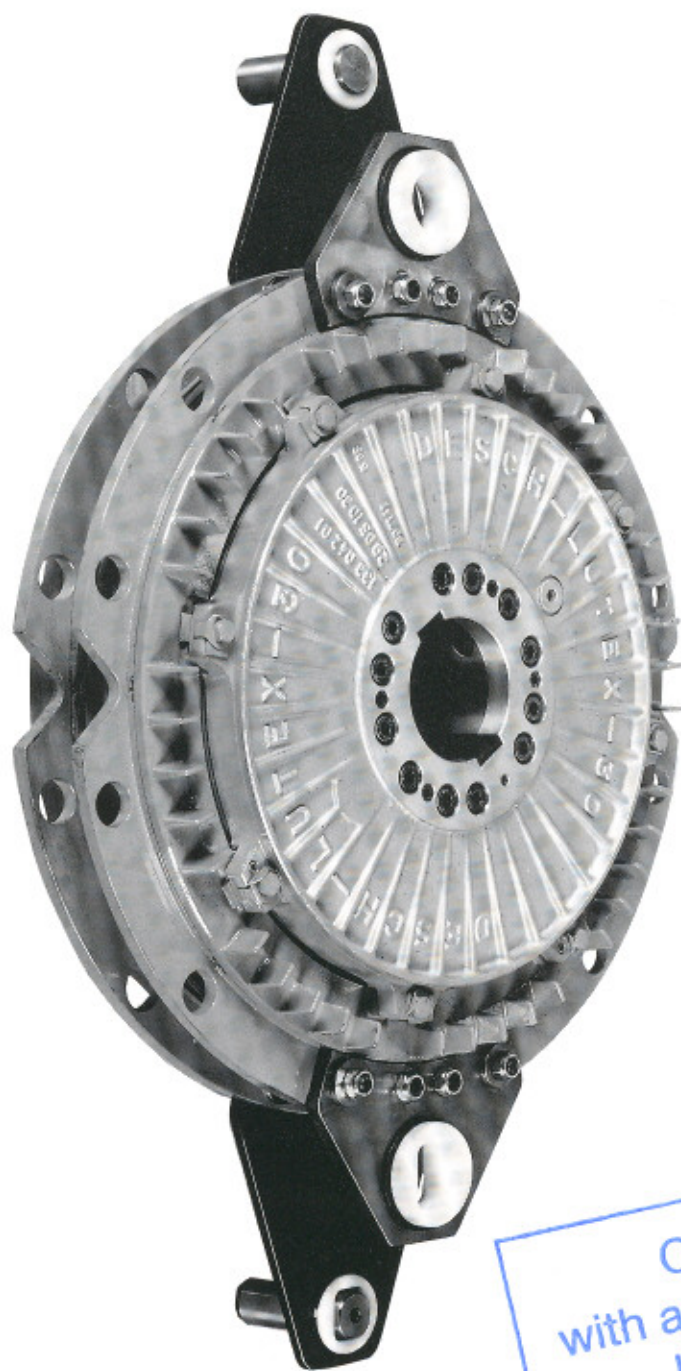


# Desch

Antriebstechnik

## Installation and operating instructions



Only valid  
with additional sheet  
LKZ 96 - E

# Lutex® CLUTCH- BRAKE COMBINATIONS

Types LKB, LKBZ, LKBZU, LKBBZ, LKBBZU

Instruction LKB 00 α-E

# Parts of the Lutex® Clutch-brake combination types

## LKB, LKBZ, LKBZU, LKBBZ and LKBBZU

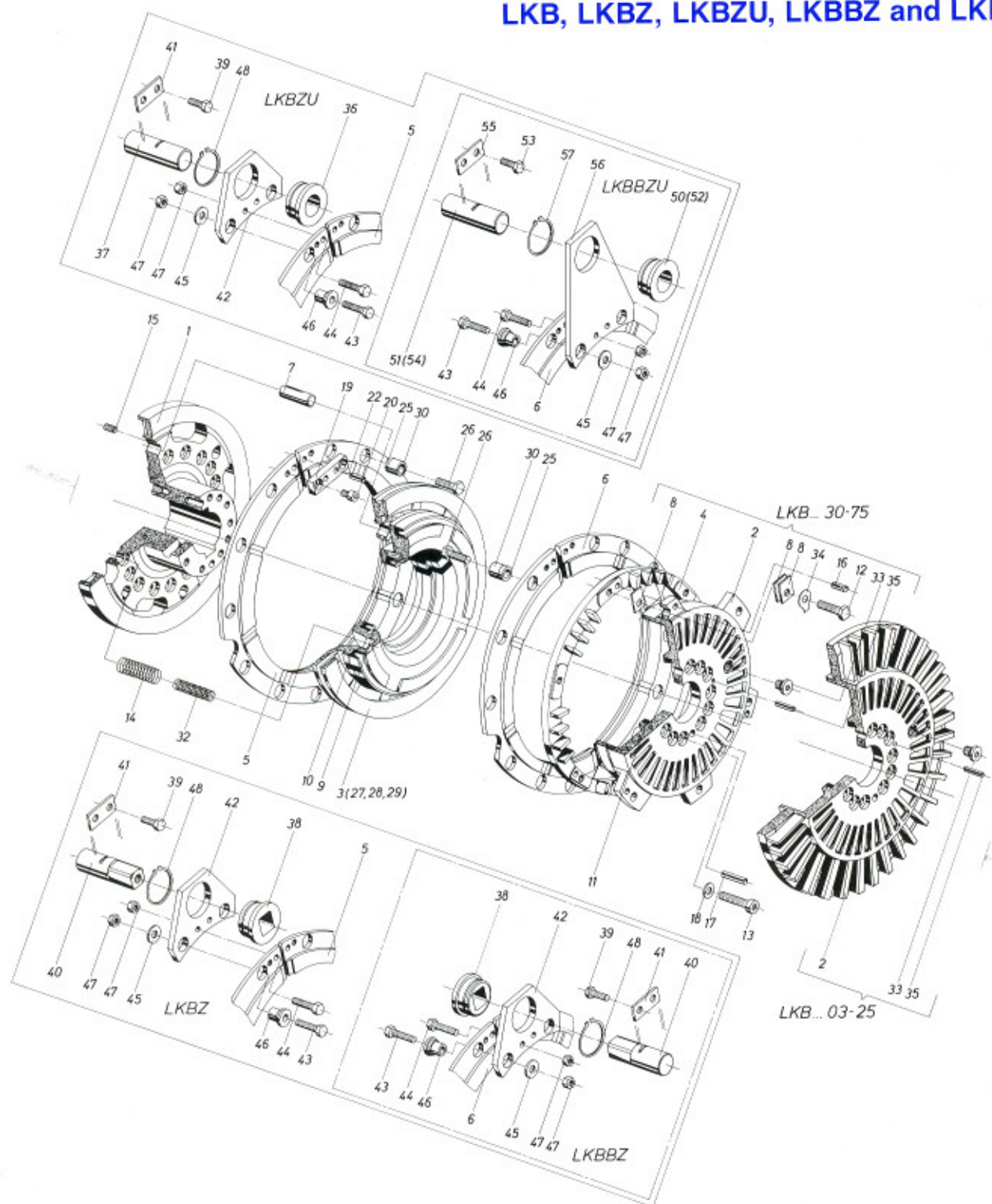


fig. 1

- |                                 |  |                                 |                                 |
|---------------------------------|--|---------------------------------|---------------------------------|
| 1 Hub*                          | 17 Spring pin                                  | 33 Socket head screw            | 46 Collar bush                  |
| 2 Cylinder*                     | 18 Disc (sizes 30-60)                          | 34 Tab washer (sizes 30-75)     | 47 Hexagon nut                  |
| 3 Piston*                       | 19 Strap                                       | 35 Spring pin                   | 48 Clamping ring                |
| 4 Pressure plate (sizes 30-75)* | 20 Socket head screw (self-locking)            | 36 Plastic collar bush (round)  | 50 Plastic collar bush (round)  |
| 5 Clutch disc*                  | 22 Spring pin                                  | 37 Bolt (round)                 | 51 Bolt (round)                 |
