

LEADING PNEUMATIC & HYDRAULIC SYSTEM

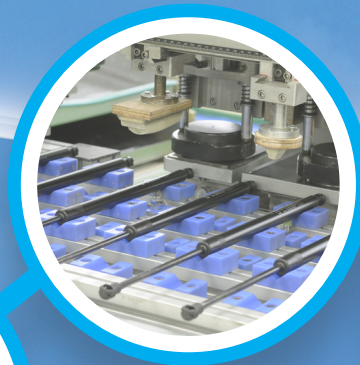
HANIL PRECISION



MISSION

We create ultimate comfort for
perfection with our minor differences

Say "Yes, I can."
Think Positively
Do our best in everything.



INFORMATION

INFORMATION

As Potential Premier Global Company

Hanil Precision Co., Ltd. was established in 1984 as the first specialist of gas spring and hydraulic shock absorber in Korea and had been selected as a promising company from various kinds of banks and institutions as well as associations related to modernization. Since then, Hanil Precision Co., Ltd. has grown to become the top position in Korean gas spring market.

HANIL's Challenge and History of Opening the New World

- 1984** Designated as Best prospective medium & small company from Gov't
- 1986** Export to **JAPAN**, quality approval from **SHARP (JAPAN)**
- 1997** Registered Tier 1 supplier for **DAEWOO MOTOR (GM KOREA)**
- 1998** Export to **SWEDEN**
- 1999** Registered Tier 1 supplier for **HYUNDAI MOTOR**, export to **U.S.A.** aftermarket
QS 9000/ISO 9001 Accreditation
- 2000** Established **JOINT VENTURE** in **MALAYSIA (NHL)**
- 2001** **TECHNOLOGY TRANSFER** to **MALAYSIA**, supply to **PROTON MOTOR COMPANY**
- 2003** Development of Shock-absorber for washing machine(**SAMSUNG ELEC.**)
ISO 14001 Accreditation
- 2004** Technical alliance with **KAYABA (JAPAN)**
- 2005** Notification of **FOREIGN-INVESTED CORPORATION**
(Partly owned by **LESJOFORS AB** in **SWEDEN**)
ISO/TS 16949 Accreditation
- 2006** Awarded 5Million USD-Export tower By Korean government
- 2007** Export to **YAMAHA (JAPAN)** for Motor cycle
- 2008** Established **JOINT VENTURE** in **LATVIA** with **LESJOFORS AB.**
- 2010** Introduction of Environmental Chamber for Automotive parts
- 2011** Acquiring **10 MILLION PRODUCT CAPACITY** by factory expansion



VISION

The world most qualified various absorbing system provider

Goal

- World market share 20%, Single PPM

Core capability

- Flexible automatic mass-production line
- Production system of multiple types in small quantities
- Applied to various kinds of applications

Business Strategy

- Promptly cope with changes in environment

CREATIVITY

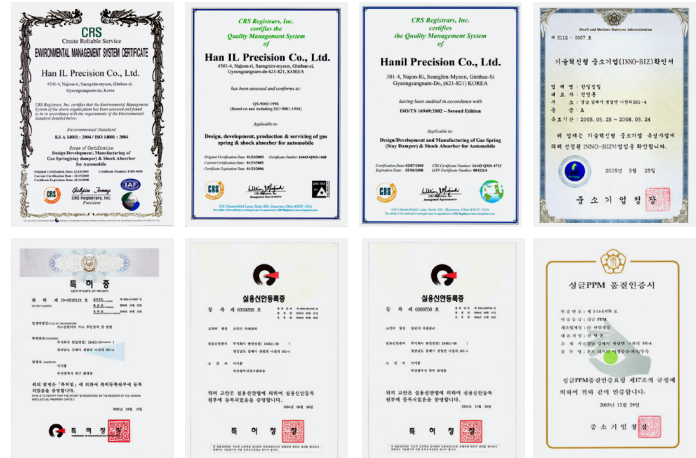
FLEXIBILITY

CREDIBILITY

CUSTOMIZATION

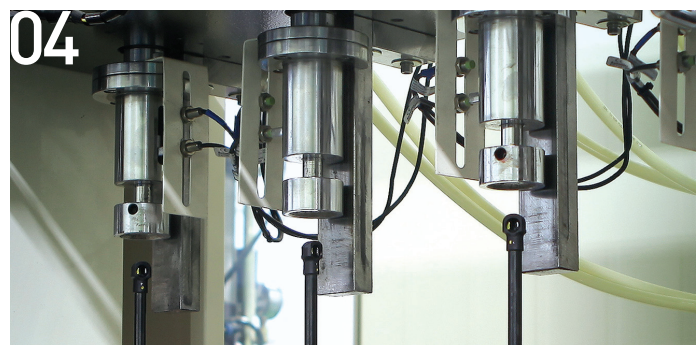
CERTIFICATE

The environmental friendly line & Intensive quality control system in accordance with ISO/TS16949



