

# ENERPAC APPLICATION INSPIRATION



- Buildings and Stadiums
- Bridges and Infrastructure
- Manufacturing
- Power Generation
- Steel and Metal Production
- Oil and Gas, Petrochemical
- Shipbuilding
- **Mining**

# Enerpac Application Inspiration



**POWERFUL SOLUTIONS. GLOBAL FORCE.**

With more than 50 years of experience, Enerpac has gained unique expertise in delivering hydraulic solutions for the controlled movement and positioning of heavy loads.

This expertise has been acknowledged by the world's leading industrial professionals and has contributed to the successful movement of a number of the most recognizable structures on earth.

In addition to providing the most comprehensive line of globally-supplied, locally supported Heavy Lifting products, Enerpac combines hydraulics, steel fabrication and electronic control with engineering and application knowledge, to design and manufacture solutions that ensure your projects are completed safely and efficiently.

<b>Mining Project</b>	<b>Page</b>
Electric Rope Shovel Undecking	4
Stud Removal on Stacker Reclaimer with Hydraulic Tensioners	5
Controlled Tightening on Dump Truck Suspension Struts	6
Lifting a Reclaimer Stacker for Bearing Replacement	7
Removing the Wheel Studs on Caterpillar 777 Dump Truck	8
Lifting a Coker for Base Repair Maintenance	9
Lifting and Lowering Massive Conveyor Sections	10
Technology Achievements – Enerpac Strand Lifting Safely Hoists Massive Iron Ore Mills	11
Undecking an Electric Rope Shovel	12
Lifting 5000 ton Coal Mine Excavator	13
Lifting 3500 ton Mining Dragline for Maintenance	14
Lifting Heavy Mining Trucks Quickly and Safely using POW'R-Lock™ Mobile Lift System	15

## Electric Rope Shovel Undecking

**Customer:** Joy Global

**Location:** Gold Mine, U.S.A.

**Challenge:** Routine maintenance is required on a P&H4100XPC Electric Rope Shovel after every 30,000 hours of operation. The maintenance activities require the upper section to be lifted off the car body to machine bearing surfaces and inspect and repair structural components. Weighing approximately 1000 tons, lifting the upper car body requires a significant amount of force and control. The maintenance team at Joy Global reached out to Enerpac to deliver a shovel lift system to undeck a shovel in approximately one hour and be transported on the highway without oversized load permits.

**Solution:** We had previously built a similar shovel lift system for Joy Global's maintenance team in Chile. The second generation system built for Joy Global's service team in Gillette provided significantly more speed. The system included four 500 ton cylinders with 183 cm of stroke, an EVO synchronous control unit and four custom 8000 series hydraulic pumps. Each pump was built to operate in extremely cold or hot environments. The EVO synchronous control unit enabled a single operator to control the entire lift and ensure each lifting point remained within 9,5 mm.

**Products:** Custom 500 ton cylinders, 72 inches stroke,  
Custom 8000 series hydraulic pumps,  
EVO-Series, Synchronous Control Unit



## Stud Removal on a Stacker Reclaimer with Hydraulic Tensioners



**Customer:** Port Waratah Coal Services

**Location:** Newcastle, NSW, Australia

**Challenge:** Removing the 3 meter long studs on the bucket wheel drive output of a Sandvik stacker reclaimer is a difficult and lengthy operation. Operating conditions corroded the studs and the confined location of the stud does not allow access with traditional removal equipment. Previous operations required more than 10 hours to remove each stud and used up to 120 tons of force to push and pull a total of 16 studs.

**Solution:** A custom GT4 hydraulic tensioner was developed for removing the studs in a safe and timely manner. The tensioner pulled each stud out in about 30 minutes, providing a huge time savings for the maintenance team. The height and puller sleeve of the tensioner was modified to fit the confined space of the studs.

**Products:** Custom GT4-Series Hydraulic Tensioner, ZUTP1500E Electric Tensioning Pump



## Controlled Tightening on Dump Truck Suspension Struts

**Location:** Brisbane, Queensland, Australia

**Challenge:** The maintenance team needed to replace the suspension strut bolts on 777F, 785D, 789D and 793F dump trucks. Due to the confined location of the suspension struts there was limited space for accessing the bolts. Existing methods of using flogging spanners often took several hours to replace the nuts, caused minor injuries to hands and the torque was not accurate.

**Solution:** An S1500 hydraulic torque wrench was an ideal tool for removing the space restricted bolts in a safe and efficient manner. The high torque output of the S-Series torque wrench enabled the maintenance team to remove the bolts within 60 minutes, which decreased downtime and provided a more controlled method of loosening and tightening the bolts. The ZU4T-Series torque wrench pump programmable torque output settings ensured the bolts were tightened with the appropriate amount of torque.

