Nitrogen Gas Lifter Technical Data

Nitrogen Gas Lifter Installation and Operation

DADCO has established operating specifications and installation requirements for its Nitrogen Gas Lifters to help ensure customer safety and to optimize product performance. Review the guidelines in this bulletin carefully.

Operating Specifications

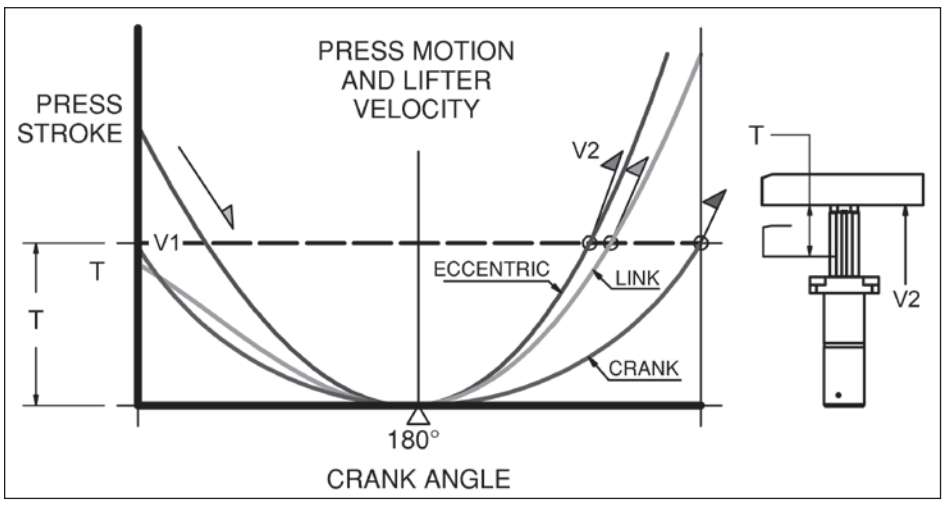
- Nitrogen is an abundant gas that does not react easily with other elements. These properties make it the ideal charging medium for gas spring lifters. **No other gas should be used.**
- Refer to the chart for the maximum charging pressure for the different gas spring lifter models. Do not exceed the maximum charging pressure.
- Operating the gas spring lifter within the specified temperature range is important to extend gas spring lifter life. For high-temperature operations contact DADCO for assistance. Immediately after prolonged operation, the outside of the gas spring lifter may be hot to touch; handle with care.
- Operating the gas spring lifters within speed limits prevents heat build-up and prolongs gas spring lifter life. For applications outside of the speed limits contact DADCO.
- TRAVEL SHOULD NOT EXCEED 90% OF STROKE.
- DESIGN ADEQUATE SAFETY SO LIFTER IS NOT OVER-STROKED.

Lifter Model	Gas Spring Used	Maximum Charging Pressure	Operating Temperature Range	Maximum Speed
SL2.090	C.090	177 bar *(2560 psi)*	4°C - 71°C *(40°F - 160°F)*	1.6 m/sec *(63 in/sec)*
SL2.180	C.180	177 bar *(2560 psi)*		
SL2.300	L.300	150 bar *(2175 psi)*		
SLN.090	C.090	177 bar *(2560 psi)*		
SLN.180	C.180	177 bar *(2560 psi)*		
SLN.300	Integral	150 bar *(2175 psi)*		
SLC.500	Integral	70 bar *(1000 psi)*		
SLC.800	Integral	70 bar *(1000 psi)*		

Maximum Velocity and Attachment Capacity Per Lifter

Ram extension velocity varies by strokes per minute, press stroke and press type. For link or eccentric type presses, the extension velocity may exceed 1.6 m/s (*63 in/s*). Using the press manufacturer's data, verify that the attachment mass does not exceed recommended limits.

Determine ram velocity and reference the recommended attachment mass per lifter. Attachment mass assumes balanced load and actuation force. Do not exceed the ram velocity per lifter. For increased capacity, install external positive stops or add more lifter units to prevent lifter damage.