RELIABILITY ENSURING

1. Durability test
2. Environmental chamber with Durability test
3. Salt spray test
4. Reaction force & Speed test



WHAT IS GAS SPRING?

The gas spring is usually mounted to the tail gate or hood/bonnet and makes easy of lifting/lowering the coverlet. The gas spring consists of pressure tube(Cylinder), piston rod(Shaft), oil seal and other components.

After sealing the Nitrogen gas in the pressure tube, it is sealed not to leak, then piston rod is operating.

It is supposed to operate owing to the difference of internal pressure and load in which are depending on Volume transformation in the pressure tube.

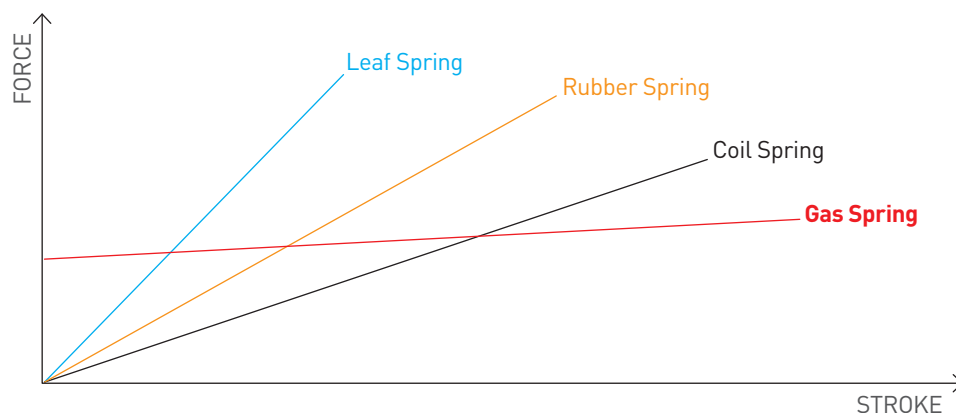
MERITS OF GAS SPRING

A gas spring is utilized for the adjustment of reaction force of application, which requires convenience and easiness of operating.

- 1) Sustaining of the constant elasticity change rate even in the high reaction force and long stroke.
- 2) Compact design and appearance.
- 3) Easy mounting and installing in any application at any position.
- 4) Automatic operational damping function without any additional adjustment device.
- 5) Compression and extension speed adjustable.
- 6) Reaction force will be adjustable at any time of usage (in case of charge up).
- 7) The unique gas filling system.
- 8) The first localized gas spring in Korea(Design registered No.16790).

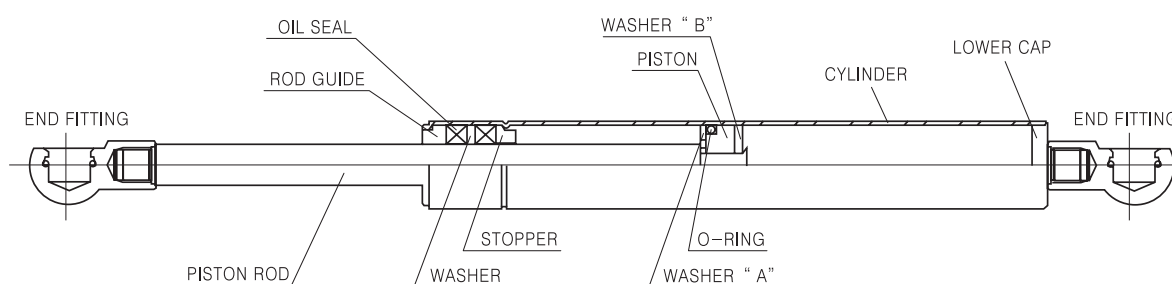
FUNCTION OF GAS SPRING

A gas spring can be effectively used to offset the reaction force of coverlet or opening & closing cockpit, which has heavy weight. It makes easy control of material which is hard to deal with, and it makes ideal position of lifting and lowering safely. Against of the other general springs, gas spring makes little difference of force with long stroke.



