Mine Conveyor Backstop Application Guide

RegalRexnord™

REGAL REXNORD BRANDS ARE LEADERS IN BACKSTOPPING TECHNOLOGY

With more than 85 years of experience, **Formsprag Clutch**, **Marland Clutch** and **Stieber** provide advanced backstopping solutions to meet bulk material handling requirements around the world.

Regal Rexnord backstopping products are widely used on inclined conveyor drives and bucket excavators in both open pit and underground coal, copper, nickel and iron ore mines, processing plants and shore-to-ship loading and unloading facilities.

Bore Sizes

Sizes range from 0.25 to 23.0 inches (6 to 600 mm).

Quality

The Quality Management Systems for all three brands are certified to ISO 9001 2015.

CONVEYOR BACKSTOP POSITIONS

LOW SPEED

Torque 3,000 to 2,100,000 lb.ft. (4,067 to 2,847,222 Nm).
Bore Sizes up to 23.0 in. (600 mm).

BCMA

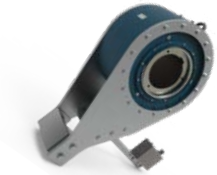
Marland BCMA roller-type, bearing supported backstops are designed to be mounted on the drive. The self-contained, oil lubricated units feature a grease labyrinth that prevents dust from attacking oil lip seals.

RDBR

Stieber roller-type RDBR backstops with a bearing supported multi-disc brake for torque limiting and load sharing functionality. An optional release function allows for a controlled release under load while providing virtually unlimited backward rotation for maintenance and jam clearing.

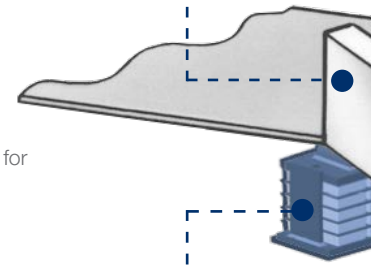
LLH

Formsprag LLH sprag-type, oil-lubricated holdback clutches come ready to install and are equipped with a one-piece, quickly detachable torque arm. A grease labyrinth protects oil seals that positively prevent airborne contaminants from reaching internal seals and parts.



Special Designs

Stieber routinely modifies standard products to meet unique customer requirements for retrofits and new applications.



Load Sharing Blocks

Used when two backstops share the same reverse load

HIGH SPEED (External)

Torque 275 to 132,840 lb.ft. (374 to 108,000 Nm).
Bore Sizes up to 11.8 in. (300 mm). Speeds up to 3,600 RPM.

FS/FSO/HPI

Formsprag FS, FSO, and HPI 750-1027 through-shaft mounted sprag-type freewheels are self-contained, sealed and bearing supported, using two ball bearings. Units feature a high torque density and require no adjustments or controls.

HSB

Formsprag HSB (High Speed Backstops) consist of a standard FSO clutch and an attached oil reservoir for increased oil capacity and cooler operation.

HIGH SPEED (Internal)

Torque 468 to 184,500 lb.ft.(52 to 250,000 Nm).
Bore Sizes up to 11.8 in. (300 mm). Speeds up to 15,000 RPM.

