NORD-LOCK GROUP

SUPERBOLT®
PRESS APPLICATIONS

POWER IN SIMPLICITY

AEHH
AIR*ELECTRIC*HYDRAULIC AND HOIST LLC
Applying Innovation to Manufacturing
Engineered Fastening Solutions Group

AUTHORIZED DISTRIBUTOR OF
SUPERBOLT®

THE ULTIMATE SOLUTION FOR BOLTED JOINTS

The Nord-Lock Group has been manufacturing safe and secure bolting solutions since 1982. Our innovative solutions include wedge-locking technology and Superbolt tensioners.

Bolting applications for presses can be especially challenging. You need a bolting solution that can be installed and removed safely and quickly. One that will keep your bolted joints tight through demanding operations and improve your bottom line. That's where Superbolt tensioners come in.

On the following pages you will see several examples of bolting problems solved with Superbolt tensioners from the Nord-Lock Group. In addition to Superbolt products, we offer wedge-locking solutions, expansion bolts, studs, and more. We look forward to working with you on your critical bolting applications.

CHALLENGE

Bolts with a diameter greater than 1” cannot be effectively torqued to capacity with hand tools. To achieve high preload levels, some form of high energy equipment is required. Slugging wrenches and crane wrenches are dangerous and thermal tightening can be time consuming. Hydraulic wrenching can be expensive, time consuming, inaccurate and it often leads to thread galling problems. Hydraulic tensioning also shares the same disadvantages and is additionally difficult to retrofit when out in the field.

SOLUTION

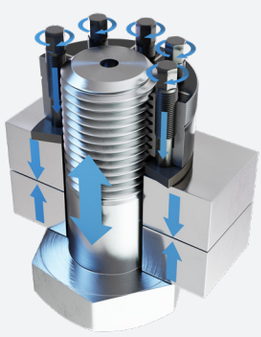
Superbolt tensioners are designed as direct replacements for standard bolting. They can be threaded onto a new or existing bolt, stud, threaded rod or shaft. With Superbolt tensioners, bolting is fast, safe, easy and accurate - only hand tools are required.

Superbolt vs. Hydraulic Wrench:
With a hydraulic wrench one would need 18,925 lb•ft (22,500 Nm) of torque to stress a 3” stud to 428,400 lbs (1,950 kN) using a hex nut. With a 3” MTX Superbolt tensioner, only 114 lb•ft (154 Nm) on each of the jackbolts is needed to produce the same bolt load.

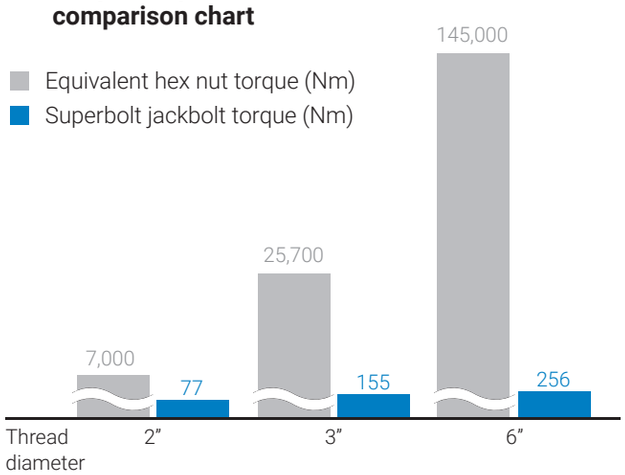
How it works

The hardened washer is installed first to protect the joint surface. The Superbolt tensioner is spun on hand tight, for positioning.

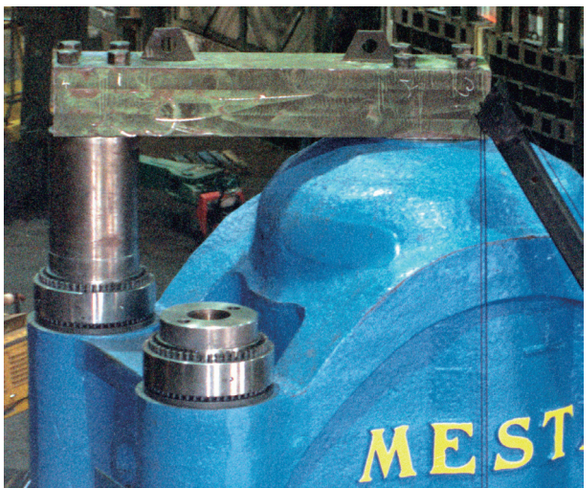
Easy turn jackbolts “push” the nut body up, tightening the existing bolt or stud in pure tension.