| 6 Brake disc*                   | 25 Bush  | 38 Plastic collar bush (square) | 52 Plastic collar bush (square) |
| 7 Bolt                          | 26 Hexagon screw (self-locking)                | 39 Hexagon screw (self-locking) | 53 Hexagon screw (self-locking) |
| 8 Distance plate (sizes 30-75)  | 27 Piston ring (sizes 65-76, see fig. 4)       | 40 Bolt (square)                | 54 Bolt (square)                |
| 9 Grooved ring*                 | 28 Socket head screw (sizes 65-75, see fig. 4) | 41 Safety retaining plate       | 55 Safety retaining plate       |
| 10 Grooved ring*                | 29 Spring pin (sizes 65-75; see fig. 4)        | 42 Strap*                       | 56 Strap*                       |
| 11 O-ring*                      | 30 Plastic bush                                | 43 Hexagon screw                | 57 Clamping ring                |
| 12 Hexagon screw (sizes 30-75)  | 32 Inner spring                                | 44 Hexagon screw                |                                 |
| 13 Socket head screw            |  | 45 Disc                         |                                 |
| 14 Main spring                  |  |                                 |                                 |
| 15 Grub screw                   |  |                                 |                                 |
| 16 Spring pin (sizes 30-75)     |  |                                 |                                 |

