

# Directional Control Valve Rapid Extend Log Splitter

**Nordvalves**  
hydraulic components

The P81 Rs is a log splitter valve like its earlier version P81 A2, but now it features an extremely fast "rapid extend" high speed mode. The P81 Rs has been specifically designed to reduce system cost by allowing a single stage pump to be used in systems currently using two stage (hi-low) pumps. When extra force is required the P81 Rs allows the user to manually shift from high speed mode to high force mode. A "soft stop" differentiates between high force and high speed modes.

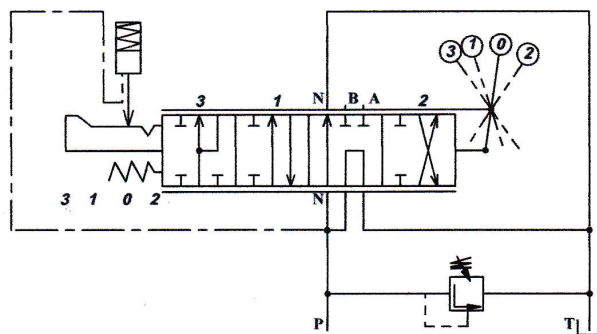
## Standard features

- Hydraulically balanced, hard chrome plated spool
- Lever system in which the handle can be installed in up or down position
- Pressure release detent on retract
- Nominal flow - 16 l/min, extends the flow up to 80 l/min
- Manual shift from high speed mode to high force mode
- Spring center 4 position spool with soft stop
- In exposed environments do NOT mount with spool in vertical position



Nominal flow rating		16 l/min	4 gpm
Operating pressure (max.)	at port P	250 bar	3600 psi
	at work ports A and B	300 bar	4300 psi
Back pressure (max.)	outlet port T	10 bar	150 psi
Internal leakage (standard) A(B) > T	p = 120 bar	20 cm <sup>3</sup> /min	1,2 in <sup>3</sup> /min
Fluid		Mineral base oil	
Fluid temperature	with NRB (BUNA-N) seals	from -20°C to 80°C	from -4°F to 176°F
	operating range	from 15 to 75 mm <sup>2</sup> /s	from 15 to 75cSt
Viscosity	min.	12 mm <sup>2</sup> /s	12 cSt
	max.	400 mm <sup>2</sup> /s	400 cSt
Max. contamination level		-/19/16 – ISO 4406	NAS 1638 – class 10
Ambient temperature for working conditions		from -40°C to 60°C	from -40°F to 140°F
Spool stroke		8,5/10,5	0,34/0,4 in
Actuating force		<220 N	<50 lbs

## Hydraulic Scheme of P81-Rs-S10



Stroke to pos. 1 (pull) - 8,5 mm  
 Stroke to pos. 2 (push) - 5,5 mm "High force mode"  
 Stroke to pos. 3 (push) - 5,5 + 5 mm "High speed mode"