Torque vs. preload comparison chart



PRESS COLUMNS



3,250 ton Mesta forging press. 18" Thrust Collar style tensioners (no column threads).

CHALLENGE

Due to the nature of big presses, large diameter columns must be used to distribute the extremely high working loads generated. However, the torque required to prestress these columns is almost impossible to achieve with conventional bolting methods.

Traditionally, sledgehammers, overhead cranes, or stud heaters are used. These methods are inaccurate, ineffective, time consuming and are a safety hazard. Sufficient and accurate preload is difficult to achieve on small presses and nearly impossible on larger presses. If the columns are not properly prestressed, fatigue fractures can occur.

SOLUTION

Superbolt tensioners are designed as direct replacements for the OEM nuts, and are being used by press OEM companies, press repair shops, and end users. Only ordinary hand torque wrenches are required to properly prestress any size press column.

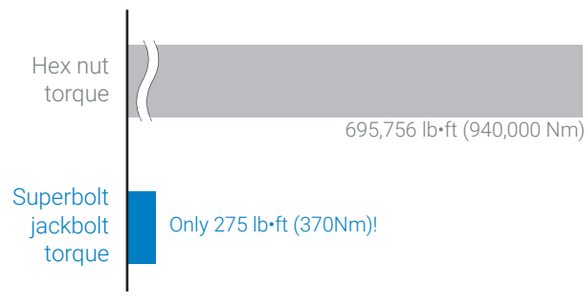
The entire operation can be performed safely by a single man in a fraction of the time it takes to use traditional tightening methods. The Mesta Press shown required less than 6 hours installation time with only 1 man for all 8 nuts vs. the 2-1/2 full days it previously took with additional personnel.

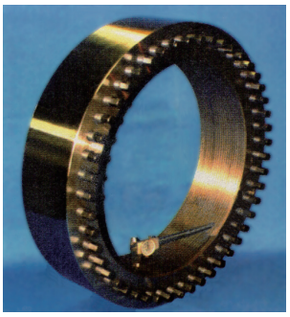
Removal is also a simple task. Tensioners will not gall the main column thread during removal. Once the preload is relieved by loosening the jackbolts, the tensioner easily spins off!

2,500 ton forging press with 15-3/4" diameter Superbolt tensioners.

5,000 ton forging press with 20" diameter Superbolt MT tensioners.

A comparison of torque requirement for 18" nut
Preload = 2,625,000 lbs (11,700 kN)



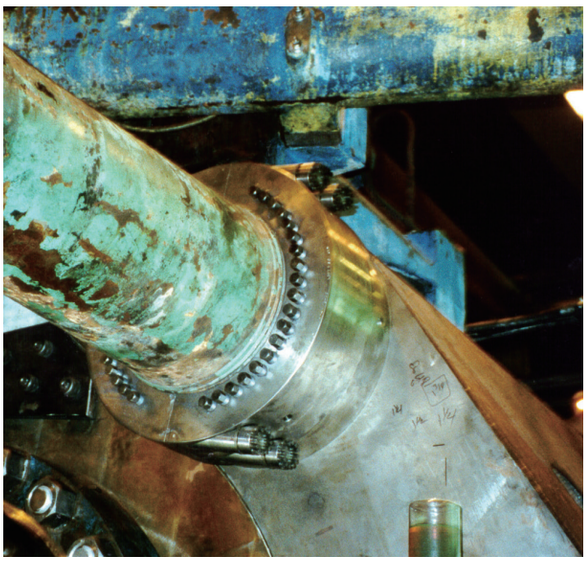


18" Superbolt tensioner creates 2,625,000 lbs (11,700 kN) of preload with only 275 lb•ft (370 Nm) of torque.

