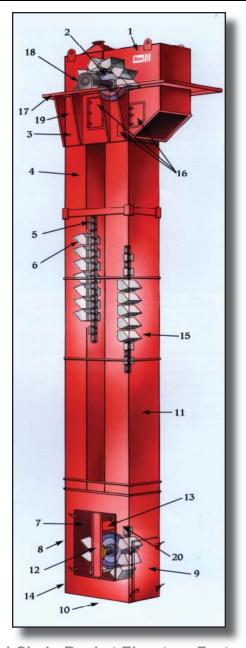
Rexnord chain type bucket elevators are selected most often for bucket elevator applications. Why? Because in a properly designed and operated Rexnord bucket elevator equipped with Rexnord elevator chains, the user can achieve a very predictable and measurable wear life for the elevator chain without concern over catastrophic breakage. A simple chain elongation measurement procedure showing chain wear limits is contained in the Rexnord Service Manual supplied with each elevator. By routinely measuring the chain elongation as part of the plant's preventive maintenance program, the user can easily determine when it's time to replace the chain after the chain has reached the end of its useful life without concern over failure. Designed to:

- Operate reliably in tough, hostile environments 24 hours per day, 365 days per
- Combine the right chain speed, bucket design and spacing to centrifugally discharge elevated materials cleanly at chain speeds from 1.3 to 2.0 meters per second (260 to 395 fpm).

year.

 Handle free flowing materials from fines on up to 50 mm (2 inch) lumps.





Rexnord Chain Bucket Elevators Features and Benefits

- Steel split upper head section offers easier access to elevator components for maintenance and/or replacement.
- 2. Segmental rim traction wheels on both head and tail shafts -deep carburized and induction case hardened rims to 60 RC minimum offer longer wear life than competitors claims of "hardened sprockets or rims." Easy to replace rim segments mean shorter downtime. Standardization of head and tail shaft rims permit interchangeability and fewer replacement parts to be inventoried.

- Lower head section of 6 mm (1/4 in.) steel plate stiffened with heavy structural channel members provides integrity and support for proper elevator performance.
- 4. Intermediate sections of 5 mm (3/16 in.)on twin leg castings, 4mm (10 gauge) on single leg steel sheet with deep beaded crimps for stiffness. Self-supporting single leg design and twin leg casing designs are available. Lateral supports recommended to adjoining structures at approximately 6 meters (20 feet) intervals. On twin leg every 18 meters (60 feet).
- Rexnord engineered class steel rollerless chain available in a full range of sizes specifically designed for bucket elevator service.
- Rexnord patented fatigue
 resistant fabricated steel elevator
 buckets with optional 400 BHN
 abrasion resistant wear lip are
 engineered to provide the best
 combination of in-feed to the
 elevator with a properly controlled
 material discharge.
- Large double-hinged access doors with quick opening latches (where permitted) for easy inspection and/or maintenance. Doors are designed to permit field selectable right or left door opening.
- 8. Flanged inlet opening, properly sized and positioned to provide direct feed into bucket with reduced material spillage and minimized bucket digging. Abrasion resistant wear liner is available as an option.
- Removable front and rear clean-out panels with quick acting latches



Rexnord® 900 Series Elevator Chains wrap around a segmental traction wheel. All components receive special heat treatment for extended wear life.



Rexnord 900 Series chain has 30% more fatigue strength than our previous generation 800 series bucket elevator chains.



Large, easy opening access doors in the boot section are standard (and at other important locations as optional accessories) are for general maintenance and inspection.