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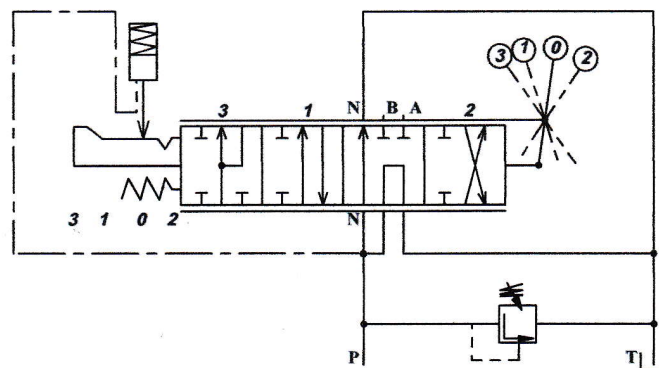
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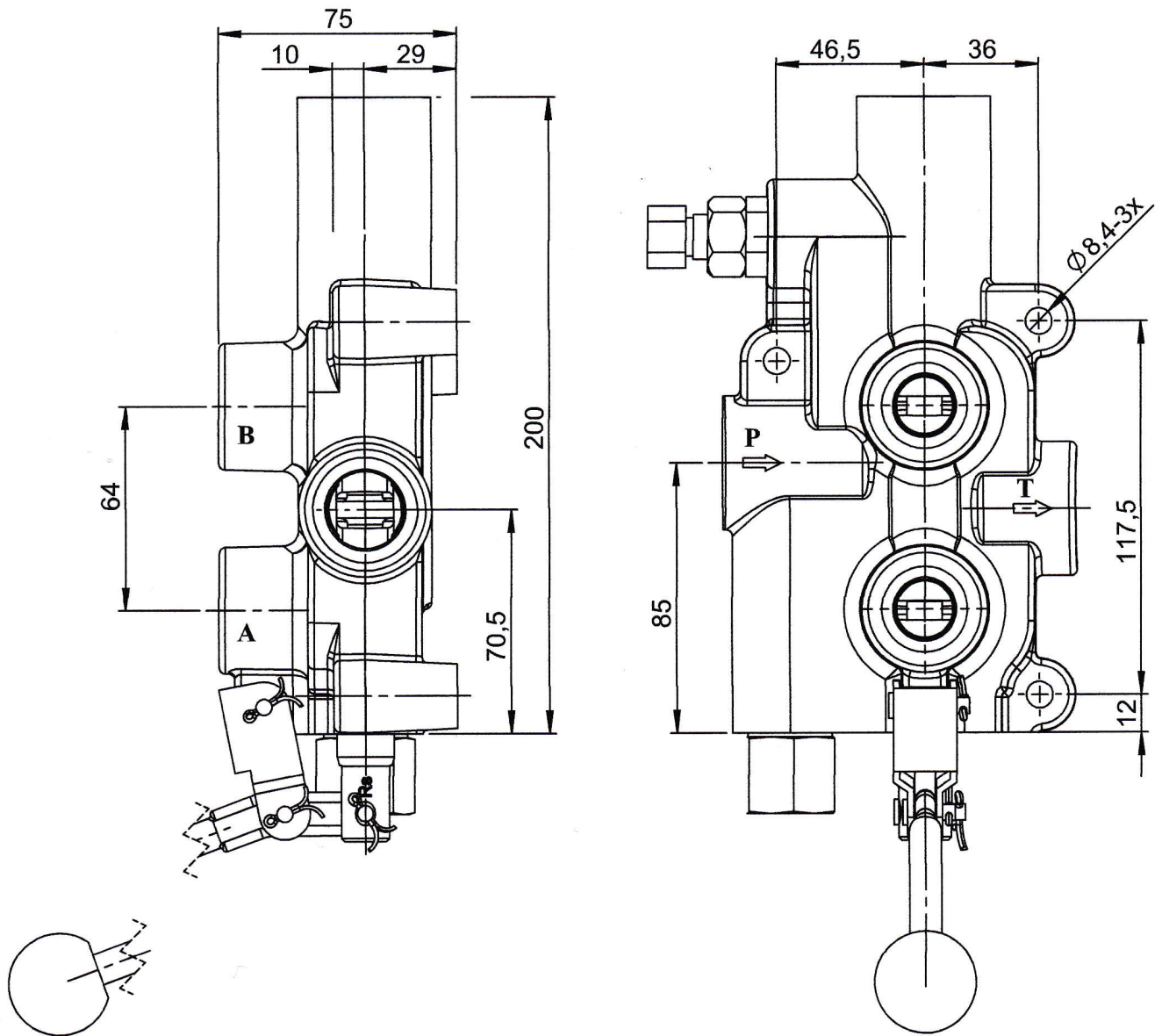
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Available threads for that valve:

UN-UNF (order code S10)

Working ports A, B: 7/8-14UNF

Inlet port P: 1-1/16-12UNF

Outlet port T: 1-1/16-12UNF

NPT (order code NPTF)