4,250 TON ALUMINIUM EXTRUSION PRESS

CHALLENGE

This customer traditionally used the press force to prestress the columns. To remove the nuts, the press is loaded to 110% of the press rated load and the split column nuts are removed. In this case, there was a failure in the hydraulic cylinder and the press could not be used to unload the column nuts. The nuts were burned off, which took 2 days.

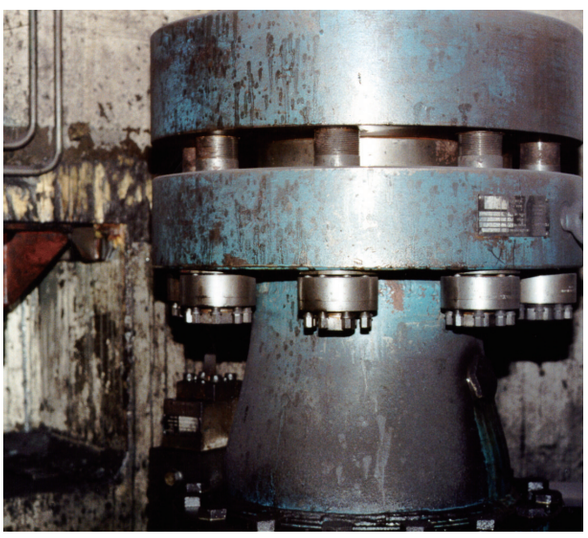


SOLUTION

The old cast steel split column nuts were replaced with split tensioners from Superbolt. The preload was achieved by loading the press to 110% of working load and some additional preload was achieved by torquing the jackbolts of the tensioners to 100 lb•ft (140 Nm). Without hydraulic help from the main cylinder, the jackbolts would have to be torqued to 460 lb•ft (620 Nm) to achieve equivalent total preload of 3,500,000 lbs (15,000 kN). The tensioner halves were held together with 1-1/2" high powered Superbolt bolt style tensioners. In the future, the column tensioners can be unloaded without the hydraulic help of the main cylinder by simply untorquing the jackbolts.

HYDRAULIC PRESSES FOR HIGH PRESSURE PIPING

Main hydraulic line - pre-fill and decompression valve.



Hydraulic line - main ram.

STAMPING PRESS

CHALLENGE

This stamping press sticks in a down position. To release the press, you must loosen the tie rods. This can be expensive, hazardous and time consuming, requiring 8 - 12 hours of downtime.

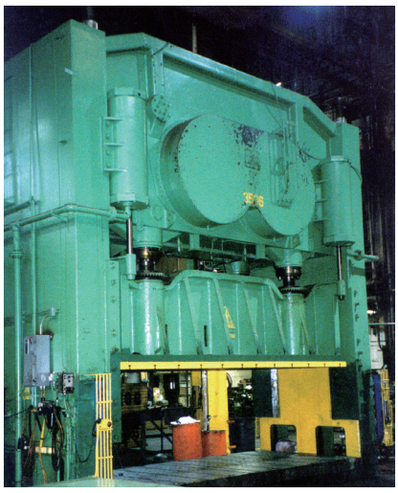
Rebuild, repair or adjustment of the press:

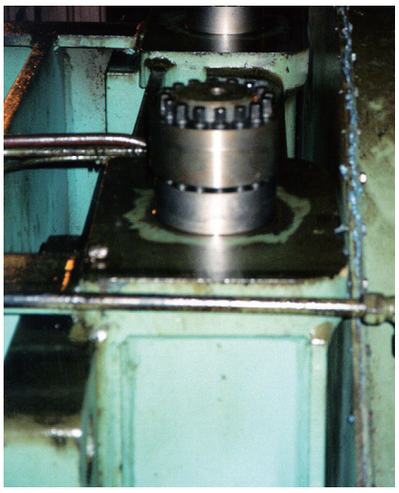
- Thread galling and tie rod damage.
- Requires heating rods, slug wrenches and heavy impact wrenches.