FS-20 & FS-50

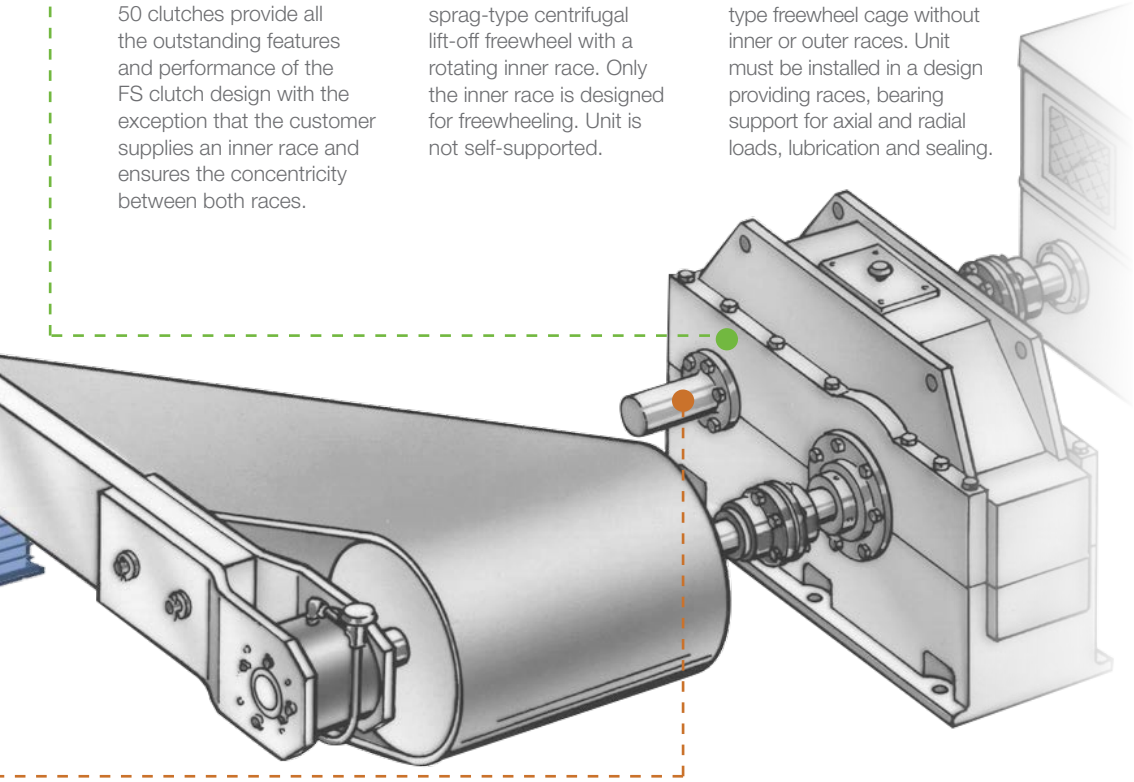
Formsprag Series 20 and 50 clutches provide all the outstanding features and performance of the FS clutch design with the exception that the customer supplies an inner race and ensures the concentricity between both races.

RSCI

Stieber Type RSCI is a sprag-type centrifugal lift-off freewheel with a rotating inner race. Only the inner race is designed for freewheeling. Unit is not self-supported.

DC

Stieber Type DC is a sprag type freewheel cage without inner or outer races. Unit must be installed in a design providing races, bearing support for axial and radial loads, lubrication and sealing.



FHB

Formsprag FHB centrifugal throw-out (C/T) sprag-type backstop features internal sealed ball bearings.
Unit is self-contained and completely maintenance-free.

RIZ G2G3/G3G4

Stieber Types RIZ.. G2G3/G3G4 centrifugal lift-off sprag-type lift-off freewheel with a rotating inner race. Only the inner race is designed for freewheeling. Unit is not self-supported.

RDBK

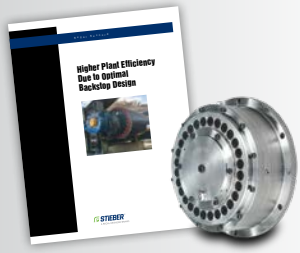
Stieber RDBK is an RSCI centrifugal lift-off sprag-type backstop with an integral torque limiter. The load-sharing, releasable unit is utilized where two or more backstops share the reverse load.
The release function allows unlimited backward rotation for maintenance and jam clearing.

