

1. Design

Several versions of mechanically actuated multi-plate clutches are available:

Single clutches up to size 63 Fig. 1, size 69 upwards Fig. 2.

Double clutches or clutch-brake combined units up to size 63 Fig. 3, size 69 upwards Fig. 4.

Housings:

Flange, cup, shoulder and hub housings are all available as standard, but special housings can be supplied.

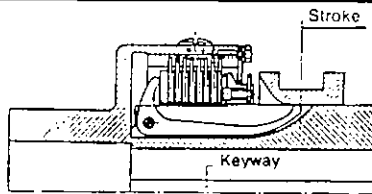


Fig. 1

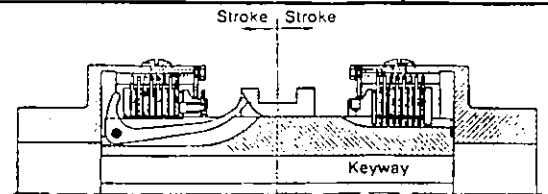


Fig. 3

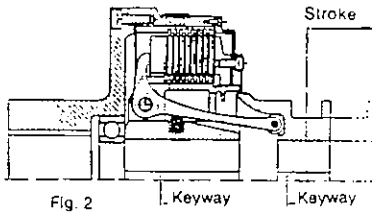


Fig. 2

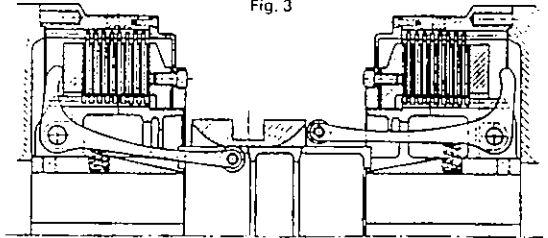


Fig. 4

2. Operation (Fig. 5 refers)

The housing (9) is splined or slotted to accept the outer plate profile (5). The SINUS inner plates (6) move axially on the hub (1), which is also splined or slotted. Moving the sliding sleeve (8) over the three levers (2) compresses the plate pack, allowing torque to be transmitted between hub and housing. The plate pack clearance can be adjusted by the adjusting nut (7).

3. Spare parts

When ordering spare parts, please give the "Fabrik" number of the clutch, which is to be found stamped either on the hub or the housing. To avoid errors, please ensure that all orders are placed in writing or by telex.

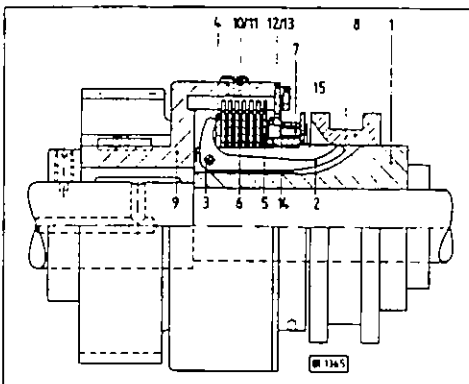


Fig. 5

Fig. 5

- 1 Hub
- 2 Lever
- 3 Pin
- 4 Pressure plate
- 5 Outer plate
- 6 Inner plate
- 7 Adjusting nut
- 8 Sliding sleeve
- 9 Housing
- 10 Drain plug
- 11 Seal
- 12 Cover
- 13 O-ring
- 14 Washer
- 15 Cover screw

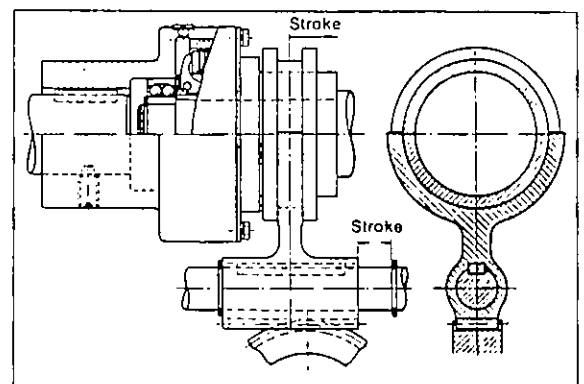


Fig. 6

4. Installation

When incorporating an Ortlinghaus clutch into your system, please observe the following points.

