

NITRO SPRINGS USER INFORMATION

GAS SPRING MAINTENANCE / SERVICE LIFE

Minimum design fatigue life is 2 million cycles (Industry standard). At this point the springs may still operate but we would consider them to be "Time Expired" and thus not fit for continued service and be replaced. After a period of ten years it is recommended that cylinders are factory inspected.

With the implementation of the PED we would recommend any gas springs that are over 10 years old (pre 2002) must be replaced.

In general, when the springs are 5 years old they should be serviced, with an inspection/overhaul (again we can supply a check list).

As with any product user safety is of prime importance. With this in mind we recommend the following as a documented procedure regarding service life of gas springs within tooling.

1. Gas springs that are pre 2002 should be replaced (pre-PED springs)
2. Gas springs over 5 years old should be inspected by a trained and certificated engineer.
3. Gas springs which have completed over 2 million cycles should be replaced.
4. Gas springs over 10 years old having carried out less than 2 million cycles should be factory inspected.
5. If an "event" has occurred in the tool, all springs should be inspected and if any damage is present they should be replaced (depending on type of damage, in some cases, all should be replaced - ((over stroke)))

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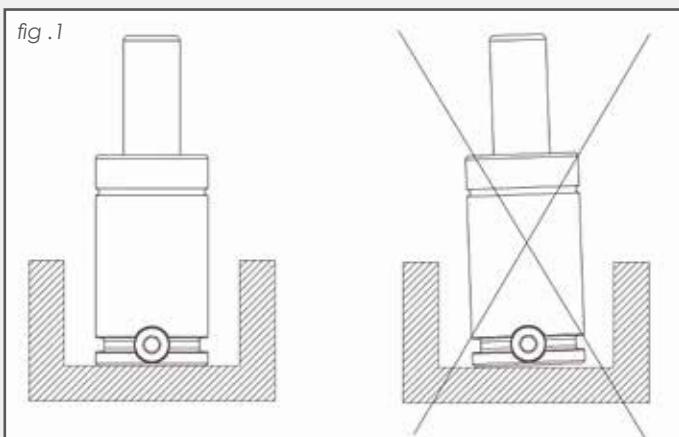
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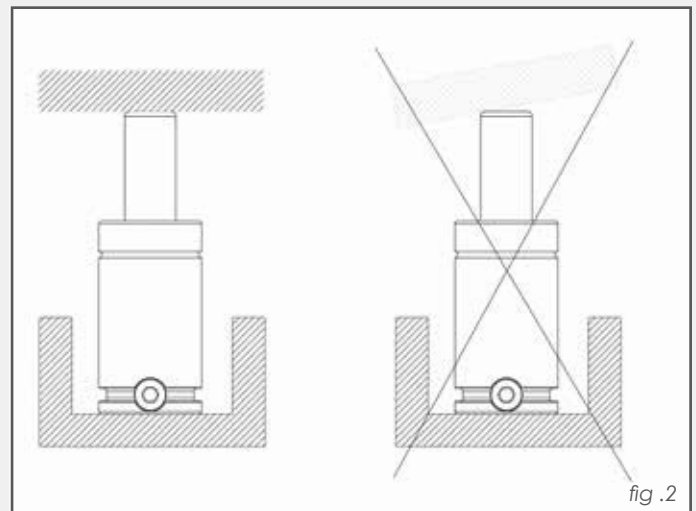
MOUNTING INSTRUCTIONS

All Nitro-Springs are factory tested prior to dispatch and will give the user many years of service. To receive the best possible life from the gas springs, the following should be adhered to:

- The mounting position and method can greatly affect the gas spring life.
- There are 6 main ways to mount a gas spring. Wherever possible it is best to use mounting positions 1,2 and 3 as these retaining options give optimum spring durability. See sheet 3
- Wherever possible retain Nitro-Springs in a positive way, i.e. Use tapped holes or a suitable flange mounting.
- Ensure that the spring is mounted parallel to the direction of the movement.



- Ensure that the mounting face is perfectly flat.
- Make sure the piston top is perpendicular to the direction of movement.



- Side forces on gas springs must always be avoided.
- The tapped hole in the piston rod is to be used only for maintenance and should not be used for mounting purposes.
- Never use a gas spring where the piston rod could be freely released from the closed position.
- Where possible the piston rod should be protected from potential damage whilst in use.

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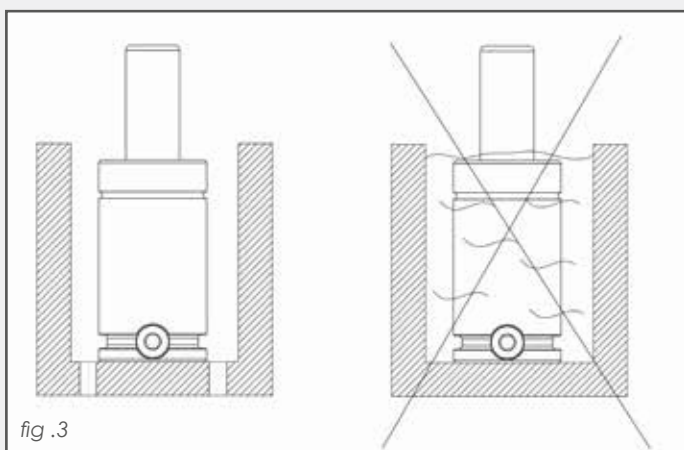
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MOUNTING INSTRUCTIONS

- During production protection from press lubricants and contamination is advised. If unavoidable drainage holes should always be used to avoid collection of lubricants. If this is ignored the gas spring could eventually hydraulic and cause irreparable damage to the spring.