Optimal Backstop Design Provides Higher Plant Efficiency

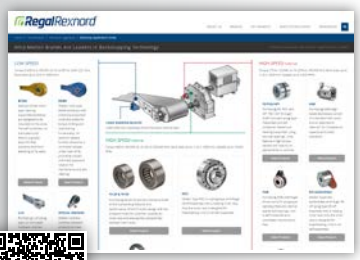
Overrunning clutches and backstops improve plant efficiency in heavy industries by preventing potentially damaging and costly reverse running and uncontrolled acceleration of loaded conveyor systems.

It is important, therefore, that low-speed and high-speed backstops are specified and designed with a high degree of precision by experienced design engineers working closely with the overrunning clutch manufacturer.

With an in-depth knowledge of the application torque loads, it is possible to design an optimal compact, cost-effective backstop that safeguards the conveyor drive train reliably against overload. Plant efficiency can be improved even further by utilizing Stieber backstops with controlled release functionality that significantly reduces stoppage times for belt unloading following a drive failure.



*For more information, download **P-8391-SC** from www.altraliterature.com*



Scan to visit the Mining Backstopping website!

BACKSTOPPING APPLICATIONS

LLH Holdbacks

Coal Mine Overland/Inclined Conveyors

Formsprag Clutch has supplied LLH (Long Life Holdbacks) for use on a coal mine conveyor belt system which feeds an existing preparation plant at a facility located in the Eastern US. Eight standard LLH units were installed at transfer points on the overland portion of the system, while two custom-designed units were utilized in the inclined conveyor section which conveys coal from the mine to the surface.

LLH Series Backstopping Clutches feature sprag technology and are specifically designed for conveyor headshafts, or any other machinery where reverse rotation must be positively prevented. LLH units come ready to install and are equipped with a one-piece, quickly detachable torque arm.

FHB High-Speed External Backstop

Taconite Mine Inclined Conveyor

A large mine in Minnesota needed a backstop delivered quickly to replace a popular competitor model that failed on an inclined conveyor used to move taconite pellets. The customer was familiar with Formsprag Clutch and had very good experiences with previously installed products.

A Formsprag Model FHB backstop was selected since it was developed as a dimensional drop-in replacement for the competitive unit and was available with a much shorter lead time. FHB backstops are specifically designed for use on inclined conveyors, bucket elevators and other applications where a rotating shaft must be absolutely prevented from rotating in a reverse direction.

Model HSB Backstopping Clutch

Steel Mill Inclined Conveyor

A major steel producer needed a backstopping clutch for use on an inclined conveyor that feeds coal into a coke oven at one of its Midwestern mills.

A Formsprag Model HSB 700 clutch, with a torque capacity of 5,000 lb.ft. (6800 Nm), was selected to meet the requirements of this application. HSB Series clutches are intended for use as backstops on the high speed shaft or intermediate shaft of a reducer, and as holdbacks on the head shaft of conveyors.

HSB units are comprised of standard FSO clutch with the addition of an oil reservoir. The oil reservoir is an aluminum casting with cooling fins.

RDBK Backstops

Coal Mine Inclined Conveyors

A leading gearbox OEM needed a compact, load-sharing, releasable backstop solution for use on a new incline conveyor system at a coal mine in Pennsylvania. Unlike other backstop designs that offer limited reverse rotation after being engaged, the new solution needed to allow for a controlled release under load and be able to rotate backwards for maintenance and clearing work.

To meet the application requirements, Stieber provided newly developed RDBK high-speed backstops. The RDBK features an internal torque limiter which is specially-designed for use on the high-speed or intermediate shaft of the driving unit in multi-drive systems, such as on large inclined conveyors, where two or more backstops share the reverse load.

BCMA Backstop

Coal Mine Inclined Conveyor

A new Midwestern mine needed a backstop solution for an inclined conveyor that transports coal up to the top of a preparation plant where the coal falls through various sizing screens for sorting prior to shipping. The backstop prevents uncontrolled reverse runaways of the conveyor in the event of an unplanned power outage or mechanical failure in the drive.