Working ports A,B: 1/2-12 NPTF

Inlet port P: 3/4-14 NPTF

Outlet port T: 3/4-14 NPTF

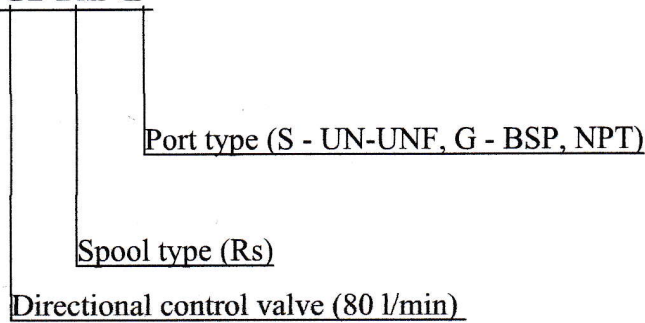
BSP (order code G12)

Working ports A, B: G 1/2

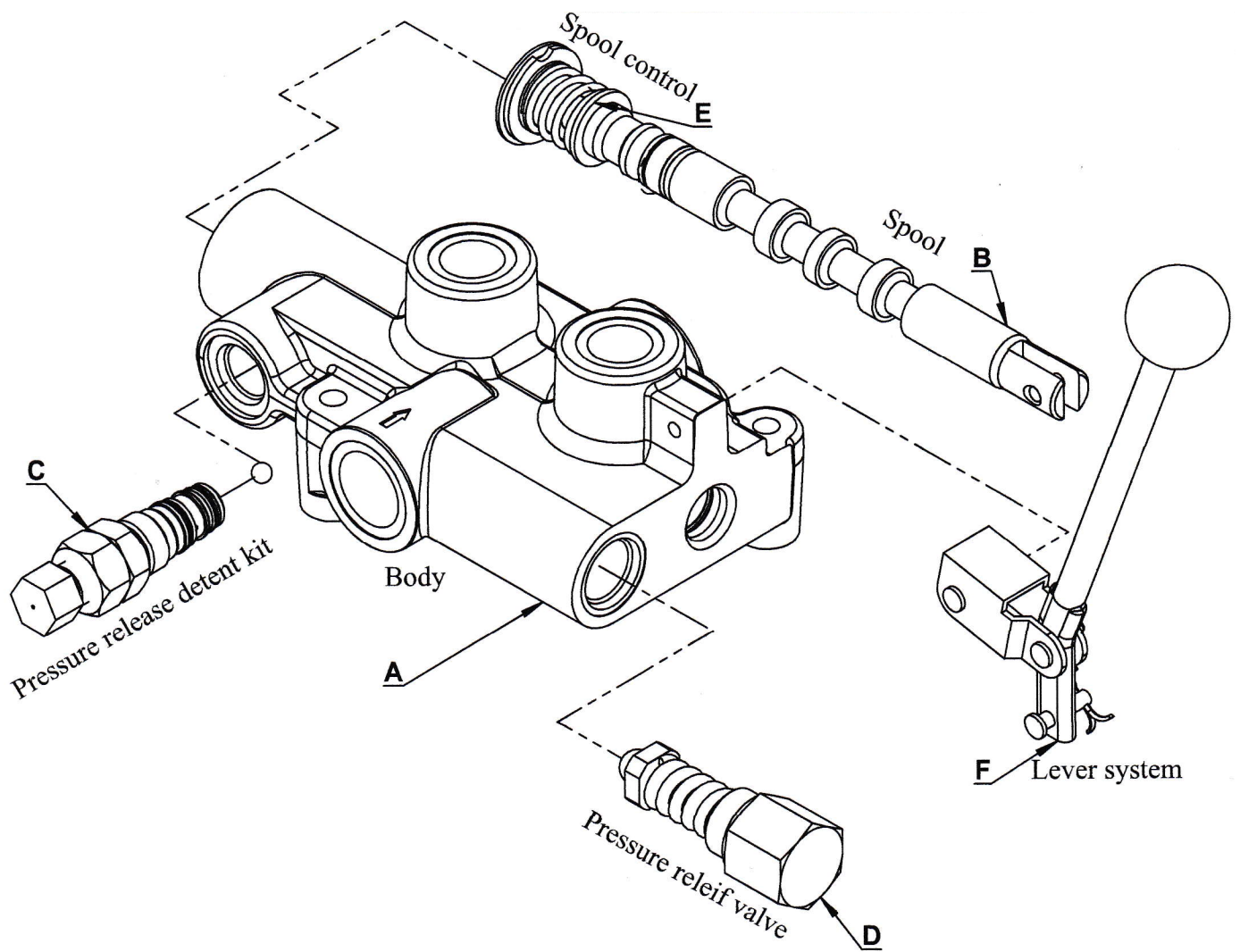
Inlet port P: G 3/4