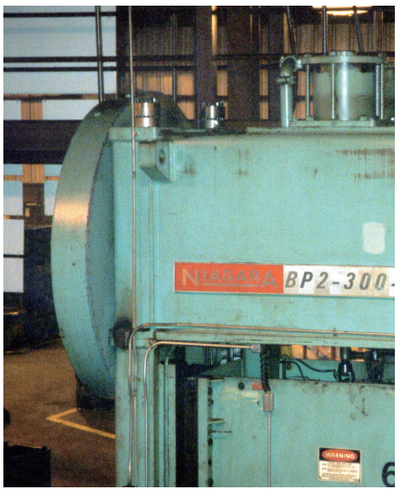
SOLUTION

Superbolt multi-jackbolt tensioners were installed, resulting in the following:

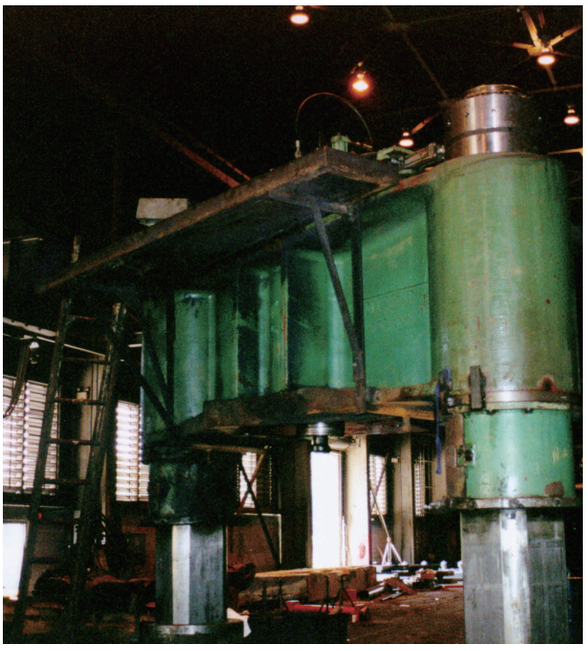
- Backing off jackbolts loosens press sufficiently to free it from down positions.
- Jackbolts used to develop preload in pure tension.
- Requires simple hand tools, eliminating unsafe, time consuming bolting methods.
- Greatly reduces installation and removal times
- Eliminates thread galling and stud damage.







HYDRAULIC FORGING PRESS

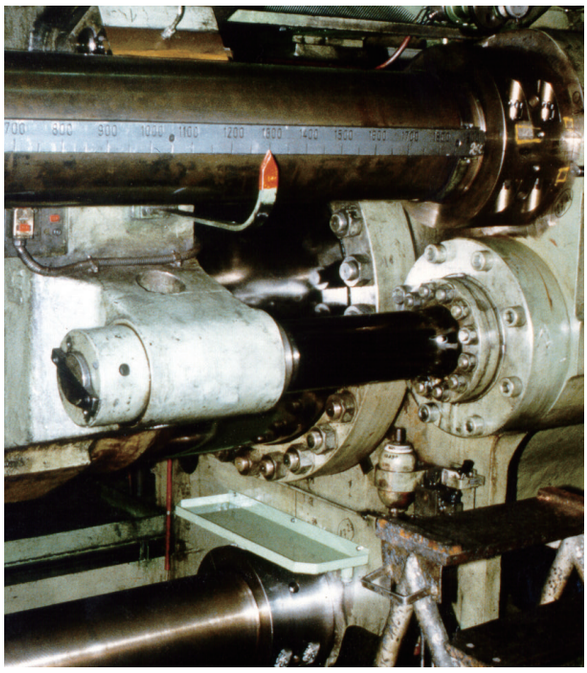


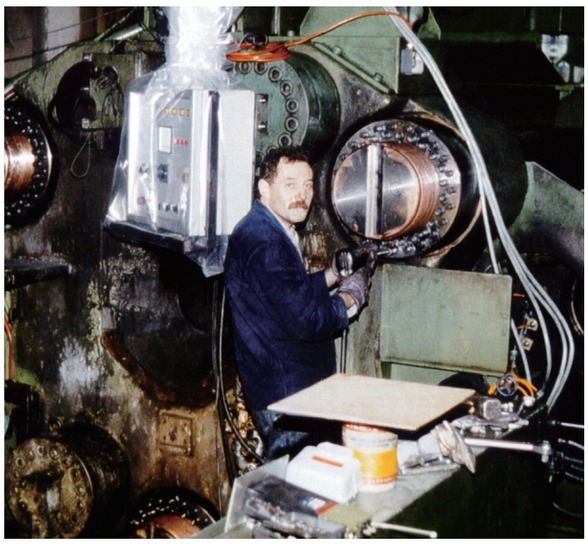
Superbolt nut style tensioners on 400 mm (approx. 15.75”) columns for a 1,500 ton underground hydraulic forging press.

