



## Operating Instructions Work Supports



### Work supports

- flange type
- with hydraulic port and tubes or with hydraulic manifold mounting port
- single acting

These operating instructions are available for work supports of the following types:

190x-001  
191x-021  
1913-010  
1914-0x0  
192x-x0x

### Target group of this document

Fitters and setters of machine tools. They have to be familiar with the handling of hydraulic power workholding components.

### Provided use

Supporting of workpieces against vibration and deflection. Use only hydraulic oil.

Spring force should not be used to lift workpieces.

Avoid side loads acting on the support plunger.

### Safety



#### **Danger of crushing**

Keep hands and other parts of the body out of the working area!

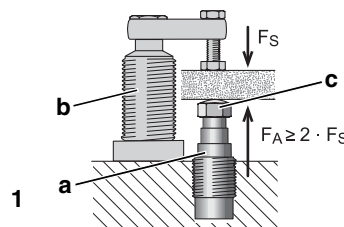
### Instructions for safe operation

- ◆ Design the operating pressure so that the support force  $F_A$  is more than twice the clamping force  $F_S$ . This reserve allows the compensation of machining forces.
- ◆ The recommended minimum operating pressure is 100 bar.

- ◆ Operate the work supports only with mounted contact bolt to avoid damage of the bolt and penetration of liquids. Use contact bolts as per data sheet G 3.800.
- ◆ Contact bolts and extensions with large weight can influence the functions of the work support.
- ◆ Use hydraulic oil as per Römheld data sheet A 0.100.

### Function

The support plunger moves with little force against the workpiece. The support plunger will be locked hydraulically, either together with hydraulic clamping of the workpiece or independantly.



- 1
- a Work support (schematic figure)
  - b Swing clamp
  - c Contact bolt

### Function

Category	1	2	3
Types	190x-001 192x-001	192x-x02 <sup>1</sup> 192x-x03	191x-021 1913-010 1914-xxx
Extend	always	pneumatically	hydraulically
Contact	spring	pneumatically	spring
Locking	hydraulically	hydraulically	hydraulically
Retract	no	Return spring <sup>1</sup>	return spring

<sup>1</sup> Typ -x02 is without return spring, i. e. return by external load.

#### Category 1

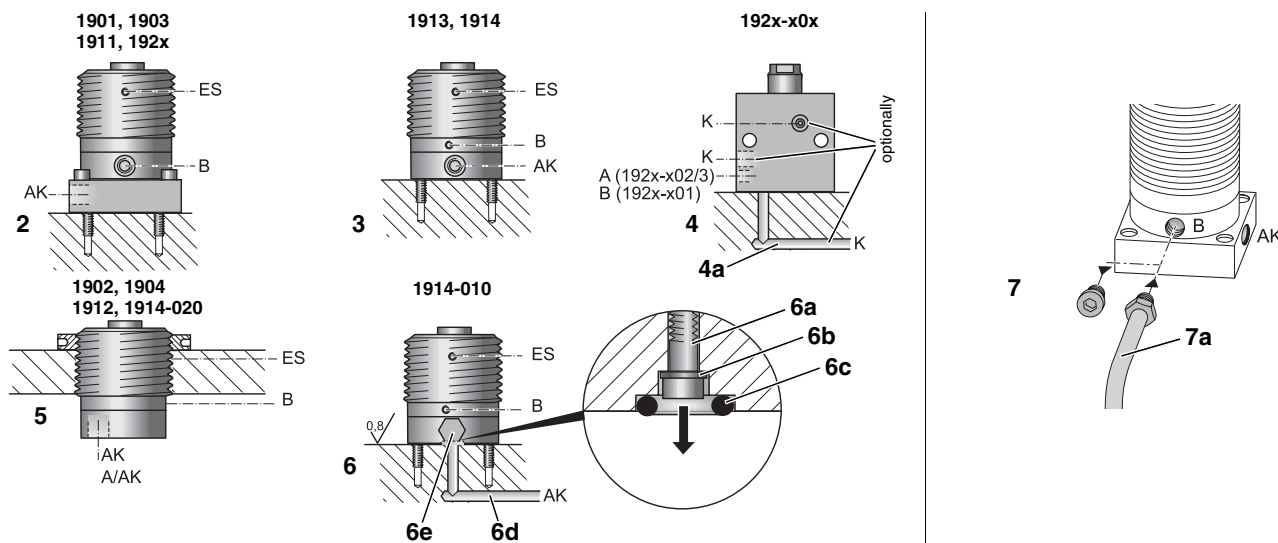
The support plunger is extended in off-position.

#### Category 2

The support plunger is retracted in off-position. The pneumatically-actuated plunger allows precise setting of the plunger contact force by means of a pressure reducing valve.

#### Category 3

The support plunger is retracted in off-position. It moves forward with a light spring force against the workpiece, when hydraulic pressure is applied. With increasing oil pressure, the support plunger locks hydraulically.



All figures are schematic figures.

## Install work support

### Flange or block type (hydraulic port and tubes)

- ♦ Clean the support surfaces.
- ♦ Fasten work support at the flange (2, 3 bzw. 4).

