

Technical Product Information No. 961

Hydraulically released spring applied brake of series 0-023

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About this technical product information note (TPI)

To whom is this TPI addressed?

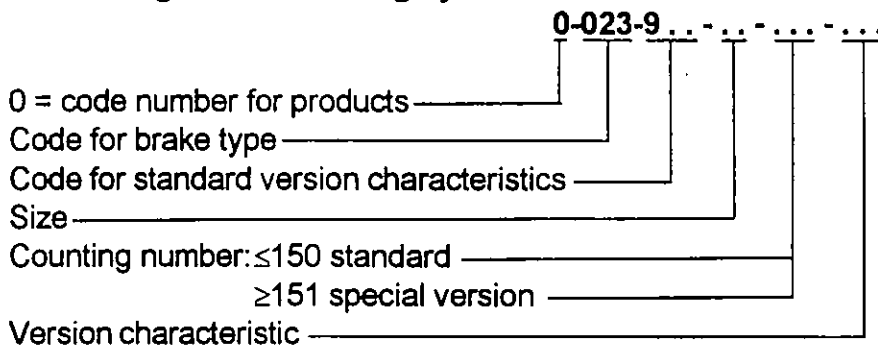
This technical product information note is addressed to

- the final manufacturer's methods engineers and fitters and
- the final customer's works fitters and machine operators.

What will you find in the TPI?

The TPI offers you all the important information needed for the installation and maintenance of series 0-023 brakes. Part of the TPI is represented by a general drawing which you should have received in the course of the processing of your order. If you have not, please request one from us quoting the article number stated in the order documentation.

The Ortlinghaus numbering system:



What will you not find in the TPI?

The TPI does not provide information to support you in design work. You will find such information in our catalogue and prospectuses. Please find information on accessories (oil inlets, hydraulic units etc.) in the separate TPI 730.

Significance of the symbols accompanying the text

There is a danger of injury during installation and in the course of production!



There is a danger of damage to materials during installation and in the course of production!



Please pass on this TPI to your customers

You can order further copies of it from us for your customers. You may also make copies of this TPI to pass on to your customers.

About the product

Application and mode of functioning of the brake

Spring-applied, hydraulically-released brakes for incorporation in presses are characterised by the low amount of space they take up, by their low moment of inertia and by the high rates at which they can be reliably applied and released. They are maintenance-free to a large extent. In addition their multi-plate form of construction enables them to brake high torques without the production of a large amount of heat. Furthermore, even without additional sound insulation, the brake produces only a low level of noise (around 85 dB (A) when being applied/released.

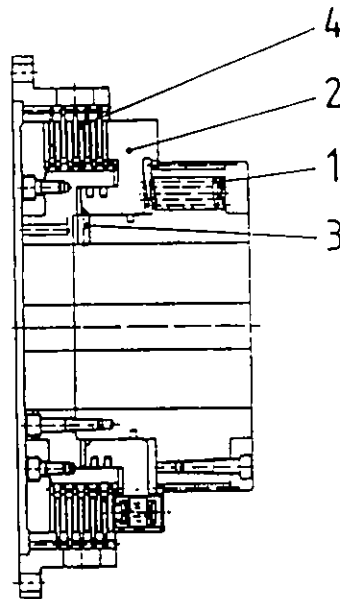


Fig. 1: Function of the brake

Application of the brake: Springs 1 press against piston 2 in the cylinder. This causes the plates to be pressed together so that the brake is applied.

Releasing of the brake:

Hydraulic oil 3 causes the piston to push back the springs. As a result the brake plates 4 are no longer pressed together and the brake is released.



The normal pressure for releasing the brake is **60 bar**, the maximum permissible pressure **65 bar**. **Never use a higher pressure** for releasing the brake since then there is the risk of bolts shearing.



Fit a throttle directly upstream of the main valve in order to prevent short-term pressure peaks in excess of 70 bar.