4,250 TON ALUMINIUM EXTRUSION PRESS

CHALLENGE

The press columns failed twice and had to be totally replaced. The insurance company did not want to insure the press anymore unless the machine was correctly pretensioned.





SOLUTION

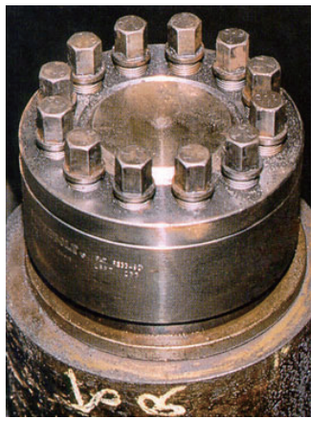
The press was modified. The existing columns were checked and can be reused. On both sides the columns are stretched by Superbolt multi-jackbolt tensioners. The higher preload can now safely take up the heavy loads of the machine. There has not been one failure since the press was modified.

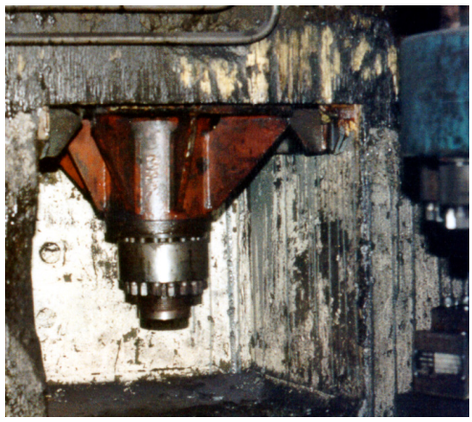
Installation: Complete reconstruction including 6 pieces of MTS355x12/W-Special.

PRESS ANCHORBOLTS

This 2,000 ton hydraulic press is utilizing a 3" - 8 tpi Superbolt tensioner on the anchorbolt. The Superbolt tensioner can be safely installed and removed with only hand tools.

Preload = 379,000 lbs (1,700kN)
Superbolt jackbolt torque = 205 lb•ft (280 Nm)
Equivalent hex nut torque = 16,750 lb•ft (22,700 Nm)





3-1/2" - 8 tpi Superbolt tensioner on the anchorbolt for this 1,500 ton hydraulic press.

Preload = 525,000 lbs (2,300 kN)
Superbolt jackbolt torque = 215 lb•ft (290 Nm)
Equivalent hex nut torque = 27,050 lb•ft (36,700 Nm)

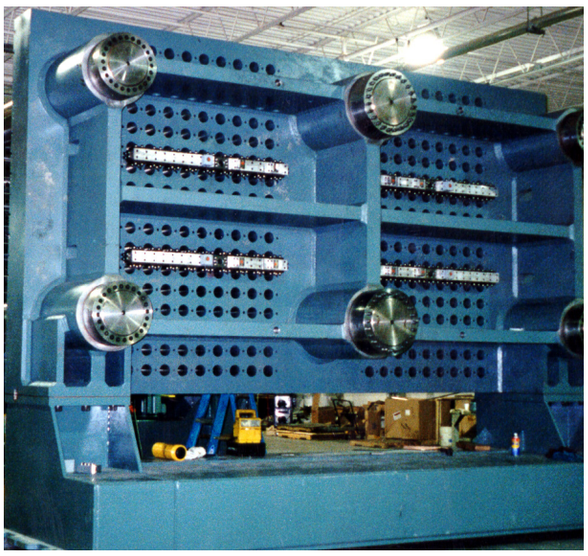
INJECTION MOLDING PRESS

CHALLENGE

Due to the large size of the tensioners the OEM had to incorporate the use of special devices to tension the nuts properly. Overhead cranes and large cumbersome hydraulic tools were also needed. This method was unsafe and time consuming. It took two men 21 hours for installation and removal time was 25 hours.