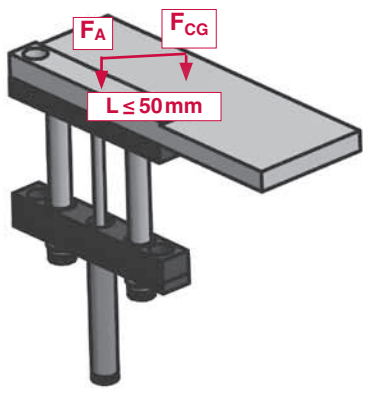
All Lifters			SL2.090 / SLN.090 / SLC.500		SL2.180 / SLN.180 / SLN.300 / SLC.800*		SL2.300	
Ram Velocity			Attachment Mass		Attachment Mass		Attachment Mass	
mm/s	fpm	in/s	kg	lbs-mass	kg	lbs-mass	kg	lbs-mass
300	59	12	20	44	31	68	46	102
400	79	16	11	25	17	38	26	57
500	98	20	7.3	16	11	24	17	37
600	118	24	5.0	11	7.7	17	12	25
700	138	28	3.7	8	5.6	12	8	19
800	157	31	2.8	6	4.3	10	6	14

**SLC.800 may have production rate limits depending upon charging pressure.*

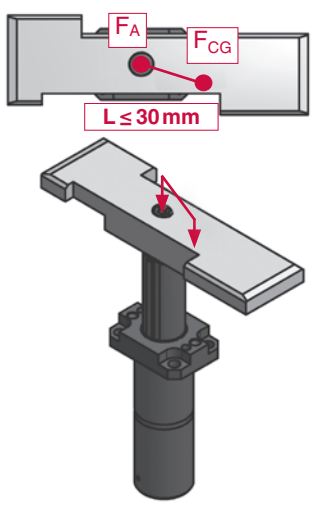
Lifter Loading and Center of Gravity

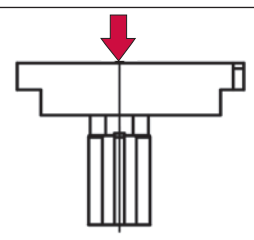
To maximize the reliability of a stand-alone lifter, actuate as close to **F_A** as possible. Good design practice should minimize **L** and locate **F_{CG}** on the centerline of the lifter. Increased wear on the bearing will occur if **L** is exceeded or if **F_A** is offset from the centerline. If a large offset is required, reduce the attachment load or add a second lifter.

SL2.090 / SL2.180 / SL2.300

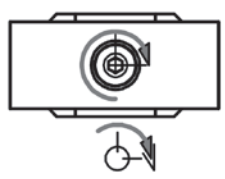


SLN.090 / SLN.180 / SLN.300

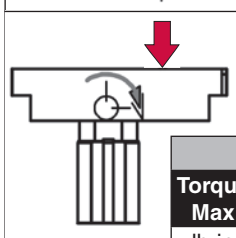




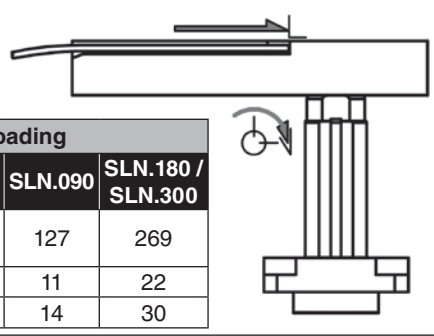
On-center loading is preferred.



Max dynamic torque 4.6 N/m *(3.3 ft-lb).*



Avoid side load and limit dynamic torque.



Dynamic Moment Loading					
Torque Max	SL2.090	SL2.180	SL2.300	SLN.090	SLN.180 / SLN.300
lb-in max	122	163	131	127	269
lb-ft	10	14	11	11	22
N.m	14	18	15	14	30

SL2 Installation Guidelines

Rails may be attached to the SL2 lifters with the two or four tapped holes on the top rail plate (Figure 1A). When using multiple lifters, key or dowel the location on only one lifter, to prevent binding (Figure 1B). The SL2 lifters may be installed using the basic installation (Figures 2A and 3A). For higher precision, install using the dimensions given in the Precise Installation (Figures 2B and 3B). The bearings will serve as dowels for the SL2.090 and SL2.180. For the SL2.300 the bearing or dowels may be used for precise location.