**Products:** S1500 Hydraulic Torque Wrench,  
ZU4T-Series, Electric Torque Wrench Pump



## Lifting a Reclaimer Stacker for Bearing Replacement



**Customer:** Vale Vitória

**Location:** Vitória, Espírito Santo, Brazil

**Challenge:** The main bearing on a Bardella iron ore reclaimer stacker needed to be replaced. Safely replacing the bearing without injury or damaging the stacker required lifting the 470 metric ton stacker approximately 400 mm (15.74 inches) while maintaining the machine's center of gravity.

**Solution:** Vale Vitória utilized a four point EVO Synchronous Lifting System and four hydraulic cylinders to lift and lower the stacker 400 mm. The EVO system provided the ability to synchronize and control each lifting point and monitor the load's center of gravity from a touchscreen display interface. A centralized control unit allowed the maintenance team to perform the lifting and lowering operations from a safe distance of 30 meters from the load. In collaboration with Rotec Equipamentos, Vale Vitória was able to replace the stacker's bearing without injury or damage, and within the scheduled timeframe.

**Products:** 4-point EVO-Series, Synchronous Lifting System



## Removing the Wheel Studs on a Caterpillar 777 Dump Truck

**Customer:** Caterpillar Barloworld Equipment

**Location:** Pretoria, South Africa

**Challenge:** Loose wheel studs on Caterpillar 777 dump truck were increasing the vehicle's downtime and needed to be removed and replaced. The current method of removal used a cutting torch which was unsafe and would damage the main structure of the wheel.

**Solution:** An A-210 C-Clamp and RC-Series hydraulic cylinder safely removed the wheel studs with ease. Preventing future issues with loose studs required applying the appropriate amount of torque to each stud. An S-Series hydraulic torque wrench was used to torque the studs properly. The hydraulic equipment supplied reduced the truck's downtime by improving the ease, speed and safety of the required repair.

**Products:** A-210 C-Clamp Press,  
RC-Series, General Purpose Cylinder,  
S1500 Hydraulic Torque Wrench



## Lifting a Coker for Base Repair Maintenance



**Customer:** Oil Sands refinery in Alberta

**Location:** Ft. McMurray, Alberta, Canada

**Challenge:** The base below a coker at a refinery in the Oil Sands needed to be repaired in order to stabilize the foundation. In order to perform the base repair maintenance the massive vessel needed to be lifted approximately 100 mm. Lifting a vessel weighing 600 tons, 9m in diameter and 40m tall required a solution with a high degree of safety, capable of maintaining the balance of the load throughout the lift.

**Solution:** Enerpac worked closely with the local distributor, HyPower Systems, and the site contractor to design a system to lift the coker with the highest degree of safety. To ensure operation in cold temperatures a custom synchronous lifting system was developed. The lift system included eight CLRG high tonnage hydraulic cylinders with stroke sensors and custom cold-weather cables, manifolds, load holding valves, artic hydraulic oil and a hydraulic power unit. HyPower Systems on-site training, supervision, and 24 hour technical support, along with close collaboration with Enerpac ensured the custom Sync-Lift system completed the lift successfully.

**Products:** Custom Synchronous Lifting System, CLRG-Series High Tonnage Hydraulic Cylinders



## Lifting and Lowering Massive Conveyor Sections

**Customer:** Mammoet

**Location:** Rio Tinto Mine, Western Australia

**Challenge:** To lift and lower into place large conveyor sections for more efficient installation procedures. Mammoet, a leading heavy lifting and multimodal transport solutions specialist needed to install 98 large conveyor sections as part of Rio Tinto's Western Turner Syncline Project, at their open pit mine 20km northwest of Tom Price, in the outback of Western Australia.

**Solution:** Enerpac helped Mammoet achieve a 4X productivity increase by delivering two, stage lifting sets both consisting of four BLS506 cylinders operated by a ZE split flow pump. With Enerpac's system, Mammoet was able to significantly increase its conveyor installation rate lowering four conveyor sections per day and increasing their efficiency fourfold, despite the rugged conditions of the site.

**Products:** Split-Flow Pump (based on ZE-Series),  
BLS506 Climbing Jacks



## Technology achievements abound as Enerpac Strand Lifting safely hoists massive iron ore mills



**Customer:** CITIC Pacific Mining and VDM Group

**Location:** Western Australia

An Enerpac Strand Lift system capable of safely positioning huge loads to accuracies within fractions of a millimeter is being employed by VDM Group in constructing Australia's largest-ever magnetite mining and processing operation.

CITIC Pacific Mining's \$US4 billion Sino Iron Ore project in Western Australia involves 12 of the biggest iron ore processing mills ever built, which are manufactured in China and transported in sub-assembly form for precision positioning onto their bearings 21 metres above the ground.

It is the first time iron ore processing mills have been fabricated in a factory in China and transported internationally, traveling by sea and road for rapid assembly at a destination more than 7000 km distant and in the process achieving huge time savings over on-site fabrication.