OPTIMUM APPEARANCE

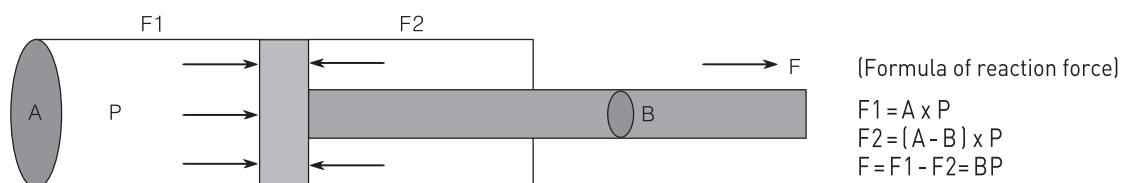
A gas spring is composed of sealed tube with piston rod (shaft), piston, oil seal and the other Components. Compressed insert nitrogen gas and minimum operating oil was included inside of the tube as well.



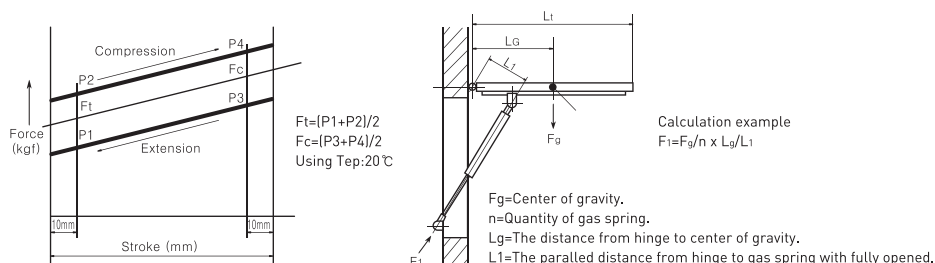
OPERATIONAL PRINCIPLE

	MAIN	SUB
Material	Steel	Stainless
Rod treatment	Nitriding	Chromum plating
Cylinder painting	Liquid painting	Shrink sleeve

The equivalent pressure inside of the tube ("P" on the picture) is the same as that of both side of piston.



While the rod (shaft) is pushed into the cylinder, the part of gas volume is replaced with pressure as inside pressure is slightly increasing. This replacement causes reaction force as function of stroke. This reaction force of gas spring is also affected by friction force (both in the dynamic and static).

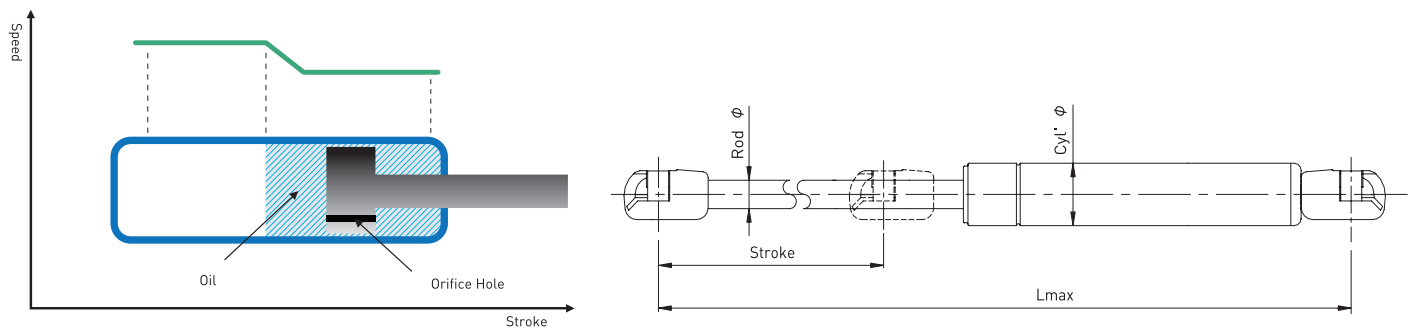


CONVENTIONAL GAS SPRING

Both Thread type	•
Both Welding type	•
Thread-Welding type	•

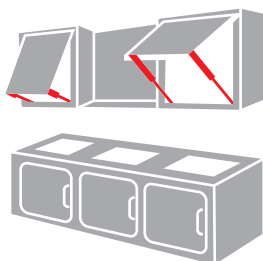
Function

- During compression and expansion process on a gas spring with oil, damping is occurred with oil pass through the orifice holes on the piston. But damping speed goes down instantly with reference "green-steep curve in below picture".
- Can be controlled door open speed by orifice hole size on a piston.
- Standard oil damping type gas spring which is optimized at push-up design.

