

## Technical Product Information No. 830 EN

### Hydraulically actuated clutch/brake combined unit series 0123 ♦ size 75 - 90

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## About this Technical Product Information (TPI)

### Who is this TPI directed at?

This TPI is directed at qualified personnel who

- are entrusted with the assembly, commissioning and operation of the product and who
- have obtained the necessary qualifications by reading and understanding the instructions by training or instruction

It is intended for

- Fitters at the manufacturer of the machine / plant
- Maintenance fitters at the machine users.

### What will you find in the TPI?

The TPI provides all the necessary information for the assembly and maintenance of the product described on the title page

### Notes on the symbols used in the text

On the pages which follow, important sections of text are highlighted with the following symbols.



This symbol means:

There is a risk of injury during the activity described or in operational running!



This symbol means:

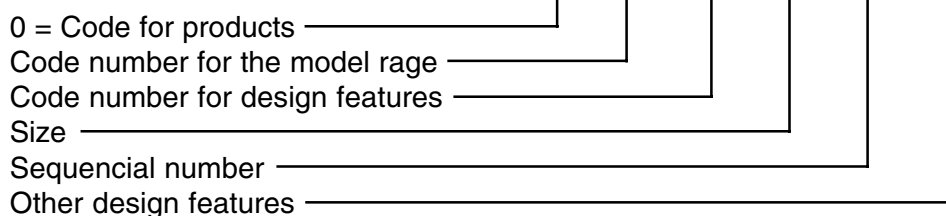
There is a risk of material damage during the activity described or in operational running!



This symbol indicates sections of text to which particular attention must be paid.

### The Ortlinghaus numbering system

**Example:** 0 111 - 222 - 33 - 444 555



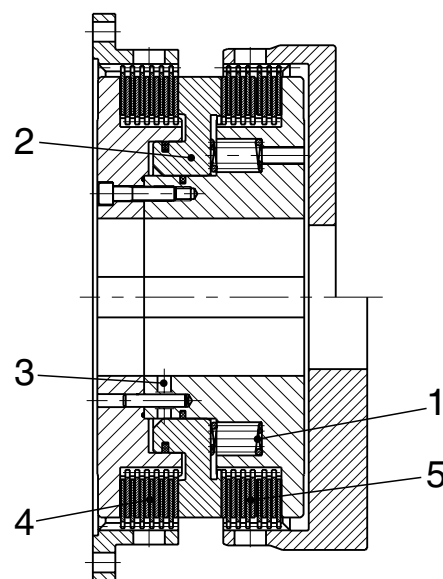
Pass this TPI on to your customers ! You can either order further copies of this TPI from us or you are free to make copies, for use by your customers.

## About the product

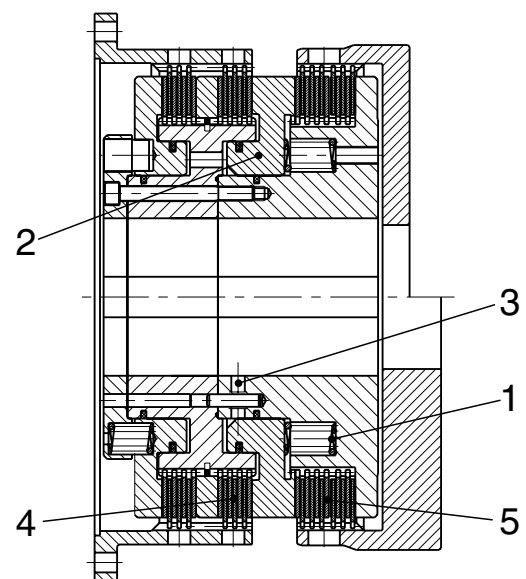
### Purpose and mode of functioning of the clutch/brake combined unit

Hydraulically-actuated clutch/brake combined units for 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 engaged and disengaged. They are maintenance-free to a large extent. In addition their multi-plate form of construction enables them to transmit high torques even when thermal loadings are high.

When fitted with a sealed housing cup, they can cause no contamination of the ambient air in the form of dust from the linings or oil mist. Furthermore, even without additional sound insulation, the clutch produces only a low level of noise (around 85 dB (A)) when being engaged/disengaged.