To meet the application requirements Marland supplied a BC-720MA model with a guaranteed backstopping holding torque of 975,600 Nm (720,000 lb.ft.). The ramp-and-roller style backstop is designed to operate in an environment of airborne grit in temperatures that reach 115 degrees F.

FSO Overrunning Clutch

Ore Mine Cone Crusher

A mine equipment manufacturer required a reliable overrunning clutch for use on a cone crusher. Ore is crushed between an eccentrically rotating cone mantle and a concave bowl liner. The clutch prevents the mantle head from rotating in the reverse direction from the design parameters.

Formsprag Clutch supplied a grease-lubricated, 8.75" diameter FSO-750 clutch with a 7,000 lb.ft. (9,520 Nm) torque capacity to meet the challenging application requirements. FSO overrunning clutches feature a high torque density and require no adjustments or controls. All models contain Formchrome® sprags and Formsprag "Free-action" retainers. These clutches mount on a through shaft, with the inner race driven by a key.

RDBR-E Torque Limiting/Releasable Backstops

Coal Mine Inclined Conveyors

A load-sharing, releasable backstop solution was needed for use on new conveyors at the Moolarben Coal Complex in Australia. The inclined conveyor features an 80 m (262 ft.) lift and has a capacity of 4,500 tph. Additional releasable backstops were also required for the mine's surface ramp conveyor.

Based on a long-standing relationship, Stieber approached the project's conveyor OEM to introduce its new RDBR-E torque-limiting/load-sharing releasable backstop technology. Unlike other backstop designs that offer limited reverse rotation after being engaged, the new Stieber design allows for a controlled release under load while providing virtually unlimited backward rotation for maintenance and clearing work.

RSCI Overrunning/Backstopping Clutch

Coal Mine Bucket Wheel Excavator

A major European mine equipment manufacturer required a backstopping clutch for a bucket wheel excavator used at an open pit coal mine. The continuously rotating bucket wheel removes overburden which is transferred to an onboard inclined discharge conveyor that dumps the material onto an overland conveyor for further transport to an overburden spreader.

A Stieber Model RSCI 260 clutch, with a torque capacity of 47,970 lb.ft. (65,000 Nm), was selected to meet the requirements of this challenging application. Model RSCI is an external bearing-supported, centrifugal throwout (C/T) sprag type overrunning clutch with a rotating inner race. The primary advantage of the centrifugal throwout sprag retainer is that when the sprags lift off the outer race, there is no rubbing contact in the clutch.

SMART MARLAND MONITORING SYSTEM

Up to the minute access to critical system operating conditions including Vibration, Temperature and Oil Level. You can now remotely monitor the condition of your equipment from anywhere using your computer or cell phone.

Performance Capabilities:

- Monitor up to 6 devices from a single gateway
- Set desired report intervals
- Perform statistical analysis to identify maintenance and repair needs
- Alarm notifications

Simple System Requirements:

- Power supply (24Vdc, 120/240 VAC, 50/60 Hz)
- Less than 200 m line of site between gateway and devices
- Access to local network or cellular signal

Reporting Capability:

- Current measurements
- Historic trending
- Vibration analysis

BCMA BACKSTOP AUTOMATIC GREASE LUBRICATION SYSTEM

Automates the lubrication process and provides the highest level of protection from external contamination