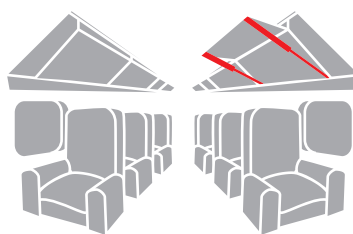


No	Rod Size (mm)	Cylinder Size (mm)	Lmax (mm)		Stroke (mm)		Force (N)	
			Min	Max	Min	Max	Min	Max
1	ø4	ø12	80	350	10	100	15	200
2	ø6	ø15	100	500	15	200	50	350
3	ø8	ø18	100	650	15	300	80	550
4	ø10	ø22	150	900	30	400	120	900
5	ø12.5	ø22	200	900	50	400	200	1,100
6	ø12.5	ø27.4	200	900	50	400	200	1,500
7	ø14	ø27.4	300	1200	100	550	250	1,700
7	ø20	ø40	300	1200	100	550	500	3,000

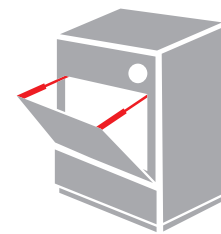
* To be made various gas springs with insert or welding type end fittings.



Kitchen Cabinet & Door



Air Plane Luggage Door



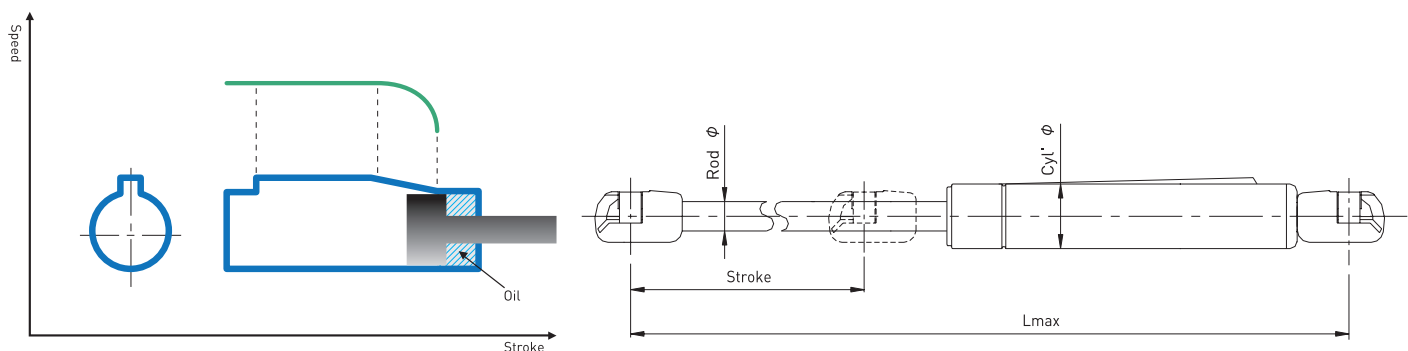
Home Appliance

DYNAMIC GAS SPRING

Both Thread type	•
Both Welding type	
Thread-Welding type	

Function

- While a gas spring operates following the slotting hole inside surface on Cylinder, damping is occurred with becoming smaller cross-section area of grooved (slotted) line.
- Can be controlled door open speed and damping section by gas movement following grooved (slotted) line in Cylinder.
- Improved damping compared to conventional gas spring for operation feeling on door end which is optimized at flap over design.
- Light weight product compared to conventional gas spring with minimum oil contained inside Cylinder.



No	Rod Size (mm)	Cylinder Size (mm)	Lmax (mm)		Stroke (mm)		Force (N)	
			Min	Max	Min	Max	Min	Max
1	ø8	ø18	220	650	10	300	80	550
2	ø10	ø22	250	900	30	400	120	900

* To be made various gas springs with insert or welding type end fittings.