**Fig. 1: Function of the clutch/brake combined unit (single brake)**

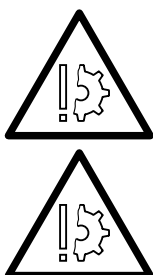


**Fig. 2: Function of the clutch/brake combined unit (double brake)**

**Braking:** Springs 1 load piston 2 or, in the case of the double brake version, both pistons in the cylinder. As a result there is a frictional connection between the brake plates and the brake is activated in this way.

**Engaging of the clutch:** Hydraulic oil 3 moves the piston or, in the case of the double brake version, both pistons against the force of the springs. As a result the brake plates 4 are released and there is a frictional connection between the clutch plates 5.

The normal operating pressure is 63 bar, the maximum permissible pressure 68 bar. **Never** operate the clutch/brake combined unit **with a higher pressure** since otherwise there is the risk of screws shearing.



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

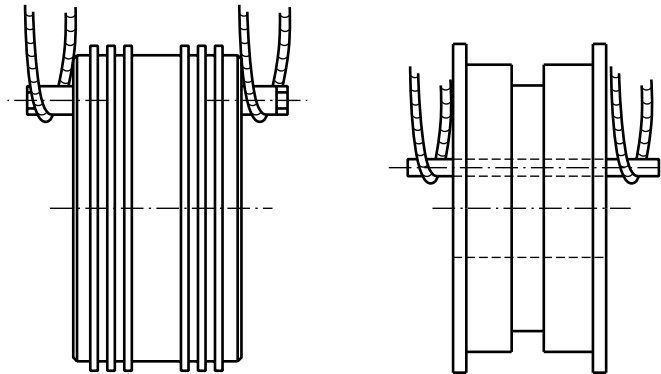
**Delivered state**

The clutch/brake combined unit is supplied with the housings in place. In addition the brake plates are already centered and aligned.



**Transport**

Avoid hard impacts during transport which might change the alignment and centering of the brake plates.



**Fig. 3: Transport aids**

You can fit transport aids as shown. For fitting bolts or eye-bolts two tapped transport holes are provided on each side.

**Size of the tapped transport holes**

Size	63	75	80	86	90
Thread	M8	M10	M12	M16	M20

**Different versions**

Clutch/brake combined units of the 0-123 series can be supplied in four different versions **whereby these can also be combined together with one another:**

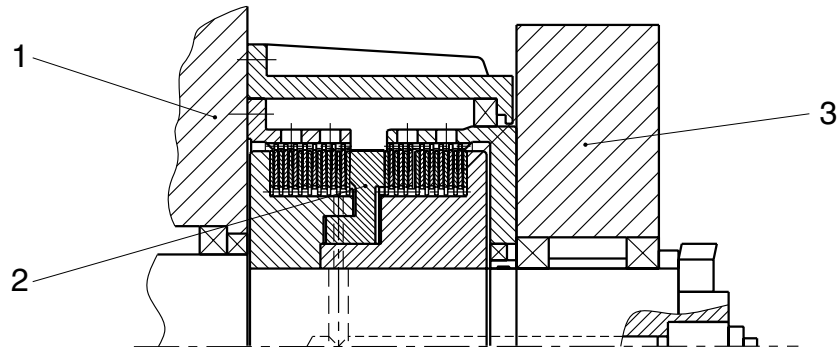
- Standard version
- Strengthened version with lengthened set of plates
- Version with double brake
- Version with internal oiling for applications with high thermal loading.

## Initial assembly and commissioning

The clutch/brake combined unit is supplied with the clutch and brake housing fitted. The brake plates have been aligned and centered in our works.

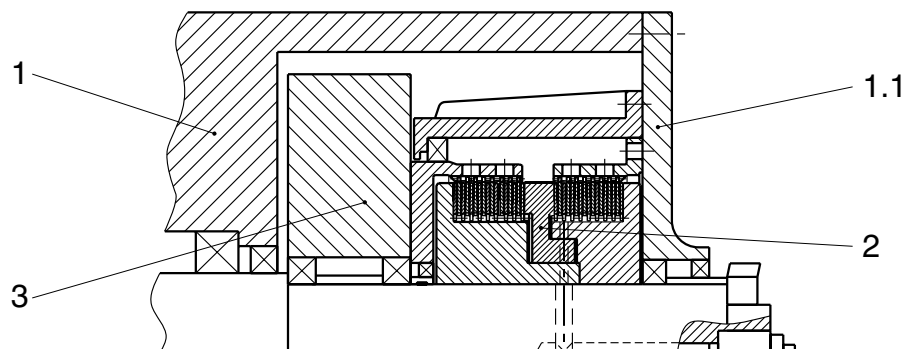
We cannot here go into special ways of fitting the unit to particular designs of machine. One can however differentiate between two different basic ways in which the unit can be fitted:

### Basic fitting variants



**Fig. 4: Fitting variant 1**

- Clutch/brake combined unit **2** fitted between machine body **1** and flywheel **3**.



**Fig. 5: Fitting variant 2**

- Clutch/brake combined unit **2** fitted between flywheel **3** and machine body plate **1.1**.

### Fitting the clutch/brake combined unit between machine body and flywheel (fitting variant 1)

- Remove clutch and brake housings.
- Connect the brake housing to the machine body.
- Mount the clutch/brake combined unit on the shaft with feather keys (apply copper-base friction-reducing paste thinly - do not use paste containing graphite).
- Fit housing cup (accessory) to the machine body.
- Mount clutch housing to the flywheel.
- Slide the clutch housing with flywheel on to the clutch/brake combined unit, guiding the clutch plates into the tothing in the housing.

## Fitting the clutch/brake combined unit between flywheel and machine body plate (fitting variant 2)

- Remove clutch and brake housings.
- Mount clutch housing to the flywheel.
- Mount the clutch/brake combined unit on the shaft with feather keys (apply copper-base friction-reducing paste thinly - **do not use paste containing graphite**), guiding the clutch plates into the tothing in the housing.
- Secure the brake housing to the machine body plate.
- Fit housing cup (accessory) to the machine body plate.
- Slide the machine body plate with brake housing and housing cup on to the clutch/brake combined unit.
- Connect the machine body plate to the machine body.

## Test run of the clutch/brake combined unit

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

## Maintenance

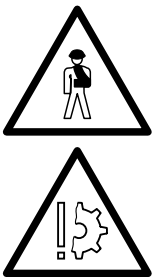
### Checks during the operation of the machine

The clutch/brake combined unit is wear-free and maintenance-free to a large extent.

However wear can take place if the unit is used improperly (too low oil pressure, too high operating temperature ....)

Plate wear manifests itself in the form of the operating characteristics of the clutch/brake combined unit changing, i.e.:

- the braking angle increases, i.e. the press ram travels beyond the top dead point before it comes to a halt, and
- the clutch slips.



If you find that the braking angle has increased or that the clutch is slipping, stop using the machine immediately and get customer service assistance.

## Fault finding

Fault	Reason	Remedy
Clutch slips	Oil pressure too low	Increase operating pressure to 60 bar
	Fault in the hydraulic system (dirt,, leaks ...)	Repair hydraulic system
	Friction linings worn down (maximum permissible size of the air gap reached)	Get customer service to change the plates
	Reason cannot be established <b>machine-damage</b>	Obtain technical service
Brake slips (braking angle increased)	Friction linings worn down (maximum permissible size of air gap reached)	Get customer service to change the plates
	Reason cannot be established <b>machine-damage</b>	Obtain customer service



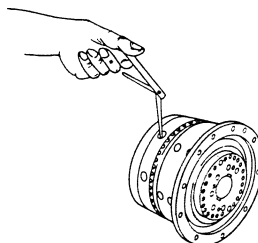
If plate wear has taken place, then the clutch/brake combined unit must have been improperly operated (too low operating pressure, too high operating temperature ...). For this reason you should establish the way in which the unit has been improperly operated and correct this so that further wear does 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 filler plates at the same time.

### Checking for wear prior to dismantling

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



**Fig. 6: Air gap**

- The measurement of the air gap is done through the openings in the clutch housing, between an inner disc and the lining of an outer disc.

