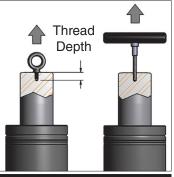
Gas Spring Installation Design and Operation

DADCO has established operating specifications and installation requirements for its Mini (L, LJ), **Ultra Force**® (U.0400 – U.20000), UH, SCR and Large (90.8, 90.5B2, 90.10, UX and SC) Series Nitrogen Gas Springs to help ensure customer safety and optimize product performance. Review the guidelines in this bulletin carefully. For information on installation and operation practices for DADCO's Micro (C) Series and U.0175 - U.0325 Gas Springs, refer to bulletin B13102E.

Operating Specifications

Charging Medium	Nitrogen Gas	Nitrogen is an abundant gas that does not react easily with other elements. These properties make it the ideal charging medium for gas springs. No other gas should be used.	
Charging Pressure Range	15 – 150 bar <i>(220 – 2175 psi)</i>	The maximum charging pressure for self-contained and linked nitrogen gas springs is indicated at the left. Do not exceed maximum charging pressure.	
	SCR Series / U.0400 / UH.0400: 15 – 180 bar (220 – 2600 psi)		
Operating Temperature	4°C – 71°C (40°F – 160°F)	Operating the gas spring within the specified temperature range is important to extend gas spring life. For high-temperature operations, contact DADCO for assistance. After prolonged operation, the outside of the gas spring may be hot to touch, handle with care.	
Maximum Speed	1.6 m/s (63 in/s)	Operating the gas spring within speed limits is required for safe operation. For estimating operation rate/temperature, please refer to the web-based calculator at www.dadco.net.	
	SCR Series .5 m/sec (20 in/sec)		

DADCO recommends using the rod end thread to transport selected springs. Use an eve bolt or the appropriate T-handle for transportation. Verify that the proper thread engagement is achieved prior to transportation.



Gas Spring Models	Rod End Thread	Required Thread Engagement
90.10.03000, 90.10.05000, 90.10.07500	M8	12 mm
90.10.10000	M10	15 mm
U.9600, UX.6600, UX.9600	M8	12 mm
U.20000, UX.20000	M10	15 mm

Charging Nitrogen Gas Springs

Self-Contained Gas Springs typically arrive charged. The instructions below apply to an uncharged gas spring.



1.) Before charging either a Self-Contained or Linked System, verify the rod is fully extended to its proper stroke length, ensuring that the housing is seated properly against the c-style retaining ring. Use a DADCO T-Handle to extend the rod.



2a.) To prepare the Filling Port in a Self-Contained Operation, remove the protective screw/flush plug. Then, thread the appropriate DADCO Filler Valve into the port. Finally, connect the female quick disconnect adapter on the charging assembly to the filler valve.



2b.) In a Linked System Operation, pipe all gas springs to the control panel or multi panel following proper assembly guidelines. Make sure all hoses and fittings are tight. Attach the charging assembly to the filler valve on the control panel or multi panel.

3.) Open the main valve on the nitrogen tank. Set the desired charging pressure on the regulator. Slowly open the shut-off valve and allow the gas spring or system to reach the desired charging pressure. After each spring has been charged to the desired pressure, CLOSE THE HOSE SHUT-OFF VALVE. Disconnect the charging assembly from the filler valve. The small amount of nitrogen trapped between the shut-off valve and filler valve will bleed off as you disconnect the fitting. If you're using the 90.310.340 filling assembly with the 90.310.044 charging assembly, the gas will vent when the valve closes

4.) For self-contained units, verify the internal pressure using a DADCO Load Cell or Pressure Analyzer, contact DADCO for load cell instructions and additional information. DO NOT test the pressure using a hammer. DADCO recommends periodic checking of internal gas spring pressure as a preventive maintenance measure.



5.) CLOSE the tank shut-off valve when not charging gas springs. NOTE: If you're not using a DADCO Charging Assembly, make sure your charging assembly consists of a high pressure thermoplastic hose, o-ring face seal fittings and a high pressure valve.