Tail Gate



Hood



SAFETY LOCK GAS SPRING

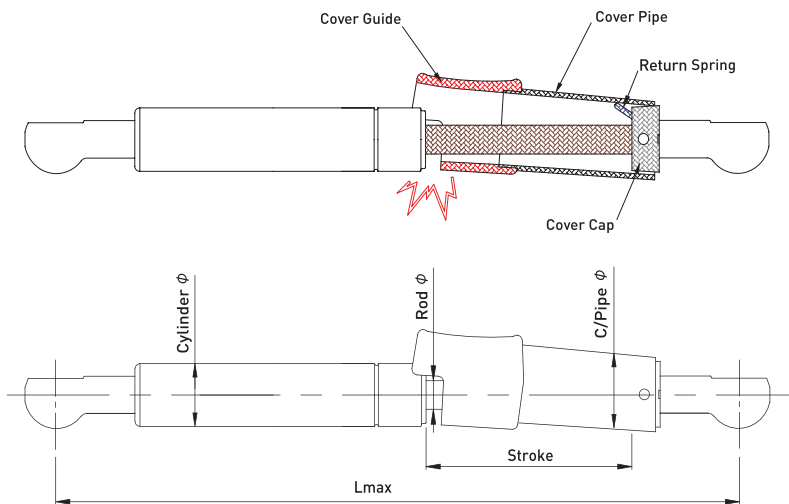
Both Thread type	•
Both Welding type	•
Thread-Welding type	•

Function

- Added Locking and unlocking function on general conventional gas spring propping subject up.
- Can be keeping safely with locking or unlocking function.

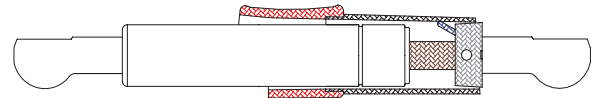
Lock

No cylinder compression by cover guide interruption.



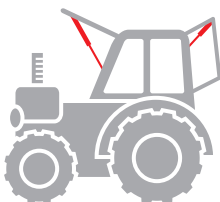
Unlock

Cylinder compression with unlock function.



No	Rod Size (mm)	Cylinder Size (mm)	Cover Pipe Size (mm)	Lmax (mm)		Stroke (mm)		Force (N)	
				Min	Max	Min	Max	Min	Max
1	ø10	ø22	ø27.4	300	950	30	400	120	900
2	ø12.5	ø22	ø27.4	300	950	30	400	200	1,100
3	ø12.5	ø27.4	ø35	300	950	50	400	200	1,500
4	ø14	ø27.4	ø35	300	950	50	400	250	1,700

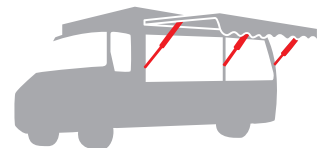
* To be made various gas springs with insert or welding type end fittings.



Cockpit Glass of Heavy Equipment



Cockpit Glass of Heavy Equipment



Trunk Side Roof

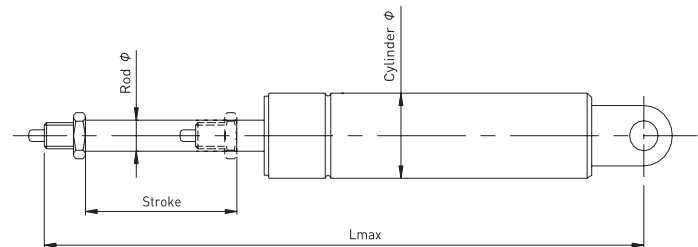
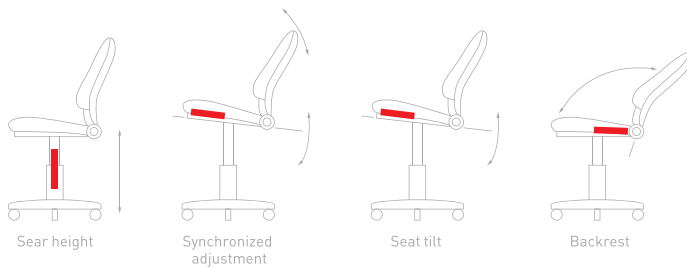
LOCKABLE GAS SPRING

Both Thread type	
Both Welding type	
Thread-Welding type	•

Function

- Gas spring with special function being stopped randomly at any position.

Useful for controlling height for chairs or desk.