- (where permitted) for fast access.
- Flanged bottom with flat steel bottom plate for complete load bearing on foundation.
- 11. Large double-hinged access doors with quick opening latches (where permitted) are available as options at various intermediate section locations to permit easy inspection and maintenance at various floor levels.
- Rexnord counterweighted internal gravity take-up assembly complete with Rexnord cast Ni-hard bearing blocks and sleeves. The bearings
 - and sleeves require no lubrication and no periodic maintenance. A special heat treatment of these bearings and sleeves to 550 BHN minimum, helps insure long life. Includes counterweight box, guides for an automatic takeup adjustment and adjustable stop blocks.
- **13**. Take-up hoist beam in boot section permits servicing of internal gravity take-up.
- Boot section of heavy 6 mm (1/4 in.) steel plate for strength with reinforcing corner angles.
- 15. Generous clearance between casing and buckets insure buckets do not contact casing during operation and allows for future retrofitting to increase capacity.
- 16. Six service doors conveniently located in lower head permit inspection and access to head shaft components. Adjustable rubber lip in discharge spout minimizes back legging. Discharge chute can be furnished with abrasion resistant wear liners as an option.
- Headshaft bearing supports are integral with lower head section. Assures proper head shaft assembly support.
- Rexnord or Link-Belt® heavy-duty, doublerow spherical roller bearing pillow blocks for long life.
- 19. Motion sensor in head section warns of chain slippage, missing buckets, motor coupling failure, etc.
- 20. Level sensor in boot section warns of over feed condition or back legging causing boot flooding.



Cast Ni-hard take-up bearings and Ni-hard sleeves require no lubrication and no periodic maintenance and have long service life.



Rexnord internal gravity take-up assembly provides constant tension on the elevator chain and automatically adjusts tension to allow for chain elongation.



Rexnord® Belt Elevators Incorporate the Latest Technology

Research and development, field testing and installation experience have allowed Rexnord to produce a belt bucket elevator that incorporates concepts and components that reflect state-of-the-art technology. Rexnord belt elevators are currently handling such products as alumina, coke, foundry sand, raw meal, wood chips and other materials where physical characteristics are best suited to a belt type elevator. Rexnord belt elevators have been supplied with lifts in excess of 100 meters (328 feet).

The Benefits of Rexnord Belt Elevators

Higher conveying capacities at speeds up to 115 meters per minute (377 feet per minute).

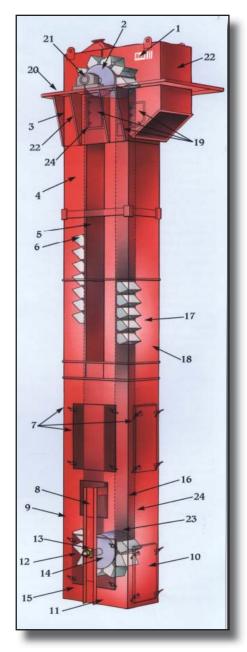
Higher lifts are possible in comparison to chain elevators.

Superior bucket fastening method uses large diameter flat head type fasteners to hold buckets to the belt.

Belt material options mean that various types of belts including polyester/nylon reinforced, special steel reinforced, and others may be selected depending upon the application. Rely on Rexnord's experience with thousands of elevator installations to apply the right belt for the application.

Rexnord patented belt splice is easier and faster to install than competitive designs - typically in 4 to 6 hours.

Unique metal lagging on head pulley provides positive traction surface for the belt. Hard metal lagging provides years longer wear life than conventional rubber lagging and helps provide continuous tracking of the belt.



Rexnord Belt Bucket Elevator Features and Benefits

- 1. Steel split upper head section offers easier access to elevator components for maintenance/replacement.
- Welded steel head pulley with taper lock hubs and hard metal sprayed-on lagging offers continuous positive tracking of belt with years of longer service life.
- 3. Lower head section of 6 mm (I/4 in.) steel plate stiffened with heavy structural channel members provides structural integrity and support for proper elevator performance.

- 4. Intermediate casing sections of 5mm (3/.6 in.) steel sheet on twin leg casings, 4mm (10 gauge) on single leg designs with deep beaded crimps for stiffness. Self-supporting single leg and twin leg designs are available. Lateral supports recommended to adjoining structures at approximately 6 meters (20 feet) intervals. On twin leg every 18 meters (60 feet).
- Belting specifically designed and manufactured under Rexnord specifications is selected for individual applications.
- Rexnord patented fatigue resistant fabricated and reinforced steel elevator buckets with optional 400 BHN abrasion resistant wear lips in single or staggered double rows, secured to belt with large, flat-head elevator bucket fasteners for positive bucket retention.
- 7. First intermediate casing above boot section has three large, double hinged access doors with quick opening latches (where permitted) to permit ease of installation of belt splice, buckets and routine elevator inspection.
- 8. Rexnord counterweighted external gravity take-up with adjustable channel frame automatically adjusts to keep proper tension on the belt.
 - Single point adjustment makes belt training easier. Belt tracking switches alert personnel when adjustment is required.
- Flanged inlet opening, properly sized and positioned to provide direct feed into buckets with reduced material spillage and minimized bucket digging.
- Removable front and rear cleanout panels with quick acting latches (where permitted) for fast access.
- Flanged bottom with flat steel bottom plate for complete load bearing on foundation.
- 12. Two, bolted, dust tight access doors for removal of take-up foot pulley if required.

