

Technical Product Information No. 900 EN

Pneumatically actuated clutch/brake combined unit for wet-running Series 0424

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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:

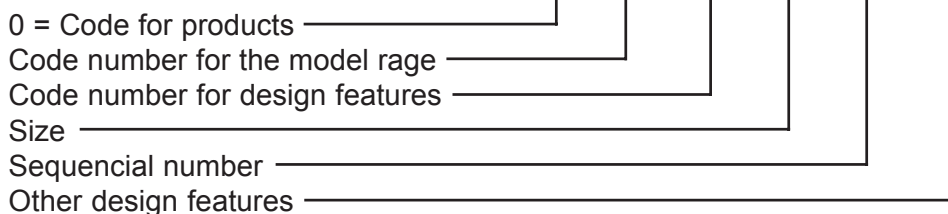
There is a risk of material damage during the activity described or in operational running!



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

The Ortlinghaus numbering system

Example: 0 111 - 222 - 33 - 444 555



Please pass on this product information to your customers! If required you can download our TPIs via the Internet from www.ortlinghaus.com in the directory 'Service'. However you may also duplicate the copy you have.

About the product

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

Pneumatically 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.

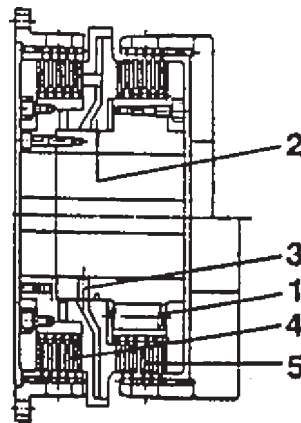


Fig. 1: Function of the clutch/brake combined unit

Braking: Springs 1 load piston 2 piston 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 against the force of the springs. As a result the brake plates 4 are forced apart and there is a frictional connection between the clutch plates 5.



The normal operating pressure is **5,5 bar**, the maximum permissible pressure **6 bar**. **Never** operate the clutch/brake combined unit **with a higher pressure** since otherwise there is the risk of a cylinder fracture.

- Always use dustfree, dry compressed air (a maintenance unit is required)
- Set the oiler of your maintenance unit so that it delivers from 1 to 3 drops of oil per 1 m³ air.

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.

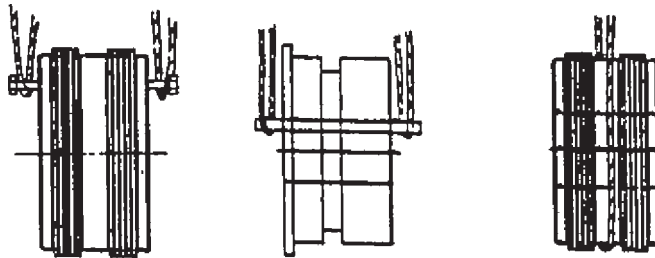


Fig. 2: Transport aids

You can fit transport aids as shown. For fitting bolts or eyebolts the following tapped transport holes are provided three holes in each stop plate in the combined unit with a single brake.

Size of the tapped transport holes

| | | | | | |
|--------|-----|-----|-----|-----|-----|
| Size | 75 | 80 | 86 | 90 | 94 |
| Thread | M10 | M12 | M16 | M20 | M20 |

Different versions

Clutch/brake combined units of the 0424 series 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 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

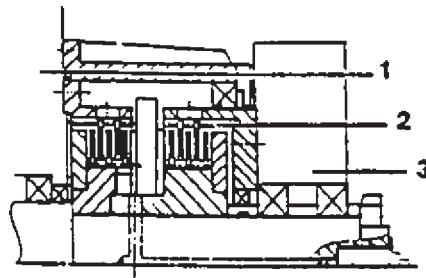


Fig. 3: Fitting variant 1

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

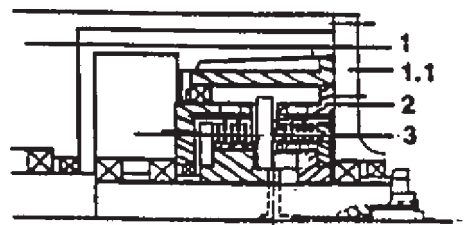


Fig. 4: Fitting variant 2

- 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.
- Secure 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.
- Put housing cup (accessory) on clutch brake unit.
- 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.
- Slide the machine body plate with brake housing on to the clutch/brake combined unit.
- Fit housing cup radial through machine body.
- 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

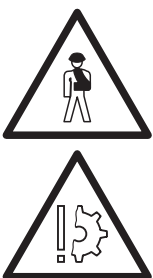
Checks during the operation of the machine

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 air 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 | Air pressure too low | Increase operating pressure to 5,5 bar |
| | 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 |
| 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 machine-damage | 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.