CAUTION

Always wear safety glasses when performing maintenance on nitrogen gas springs.

Discharging

CAUTION: Before disposing of damaged or worn out gas springs, be sure to discharge all pressure. Contact DADCO for additional information.



1.) When discharging a DADCO Nitrogen Gas Spring, position the gas spring horizontally with the port up for safety. Remove the port plug.





If still unsuccessful, STOP and contact DADCO.





2.) Keeping face and hands clear of the port, use the Valve Bleed Tool (90.360.4) or Port Servicing Tool (90.320.8) to depress the valve. Cover the port with a cloth to absorb discharge. After all of the gas pressure is exhausted, be sure that the piston rod will freely compress into the tube manually. If not, try depressing the valve again.



3.) Exhaust the nitrogen gas by opening the bleed valve on the control panel. Verify that all pressure is relieved by manually compressing the piston rod into the tube. If the rod will not fully retract release the remaining pressure. If still unsuccessful, STOP and contact DADCO.

Tools for Charging and Discharging



Port Servicing Tool 90.320.8



Quick Disconnect Charging Assembly

Standard 90.310.040 • High Pressure 90.310.041/44 • European 90.310.045

Self-Venting Quick Disconnect Filling Assembly 90.310.338 • 90.310.339 • 90.310.340

Valve Bleed Tool

90.360.4



M6 Charging Nipple 90.310.143



G1/8 Charging Nipple 90.310.111

NOTE: DADCO recommends that customers identify tools containing high pressure nitrogen gas springs with a safety plate to ensure their proper handling. Contact DADCO for Safety Plate ordering information.

Service

DADCO's Mini (L, LJ), Ultra Force® (U.0400 – U.20000), UH, SCR and Large (90.8, 90.5B2, 90.10, UX and SC) Series Nitrogen Gas Springs are repairable. DADCO supplies detailed repair instructions with its repair and seal kits. After reviewing the maintenance guides, if you require additional training or have any questions, please contact DADCO. Contact DADCO for SCR Series gas spring repair.



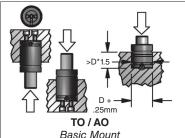
Gas Spring Installation Design and Operation

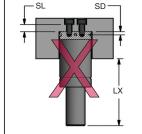
Mounting

DADCO offers a wide selection of mounts to meet specific customer applications. As a general rule, installation and fastening of the gas spring should take into consideration load support, fastener selection and torque values. DADCO recommends using medium strength serviceable thread locking compound on mounting screws. Refer to DADCO's product catalogs for mount compatibility with each series and model of nitrogen gas spring.

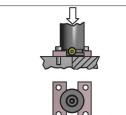
CAUTION

- Do not weld
- Do not machine or modify
- · Protect from damage



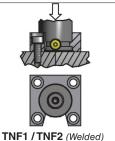


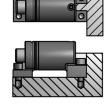
Drop in, flat bottom pocket. Mount from base. Choose proper length screws to maximize thread engagement (SD). Thread engagement (SD) is determined by the tolerance of SL. Not for applications with long stroke extensions (LX) in upper dies.



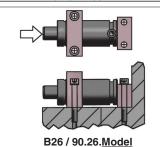
F12 / B12 / B30 / 90.12 / 90.112 / 90.212 / 90.312 / 90.30.Model

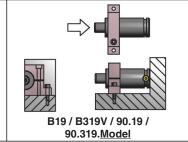
Mount from top only. Back-up is required to support the full load.



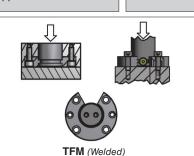


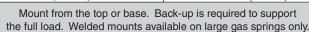
Mount from top only. Back-up is required to support the full load. Welded mounts available on large gas springs only.