Outlet port T: G 3/4

**Order Code: P81 Rs G**

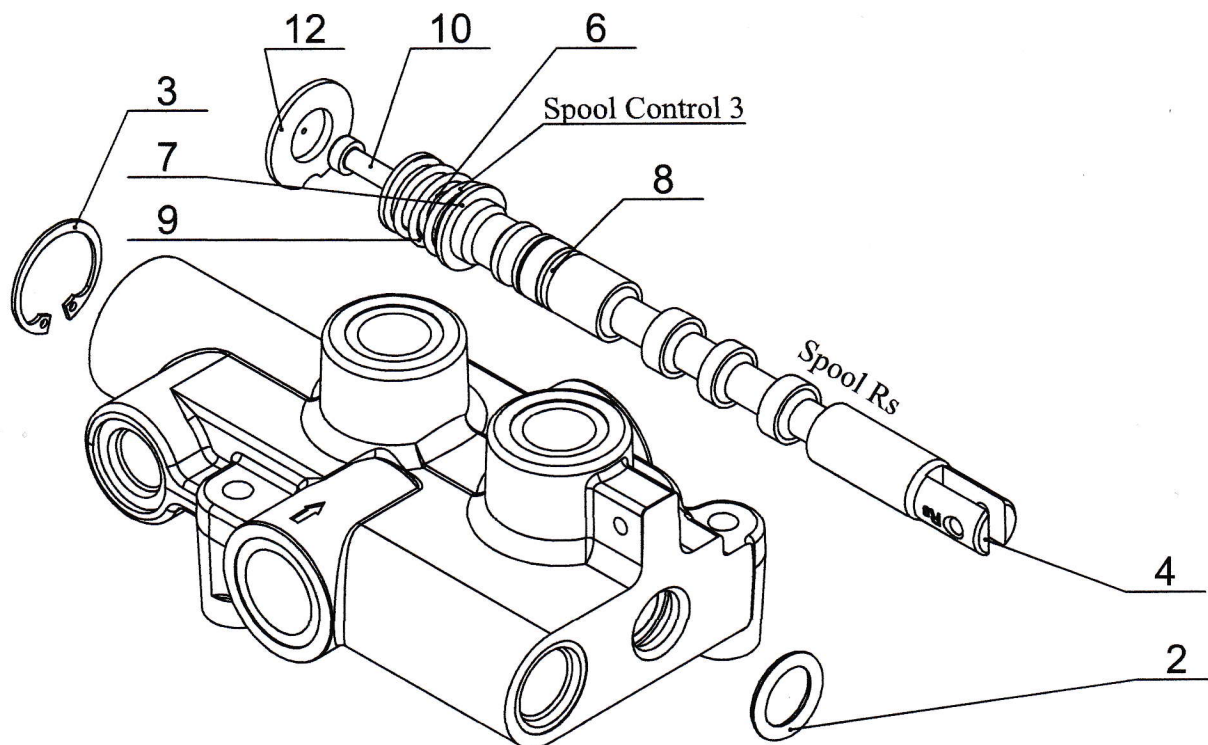






Code	Part No.	Description
A	414.00.00.04	Valve body
B	414.01.00.15	Spool
C		Pressure release detent kit
D		Pressure relief valve
E		Spool control
F		Lever system