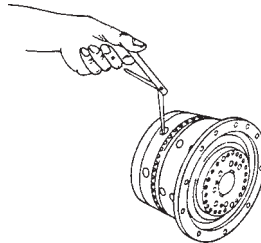


Fig. 5: Air gap

- 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:

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

- 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 ¹ | |
|------|---|----------------|
| | 5 AL (* 6 AL) | 10 AL (* 9 AL) |
| 52* | 0,7 - 1,0 | 1,0 - 1,4 |
| 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 |

AL - outer plates

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



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 ($2 \times L_{\text{neu}}$), an inspection must be carried out without fail.

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.



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

- Slacken 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 | 75 | 80 | 86 | 90 | 94 |
| Thread | M8 | M10 | M12 | M16 | - |

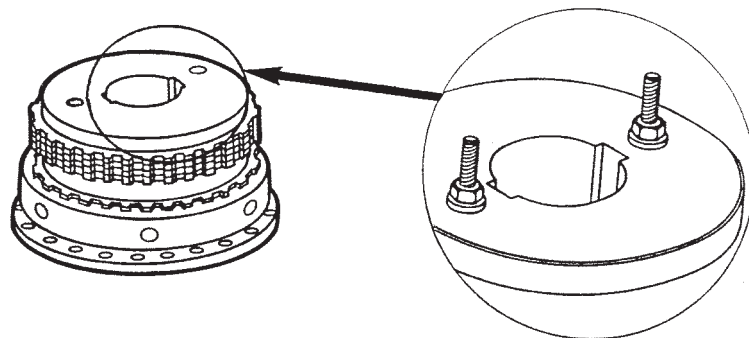


Fig. 6 Safeguarding at dismantling

- 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.
- 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

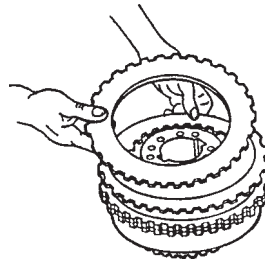


Fig. 7: Inserting the plates

- 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 cylinder assembly on to the hub, ensuring that the tapped holes in the piston line up with the transport holes in the hub.

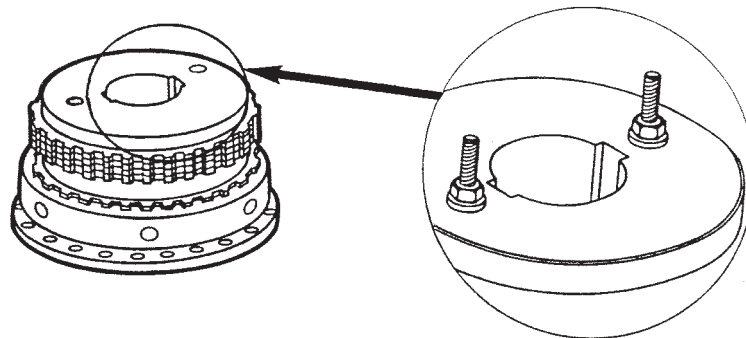


Fig. 8: Threaded rods

- 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.

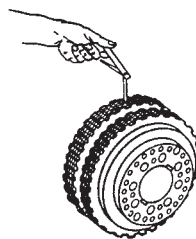


Fig. 9: Air gap of brake

- Measure air gap (see table on page 8)

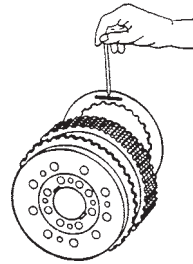


Fig. 10: Filler plates

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

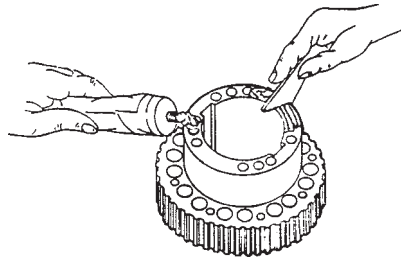


Fig. 11: Sealing

- 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.
- Guide the cylinder with the set of plates on to the hub and secure with studs and screws.

Size and tightening torques of the screws

Strength category 10.9

Locking: LOCTITE Type 262

| Size | Thread | MA [Nm] |
|------|--------|---------|
| 75 | M8 | 37 |
| 80 | M10 | 75 |
| 86 | M12 | 130 |
| 90 | M16 | 310 |
| 94 | M24 | 1060 |

- 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.