No	Rod Size (mm)	Cylinder Size (mm)	Lmax (mm)		Stroke (mm)		Force (N)	
			Min	Max	Min	Max	Min	Max
1	ø10	ø27.4	110	600	10	200	150	1000

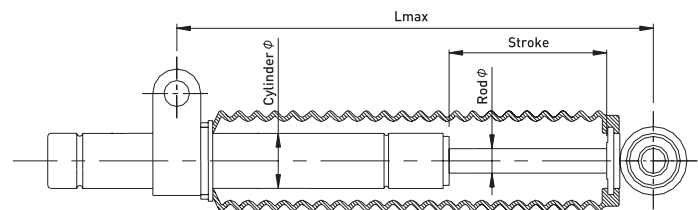
* To be made various gas springs with insert or welding type end fittings.

OIL DAMPER

Both Thread type	•
Both Welding type	•
Thread-Welding type	•

Function

- Use for accelerator pedal or Clutch return.
- Absorbs the vibration from Straight-line motion.

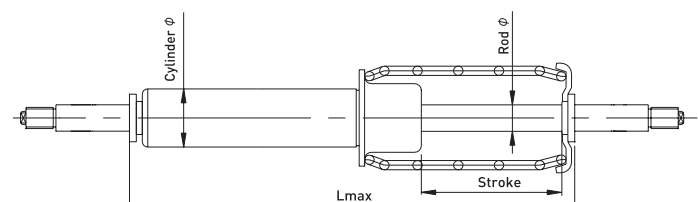


SHOCK ABSORBER

Both Thread type	•
Both Welding type	•
Thread-Welding type	•

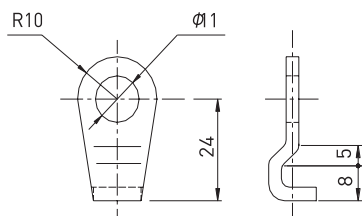
Function

- Use for laundry machine.
- Absorbs the vibration from Straight-line and rotary motion.



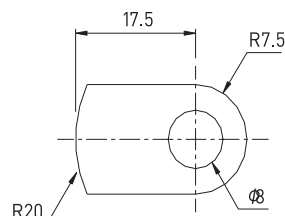
BRACKET TYPE END FITTING

thickness : 3.2T



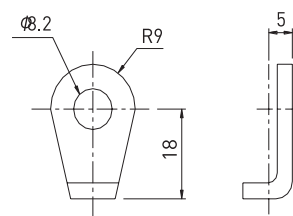
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thickness : 5.0T



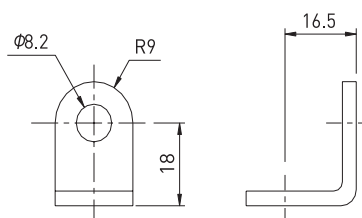
14902A

thickness : 3.2T



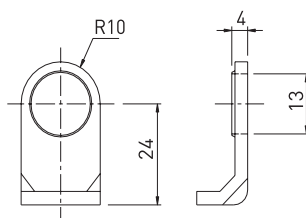
14903A

thickness : 3.2T



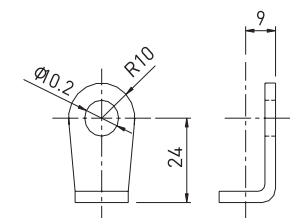
14905A

thickness : 3.2T



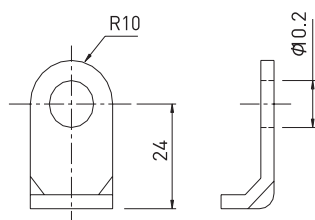
14906A

thickness : 3.2T



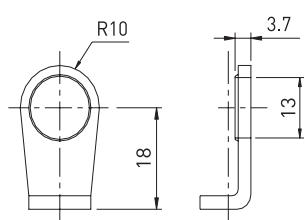
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thickness : 3.2T



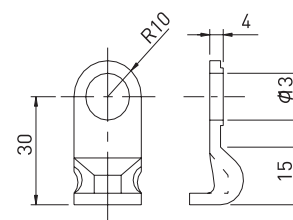
14908A

thickness : 3.2T



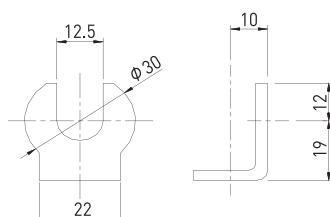
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thickness : 3.2T