The bearings should be positioned as close to the clutch as possible. If this is not practical, or if the clutch is to run at high speeds, then for split-shaft applications the shafts should be stepped into one another (Fig. 6). Split-shafts must be accurately aligned (Fig. 7-9). The hub must be securely fixed to the shaft, and anchored against axial movement. The housing must also be secured (by a screw or a taper lock bearing) to prevent axial movement, but must rotate freely relative to the hub when the unit is disengaged. The clutch can be actuated by an actuator ring or an actuating fork. The actuating fork must encircle the sliding sleeve to act at two diametrically opposing points, and must never act on one point only, thus ensuring smooth clutch engagement. The engaged and disengaged positions of the lever must be set by stops or limit switches, to prevent partial clutch engagement which in turn would lead to slipping and overheating of the unit. The actuator ring/actuating fork must not be under load in either the engaged or disengaged positions. When the unit has been installed it should be checked for smooth and correct operation. If the unit fails to engage properly, it must be adjusted (Para. 5).

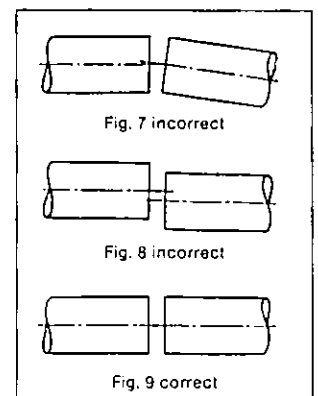


Fig. 7 incorrect

Fig. 8 incorrect

Fig. 9 correct

5. Adjustment

Slotted nut (Fig. 10 and 11). Clutches up to size 39 are equipped with slotted nuts (fine adjustment nuts). If readjustment of these clutches is needed, release the nut by withdrawing the locking pin (see Fig. 11). Then turn the nut for about 1/12 rev to the right and lock it again. Ensure that the locking pin will engage after the adjustment again into the next slot of the slotted ring which sits behind the nut and is provided with 24 slots.

Double nut (Fig. 12 and 13).

To adjust the clutch, slacken the locking screws in the double nut, and turn the latter in steps of 1/20 to 1/30 rev according to the size of the unit. Check the operation of the unit, then re-tighten the locking screws.

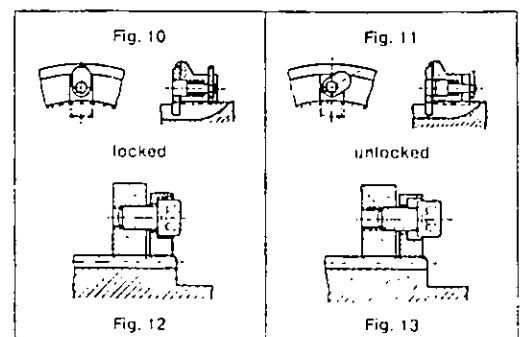


Fig. 10

Fig. 11

locked

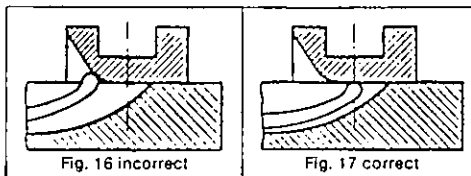
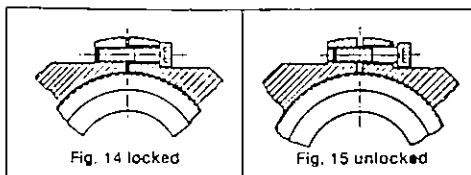
unlocked

Fig. 12

Fig. 13

Split nut (Fig. 14 and 15). Loosen the locking screw and turn the split nut in steps of 1/20 to 1/30 rev depending on the size of the unit. Check the operation of the unit. Repeat until the correct adjustment is obtained, then re-tighten the locking screw.

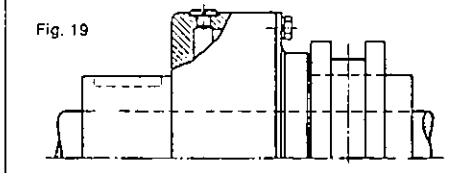
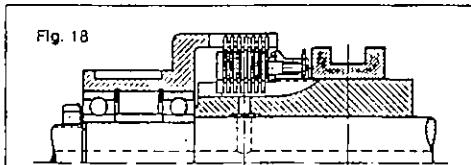
Turning the adjusting nut clockwise increases the torque – anticlockwise decreases the torque. The clutch should be adjusted such that it will transmit rated torque without slipping, but the housing must rotate freely relative to the hub when the unit is disengaged. Care must be taken to ensure that when the unit is engaged, the lever heads are on the flat position of the sliding sleeve and not in the curve. If the lever heads are in the curve, due either to over-adjustment or to a restricted stroke, the unit will not transmit full rated torque, neither is it self engaging. This means that the sliding sleeve will still be under load, and will wear and overheat.