\*Spare parts see chapter 7



## 1. Safety instructions

The Lutex® is a pneumatically operated clutch-brake combination which can be used on a wide range of machines. **Please pay particular attention to the safety precautions which may apply to your particular industry or application.**

(In the text that follows the clutch-brake combination is referred to as the C-B-C).

In order to minimise the possibility of accidents and injuries the following points should be strictly observed:

- During servicing and repairs the driven machine must be switched off and steps taken to prevent accidental restarting.
- The press slide bar must be locked.
- The maximum speed (see table, section 2) must not be exceeded.
- The maximum air pressure of 6,5 bar should not be exceeded. Excessive pressure will damage the C-B-C. Over pressure must not be used to free dies that have become clamped in the press.
- The maximum working temperature of the friction surfaces should not exceed 110° C.
- The connection between the compressed air supply line and the shaft must be pressure tight.
- Please observe the appropriate working and safety regulations when assembling accessories for the compressed air system.
- Appropriate noise regulations need to be observed. The noise level of the C-B-C can be as high as 110 dB. Acoustic insulation should be considered.
- Rotating parts must be covered with safety guards.
- Friction linings must be kept free of grease and oil — otherwise the full driving and braking torque may not be transmitted. Lubricating oil in the compressed air system should be kept to a minimum; excessive oil in the air supply will eventually penetrate the piston seals and contaminate the friction linings.
- When cleaning ensure that no grease or corrosive fluid comes into contact with the C-B-C.
- There is a danger of burns when working on a hot C-B-C.
- When mounting the brake disc or re-setting worn friction plates the air pressure must be maintained. Do not put fingers in the brake housing; there is a danger of them being crushed should the air pressure fail.
- When dismantling the C-B-C one should be aware of the spring pressure on the cylinder. Improper dismantling of the C-B-C could cause personnel injury.
- Loose screws may cause the brake to fail. It is absolutely essential that the torque setting for all screws is correct (see table, section 1 and 6).
- Screws should be sealed or locked.

Alterations to the C-B-C are forbidden except on the express written authority of the manufacturer.

You should consult the manufacturer before exceeding the specified performance of the C-B-C.

Our service engineers are available for repairs and maintenance. This will eliminate faults caused by improper handling.

## 2. Operating conditions

### 2.1 Air pressure.

The working pressure for the C-B-C is 6 bar. A maximum of 6,5 bar is allowed. A reduction in the air pressure will result in a reduction of the torque transmission capacity.

The back pressure of the brake is the pressure that must be produced in the cylinder to overcome spring pressure. This can vary from 1 to 3 bar depending on the number of springs.

### 2.2 Maximum speed

**This is shown in the table under section 2. This maximum clutch speed does not relate to single stroke working.**

When operating at 70% or more of this maximum speed we would recommend that the C-B-C is dynamically balanced by us before the clutch is despatched.

When operating at high single stroke speeds or if you should require a higher maximum speed please consult Desch.

### 2.3 Mounting case

The mounting case of the C-B-C must be dry. Ensure that grease and oil do not contaminate the friction surfaces.

In order to ensure adequate cooling for the C-B-C, ventilation holes should be bored in the flywheel and the brake flange.

### 2.4 Air supply through the shaft

The bore „D“ should have a cross section twice that of bore „d“ (see fig. 9 and 10). The dimensions are shown in the table, section 3.

## 3. Function

The brake disc (6) is mounted on the press machine housing whilst the clutch disc (5) is mounted on the flywheel. The piston (3) is mounted on the hub (1) and is free to move axially between the hub and the cylinder (2). In the no air pressure state spring tension keeps the brake disc in contact with cylinder. As air is fed into the cylinder the spring tension is overcome and the brake begins to release; the increase of air pressure engages the clutch. If the air pressure is released the clutch is disengaged and the brake is applied.