### Air gap between inner plate and friction lining of the outer plate (Version with single or double brake)

In continuous operation the air gaps will increase as a result of the normal running-in process of the frictional faces. The air gaps in the run-in state of the plates can be calculated as follows:

$$L_{ein} = L_{neu} + (AL_{ges} \times 0,1)$$

- $L_{neu}$  - Air Gap, new state
- $L_{ein}$  - Air gap, run-in state
- $AL_{ges}$  - Number of external plates of clutch and brake

Size	Air gap $L_{neu}$ (New state) [mm] make up of plate pack <sup>1</sup>			
	5 AL	6 AL	8 AL	9 AL
75	0,8 - 1,0	1,0 - 1,2	1,3 - 1,6	1,4 - 1,8
80	0,9 - 1,1	1,1 - 1,3	1,5 - 1,8	1,7 - 2,0
86	1,0 - 1,2	1,2 - 1,4	1,6 - 1,9	1,8 - 2,2
90	1,2 - 1,4	1,4 - 1,7	1,9 - 2,2	2,2 - 2,5

AL - outer plates



If the air gap  $L_{ein}$  is exceeded we recommend that you carry out an inspection. If the air gap reaches twice the size of the new state ( $2 \times L_{neu}$ ), an inspection must be carried out without fail.

<sup>1</sup> make up of the larger plate pack (= greater number of outer plates) in clutch or brake.

### Air gap for the auxiliary brake (only for versions with double brake)

- air gap for the auxiliary brake between piston 14 and spring location disc 3.

Size	Air gap $L_{neu}$ (New state) $1/2/3 AL_{ZB}$ [mm]
52	0,4 - 0,6
63	0,4 - 0,6
75	0,5 - 0,7
80	0,5 - 0,7
86	0,5 - 0,7
90	0,7 - 0,9

$AL_{ZB}$  - Outer Plates of the auxiliary brake

### Dismantling

Before starting work on the machine, make certain that no unintended machine movement can take place as a result of the brake being deactivated.



- Move the press ram to its lower dead point.
- **Switch off the drive.**

Remove the brake and clutch housings and draw the clutch/brake combined unit off from the shaft. For this you can use the 2 tapped transport holes provided on each side as drawing-off holes.

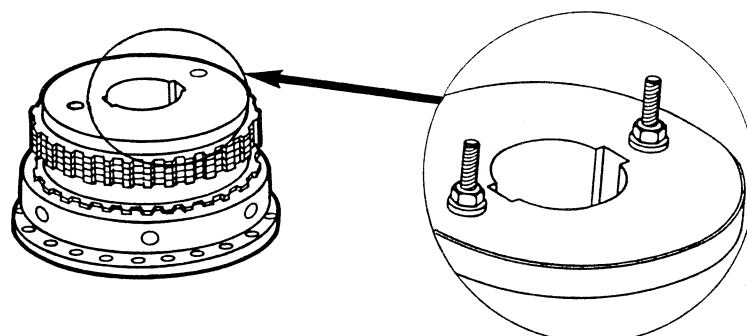


The inner parts of the unit are under spring pressure. They would become free and fly out suddenly and fly out if you just simply took the screws out.

- For this reason always first insert threaded rods through the transport holes on the clutch side and screw them into the piston.
- Fit washers and nuts on to the rods.
- Tighten up the nuts uniformly. In this way the piston will be drawn against the clutch plates and the springs held in place.

### Sizes of the tapped auxiliary holes in the piston

Size	63	75	80	86	90
Thread	M6	M8	M10	M12	M16

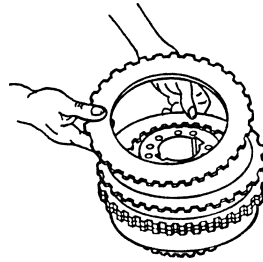


**Fig. 7: Safeguarding the unit before dismantling**

- Only after the above has been done, unscrew the screws and remove the studs. Draw off the cylinder with brake plates from the piston/hub (in the case of the version with a double brake, the plates, piston and springs of the 2nd brake become free).
- Slacken the nuts uniformly together so that the pressure in the springs is removed. The piston will now separate from the clutch plates.
- Draw off the piston and plates from the hub.