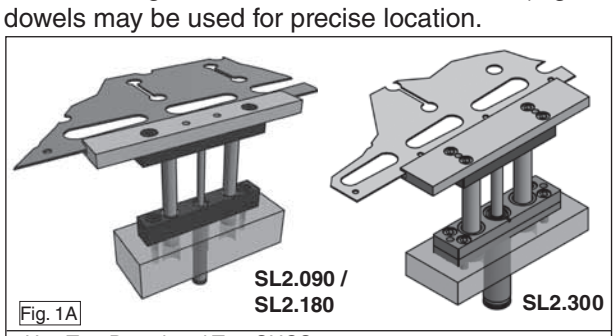


Fig. 1A

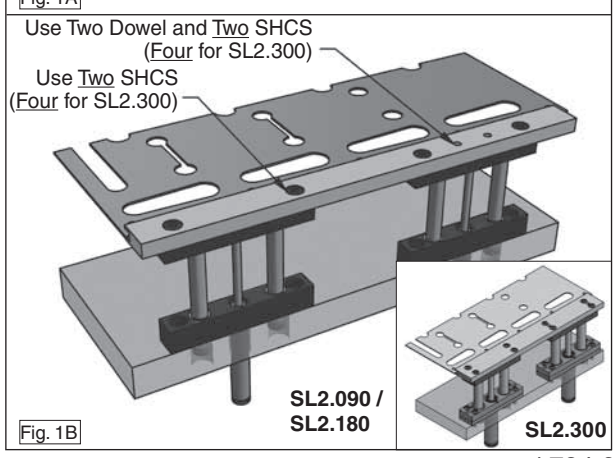
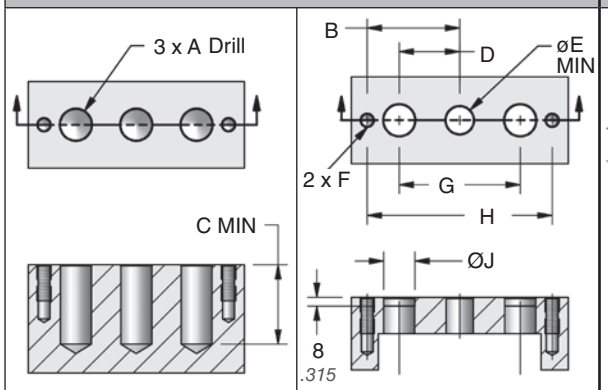