- Avoid grinding dust on any surface of the gas spring.
- Where possible fit hardened "strike plates" where the gas spring piston contacts.
- Always keep the striking distance between the end of the piston and the mating face to a minimum. This will cut down any additional forces at the point of initial contact between the piston and "strike plate."
- Always ensure that all gas springs are mounted with out any pre-load.

PIPE SYSTEM WITH CONTROL PANEL

- Wherever possible connect the gas springs in a full loop system. This makes charging and discharging the system much quicker. Also if a hose becomes damaged you are still able to run the system without any problems by removing the damaged hose and recharging to the required pressure.
- Never bend the hoses with less than a 20mm radius.
- Always discharge the pipe system before working on it unless you have adequate Metrol training.
- Wherever possible fasten the hoses down in a fixed position to prevent trapping.

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PIPE SYSTEM WITH CONTROL PANEL

The table below is for ISNG style gas spring only. The mounting positions apply to all of the gas spring ranges.

GAS SPRING TYPE	F2 MAX.	Ø E	F	G	Ø T	U
1500N / 1000N	-	33.5	15	2	70	60
2500N / 1600N	-	39.5	15		80	70
5000N / 3300N	-	46.5	21		100	90
7500N / 5000N	25	51.5	21		120	90
15000N / 10000N	30	76.5	26	3	140	115
30000N / 20000N	40	96.5	30		170	135
50000N / 33300N	50	122	33		190	155
75000N / 50300N	60	152	38		240	205
100000N / 70000N	70	197	44		310	225

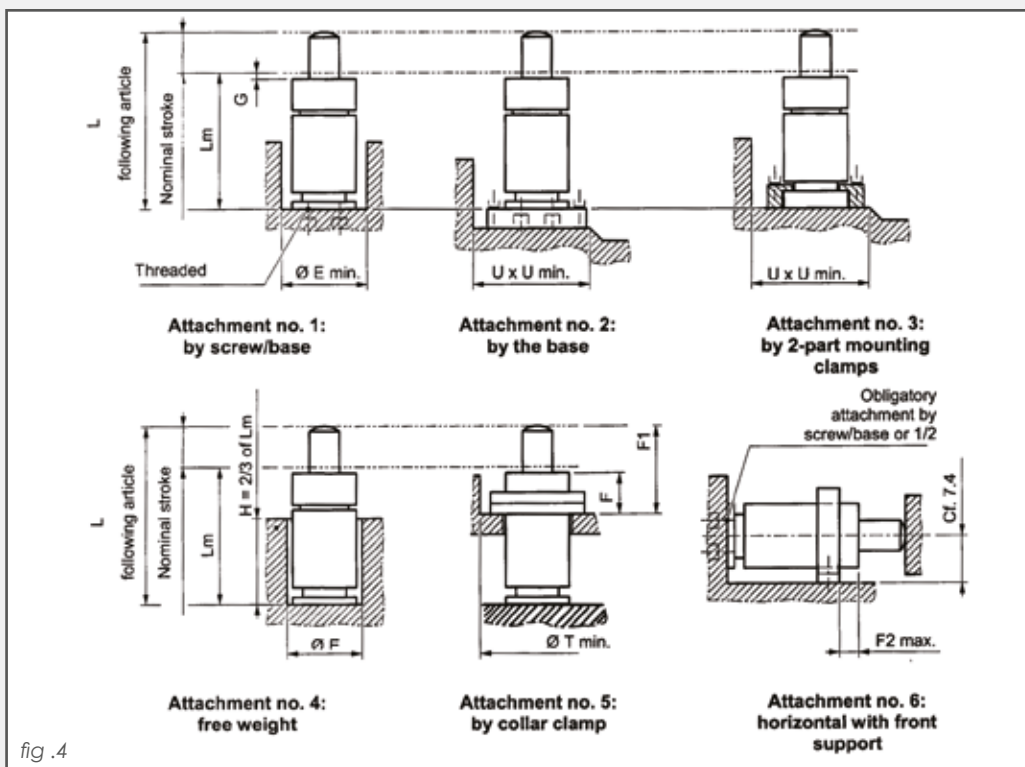


fig .4

Please note: when method 5 is used the gas spring must always be supported at the base.

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STROKE LENGTH

- Use of the full stroke (S) is never recommended. As a rule of thumb always leave at least 5mm or 10% margin. This allows for over stroking/ setting errors.
- Over stroking of the gas spring will cause damage to the spring. Wherever possible use positive stops on all tooling to prevent this from occurring.

MAXIMUM SPEED

- All Metrol gas springs are design to be used in applications where the maximum piston velocity is 38m/min or less.

