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Dragline Motor Braking Systems

As seen in
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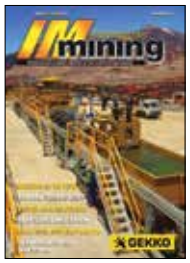

Twiflex® Limited

An Altra Industrial Motion Company

Dragline Motor Braking Systems

by Paul Moore
Editor, International Mining

Twiflex offers the largest range of industrial disc brake calipers in the world. Spring applied units may be retracted pneumatically, hydraulically or electrically (depending on caliper design) while most direct acting brakes have some form of positive retraction device. A key market for the company is mining, including brakes for large dragline motors.

A major Australian coal mine operator needed to replace the brakes on the dragline at their mine in the Bowen Basin. In constant operation since 2011, the dragline's original braking systems had reached the end of their useful service life. With a working weight of 6,950 tons and a bucket capacity of 152 yd^3, the dragline can move 240 tons of overburden in a single pass. Twiflex was selected to provide spring-applied, air-released replacement caliper brakes for all of the dragline's eight hoist and eight drag 1,450 hp motors. Each have been equipped with multiple GMR-SD 15.6 caliper brakes operating on 46 in. diameter discs that provide a combined braking force of 72 kN.

On the eight swing 1,045 hp motors, Twiflex equipped each with multiple GMR-SD 8.4 caliper brakes operating on 46 in. diameter discs that provide a combined braking force of 39 kN.

On the four propel 1,045 hp motors, Twiflex equipped each with multiple GMR-SD 15.6 caliper brakes operating on 46 in diameter discs that provide a combined braking force of 72 kN.

The GMR-SD caliper brake's modular design allows for quick change outs and the ability to use multiple units of varying sizes to meet specific installation requirements. Torque is adjusted in the field to meet operating conditions. The low-maintenance brakes feature easy-to-replace brake pads and low cost spares.

Twiflex also recently provided GMR-SD caliper brakes for use on a new medium-duty 4,500 ton dragline at a mine in India. The brakes stop the dragline's load from moving as quickly as possible and bring it to rest in a controlled manner to avoid shocking the drivetrain and machine frame. The GMR-SD brakes are designed to handle the high energy associated with stopping these massive loads.

The GMR-SD caliper is Twiflex's most popular model for draglines and consists of a cast frame with two pivot-mounted arms actuated by a spring-applied, air-released thruster. Depending on the peak disc temperature calculated, the calipers can be fitted with either organic or sintered bronze pads which are suitable for emergency stops.

For the Indian project, Twiflex provided GMR-SD spring-applied, air-released caliper brakes for the four hoist and four drag 1,230 kW motors, each with multiple GMR-SD 15.6 caliper brakes operating on 38 in. diameter discs that provide a combined braking force of 108 kN; and on four swing 932 kW motors, each with multiple GMR-SD 8.4 caliper brakes operating on 38 in. diameter discs that provide a combined braking force of 58.5 kN.

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