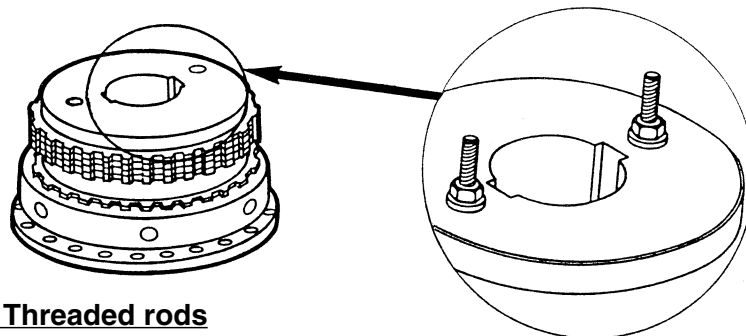
### Assembling the dismantled clutch/brake combined unit

- Degrease all parts



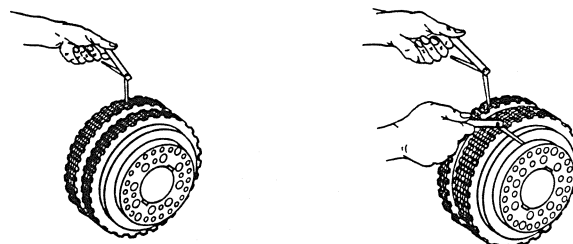
**Fig. 8: Inserting the plates**

- Mount the plates on the clutch side. When inserting the plates, make sure they are inserted in the following order: outer plate (first), inner plate, ....., inner plate (last)
- Insert the springs so that they form a symmetrical pattern.
- Slide the piston on to the hub, ensuring that the tapped holes in the piston line up with the transport holes in the hub.



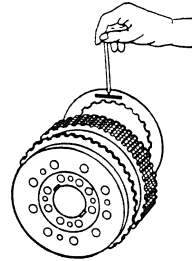
**Fig. 9: Threaded rods**

- Draw the piston against the pressure of the springs up against the clutch plates with the aid of the threaded rods, washers and nuts.
- Guide the cylinder with plates on to the hub (in the case of the double brake version: mount the set of plates with the 2nd piston on the cylinder and secure them on the hub together with the springs and spring reception plate).



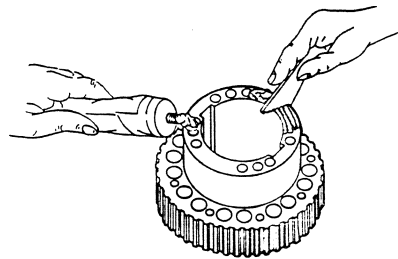
**Fig. 10: Air gap with single and double brake**

- Measure air gap (see table on page 8)



**Fig. 11: Filler plates**

- To set the air gap, insert filler plates in place of inner plates or vice-versa.



**Fig. 12: Sealing**

- For the final assembly, seal the face of the hub that contacts the cylinder to 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.
- Fit O-ring **31** into the groove in cylinder **2**.
- Guide the cylinder with the set of plates (in the case of the double brake with the 2nd piston and spring reception plate) on to the hub and secure with studs and screws.

### Size and tightening torques of the screws

Size	Thread	MA [Nm]
63	M6	15,5
75	M8	37
80	M10	75
86	M12	130
90	M16	310

- Align and centre the brake plates; only then slacken the nuts uniformly together and remove the threaded rods.

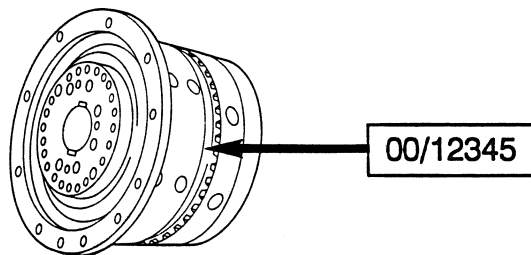
## Spare parts

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

You will find the fabrication number, under which your clutch/brake combined unit 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. 00/12345.

In addition please state if possible the article number of your clutch/brake combined unit.