## Types of the Lutex® clutch- brake combination

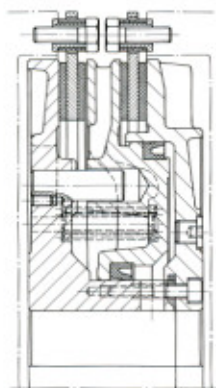


fig. 2 LKB  
size 03-25

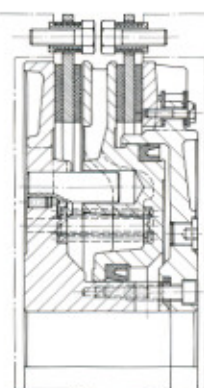


fig. 3 LKB  
size 30-60

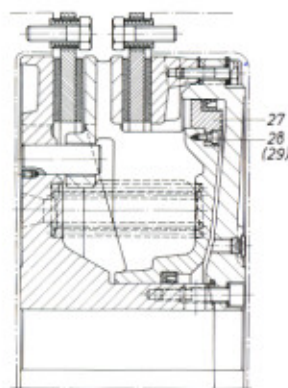


fig. 4 LKB  
size 65-75

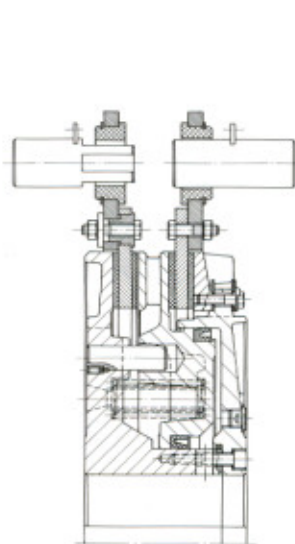


fig. 5 LKBZ

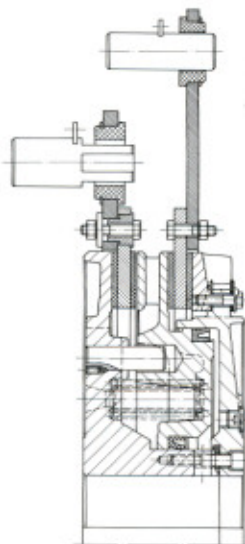


fig. 6 LKBZU

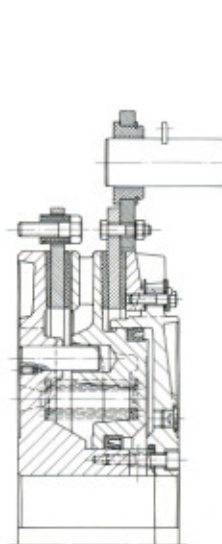


fig. 7 LKBBZ

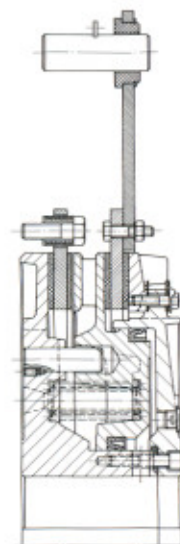
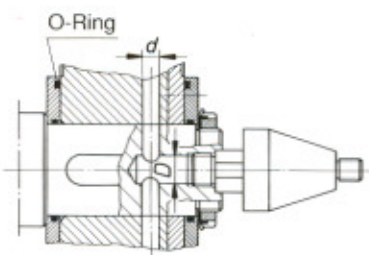


fig. 8 LKBBZU

## 4. Installation

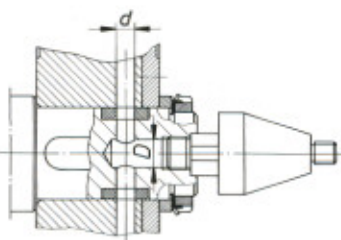
Mount the assembled Lutex® C-B-C, with or without its friction discs (5, 6) on the shaft. The C-B-C must be so mounted as to preclude any axial movement. If, during this process, an easing agent is used care must be taken to ensure that it cannot later accidentally contaminate the friction surfaces.

Seals between the shaft and the C-B-C should be used to prevent air losses (see fig. 9 and 10).



Cover seal is only possible with a closed keyway

fig. 9



Grooved shaft seal is possible with an open keyway

fig. 10

### 4.1 Installation of the friction discs (5, 6)

All versions of the C-B-C have split friction discs. The brake disc (6) must be mounted first.

The assembly dimensions given for the friction discs and the 2-point suspension must be adhered to.

After assembly ensure that the friction discs are free to move axially on their bolts or bushes.