14910A

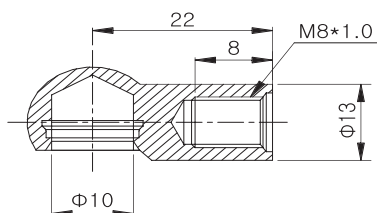
thickness : 3.2T



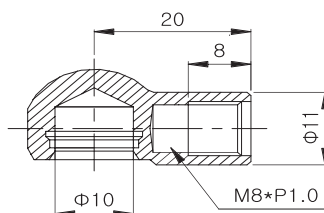
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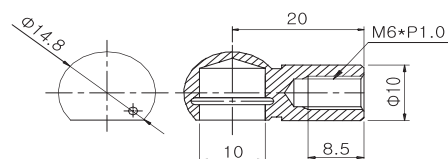
SOCKET TYPE END FITTING



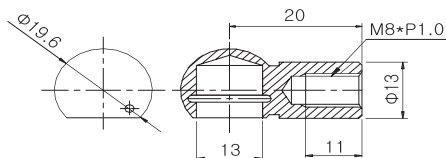
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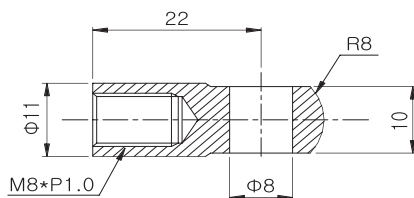
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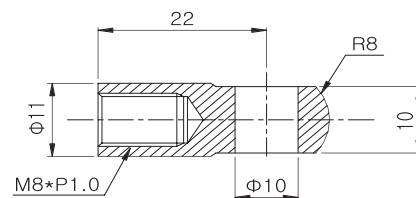
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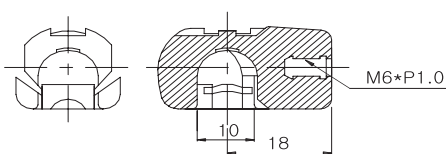
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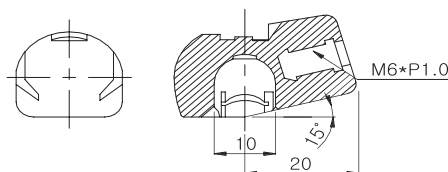
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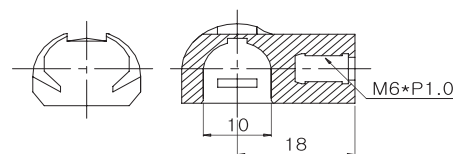
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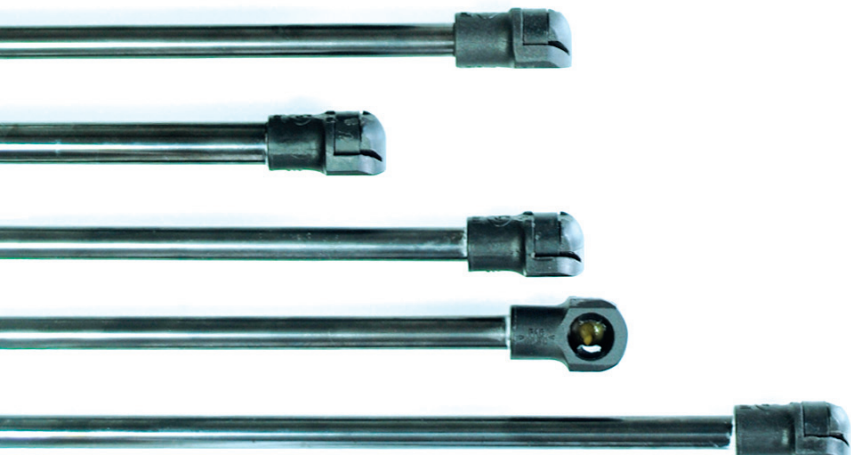
10964A



10966A



109B2A





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We will move the hearts of customers with best technical supports and continuous R&D

NORTH AMERICA

Associated Spring
RAYMOND

JOHN DEERE

NEA



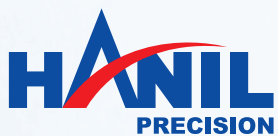
SOUTH AMERICA

JOHN DEERE



HANIL
PRECISION

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REVISION NO. 0