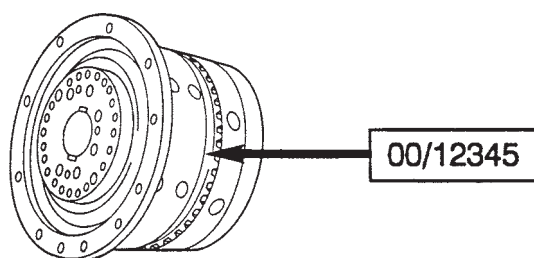


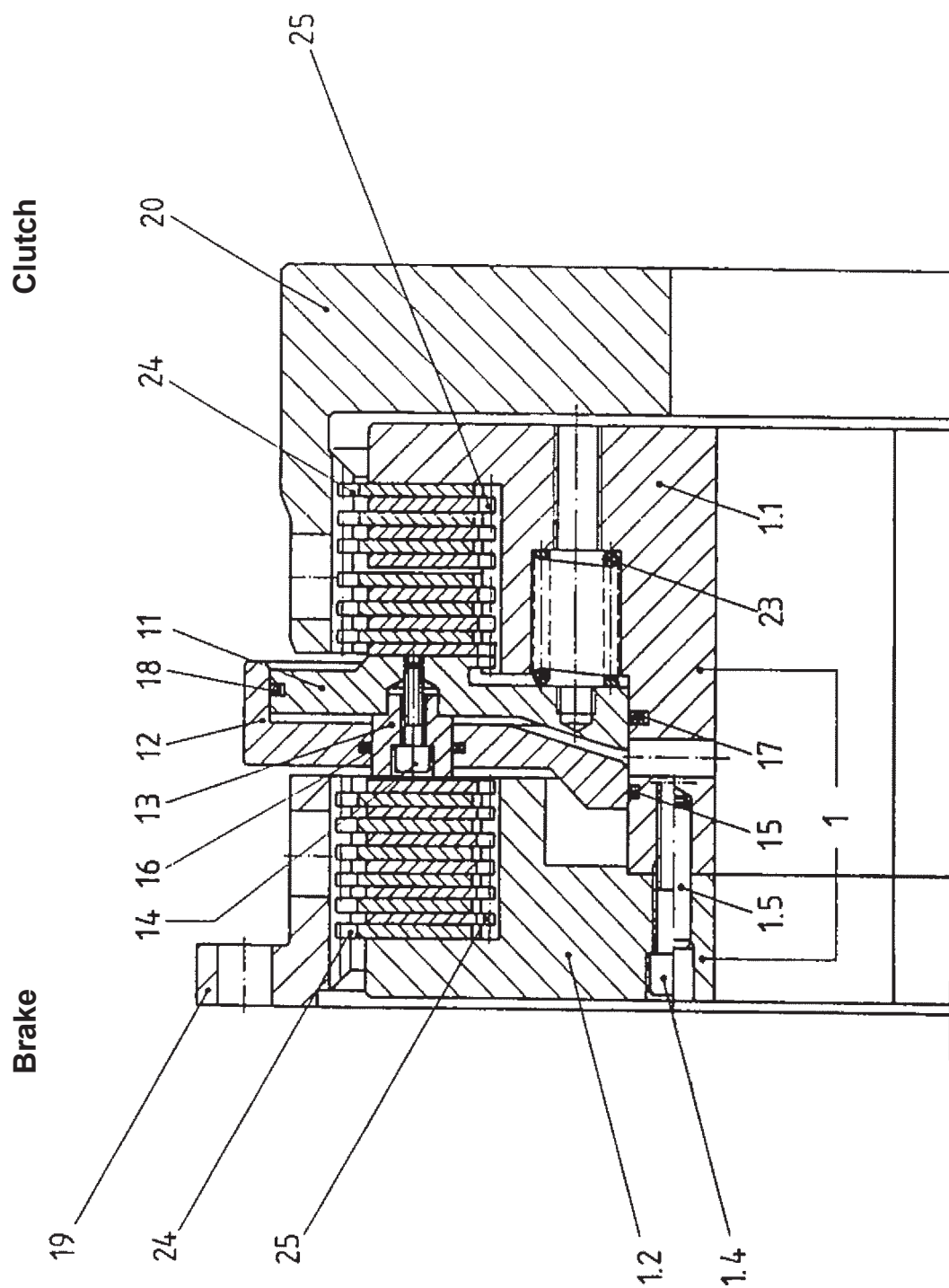
Fig. 12: Fabrication number

List of parts

(see sectional drawings)

| Item | Part |
|------|----------------|
| 1 | Hub |
| 1.1 | Hub |
| 1.2 | Cylinder |
| 1.4 | Screw |
| 1.5 | Pin |
| 11 | Piston |
| 12 | Cylinder |
| 13 | Stud |
| 14 | Screw |
| 15 | O-ring |
| 16 | Packing ring |
| 17 | Packing ring |
| 18 | Packing ring |
| 19 | Flange housing |
| 20 | Cup housing |
| 23 | Spring |
| 24 | Outer plate |
| 25 | Inner plate |

Sectional drawing



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.

| Oil type | Manufacturer | Trade name |
|-----------------|---------------------|--------------------------|
| 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 |