**All screws (pos. 26, 39, 43, 44 and 53) must be tightened with a torque wrench according to the torque levels given in the table, section 1. We recommend that loctite (or a similar locking sealant) be used to secure the screws when operating under heavy shock load conditions.**

#### 4.1.1 Installation of the brake disc (6) on C-B-C type LKB (fig. 2, 3, 4)

Apply air pressure to the C-B-C, this will move the piston forward to the hub and open the brake housing. **Warning!** Loss of air pressure will allow the spring tension to move the piston and close the brake housing. Do not put fingers into the brake housing. **Danger of crushed fingers.**

Insert the brake friction disc (6) radially into the housing. Insert the bushes (25) together with the plastic collars (30) and tighten the hexagon headed screws to the prescribed torque level (as shown in the table, section 1). The bushes must be mounted so that the steel collars lie in the counter bores of the flywheel or the brake flange. A particular screw locking is only necessary under heavy shock loading or high vibration conditions because the screws are self-locking.



#### 4.1.2 Installation of the clutch disc (5) on C-B-C types LKB, LKBBZ and LKBBZU (fig. 2, 3, 4, 7, 8)

Release the air from the clutch. Insert the split clutch disc (5) radially. The discs have recesses to facilitate the assembling and dismantling of the screws (26). Rotate the flywheel until the securing hole and a recess in the brake disc (6) are opposite each other. Insert the bushes (25) together with the plastic collars (30) and tighten the hexagon headed screws to the prescribed torque level (as shown in the table, section 1). Rotate the flywheel 30 degrees at a time inserting and tightening all 12 bushes (25) and screws (26).

Screw locking see para 4.1. After assembly, connect the split disc (5) with strap (19), spring pin (22) and socket head screw (20).

#### 4.1.3 Installation of the brake disc (6) on C-B-C types LKBZ, LKBZU, LKBBZ, and LKBBZU (fig. 5-8)

Follow the instructions given in para 4.1.1. In these types of C-B-C the brake disc is guided on two bolts (37 or 51 round) and (40 or 54 square) which are themselves secured to the machine frame. Axial movement of these bolts (37, 40) or (51, 54) is prevented by the safety plates (41) or (55) which are affixed by screws (39) or (53) to the machine

frame. These safety plates must be assembled tangentially to the C-B-C. When mounted horizontally the completely cylindrical bolt (37) or (51) must be mounted at the upper side and the square bolt (40) or (54) at the lower side of the C-B-C.

Insert the plastic collars (36, 38) or (50, 52) into the binding straps (42) or (56) and secure with the spring clip (48) or (57).

The square collar (38) or (52) needs to be pushed on to the square bolt (40) or (54) so that it can move radially in the direction of the shaft. This allows for the slight axial movement required by the friction disc during heat expansion.

The split halves of the brake disc are joined by using the straps (42) or (56) and the screw set (43, 44, 45, 46 and 47) as shown in fig. 1.

**It is essential that the torque settings given in the table, section 1 are adhered to!**

#### 4.1.4 Installation of the clutch disc (5) on C-B-C types LKBZ and LKBZU (fig. 5 and 6)

Release the air from the clutch. Insert the disc halves (5), push the straps onto the bolts. Screw the straps to the disc halves and tighten the bolts as described in para 4.1.3.

