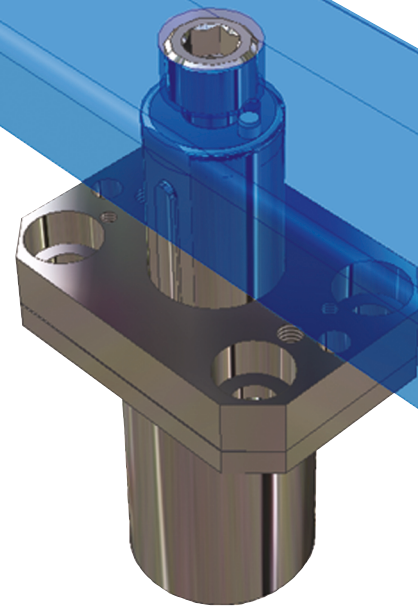


# NITROGEN GAS

# LIFTERS



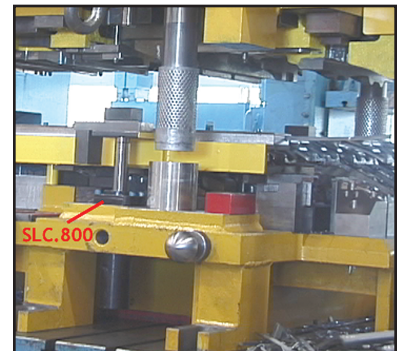
Today products with the ability to “multi-task,” combining multiple functions into one product, are in demand as the metal forming industry searches for innovative ways to reduce die construction costs while maintaining part quality. Specifically, die builders have requested nitrogen gas springs that combine the function of lift with built-in guidance. In response to these requests DADCO, Inc., a leading nitrogen gas spring manufacturer located in Plymouth, Michigan, has developed a line of nitrogen gas spring lifters that multi-task. These new products: the SLC.800, SLN.300, SLN.090 and the SL.16 provide the metal forming industry with innovative, cost-effective solutions to lifting in die operations.

## SLC.800 Nitrogen Gas Spring Rail Lifter

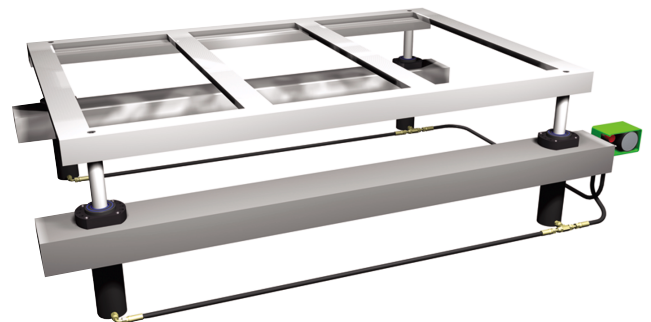
In 2002 a premier die builder in west Michigan approached DADCO with a request for a nitrogen gas spring lifter that would provide built-in guidance as well as uniform lifting force when used in a rail lift system. Armed with input from the die builder, DADCO engineers conceptualized the SLC.800. After a rapid development period, the resulting product is a linked nitrogen gas spring lifter with built-in guidance and an internal cushion. The SLC.800 Nitrogen Gas Spring Rail Lifter facilitates smooth operation at high production rates, leading to improved part handling. The lifter's operational control is obtained with an internal cushion to decelerate the load; preventing rail impact and vibration, issues that stampers often encounter with custom designed lifter systems. Additional internal guidance assures stable lifting.



Typically installed in progressive die lifter rail applications, the SLC.800 operates exclusively in a linked system to ensure equal force and reaction during operation. A narrow flange mount is supplied as standard for installation, and a dowel hole located at the rod end allows for easy alignment to lifter rails. DADCO's SLC.800 lifter may be charged to 1000 psi with stroke lengths of 50 – 150 mm and forces on contact ranging from 395 lb. to 1580 lb. The SLC.800's design provides a unique all-in-one package eliminating the need for separate guidance components, thereby reducing overall construction costs.



DADCO's SLC.800 installed in a progressive die at Synergis Technologies Group.