**Fig. 13: Fabrication number**

## List of parts

(see sectional drawings)

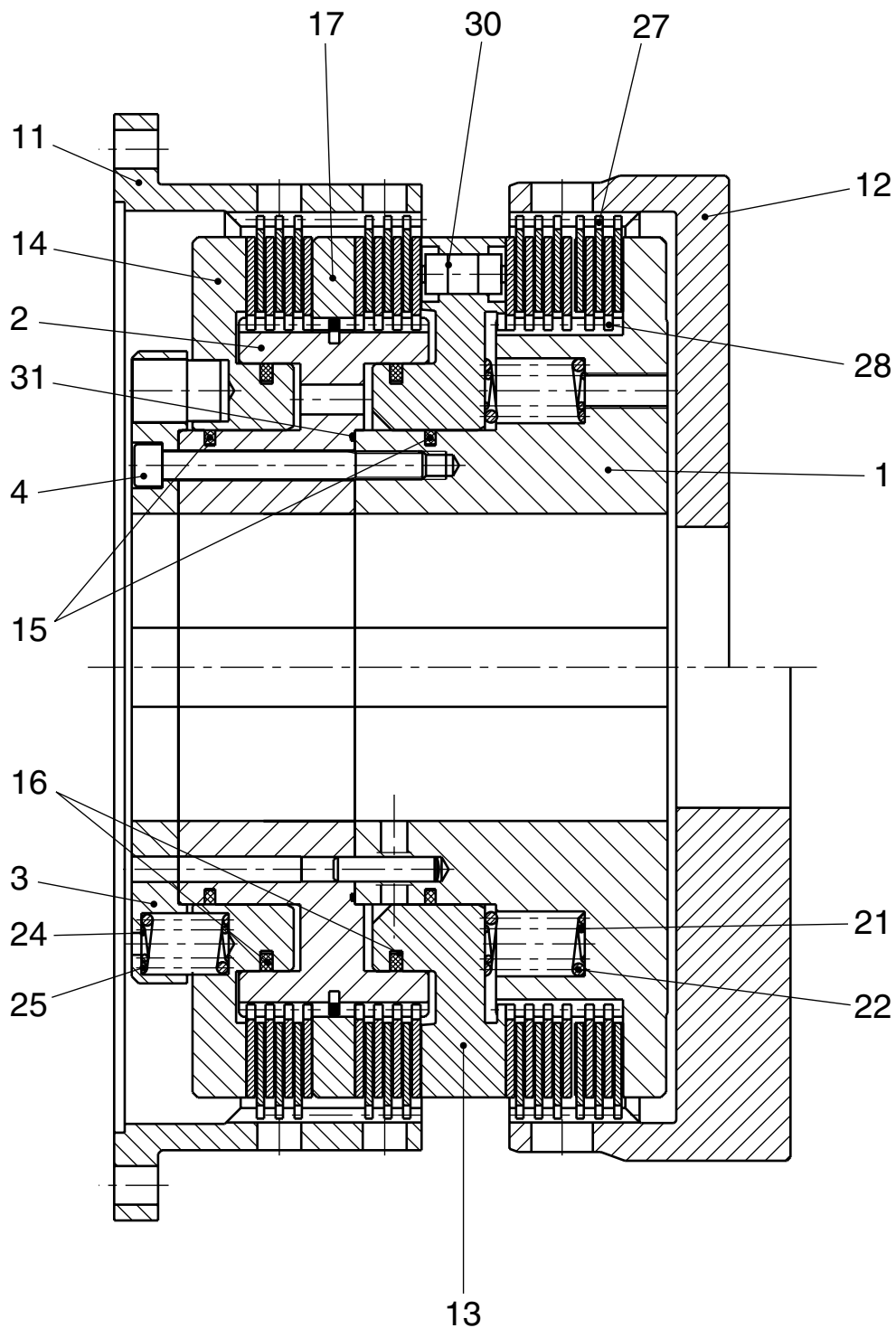
Item	Part
1	Hub
2	Cylinder
3	Spring reception plate (only with double brake)
4	Screw
11	Brake housing (here flange housing)
12	Clutch housing (here pot housing)
13	Piston
14	Piston of the supplementary brake (only double brake)
15	Piston ring
16	Piston ring
19	Middle plate (only double brake)
21	Spring
22	Spring
24	Spring of the supplementary brake (only double brake)
25	Spring of the supplementary brake (only double brake)
27	Outer plate
28	Inner plate
30	Damping element
31	O-ring

### Parts - double brake

#### Double brake

(no reinforced version can be supplied)