**Ensure that the correct level of torque is achieved when tightening the screws and bolts.**

## Installation and operating data

1																	
Screws DIN 933 8.8		M 4		M 5		M 6		M 8		M 10		M 12		M 14		M 16	
Torques for positions 26, 39, 43, 44, 53 (Nm)		3.1		6.1		10.4		25		51		87		140		215	
Clutch size		03	05	10	15	20	25	30	35	40	45	50	55	60	65	70	75
2 Max. clutch speed 1/min		3000	2800	2800	2500	1800	1400	1200	1100	1000	900	800	700	600	600	550	500
3 Diameter of cross bore in the shaft d		5	7	8	8.5	12	14	14	18	18	18	20	20	24	28	30	32
Diameter of shaft bore D		7	10	11	12	17	20	20	26	26	26	29	29	34	40	43	45
4 Air-gap "X" (mm) new worn		0.7 3.5	1 3.5	1 4	1 4.5	1 6	1 6	1 7	1 7.5	1 8.5	1 9.5	1 12	1.5 12	1.5 16	1.5 14	1.5 15	1.5 18
Cylinder volume (L) new worn		0.03 0.05	0.05 0.08	0.06 0.1	0.09 0.15	0.17 0.3	0.3 0.55	0.5 0.9	0.65 1.1	0.8 1.3	1.2 2	1.5 2.5	1.9 3.1	3.3 5	3.5 6.5	5 8.5	6 10
5 Rotor size		R 3/8"			R 3/4"			R 1 1/4"			R 2"						
		R 1/2"			R 1"			R 1 1/2"									
6 Pos. 13-DIN 912-10.9 Dimension Number Torque (Nm)		M 5x25 8 6.1	M 5x25 12 6.1	M 5x25 12 6.1	M 6x35 12 10.4	M 8x40 12 25	M 8x45 12 25	M 10x50 12 51	M 10x65 12 51	M 12x65 12 87	M 12x70 12 87	M 14x70 12 140	M 14x70 12 140	M 16x90 12 215	M 20x90 12 430	M 20x90 12 430	M 24x120 12 740
Pos. 12-DIN 933-8.8 Dimension Number Torque (Nm)								M 8x30 8 25	M 10x35 8 51	M 10x35 8 51	M 10x35 8 51	M 12x45 12 87	M 12x50 12 87	M 14x60 12 140	M 16x65 12 215	M 16x75 12 215	M 20x80 12 430
7 Outlet bore		M 5	M 5	M 5	M 6	M 8	M 10	M 12	M 12	M 16	M 16	M 20	M 20	M 20	M 24	M 30	M 30
8 Dimensions of threaded rods		M 5x65	M 5x65	M 5x65	M 6x75	M 8x85	M 8x95	M 10x115	M 10x135	M 12x145	M 12x145	M 14x150	M 14x160	M 16x190	M 20x220	M 20x240	M 24x290



#### 4.2 Painting of the LKB, LKBZ, LKBZU, LKBBZ and LKBBZU

The plastic bushes (30) of the twelve-point suspension and the bolts (37, 40, 51 and 54) of the two-point suspension of the friction discs must not be coated with paint (see Figs. 12 and 13). For trouble-free operation of the clutch-brake combination, it must be guaranteed that the clutch disc and the brake disc are free to move axially on the plastic bushes of the twelve-point suspension or on the bolts of the two-point suspension. If this prerequisite is not fulfilled, the LKB may be destroyed as a result of permanent friction.

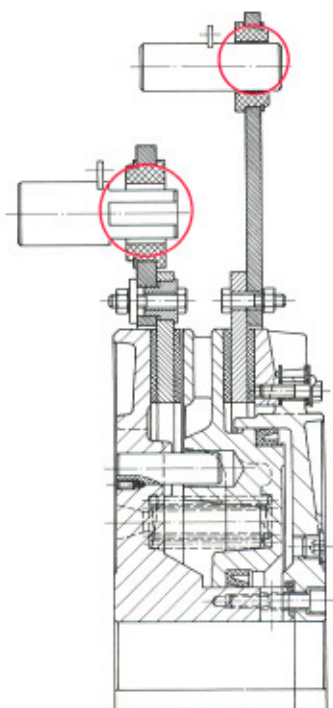


Fig. 12 LKBZU

○ No paint on to the marked areas of the plastic bushes and bolts.

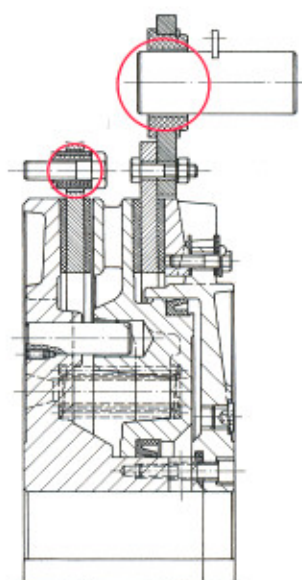


Fig. 13 LKBBZ

#### 5.1.1 Permissible Wear of the Friction-Disc Suspension

The plastic components of the friction-disc suspension are subject to natural wear and must be replaced when the wear limit has been reached.

The plastic bushes (30) of the twelve-point suspension must be changed when the max. wear has been reached (see Fig. 14 and Table 2).

The round collar bushes (36 and 50) must be replaced when the »D4 worn« dimension (see Fig. 15 and Table 2) has been reached at one position on the bore. The square collar bushes (38 and 52) of the two-point suspension must be changed when a clearance of 0.6 mm has occurred between the bolt and the collar bush (see Fig. 16). The bore diameter of the collar bushes in the new and worn states are specified in Table 2 below.