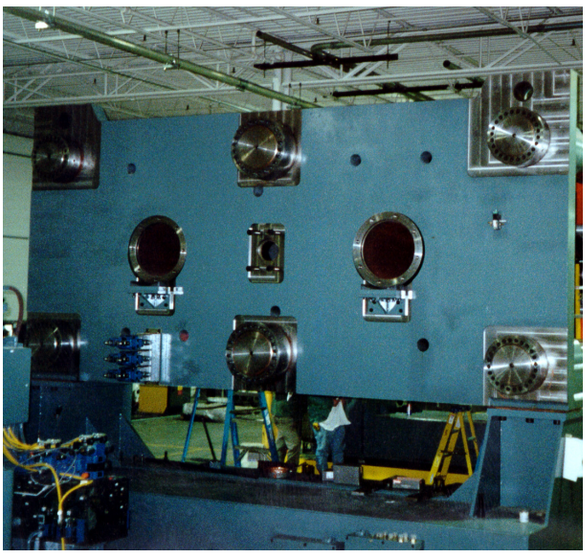
SOLUTION

Superbolt tensioners were installed using a 3/4" air impact and hand held torque wrench. Installation was accomplished by two men in two hours. Removal time was the same.



14-1/2" thread diameter

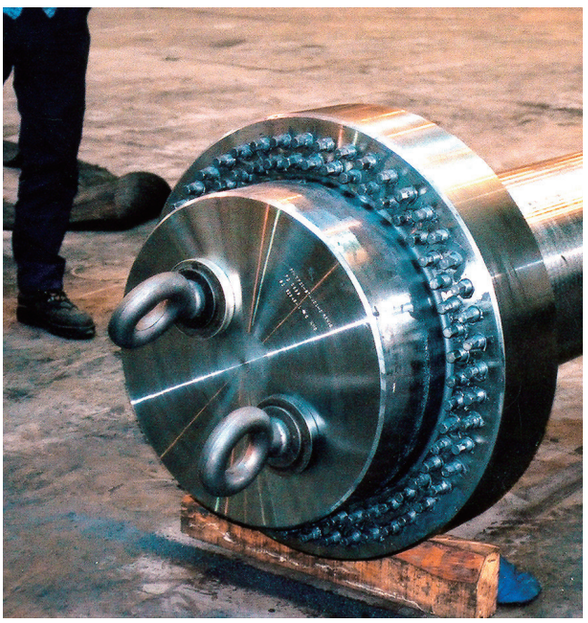
Preload = 1,300,000 lbs (5,800 kN)
Superbolt jackbolt torque = 270 lb•ft (370 Nm)
Equiv. hex nut torque = 277,570 lb•ft (376,300 Nm)



12" thread diameter

Preload = 775,000 lbs (3,400 kN)
Superbolt jackbolt torque = 250 lb•ft (340 Nm)
Equiv. hex nut torque = 136,940 lb•ft (185,600 Nm)

FORGING PRESS - 40 FT. LONG BOLTS



Pictured above is a 2 column, 4,500 ton hydraulic open die forging press. The press columns are tightened by 20" diameter Superbolt bolt style tensioners that are approximately 40 ft. long. These are the largest Superbolt bolt style tensioners in the world.

HEPBURN PRESS

CHALLENGE

In order to properly torque the standard nuts that were formerly used on this application, heating rods were used. This method of bolting is inaccurate, time consuming and unsafe.

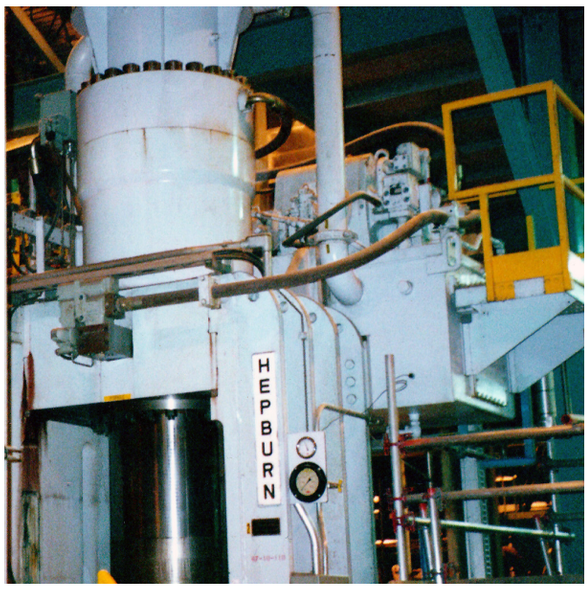
Due to improper bolt loading, oil seeped up the stud holes and between sealing surfaces (the latter causing damage to the mating surfaces).