Fig. 1B

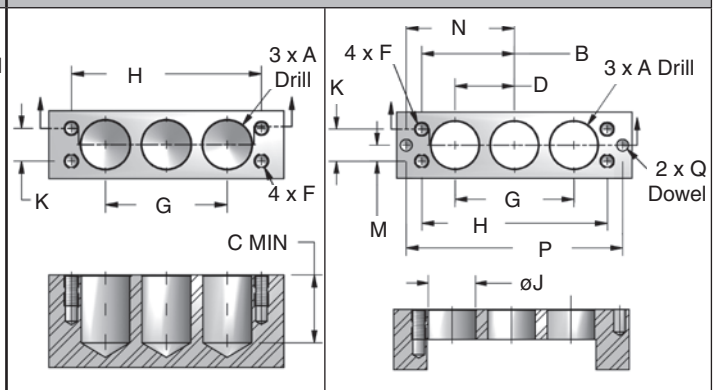
SL2.090 / SL2.180



Basic Installation Fig. 2A

Precise Installation using bearings for location. Fig. 2B

SL2.300



Basic Installation Fig. 3A

Precise Installation using dowels of bearings for location Fig. 2B

Model		A	B	D	E	F	G	H	J	K	M	N	P	Q
SL2.090	mm	ø22.5	65	42.5	19.1	M10	85	130	22H7	–	–	–	–	–
	inch	*7/8*	*2.559*	*1.673*	*.751*	*3/8"*	*3.346*	*5.118*	*.8665*					
SL2.180	mm	ø26.5	75	50	25.1	M12	100	150	26H7	–	–	–	–	–
	inch	*1-1/32*	*2.953*	*1.969*	*.988*	*1/2"*	*3.937*	*5.906*	*1.024*					
SL2.300	mm	ø40	78	50	–	M12	100	156	38H7	27	13.5	91	182	ø10
	inch	*1-9/16*	*3.071*	*1.969*		*1/2"*	*3.937*	*6.142*	*1.496*	*1.063*	*.531*	*3.583*	*7.165*	*0.394*

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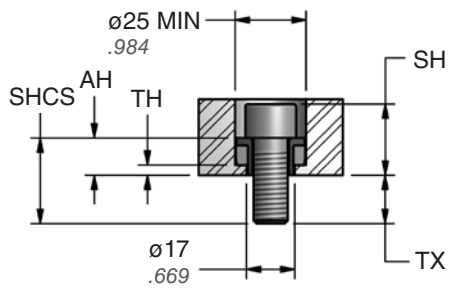
Nitrogen Gas Lifter Installation and Maintenance

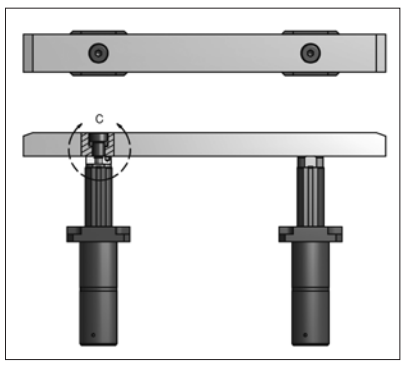
SLN Rail Attachment Principles

Rail Application for Basic Model Lifters: Rigid attachment is acceptable for single point lifts but should be avoided for rail or plate applications. Use a floating attachment method to avoid binding. Use attachment kit shown below or a similar method. Cushioned shoulder adapters may be used on either SLN or SL2 lifters. The kit allows for slight misalignment and offset forces in operation. Contact DADCO for more information.

SLN Basic Model Attachment Kit



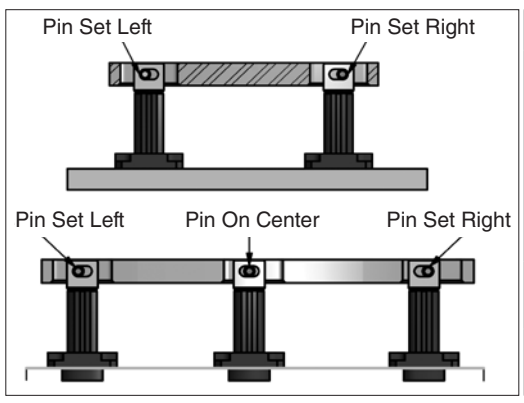
Includes cushion, shoulder spacer and 12.9 grade SHCS.



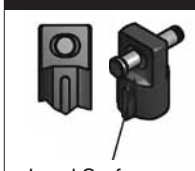
Part No.*	SHCS	AH		TH		SH		TX	
		mm	*inch*	mm	*inch*	mm	*inch*	mm	*inch*
SLN.090.CB25	M10 x 25	13	*0.51*	3.5	*0.14*	23	*0.93*	12	*0.47*
SLN.090.CB30	M10 x 30	18	*0.71*	8.5	*0.33*	28	*1.10*	12	*0.47*
SLN.090.CB35	M10 x 35	23	*0.91*	13.5	*0.53*	33	*1.30*	12	*0.47*
SLN.180.CB30	M12 x 30	13	*0.51*	3.5	*0.14*	25	*0.98*	17	*0.67*
SLN.180.CB35	M12 x 35	18	*0.71*	8.5	*0.33*	30	*1.18*	17	*0.67*
SLN.180.CB40	M12 x 40	23	*0.91*	13.5	*0.53*	35	*1.38*	17	*0.67*
SLN.180.CE12	½UNC x 1.25˝	13	*0.51*	3.5	*0.14*	25.7	*1.01*	18.8	*0.74*
SLN.180.CE15	½UNC x 1.50˝	23	*0.91*	13.5	*0.53*	35.7	*1.41*	15.1	*0.59*