In **normal operating conditions** (low shock loading and a low number of switching operations in single-stroke and one-shift operation), the wear must be **checked every year**. In cases of **higher loading** (continuous operation with high-speed eccentric shafts and high shock loading, as well as multi-shift operation), the **wear** of the specified plastic components must be **checked every six months**.

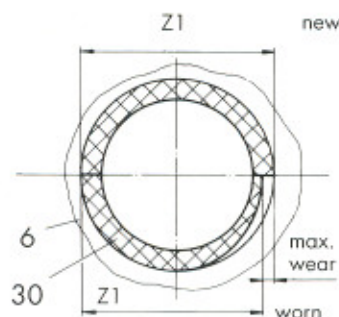


Fig. 14 Wear  
Plastic Collar Bush (30)

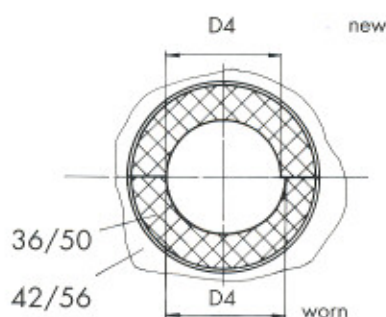


Fig. 15 Wear  
Collar Bush, Round (36 and 50)

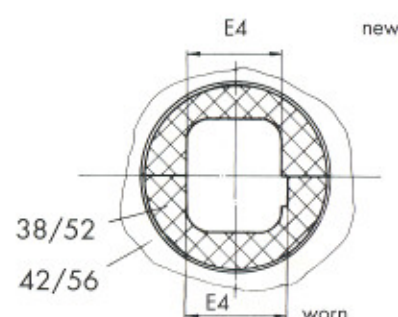


Fig. 16 Wear  
Collar Bush, Square (38 and 52)

Table 2

LKB		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
<b>Twelve-Point Suspension</b> , contained in types LKB, LKBBZ, LKBZU and LKBKZ Plastic collar bush (30) Z1 new <sup>1)</sup> Z1 worn Max. wear																
	[mm]	10	10	12	15	18	25,3	25,3	25,3	30,2	35,6	40,8	40,8	40,8	51,5	51,5
	[mm]	9,5	9,5	11,5	14,3	17	24,1	24,1	24,1	29,2	34,1	39,3	39,3	39,3	50	50
	[mm]	0,5	0,5	0,5	0,7	1	1,2	1,2	1,2	1	1,5	1,5	1,5	1,5	1,5	1,5
<b>Two-Point Suspension, Short Strap</b> , contained in types LKBZ, LKBZU, LKBBZ and LKBKZ Collar bush, round (36) D4 + 0,1 new D4 + 0,1 worn Collar bush, square (38) E4 + 0,1 new E4 + 0,1 worn																
	[mm]	14,1	14,1	22,1	22,1	30,1	40,1	40,1	40,1	45,1	55,1	55,1	65,1	65,1	65,1	80,1
	[mm]	14,6	14,6	22,6	22,6	30,6	40,6	40,6	40,6	45,6	55,6	55,6	65,6	65,6	65,6	80,6
	[mm]	11,1	11,1	18,1	18,1	27,1	35,1	35,1	35,1	38,1	45,1	45,1	52,1	52,1	52,1	65,1
	[mm]	11,6	11,6	18,6	18,6	27,6	35,6	35,6	35,6	38,6	45,6	45,6	52,6	52,6	52,6	65,6
<b>Two-Point Suspension, Long Strap</b> , contained in types LKBZU and LKBBZU Collar bush, round (50) D4 + 0,1 new D4 + 0,1 worn Collar bush, square (52) E4 + 0,1 new E4 + 0,1 worn																
	[mm]	14,1	14,1	14,1	14,1	22,1	30,1	30,1	30,1	40,1	45,1	45,1	55,1	55,1	55,1	65,1
	[mm]	14,6	14,6	14,6	14,6	22,6	30,6	30,6	30,6	40,6	45,6	45,6	55,6	55,6	55,6	65,6
	[mm]	11,1	11,1	11,1	11,1	18,1	27,1	27,1	27,1	35,1	38,1	38,1	45,1	45,1	45,1	52,1
	[mm]	11,6	11,6	11,6	11,6	18,6	27,6	27,6	27,6	35,6	38,6	38,6	45,6	45,6	45,6	52,6

<sup>1)</sup> Dimension corresponds to the latest revision status



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Kleinbahnstraße 21, D-59759 Arnsberg, Stadtteil Hüsten



## 5. Maintenance

**Warning!** At working temperature the C-B-C is hot. It can cause personal injuries in the form of **burns!**

Please observe the safety instructions given in para 1. of these instructions.