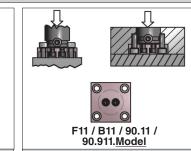




Mount from top only. Back-up is required to support the full load.







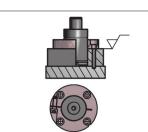
Mount from top or base. Back-up is required to support full load.





B322 / 90.322.Model

Mount from top only. Wire ring retained mount supports the full load. No back-up is required. L/ LJ only.



B27 / 90.27.Model

Mount from the top only. Back-up is required to support the full load. L/LJ only.



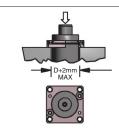
B28 / 90.28.Model

(Threaded Body)



B29 / 90.29.Model (Threaded Body)

DADCO recommends using anti-seize on threaded body springs, especially when utilizing a mount. L Series Only.



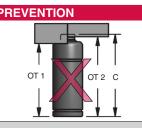
B25 / 90.25 / 90.325.Model



Mount from top only. Wire ring retained mount supports the full load. No back-up is required.

Standard Installation Principles





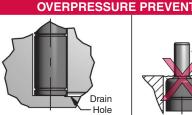
DADCO recommends at least 10% stroke reserve to achieve optimal safety. Two types of overtravel (OT) can occur, OT 1 may cause a crushed spring, OT 2 may cause internal damage. Over stroking the rod or impacting the top of the cylinder will cause permanent damage. A high travel percentage may also cause the maximum operating temperature to be exceeded. 10% stroke reserve is recommended for optimal performance (20% for Ultra Force® Series Springs).

SIDE LOAD PREVENTION



Avoid side loading when possible. Side loading resulting from press action or worn guide components causes increased wear on the bearing, seal, and piston rod. Rod end may wear soft die materials, use hardened contact surface (RC 25-40). The end of the piston rod has a construction thread intended for assembly and disassembly purposes only, and should never be used to mount or secure the gas spring. Die vibration and/or misalignment will damage the spring.

OVERPRESSURE PREVENTION



Avoid direct contact with die lubricants and cleaners. Protect gas springs by providing adequate drainage in gas spring pockets.

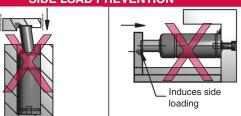
Improper Installation

OVERSTROKE PREVENTION

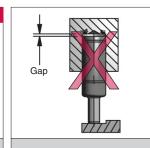


Verify cap screw length.

SIDE LOAD PREVENTION



Ensure the rod end is not constrained. Use the bottom mount in a supported application only.



Avoid large gaps in upper. Use tapped holes in base to secure, pre-load if possible.

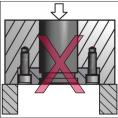


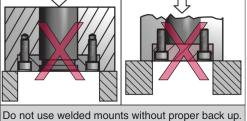
Jammed parts are very dangerous. If parts are jamming, determine the root cause and repair it before production continues. Slight pre-load of gas spring prevents damage from sudden release. Sudden release may damage and / or vent cylinders.

Safe Removal of Damaged Nitrogen Gas Springs



Choose proper length screw to maximize thread engagement. A screw that is too long will damage the spring and one that is too short does not provide enough support. Always use thread locking compound.



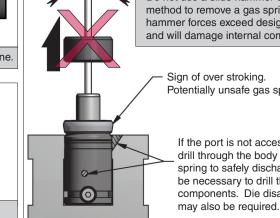


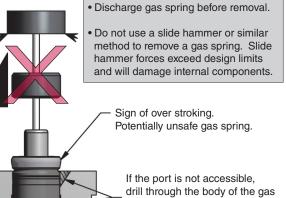
Do not use mounting screws to support the full

load. Install top flange mounts from top only.



Do not grind or machine.





spring to safely discharge. It may

be necessary to drill through die

components. Die disassembly

Do not rely on fasteners for Do not lathe turn. shear loading. Always back up. 1.734.207.1100 • fax 1.734.207.2222 • www.dadco.net