Form of delivery of the brake

The brake is supplied with the housing in place. In addition the plates are in place, centered and aligned.

Transport

Avoid hard impacts during transport since these could change the aligning and centering of the plates.

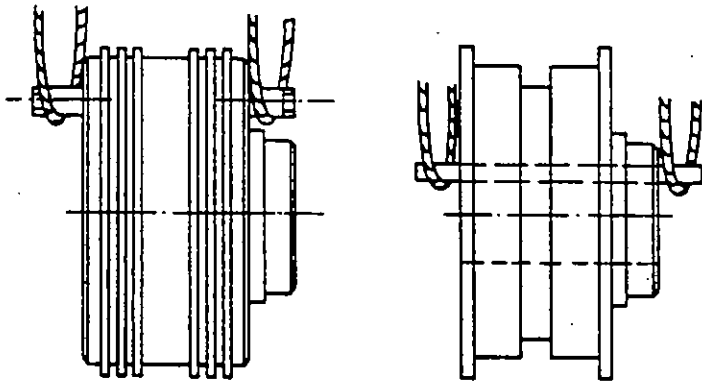


Fig. 2: Transport aids

You can fit transport aids as shown.

You will find three tapped holes for fitting transport bolts on each end of the brake.

Size of the tapped transport holes

Size	63	75	80	86	90	94	96	98
Thread	M10	M12	M16	M16	M20	M20	M24	M30

Different forms of execution

The 0-023 series brakes can be supplied in three different versions whereby these can also be combined together with one another.

- standard version,
- strengthened version with lengthened set of plates,
- version with internal oiling for applications with high thermal loading.

Initial mounting

The brake is supplied with the housing fitted and with the plates centered and aligned.

Information cannot be given here on special modes of fitting which depend on the particular design of the machine to which the brake is to be fitted.

Mounting the brake

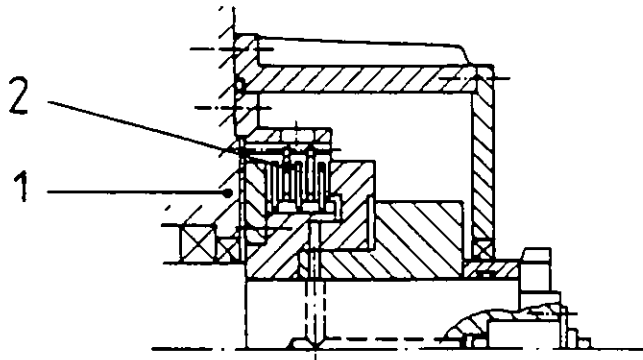


Fig. 3: Brake 2 fitted internally on machine body 1

Brake fitted internally on machine body

- Remove brake housing.
- Secure the housing to the machine body.
- Mount the brake on the shaft with feather keys (apply copper-based friction-reducing paste thinly - **do not use paste containing graphite**).

Test run of the brake

The brake must be test-run for at least 20 hours. As a rule no further plate wear will take place after this.

Maintenance

Checks during the operation of the machine

The brake is wear-free and maintenance-free to a large extent. However wear to the plates can take place if the brake is not used properly (operating temperature too high)

Plate wear manifests itself in the form of the operating characteristics of the brake changing:

- The braking angle increases, i.e. the press ram moves beyond its upper dead centre before it is stopped.

If you find that the brake angle has increased, you must immediately stop the machine. Contact customer service.



Faultfinding table

Fault	Reason	Remedy
Brake slips (braking angle has increased)	Friction linings worn down (maximum permissible size of the air gap reached)	Get customer service to change the plates
	Reason cannot be established ⇒ Machine-damage	Obtain technical service



If plate wear has taken place, then the brake must have been improperly operated (operating temperature too high ...). For this reason you should establish the way in which the brake has been improperly operated and correct this so that further wear does not occur in the future.

Complete assembly - only for customer service

Preliminary remarks:

When ordering a new set of plates, always order at least three spacer plates at the same time.