**Products:** HSL-Series Heavy Lifting Strand Jacks, Strand Recoiler, Palm Tree and Control Systems  
SLPP-Serie, Hydraulic Power Packs  
SCC Smart Cylinder Control



## Undecking an Electric Rope Shovel

**Customer:** P&H MinePro

**Location:** Chile

P&H MinePro® Chile services some of the biggest equipment around. The company knows from experience the complexity, difficulty, and safety concerns that arise when doing a multipoint lift of heavy equipment. When MinePro needed a new hydraulic lifting system capable of high capacity and high accuracy that could be safely and easily controlled by operators, it turned to Enerpac Heavy Lifting for a digitally controlled lifting system.

The hydraulic system configured for MinePro consists of four, 500-ton double-acting cylinders with a 72 inch stroke, laser position sensors, hydraulic power unit, electrical controllers and operator interface. MinePro has integrated this system into both bracket-type and large frame-type lifting apparatus designed to lift shovels in the P&H 2800 and 4100 families.

**Products:** High Tonnage Cylinders  
PLC-Controlled Synchronous Lift System



## Lifting 5000 ton Coal Mine Excavator



**Customer:** Hydraulic and Pneumatic Pty Ltd & Plant Performance Group Pty Ltd

**Location:** Australia

One of the world's most advanced heavy lifting systems has been deployed in Australia to maximise safety and precision during maintenance of a huge dredger at the largest coal mine in the Southern Hemisphere.

The PLC controlled Enerpac Synchronous Lifting system was used by Hydraulic and Pneumatic Pty Ltd of Morwell in conjunction with Plant Performance Group Pty Ltd to enhance precision and safety while monitoring the 2200-ton load's centre of gravity during the lift on Dredger 16 at Loy Yang Power.

Dredger 16 is longer than the MCG (200 metres), as high as a 16-storey building (55 metres) and has a slew ring bearing 15,2 metres in diameter containing 177 balls of 200mm diameter each weighing 32 kg. It weighs a total of more than 5000 tons and can remove 60.000 tons of overburden a day.

**Products:** PLC-Controlled Synchronous Lifting System  
6x 630 ton Hydraulic Cylinders



## Lifting a 3500 ton Mining Dragline for Maintenance

**Customer:** G&S Engineering Services

**Location:** Curragh Coal Mine, Bowen Basin, Australia

Synchronous safety on huge walking dragline reveals efficiency and control benefits for many industries

One of the world's largest precision lifting tasks of land-based equipment has been successfully undertaken in Australia. An Enerpac synchronous hydraulic lifting system has been employed by G&S Engineering Services in Queensland to lift, within tolerances of 0,5 mm, a huge mining dragline weighing more than 3500 tons.

The PLC-controlled precision hydraulic system was used to lift the dragline for essential maintenance of the bearing surfaces on which the dragline swivels.

It also delicately tilted the huge suspended weight to simulate different loads on the structure so bearing surfaces could be precisely machined to accommodate them and maximise the bearing surfaces' lifespan.

G&S Engineering Services used the PLC-controlled Enerpac synchronous hydraulic lifting system to simultaneously control 80 x 100-ton capacity hydraulic cylinders used to lift the dragline at Curragh Coal mine in the Bowen Basin in July.

**Products:** PLC-Controlled Synchronous Weighing and Lifting System  
80 x 100-ton Hydraulic Cylinders



## Lifting Heavy Mining Trucks Quickly and Safely using Self-Locking POW'R-Lock™ Mobile Lift System



**Customer:** Kal Tire and SMS

**Location:** Fort McMurray, Canada

**Challenge:** Lifting trucks for maintenance and repair at mining sites and in the shop is a common occurrence. Safety while performing these operations is always a concern, and it's also important to do the job efficiently and quickly.

**Solution:** The Pow'R-Lock™ offers continuous load locking technology and provides locking protection during lift, lower and hold functions. It is easily maneuvered into position and with the simple 2-button remote pendant it can raise and lower from up to 20 feet away. The unit also meets the standards required to be used as a jack stand, which means, no secondary jack stands need to be moved into place under the truck after it is lifted by the Pow'R-LOCK™. This makes the process more efficient, thus saving time and money.

**Products:** PL-Series, POW'R LOCK™ Self-Locking Mobile Lifting System







**Find a location near you!**



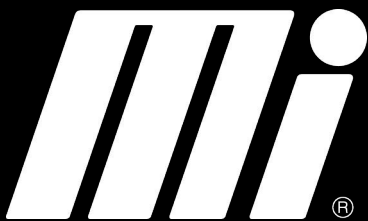
### **Mi Fluid Power Solutions**

Looking for specialized solutions for fluid power operations? Talk to the experts at Mi Fluid Power Solutions for expertise related to hydraulic power units, gearbox, and cylinder repair.

To view locations, scan QR Code or go to: [qrco.de/bd4Ofp](https://qrco.de/bd4Ofp)



© 2022 Motion



**MORE CHOICES. MORE INVENTORY. MORE EXPERTISE.**