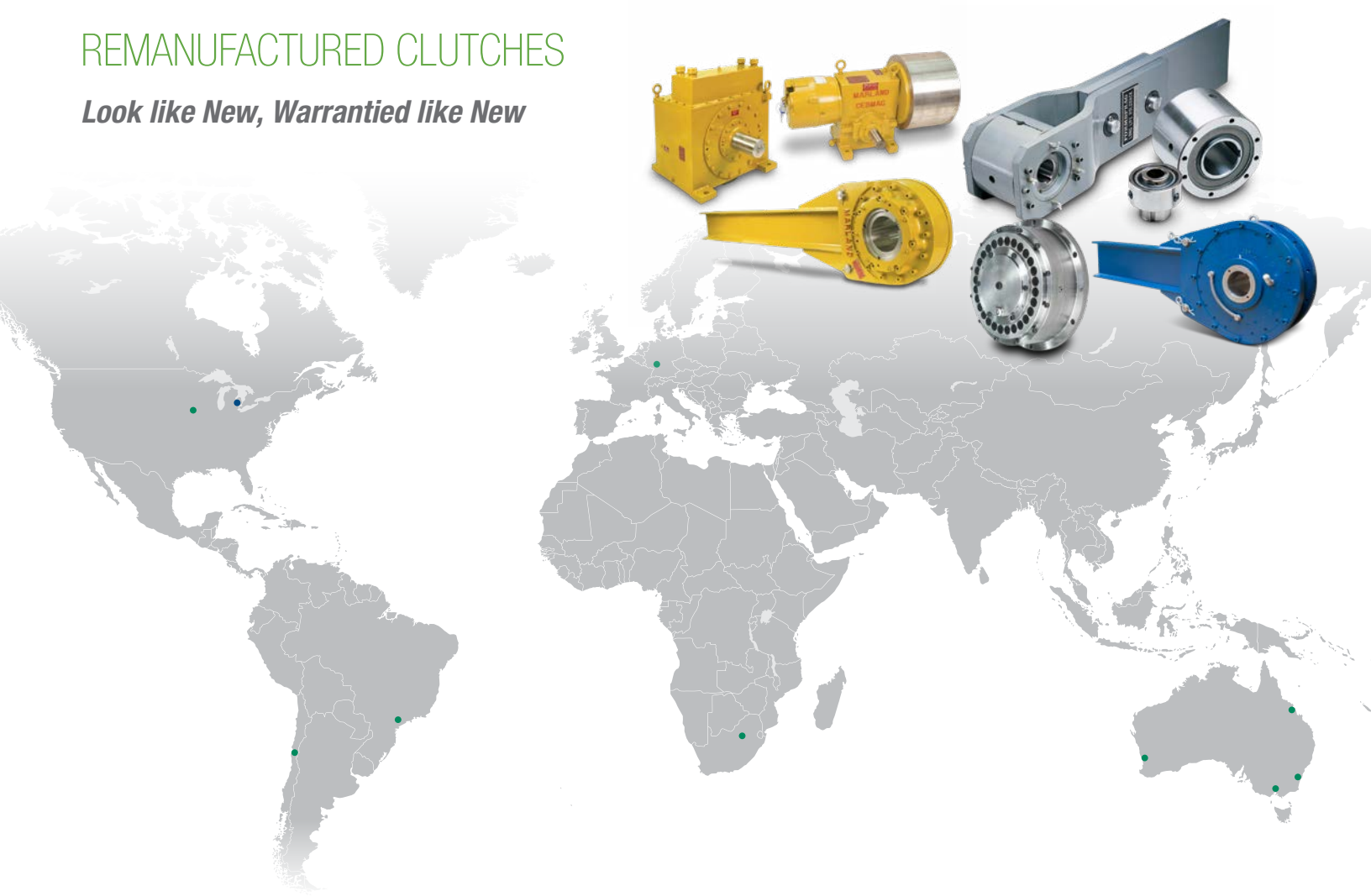
This automatic grease lubrication system is designed to automate the lubrication maintenance of the grease labyrinth section of Marland BCMA backstop models. It is beneficial to replace the grease in the labyrinth section regularly to protect seals and other internal components from airborne contaminants. This kit automates the lubrication process and provides the highest level of protection from external contamination.

The grease pump includes a controller which can be programmed for different run and rest time cycles.

Refer to the grease pump manual for information on operation of the grease pump and instructions for programming the pump controller.

REMANUFACTURED CLUTCHES

Look like New, Warrantied like New



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