Checking for wear prior to dismantling

Check the plates for wear before dismantling the unit. For this make the housing accessible.

Before starting to work on the brake make certain that no unintended machine movement can take place when the brake is put out of action.

- Move the press ram to its bottom dead centre.
- Switch off the drive.



Release the brake (apply hydraulic pressure).

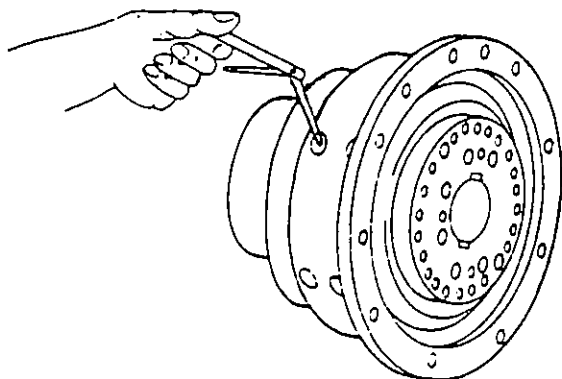


Fig. 4: Air gap

- Measure the air gap between an inner plate and the friction lining of an outer plate through the openings in the brake housing. The maximum permissible air gap has been reached when the gap has become twice the size it was when the plates were new.

Air gap between inner plate and friction lining of the outer plate!

Size	Size of gap when new in mm (standard version, 10 friction surfaces)	Size of gap when new in mm * ¹⁾ (extended version, 16 friction surfaces)
63	0.7 - 0.9	1.1 - 1.4
75	0.8 - 1.0	1.3 - 1.6
80	0.9 - 1.1	1.5 - 1.8
86	1.0 - 1.2	1.6 - 1.9
90	1.2 - 1.4	1.9 - 2.2
94	1.3 - 1.6	2.8 - 3.2
96	1.5 - 1.8	3.0 - 3.6
98	1.7 - 2.0	3.4 - 4.0

*¹⁾ 20 friction surfaces with sizes 94, 96 and 98.

Dismantling

Before starting to work on the brake make certain that no unintended machine movement can take place when the brake is put out of action.

- Move the press ram to its bottom dead centre.
- Switch off the drive.



- Disconnect the housing and the draw off the brake from the shaft. For this 3 empty tapped holes (also used for transport purposes) are provided:
 - on each of the stop plates of the brake.

Dismantling the brake

Always dismantle the end opposite the brake first and only then the brake end.



Dismantling the end opposite the brake

The stop plate is under spring pressure. It could release itself suddenly and spring out if you just took the bolts out.



- For this reason first replace three of the bolts with longer auxiliary ones (see table on p. 14).

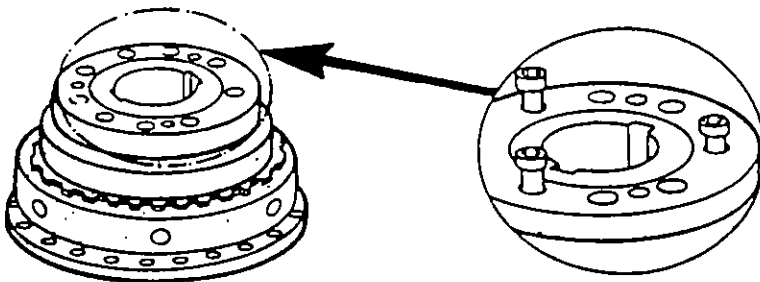


Fig. 5: Safeguarding at dismantling

- Only then slacken and remove the remaining ones and finally the auxiliary ones.

- Remove bolts 21 and remove the stop plate.
- Remove the plate set.
- Remove bolts 4 and separate the cylinder, piston and hub.