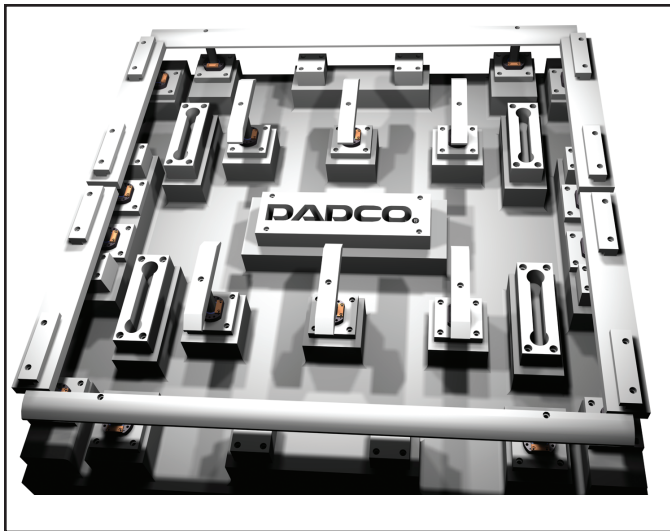


Application illustrated above depicts four linked SLC.800's returning and supporting a strip guide and lifting frame.

## SLN.300 Non-Rotating Nitrogen Gas Lifter

Upon completion of the SLC.800 DADCO's engineers turned their attention to an Ohio progressive die builder's request for a non-rotating nitrogen gas spring lifter. Designed with progressive stamping tools in mind, DADCO's non-rotating SLN.300 lifter eliminates the need for additional guidance components. The non-rotating lift is achieved with an inverted gas spring housed inside a keyed guide rod to provide reliable and adjustable lifting force. The need for additional guidance components is further reduced with the SLN.300's extended guide rod bushing that provides increased stability.

This compact unit can save die builders additional cost. Pete Everett of Rite Tool & Die explains, "We had a progressive die that was lifting two parts, we needed to change it to lift four. By bolting on some more rails and switching to the SLN.300 stock lifters, we were able to avoid fabricating a new assembly, which saved us about 50% or more in labor costs." Tom Gay, Engineering



Application illustrated above depicts eighteen SLN.300's as support lifters in a progressive stamping tool.

Manager at Lansing Tool and Engineering, also reported a cost savings with the SLN.300 lifter. "In one die we are working on, we are able to save assembly time by boring four holes and dropping in the SLN.300 lifters. Prior to the lifters, we would have had to bore at least eight holes, install bushings, etc. Once we got familiar with the product we really liked it, and have had no complaints."



DADCO's multi-tasking SLN.300 lifter operates self-contained and features an extended guide rod for attaching lifting structures. This lifter is available in a 1/3-ton force model with on-contact forces ranging from 77 lb. to 667 lb. and comes standard with a keyed narrow flange mount.

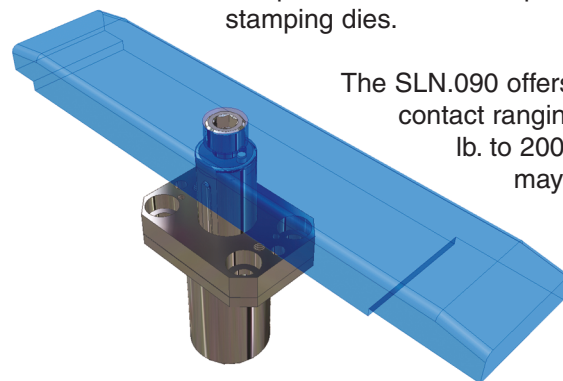
## SLN.090 Micro Nitrogen Gas Lifter

After the SLN.300 Non-Rotating Nitrogen Gas Lifter was released to the market another need was expressed to DADCO. Die builders and stampers were interested in a lifter unit with the same multi-tasking features as the SLN.300 but with less force and a more compact profile. DADCO responded immediately, having anticipated this potential need, with the design of its new SLN.090 Micro Nitrogen Gas Lifter.

In order to optimize the new product's design DADCO sought unprecedented customer input through a process of prototype test marketing. Customer feedback was reviewed by DADCO's engineering team and incorporated into the ultimate design. In June of 2004, DADCO's SLN.090 Micro Nitrogen Gas Lifter was launched. The SLN.090 is similar to DADCO's other lifter units, providing an all-in-one approach to guided lift applications, but in a much smaller package. As a direct result of customer input during the design phase, DADCO offers two guide rod options, basic and slotted, so the unit can be used for single point, multiple point or rail lifter applications.