**May be used in SL2 Lifter Applications.*

Rail Application for Slotted Model Lifters: The SLN.090/SLN.180 slot allows for angular misalignment. Locate pins to provide maximum angular compensation, refer to the examples provided below. Contact DADCO for more information.



Dampening Sleeve Kits



Load Surface

SLN.090.SKM/ SLN.090.SKE

SKM = 8 mm Pin
SKE = 3/8˝ Pin

Load Surface

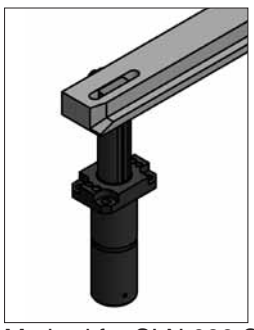
SLN.180.SKM

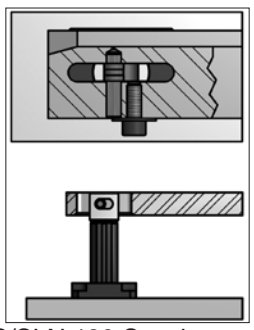
SKM = 10 mm Pin

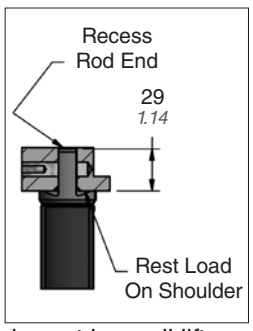
Load Surface

SLN.180.SK

SK = 10 mm or 3/8˝ Pin



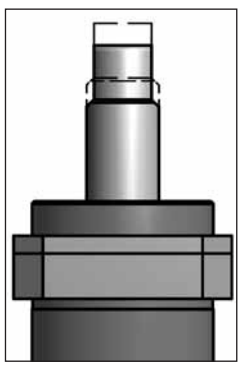


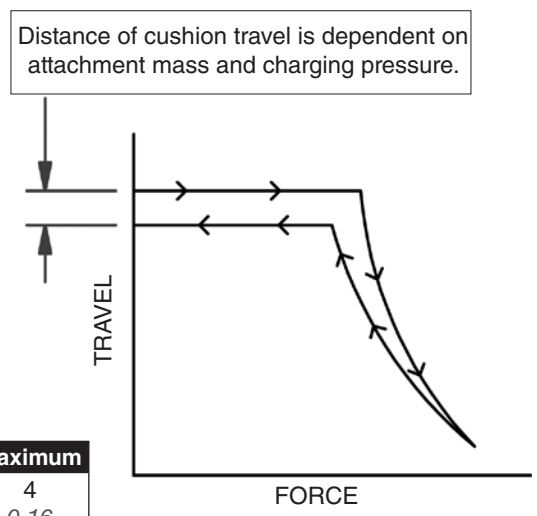


Method for SLN.090.S/SLN.180.S style attachment in a rail lift operation using a dowel pin retained by a socket head cap screw and washer. If the rail should slightly misalign, the elongated hole in the rod will minimize binding.

SLC.500/SLC.800 Internal Cushion

The SLC Lifters provide a cushioned return to decelerate the load resulting in improved part handling. Contact DADCO for more information.





Model		Minimum	Maximum
SLC.500	mm	2	4
	inch	*0.08*	*0.16*
SLC.800	mm	3	6
	inch	*0.12*	*0.24*

Service

DADCO's Nitrogen Gas Spring Lifters are repairable. DADCO supplies detailed repair instructions with each repair kit. After reviewing maintenance guide, if you require additional training or have any questions please contact DADCO.