## Spool and spool control



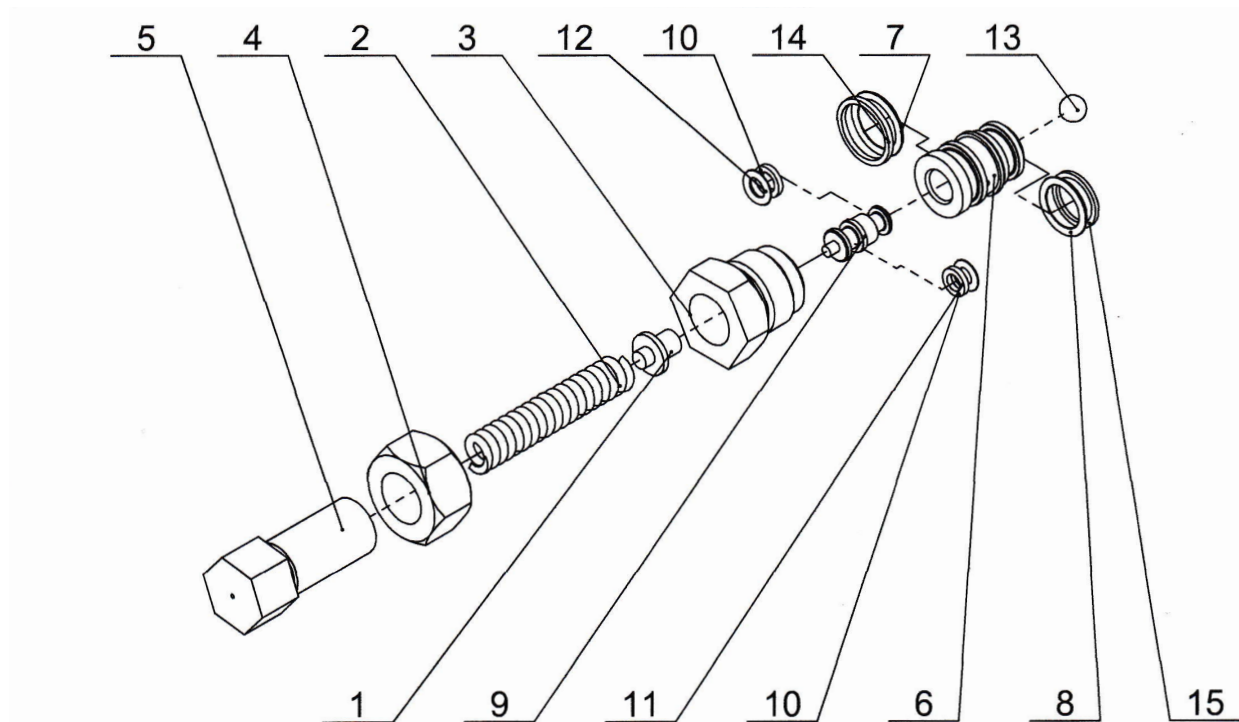
Code	Part No.	Hydraulic scheme	Description
Rs	414.01.00.00-04		Spool Rs (Regenerative) with closed working ports and open bypass channel

### How to replace a broken o-ring (2), (8)

To replace the o-ring (8) on the spool (4) the following procedure must be followed.

1. Remove the pressure release detent. (refer to page 4/7)
2. Use a needle nose pliers to reach into the cavity and to grip onto the small stem on the piston. Remove the piston.
3. Remove the steel ball at the bottom of the piston cavity (a magnet may help).
4. After removing the snap ring (3) and end plate (12) at the rear, remove the spool assembly by pushing the spool out the rear. Now you can replace o-ring (2).
5. Secure the spool and remove the button head cap screw (10). The spool may be secured by using a vice to clamp over the handle end clevis slot (with the slot perpendicular to the jaws) or by placing the clevis slot over a rigid bar. Do not clamp on the outside surface of the spool. Remove the cap screw from the spring end of the spool. If the cap screw socket is rounded out, it can be removed by using a drill to remove the button head, then removing the attachment parts and then using a locking pliers to grasp and remove the screw shank. Finally remove parts (6), (12), (7) from the spool (4).
6. The existing o-ring (8) can be cut off. The new o-ring is installed from the attachment end. After placing the new o-ring wait a few minutes so it can regain its original shape, and then reinstall the spool.
7. The valve is reassembled by following the same directions in reverse. The o-ring and spool must be lubricated with oil before installation.