#### Clutch

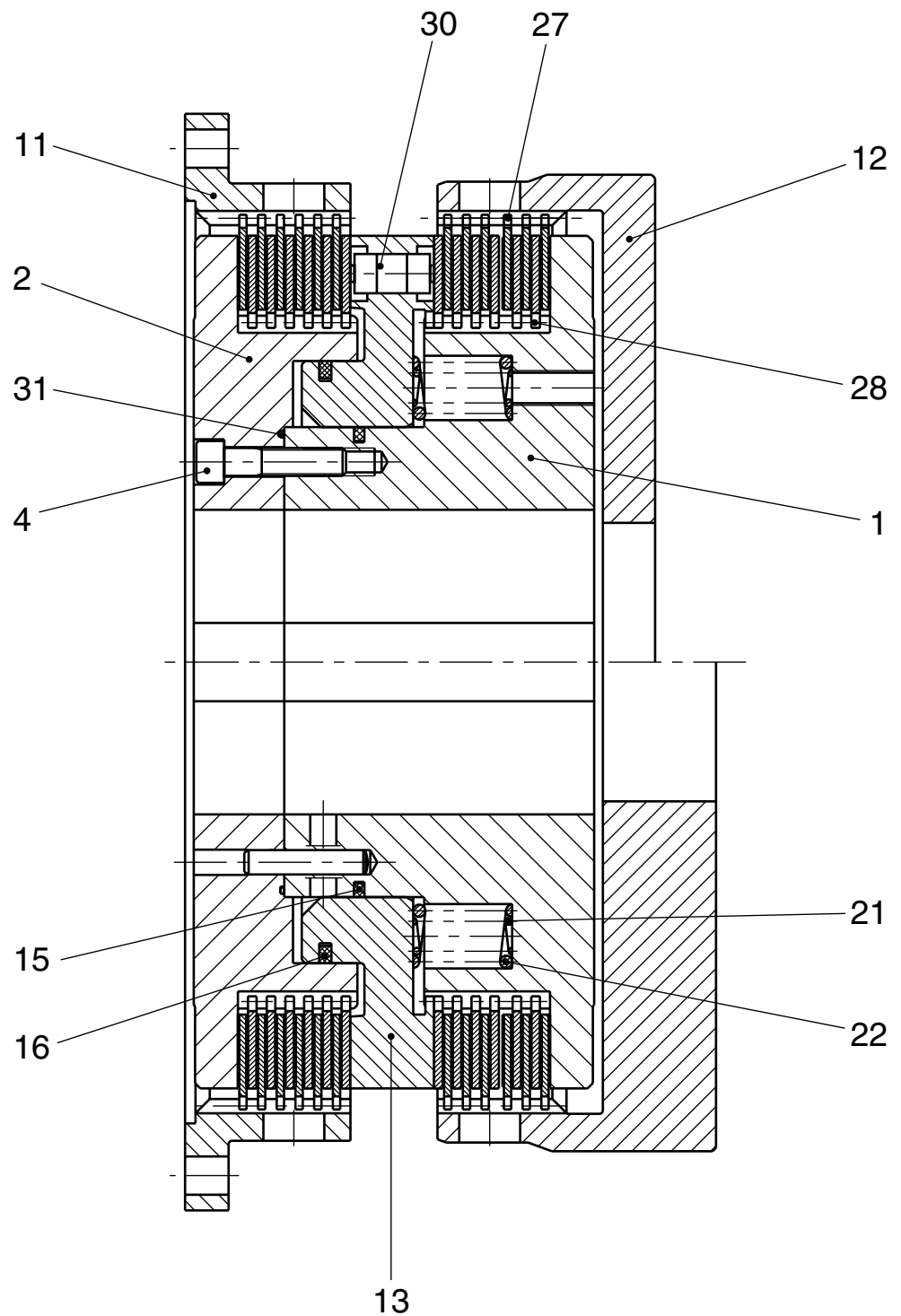


(4) Same dimension for standard and reinforced versions

**Parts -single brake**

**Brake**

**Clutch**



(4) Same dimension for standard and reinforced versions

## Approved types of oil

We have cleared the following types of oil for operation of the clutch. They have been tested by us and give an optimal performance.

<b>Oil type</b>	<b>Manufacturer</b>	<b>Trade name</b>
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