6. Dry running clutches

Friction combination: steel/organic lining ORTEX
steel/sintered lining KONSTANT.

Clutches fitted with the above plates are not to be lubricated, and care is to be taken that no lubricants contaminate the friction surface. Dry running clutches are supplied with open housing (9) without the cover-plate (12).



7. Wet running clutches

Friction combination: steel/steel
steel/sintered lining KONSTANT.

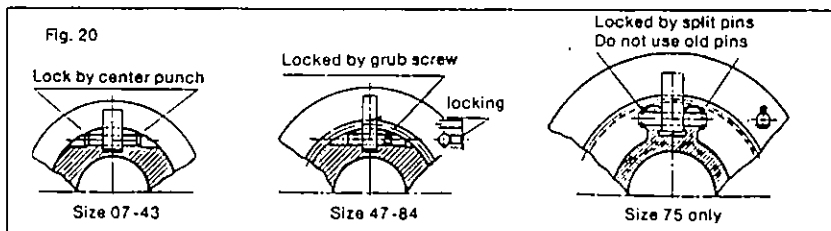
Wet running clutches fitted in gearboxes are lubricated either internally (centre fed) or by spray or mist lubrication. The oil level must only cover 1/8 diameter of the clutch. These clutches are supplied with open housing, i.e. without the cover-plate (12). Wet running clutches for use in open environments are supplied with a 'closed' housing (Fig. 19). Please note that there is a rubber seal between the housing and the cover plate. On severe, continuous running, or high frequency applications, an oil change is recommended every 200-300 working hours. On low frequency or light applications an oil change at every 1000 hours will be sufficient. Drain off the old oil, and flush the unit with a grease solvent (e.g. petroleum) before refilling with the correct grade of oil through the aperture marked "ø1" until the plates are lightly coated. A standard oil with a viscosity 68 mm²/s at 40°C, e.g. Shell Tellus Oil C 68, is suitable for most applications. If the unit is run at high (or very low) speeds, an oil of lower viscosity should be used 32 mm²/s at 40°C, e.g. Shell Tellus Oil C 32. High additive and high viscosity oils are to be avoided. It is sufficient to lubricate the plates lightly: the clutch must not be over-filled. Our engineers will give advice on any specific applications.

8. Changing the plates (Fig. 20)

Drive out the lever pins (on clutches size 47 upwards, first remove the grub screw/split pin). The levers and plate pack may now be removed. To re-assemble the unit, reverse the procedure, securing the lever pins by the appropriate method.

On units size 47 upwards, access to the plate pack can be obtained by disconnecting the operating lever, removing the sliding sleeve from the hub, and unscrewing the adjusting nut.

Note: When the plates have been renewed, the clutch must be re-adjusted.



9. Fault check

Fault	Cause	Cure	
Clutch slips/does not engage fully	clutch is under adjusted	see 5 – adjustment	
	clutch does not engage fully	check stroke (fig. 16/17)	
Clutch drags when idling	clutch is over adjusted	see 5 – adjustment	
	clutch does not disengage fully	check stroke limit	
	oil is too thick	see 7 wet running clutches	
	double clutches may show a tendency to drag. This can be overcome by use of a light brake, check with Orthinghaus engineer for specific cases.		
Clutch overheats when engaged	clutch is under adjusted	see 5 – adjustment	
	clutch does not engage fully	check stroke (fig. 16/17)	
	shafts are misaligned	see fig. 7 to 9	
Clutch overheats when disengaged	housing	insufficient lubrication of bearings	improve lubrication
	sliding sleeve	sliding sleeve is under load	check stroke (fig. 16/17)
		insufficient lubrication of sliding sleeve	improve lubrication
	plates	clutch is over adjusted	see 5 – adjustment
incorrect oil viscosity		see 7 wet running clutches	
clutch is over lubricated			