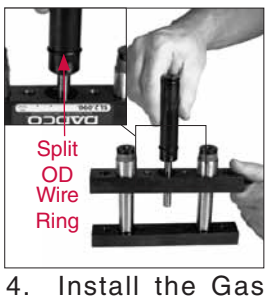
Lifter Model	Repair Kit
SL2.090	***SL2.RK.090*** *(25-125 mm stroke) or* ***SL2.RL.090*** *(150-200 mm stroke)* Repair kit includes bearings with snap rings (2), dampening devices (2) and a maintenance manual.
SL2.180	***SL2.RK.180*** *(25-125 mm stroke) or* ***SL2.RL.180*** *(150-200 mm stroke)* Repair kit includes bearings with snap rings (2), dampening devices (2) and a maintenance manual.
SL2.300	***SL2.RK.300*** Repair kit includes bearing assemblies with snap rings (2), dampening devices (2) and a maintenance manual.
SLN.090	***SLN.RK.090*** Repair kit includes bearing, piston rider, rod keys (2), assembly grease and a maintenance manual.
SLN.180	***SLN.RK.180*** Repair kit includes bearing, piston rider, rod keys (2), assembly grease and a maintenance manual.
SLN.300	***SLN.RK.300*** Repair Kit includes dust cover, bearing, cartridge assembly, piston rider, set screws, bottle of assembly oil, assembly grease and a maintenance manual.
SLC.500	***SLC.RK.500*** Repair Kit includes dust cover, cushion collar assembly, cartridge assembly, bottle of assembly oil and a maintenance manual.
SLC.800	***SLC.RK.800*** Repair Kit includes dust cover, cushion collar assembly, cartridge assembly, bottle of assembly oil and a maintenance manual.

SL2.090/SL2.180/SL2.300 Gas Spring Replacement

1. Remove the Mount Screws from the bottom of the lifter using an allen wrench. If necessary, wrap the lifter in a soft cloth and clamp it in a vise.

2. Pull the mount apart and slide the Lower Mount off the Gas Spring, *(***Micro 90®/ Micro 180® / *L.300*)**.

3. Slide the Gas Spring out of the Upper Mount. For additional maintenance refer to the complete maintenance manual included in the repair kits.



4. Install the Gas Spring with Split OD Wire Ring (and mount spacer for the SL2.300) into the Upper Mount.

5. Install the Lower Mount over the Gas Spring.

6. Install the Mount Screws. Using an allen wrench tighten to:

SL2.090/ SL2.180	180 lb-in / 20 N-m
SL2.300	250 lb-in / 28 N-m

SLN.090/SLN.180 Gas Spring Replacement

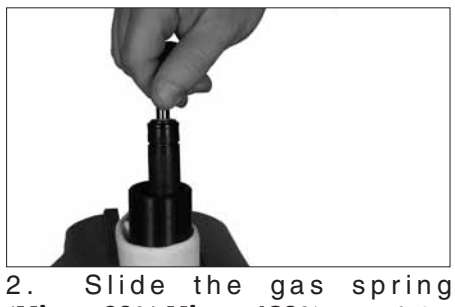
CAUTION!

Do not remove rear head if the rod is stuck in the down position. If the rod cannot be pulled up, the gas spring inside may be under pressure. Contact DADCO for assistance. The gas spring inside is preloaded 1 mm.

Rear Head Removal Tools:

SLN.090	90.380
SLN.180	SLN.HR.180

1. Wrap the SLN.090/SLN.180 cylinder body in a soft cloth. Clamp the cylinder face down in a vise so that the cylinder is secured. Remove the Rear Head using the Rear Head Removal Tool with a wrench or the Removal Kit.



2. Slide the gas spring (**Micro 90®/ Micro 180®**) out of the lifter tube. For additional maintenance refer to the complete maintenance manual included in the repair kits.

3. Lightly oil the body of the gas spring (**Micro 90®/ Micro 180®**) and install it into the tube. Add 2-3 drops of serviceable threadlocker to the threads of the rear head. Replace the rear head. Tighten using the Rear Head Removal Tool with a wrench or the Removal Kit to **180 lb-in / 20 N-m**.