Adjustable rubber peeler

lip at the discharge chute

discharging material and

helps prevent this material

from falling into the boot

belt and chain bucket

elevators.

section. Standard on both

picks up slow or late

- 13. Externally mounted Rexnord flanged block bearing assembly with spherical roller bearings and auxiliary cap seals for long bearing life.
- 14. Welded steel spiral-type foot pulley with taper-lock hubs. Spiral pulley offers self-cleaning feature and eliminates the chordal action and belt beating associated with

- conventional wingtype pulleys which are detrimental to belt life.
- 15. Boot section of heavy, 6 mm (1/4 in.) steel plate and corner angle reinforcement for strength with deep beaded crimps for stiffness.
- Self-supporting construction on both single leg and twin leg designs.



Rexnord patented belt splice has eliminated the problem of fastener fatigue breakage and related maintenance problems found in traditional clamping-type splices.

Allows for easy and first re-splicing of belt using ordinary tools.

- 17. Generous clearance between casing, belt and buckets insures belt or buckets do not contact casing during operation and allows for future retrofitting to increase capacity.
- 18. Three large, double-hinged access doors with quick opening latches (where permitted) are supplied as standard in the first intermediate section above the boot. Additional doors are available as options at various intermediate section locations to permit ease of inspection and maintenance access at various floor levels. Doors are designed to permit field selectable right or left door opening.
- 19. Six (6) service doors conveniently located in lower head permit access to head shaft components and adjustable rubber lip in discharge spout which minimizes back legging. Discharge chute can be furnished with abrasion resistant wear liners as an option.



Rexnord® belt elevator feeding raw meal to a pre-heater at a cement plant.

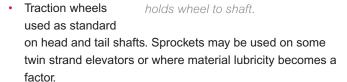
- 20. Head shaft bearing supports are integral with lower head section. Assures proper head shaft assembly support.
- 21. Rexnord® or Link-Belt® heavy-duty double row spherical roller bearing pillow blocks for long wear life.
- 22. Motion sensor in head section warns of belt slippage, missing buckets, motor coupling failure, etc.
- 23. Level sensor in boot section warns of over feed condition or back legging causing boot flooding.
- 24. Four belt tracking switches supplied as standard. Permit first alarm if belt not tracking properly. Additional alarm or belt shut-off if off-track condition not corrected.



Rexnord® and Link-Belt® components provide high quality, single source service.

Segmental rim traction wheels and sprockets

- Traction wheel rim segments easily installed, simplifying replacement without disassembling body, chain or shaft assemblies.
- Heavy-duty solid steel rim segments are factory fastened to the body using Huck fasteners, offering positive rim/
 - fastener retention without concern of loosening during operation.
- Sprocket rim segments made to same wear-resistant specifications as traction wheels, deep carburized and induction hardened to 60 RC.



Segmental-rim sprockets and traction

wheels simples installation and

replacement. Keyless locking ring

- · Sprocket segments reversible for double life.
- Head traction wheel furnished with solid bodies utilizing keyless locking ring assemblies as standard in high performance elevators. Keyless locking rings insure positive wheel retention to shaft without stress points associated with keyed shafts.

Buckets

Rexnord manufactures a variety of bucket styles in fabricated steel, cast iron and polymeric materials to meet application requirements. Years of research in Rexnord's own test elevators have given Rexnord a unique



Patented design includes reinforcement ribs on specific sizes to improve fatigue strength.

design capability to insure the optimum elevator is achieved by applying the right bucket to the application. Pictured is Rexnord's patented AC bucket design with an abrasion resistant lip for longer bucket life when handling abrasive materials. All Rexnord fabricated steel buckets are jig welded for uniformity and strength.

Bearings

Elevator head shaft is supported on split housing Link-Belt spherical roller bearing pillow blocks. Tapered bore spherical roller bearings with adapter type mounting assemblies are supplied. Outer labyrinth seals with generous grease chambers provide proper sealing for complete bearing protection.