## Pressure release detent



POS. #	PART #	DESCRIPTION	QTY.
1	414.02.00.01	SPRING ADAPTER	1
2	79.00.03	SPRING	1
3	414.02.00.03	PLUG	1
4	414.02.00.04	JAM NUT	1
5	414.02.00.05	ADJUSTING SCREW	1
6	414.03.01.01	PISTON SLEEVE	1
7	DIN 3771	O-RING 12.5x1.8	1
8	DIN 3771	O-RING 11.2x1.8	1
9	414.03.02.01	PISTON	1
10	-	BACK-UP WASHER 5.1x1.4	2
11	DIN 3771	O-RING 4x1.8	1
12	DIN 3771	O-RING 5x1.8	1
13	-	STEEL BALL	1
14	-	BACKUP RING 16x1,3x1,4	1
15	-	BACKUP RING 14.28x1x1.3	1

### Pressure release detent

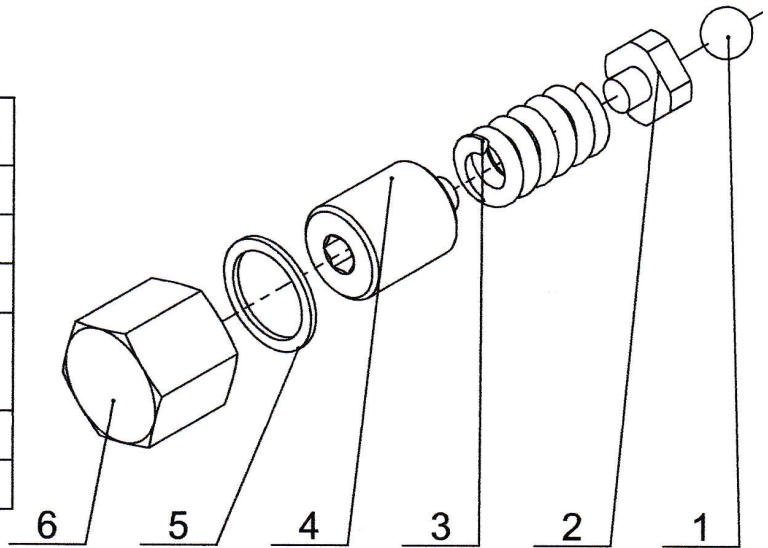
This feature provides a pressure release detent for the spool "out" (handle in) position. When the spool is manually placed in the detent position oil is directed to the "B" work port (the port away from the handle). When the pressure in the "B" port reaches a preset level the detent will release and the spool will center. The factory setting is 70 bar. The detent release pressure is adjustable by loosening the jam nut (15). Turning the adjusting screw (16) clockwise will increase the detent release pressure and counterclockwise will decrease the pressure.

NOTE: If the detent release pressure is adjusted too high the spool will not center, if the pressure is too low the detent will not hold.



## Relief Valve

POS. #	PART #	DESCRIPTION	QTY.
1	-	STEEL BALL	1
2	414.00.00.18	ADAPTER	1
3	79.00.03	SPRING	1
4	414.00.00.15	ADJUSTING SCREW	1
5	DIN7603	WASHER 21x1.5	1
6	414.00.00.14	ACORN NUT	1



### An adjustable ball spring relief valve

The standard factory setting is 150 bar. Other settings can be specified. The relief valve is adjusted by removing the acorn nut (6) and turning the adjusting screw (4). Turning the adjusting screw clockwise will increase the pressure and counterclockwise will decrease the pressure.

## Lever System

The lever system can be turned "up" or "down" depending on the location of the valve on the machine. It is done by simply rotating the lever on 180 degrees with respect to its own axis. All pins are locked in position by the use of the three cotter pins.

POS. #	PART #	DESCRIPTION	QTY.
1	414.00.00.09	LINK	1
2	414.00.00.11	LEVER	1
3	414.00.00.07	CLEVIS PIN	3
4	-	KNOB	1
5	-	COTTER PIN	3