MAXIMUM CHARGING PRESSURE

- The maximum charging pressure stated in the catalogue and marked on the springs must not be exceeded as it may affect the safety of the product.
- Unless otherwise specified all springs are delivered at maximum pressure except Mini Nitro springs which are available with variable pressure. (Please note: airfreight orders where springs are filled with holding pressure only)
- Use Nitrogen gas only when charging

OPERATING TEMPERATURE

- If the recommended operating temperatures are not adhered to, then the service life of the spring will be affected in a negative way.
- Recommended operating temperature 0 to 80°C

OPERATING TEMPERATURE

- The maximum piston rod velocity as listed in the catalogue should not be exceeded, as this will reduce the life of the gas spring.

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ESSENTIAL SAFETY NOTES

- Caution: High-pressure nitrogen.
- Do not machine or modify any part of the gas spring.
- Do not weld any mounting flanges or other equipment to the gas spring.
- If the piston will not move, assume the spring is fully charged.
- If the gas spring is damaged, the gas should be immediately vented from the spring. When the spring is emptied it should be disposed of.
- Dispose of gas springs in component form only.
- All tooling installed with Nitro springs should be fitted with a visible warning plate.

CHARGING, OVERHAUL & MAINTENANCE

- Before attempting any work on a gas spring or gas spring system the person must have attended and passed the Nitro-Spring training course. Upon completion of the course a certificate of competence is issued.
- Attempting to perform work on a spring without completing the course may infringe safety and have a negative impact on the life of the product.

- Overhaul and maintenance instructions are found in the Nitro-Springs service manual. This manual is available to people who have completed the Nitro-Springs training course.
- **USE ONLY NITROGEN WHEN CHARGING – THE USE OF OXYGEN WILL CAUSE AN EXPLOSION!**

Metrol Springs is proud to confirm that Nitro-Springs products meet the latest Pressure Equipment Directive. This is after having met the requirements of Zurich Risk Services and is covered by their certificate number 42070226.

The E.U. have recently harmonized standards regarding pressure vessels with the Pressure Equipment Directive 97/23EC, known as PED. After the 29th May 2002 it became illegal to specify or use gas springs not meeting the criteria laid out in the Pressure Equipment Directive.

The ramifications of not adhering to this legislation are far reaching. For example Public and Employee Liability Insurance will be void in the event of an accident involving nonconforming products.

It is important to realize the responsibilities encompassed by the Pressure Equipment Directive involve not only the manufacturer, but also manufacturers agents and end users.

It is a serious issue. Failure to comply can result in fines or custodial sentences.

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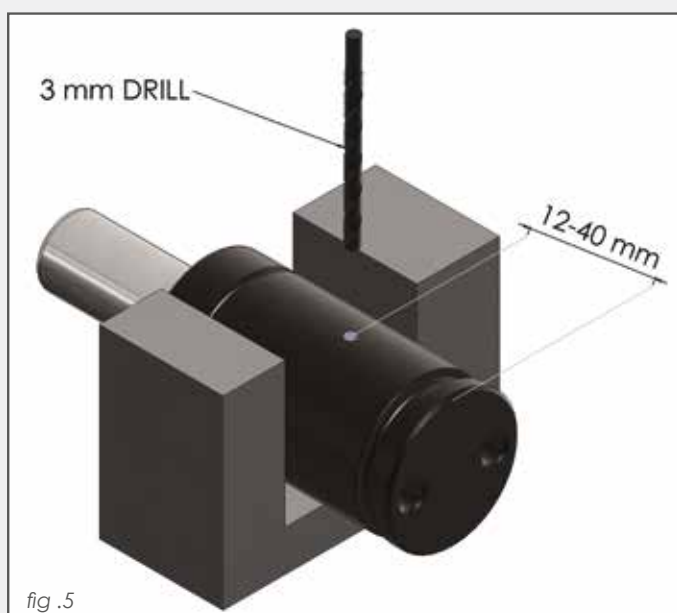
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DISPOSAL OF A GAS SPRING

Before disposal of a damaged or used gas springs be sure to discharge all of the pressure.

If a gas spring is damaged and you cannot discharge it using the standard charge port, drill a dia 3.0mm hole in the lower section of the body to discharge. If at any time you are unsure please ask.



RECYCLING

The majority of a gas spring is made of metal and therefore can be recycled.

The oil you drain from the drilled hole can also be recycled, please contact your local authority for details on regulations.

DSNG GAS SPRING DISPOSAL

If the piston of your DSNG is stuck in the down position you will need to drill into the body of the gas spring several millimeters below the top of the body. This drilling area depends on the DSNG model you have:

MODEL	DRILLING AREA (distance from top of gas spring body)
DSNG1500	72mm
DSNG3000	82mm
DSNG5000	100mm
DSNG7500	104mm

If the piston is stuck in the upright position, you can release the pressure by using the MET8013 degassing tool in the valve near the base of the body. If this is not possible, you can also drill into the gas spring 35mm from the bottom of the body upwards.

MODEL	DRILLING AREA (distance from bottom of gas spring body)
All DSNG models	35mm

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