Link-Belt® spherical roller bearing pillow blocks for heavy-duty service.

Couplings

Used typically between main drive motor and gear reducer on input shaft. Rexnord Omega® elastomer couplings feature:

- Rapid and easy assembly/ disassembly saves installation and replacement time and money.
- Lower maintenance costs since no lubrication is required.
- Reduced vibration for longer system life.



Rexnord® Omega® elastomer coupling permits rapid and easy assembly/disassembly to save time and money.

Falk® gear drives:

- Falk™ Drive One® with Swing Base Assembly: Most flexible design, handles widest assortment of motor / coupling combinations
- Falk Drive One Inching Drive Package: Designed for low maintenance, long life, and safety
- Falk™ Quadrive® shaft mounted drive: Large sump capacity eliminates the need for cooling devices on most applications.

 Standard Falk™ TA Taper® bushing provides greater flexibility to suit inch or metric driven shafts. TA TAper bushings are the easisest-on / easisest-off solution in the industry.

Optional Rexnord accessories

Standard Head Platforms and ladders

- Work platform offers maintenance personnel easier access and work area for inspection or maintenance on head section components.
- Structural steel channel framing.
- Steel floor bar grating.
- · Toe plates.
- Pipe handrail.
- Platform and ladder supported by elevator casing.

Standard Hoist frames

- Aid in maintenance on drive, motor and headshaft assembly.
- Wide flange rigid frame construction.
- Deep section I-beam for hoist trolley support.
- Designed for easy mounting to standard Rexnord head platforms.
- Several styles available.



Optional head platforms offer easy access and work area for inspection and maintenance. Hoist frames aid in drive, motor, and headshaft assembly maintenance.



Apron Feeders



Pan Conveyors

Linkmaster chain assembly tool

Maintain the advantage of interference fit by eliminating pin

grinding or heating of side bars which destroys the fatigue strength of the chain and can result in premature chain failure. This rugged tool uses a hydraulic ram and hand pump to deliver the forces necessary to drive chain pins in the field or shop. Can be used for efficiency in both chain assembly and disassembly.



Rexnord® Linkmaster® chain assembly tool is efficient in both chain assembly and disassembly.

Inching drive for maintenance

Directly connected to the main gear reducer via an overrunning mechanical clutch and its own "C" flange motor, a maintenance drive operates at approximately 10% normal operating speed so chains and buckets can be visually inspected. Available on both chain driven units, as shown, as well as right angle hollow shaft direct drives. Electronic inching drive systems available as well. Can be used for multiple elevator inspection, one unit at a time, controlled from one central control panel.



Optional inching drive runs at 10% normal operating speed to allow easy visual inspection of chain buckets and other elevator components.

"Huck®" fasteners

"Huck" fasteners can be supplied in place of conventional hardware for fastening buckets to chain. Offers fast, positive bucket fastening and retention to chain without concern of bucket loosening during operation. Requires purchase of hydraulic Huck tool and pump.

Apron conveyors, feeders and drag conveyors

In addition to bucket elevators, Rexnord Conveying Equipment Division designs, engineers and fabricates complete apron type pan conveyors and feeders, flight conveyors and drag conveyors.

Products shown are only a sample of the many conveyors Rexnord has supplied. As with our bucket elevators, all components are designed to match your material handling requirements from a single source manufacturer.



Drag Conveyors



World Class Customer Service

For more than 100 years, the dedicated people of Rexnord have delivered excellence in quality and service to our customers around the globe. Rexnord is a trusted name when it comes to providing skillfully engineered products that improve productivity and efficiency for industrial applications worldwide. We are committed to exceeding customer expectations in every area of our business: product design, application engineering, operations, and customer service.

Because of our customer focus, we are able to thoroughly understand the needs of your business and have the resources available to work closely with you to reduce maintenance costs, eliminate redundant inventories and prevent equipment down time.

Rexnord represents the most comprehensive portfolio of power transmission and conveying components in the world with the brands you know and trust.

Rexnord, Drive One, and Linkmaster are registered trademarks of Rexnord Industries, LLC. Falk and Planetgear are trademarks of Rexnord Industries, LLC.

Link-Belt is a registered trademark of the Link-Belt Construction Equipment Company.

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