Reassembly of the dismantled brake

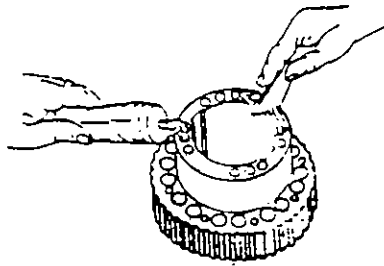


Fig. 6: Sealing

The brake is assembled in the reverse order to that for dismantling. Observe here the following points:

- Degrease all individual parts.
- Seal the face of the hub that contacts the cylinder with Permatex Form-a-Gasket No. 2 (as sold by Loctite). Apply the sealant thinly with a serrated stopping knife and wait until the surfaces become sticky.
- The sealing between the hub and cylinder with sizes 94, 96 and 98 is with Permatex and an O-ring.

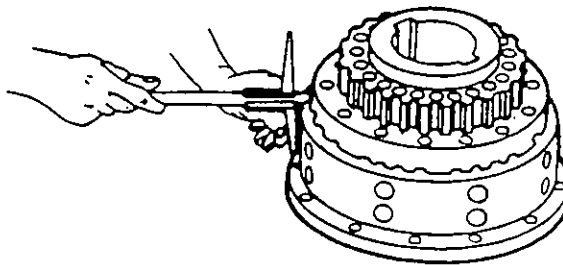


Fig. 7: Centering the set of plates

- Align and centre the set of plates.

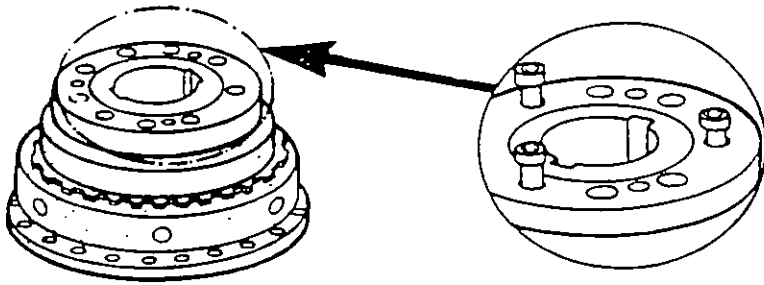


Fig. 8: Auxiliary bolts

- When fitting the stop plate to the end opposite the brake, tighten up first the longer auxiliary bolts and only then the original ones. Finally replace the auxiliary ones.

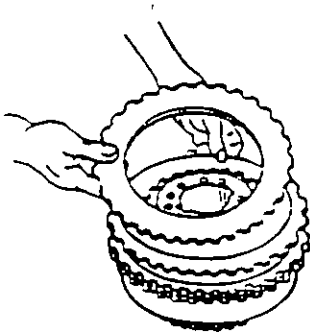


Fig. 9: Inserting the plates

- When inserting the plates, observe the following sequence: Inner plate, outer plate, ..., inner plate
- Release the brake (apply hydraulic pressure).

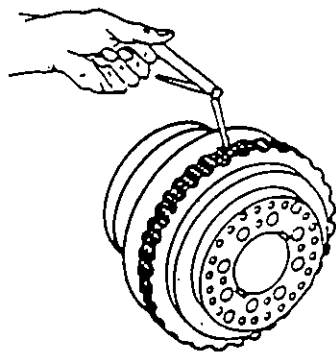


Fig. 10: Air gap of the brake

- Measure the air gap.

Air gap between inner plate and friction lining of the outer plate!

Size	Size of gap when new in mm (standard version, 10 friction surfaces)	Size of gap when new in mm ^{*1)} (extended version, 16 friction surfaces)
63	0.7 - 0.9	1.1 - 1.4
75	0.8 - 1.0	1.3 - 1.6
80	0.9 - 1.1	1.5 - 1.8
86	1.0 - 1.2	1.6 - 1.9
90	1.2 - 1.4	1.9 - 2.2
94	1.3 - 1.6	2.8 - 3.2
96	1.5 - 1.8	3.0 - 3.6
98	1.7 - 2.0	3.4 - 4.0

*1) 20 friction surfaces with sizes 94, 96 and 98.