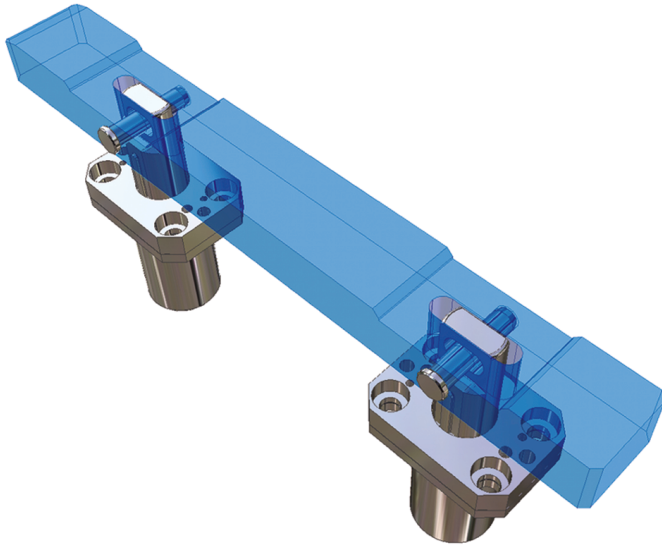
The SLN.090 is powered by DADCO's popular Micro 90™ nitrogen gas spring housed inside the guide rod. This innovative design provides reliable lifting force and facilitates a quick and easy three-step repair. The SLN.090 eliminates the need for external guidance components, with a double-keyed guide rod that prevents rotation.

This compact lifter is ideal for progressive stamping dies.



The SLN.090 offers forces on contact ranging from 40 lb. to 200 lb. and may be adjusted to meet individual

SLN.090.B is ideal for single point lifting of balanced loads, providing bearing support, non-rotation and lifting force all in one.



The SLN.090.S slotted rod end design allows for slight misalignment during operation, the elongated hole in the rod minimizes binding.

requirements. Guidelines for the attachment mass relative to the application speed are provided in DADCO's comprehensive four-page bulletin. Available with stroke lengths from 25 to 125 mm the SLN.090 comes standard with a keyed narrow flange mount.

While many metalformers have requested lifters that can handle large part lifting, other customers have expressed the need for a small lifter that will fit into tight locations and serve as a part ejector. Many die builders and stampers have expressed their desire to have an alternative to traditional spring plungers, something with more force in a smaller package.

### SL.16 Nitrogen Gas Stock Lifter

In use at the Wayne, MI, stamping and assembly plant of Ford Motor Co. DADCO's SL.16 Nitrogen Gas Spring Stock Lifter provides increased force (from 13 to 115 lb. on-contact) over traditional spring plungers in a compact envelope. The lifter features an M16 x 1.5-in. threaded body for simple installation in existing pockets. An integral hex drive at the rod end of the cylinder provides a reliable method for installation and removal. Ford-Wayne installed seven of the SL.16 lifters on a fender-forming die for the Focus automobile, run on a tandem line designed to operate at 18 strokes/min. "Running that die with standard spring-loaded plungers," says Leon Walsh, die-room



superintendent, "we weren't getting a consistent break in the vacuum and the panels would bounce around. The pins on the plungers were getting weak. This caused us to slow the automation down on the line, and run at only 12 strokes/min. We were losing too much time on that line and had to do something." Since installing the SL.16 gas spring stock lifters the line is back up to 18 strokes/min.

There are many benefits to combining lift and guidance components into one multi-tasking product. Through continued innovation, new opportunities for die builders and stampers to reduce costs associated with these traditionally separate actions will continue to emerge. As the global leader in nitrogen gas spring technology, DADCO supplies the industry with products that provide unique solutions for the wide variety of applications that exist today. DADCO's new nitrogen lifters are the latest innovations from DADCO and are designed to reduce customers' costs with their multi-tasking performance.

DADCO Inc., Plymouth, MI, has maintained a proactive approach to new product development for over 45 years leading to a line of nitrogen gas springs and accessories that set and exceed industry standards. For example, DADCO's 90.9 Series redefined the meaning of compact by providing customers with a direct replacement to the ISO Standard Nitrogen Gas Springs while achieving a 2.5" to 3" height savings, while the new Ultra Force™ Nitrogen Gas Springs continue to push the envelope by further reducing shut-height while increasing tonnage. A skilled staff supports DADCO's extensive product line with technical specialists and distributors providing direct support. Along with innovative product designs, customer satisfaction is at the forefront of DADCO's operations and can be seen in DADCO's commitment to quality. DADCO strives to go beyond the expectations of its customers and the metal forming industry.

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