Average installation time: 8 hours

SOLUTION

Superbolt nut style tensioners eliminated the need for dangerous methods of installation, creating a desired amount of torque using only simple hand tools!

Because of even tension around the flange and proper bolt load provided by the multi-jackbolt tensioners, oil waste was eliminated.



PANEL PRESS

This 2,000 ton panel press was difficult to access for the large diameter bolting. Superbolt tensioners eliminated the tooling accessibility problems while providing safe and accurate tensioning.

8,000 TON FORGING PRESS

How do you hold together a press which exerts 8,000 tons of pressure to shape red-hot pieces of metal which themselves weigh tens of tons? For A. Finkl & Sons, a leading supplier of forging die steels and custom open-die forgings, there was only one answer: Superbolt.

Finkl, a stalwart of the US steel industry based in Chicago, wanted a new press for its new $150m steel manufacturing campus and decided to design it in-house, from scratch. When it came to the tensioning of the four huge 750 mm diameter press columns, Finkl wanted an alternative to existing methods such as thermal heating and hydraulic tensioning, which are often difficult to use, time consuming and potentially dangerous.

Finkl turned to Superbolt, their trusted supplier of bolt securing solutions for over a decade. Engineers from the Nord-Lock Group came up with a patented Superbolt Split-Nut Thrust Collar (STC). The STC consists of a threadless thrust collar with jackbolts threaded through, while a split-nut is fitted above the collar, and clamped together with small multi-jackbolt tensioners. The press' eight STCs allow for very defined prestress on the columns and enable easy installation and removal, using only small tools. The result is yet another satisfied customer using Superbolt.

400 TON DANLY BLANKING PRESS

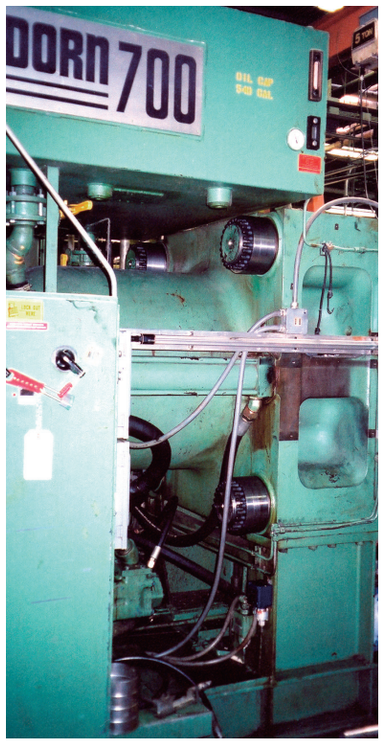
6” Tie Rod Nuts. Jackbolt torque is only 163 lb•ft (220 Nm), making installation and removal safe and easy!

6” diameter Superbolt MT tensioner, with optional ring.

ADDITIONAL PRESS APPLICATION EXAMPLES

6-3/4” tensioners on hydraulic press eliminates loosening of nuts which caused column failures in the past.

Forging press columns tensioned by 16-1/2” Superbolt split nuts.



6-1/2” MTX Tensioners on an injection molding machine.

POWER IN EXPERIENCE

Decades of experience have gotten us to the top of the tensioning industry. Our experts bring practicality and a can-do mentality to conquer real-world bolting challenges, from outer space to subsea. We work with you on identifying the best solution for your application. Count on Superbolt's expertise in every step of your journey, including after-market support.

- Global distribution network combined with local service and support
- Dedicated tech centers equipped with advanced tools and resources to support finding the most effective solutions
- Ongoing investment in growing our technical support network for faster turnaround and elevated support
- Fully-equipped labs enable rigorous testing, validation, and analysis to ensure our products perform under diverse conditions
- Receive after-market application support and service from our global network of sales teams
- Our skilled engineers can perform a thorough investigation of your bolted joints, including real-life tests or validation
- Commitment to innovating and improving our product offering to meet industry demands

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LIFETIME WARRANTY
NORD-LOCK GROUP

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