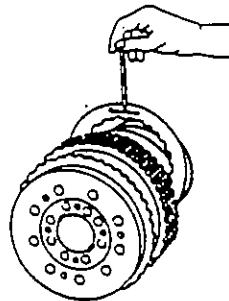


Fig. 11: Spacer plates

- To set the air gap, use spacer plates in place of inner plates.

Size and tightening torques of the bolts (see sectional drawing at the end for numbering)

Strength class: **10.9**

Locking: Loctite 262



Item Size	20	Aux- iliary bolt for 20	21	21 with ex- tended version	4	4 with ex- tended version	MA (Nm)
63	M8x35	M8x40	M8x12	M8x20	M8x35	M8x45	37
75	M8x35	M8x50	M8x16		M8x35		37
80	M10x45	M10x60	M10x20	M10x40	M10x45		75
86	M14x60	M14x75	M14x25	M14x25	M14x60	M14x90	205
90	M 16x70	M 16x90	M 16x30	M 16x70	M 16x70	M 16x110	310
94	M 20x80	M 20x100	M 20x80		M 20x80		620
96	M 24x100	M 24x110	M 24x100		M 24x100		1060
98	M 30x110	M 30x130	M 30x55		M 30x110		2100

Spare parts

Our guarantee for our products only applies when you use original Ortlinghaus spare parts. Please order spare parts only in writing.

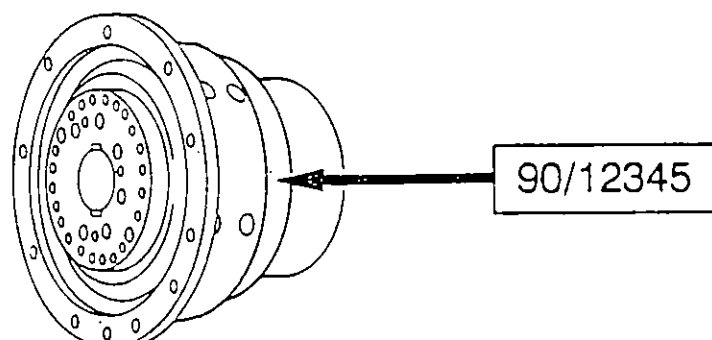


Fig. 12: Fabrication number

You will find the fabrication number, under which your brake was manufactured, on the outside of the piston. Always state this number. It is made up of two digits for the year and a consecutive number, e.g. 90/12345.

In addition state if possible the article number of your brake.

Approved oils

We approve the oils listed below for the operating of the brake. These have all been tested by us and enable the brake to perform optimally.

Oil type	Manufacturer	Oil sort
HL/CL	Agip	Agip OTE 32...68
	ARAL	Kosmol TF 32...68 Vitam UF 46, 68
	BP	BP Energol HL 46
	DEA	Astron HI 22...68
	FINA	Cirkan 22...68
	Mobil	Mobil Turbine Oil Light Mobil Turbine Oil Medium
	Shell	Morlina 22, 46, 68
ATF	Aral	ATF 33
	BP	Autran G
	Esso	Glide
	Fuchs	ATF TF M2C 33-F
	Mobil	ATF 210
	Shell	ATF Donax TF
Synthetic Oils	Castrol	Alphasyn T 32...68
	Monsanto	Santotrac 20...50

List of parts

(see sectional drawings)

Item	Part
1	Hub
2	Cylinder
3	
4	Bolt
5	Brake housing (here flange housing)
6	Brake housing (here pot housing)
7	Piston
8	
9	Stop plate
10	
11	Spring
12	Spring
13	
14	
15	Outer plate
16	Inner plate
17	Plain compression ring
18	Plain compression ring
19	Damping element
20	Bolt
21	Bolt
22	O-ring

Brake parts