### Flange or block type (hydraulic manifold mounting port)

- ♦ Drill holes (4a or 6d) for hydraulic oil supply and return in the fixture.
- ♦ For type 1914-010 (6) additionally:
  - ♦ Remove socket head cap screws (6a) and Usit-rings (6b). Insert O-rings (6c, part-no. 3000-347).
  - ♦ Seal ports A with plugs G 1/4 (6e, part-no. 3610-006).
- ♦ Clean the support surfaces.
- ♦ Fasten work supports on the fixture.

### Threaded-body version

- ♦ Produce thread in the fixture and lock the work support with a collar nut (5).

## Hydraulic connection

- ♦ Connect hydraulic lines to qualifying standards, pay attention to scrupulous cleanliness! See also Römheld data sheets A 0.100, F 9.300, F 9.310 and F 9.360.
- ♦ Use only fittings "screwed plug B" as per DIN 3852 (ISO 1179).
- ♦ Do not use sealing tape, copper rings or coned fittings.
- ♦ Check sealing of the hydraulic connections!

Port	Function
AK	Extending and locking
K	Locking
A	Retracting (pneumatically, for 192x-x02 and -x03)
B	Bleeding of the spring area
ES	Bleeding screw

## Hydraulic bleeding

Bleed the hydraulic lines during start-up of the system, otherwise clamping times can be considerably prolonged and function problems can be caused.

- ♦ Loosen carefully at low oil pressure the bleeding screw (ES) at the work support.



*For work supports 1913 install a bleeding screw at the upper ends of the piping.*

- ♦ Pump until bubble free oil comes out.
- ♦ Fasten the bleeding screw.

## Single-acting work supports

The spring area of single-acting work supports must be vented (pressure compensation). A sintered metal air filter avoids penetration of dust and swarf. If there is any danger of fluids being sucked into the filter, a vent hose has to be connected.

- ♦ The vent hose (7a) has to be placed in a position where definitely no liquids can enter. See also Römheld data sheet A 0.110.



### Troubles of functioning

*Protect the bleeding port (port B) against penetration of coolants and cutting liquids!*



## General characteristics

Part-no.		1901 1902	1903 1904	1911 1912	1913	1914	1921- 101	1921-102 1921-103	1923- 001	1923-002 1923-003	1925- 001	1925-002 1925-003
Category		1	1	3	3	3	1	2	1	2	1	2
Stroke	mm	16	18	18	8	12	6	6	8	8	10	10
Operating pressure, min. recommended	bar	100	100	100	100	100	100	100	100	100	100	100
Operating pressure, max.	bar	500	500	500	500	500	500	500	500	500	500	500
Support force at 500 bar:	kN	32	48	48	8	20	7	7	12.5	12.5	28	28
Plunger contact force min./max.	N	10/90	10/90	60/100	15/30	30/60	8/10	8/10	13.5/17	-	19.2/24	-
Plunger contact force at 1 bar air pressure	N	-	-	-	-	-	-	20.1	-	31.4	-	96.2
Admissible oil flow rate	cm <sup>3</sup> /s	-	-	70	25	35	-	-	-	-	-	-

### Admissible oil flow rate

If in the case of hydraulically extending work supports (category 3) the admissible oil flow rate will be exceeded, the support plunger will be locked before its contact at the workpiece. The admissible oil flow rate is valid for vertical mounting positions. Reduce the flow rate for other mounting positions and/or premature locking.

If the flow rate of the pump divided by the number of work supports is higher than the admissible oil flow rate, the flow rate has to be throttled to avoid any overload and thereby higher wear.

The oil flow rate can be checked as follows:

$$V_{PU} < \frac{V_{Adm.} \times 60 \times n}{1000} \text{ with}$$

$V_{PU}$  = Flow rate of the pump in the power unit in l/min

$V_{Adm.}$  = Admissible flow rate in cm<sup>3</sup>/s

$n$  = Number of elements

For this purpose flow control check valves have to be mounted in the clamping line (port AK) which allow oil return from the work support without any impediments.

### Maximum / minimum plunger contact force

The indicated maximum plunger contact force will be applied, if the support plunger contacts the workpiece already at the beginning of the stroke. At the end of the stroke the minimum plunger contact force will be applied.

## Maintenance

Check if the hydraulic ports are tight (visual control). The work support itself is maintenance free.

## Data sheets

Types	Corresponding data sheets
<b>190x</b>	B 1.900
<b>191x-021</b>	B 1.910
<b>1913</b>	B 1.913
<b>1914</b>	B 1.914
<b>192x</b>	B 1.921

## Trouble shooting

Trouble	Cause / Remedy
	Oil flow rate too high - reduce oil flow rate
Support plunger does not extend	Corrosion at support plunger or spring - Repair required by Römheld Penetration of cooling liquids - Repair required by Römheld Broken spring - Repair required by Römheld
Support plunger does not retract	Corrosion at support plunger or spring - Repair required by Römheld Penetration of cooling liquids - Repair required by Römheld Broken return spring - Repair required by Römheld
Support plunger moves back	Operating pressure not sufficient - Check the dimensioning of the operating pressure as per catalogue - Adjust the operating pressure correspondingly Load (clamping and machining force) too high - Check dimensioning of the load - Adjust the operating pressure correspondingly - Use other elements (work support/swing clamp)

Subject to changes without notice.