### 5.1 Maintenance intervals and periodic checks.

Every 8 weeks:

- Check the friction surfaces to ensure that they are free from oil and grease.
- Check the airgap "X" (fig. 11). The friction surfaces are worn when the values given in the table, section 4 are reached.

For C-B-C's up to size 25 the friction discs need to be changed (see para 5.3).

For C-B-C's of size 30 and over the airgap may be adjusted (see para 5.2).

Apart from these two points the C-B-C requires no routine maintenance.

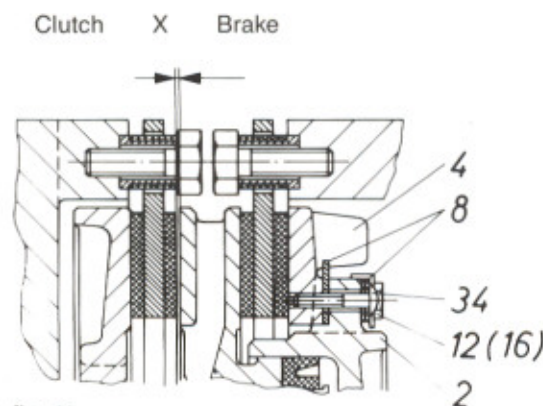


fig. 11

### 5.2 Airgap adjustment C-B-C sizes 30 to 75

The sizes 30-75 offer two airgap adjustments.

First adjustment:

Apply compressed air to the clutch (see fig. 1 and 11). Bend the safety tabs (34) and loosen the screws (12). The pressure plate (4) is held in place by the spring pins (16). Move the pressure plate (gentle taps with a hammer) on to the piston so that a second distance plate (8) can be inserted between the cylinder and the pressure plate. Retighten screw (12) with distance plate (8) and safety tabs (34). Ensure that the correct level of torque is achieved (see table section 6). Secure screws (12) again with tab washers (34).

Second adjustment:

Three distance plates (8) have to be screwed up between pressure plate (4) and cylinder (2).

### 5.3 Replacement of the friction discs (5, 6)

Dismantle the discs using the instructions given in para 4.1 in the reverse order.

Before dismantling of friction discs (5, 6) ensure that the distance plates (8) are returned to their original position (see fig. 11).

## 6. Dismantling

Please observe the safety instruction given in para 1 of these instructions.

### 6.1 Drawing the C-B-C from the shaft.

The C-B-C is pulled off of the shaft by using the access holes in the hub (1). The dimensions of these holes are given in the table, section 7.

Should it be necessary to pull the C-B-C off of the shaft from the brake side release 2 (or at maximum 4) of the hexagon cylinder screws (13). Then use the holes thus created pull the C-B-C from the shaft.

### Important!

The cylinder screws (13) must be replaced and tightened to the correct torque level (see table, section 6).

### 6.2 Dismantling the Lutex® clutch-brake combination

#### Warning!

The cylinder (2) is subject to high spring pressure: in order to avoid accidents and damage it is recommended that the Lutex® C-B-C is dismantled only by the manufacturer or by one of the manufacturers service engineers.

If dismantling is unavoidable proceed as follows:

- Release two opposite pairs of cylinder screws (13).
- Replace these screws with 4 threaded tie rods (see table, section 8). The rods should be fitted with the largest possible washers and nuts.
- Hand tighten these nuts onto the cylinder.
- Carefully release the remaining cylinder screws (13). The screws should be released in opposing pairs.
- Slowly release the spring tension by undoing the nuts on the tie rods.
- The C-B-C can now be removed.

### 6.3 Assembly

Before assembly all parts should be thoroughly cleaned. The grooved rings (9, 10) together with the running surface should be lightly lubricated. The bolts (7) should be lightly greased with Molykote such that no grease can contaminate the friction surfaces whilst the C-B-C is operating.

Re-assembly is effected by following the instructions given at para 6.2 in reverse order.

### Important!

The friction surfaces and linings must be clean and **free of grease or oil.**

The hexagon cylinder screws (13) must be renewed when the unit is re-assembled. A torque wrench must be used to ensure that they are correctly tightened; they should also be secured with liquid screw retention (e. g. Loctite type 274-3). The screws should be carefully tightened in "opposing pairs"; the torque values are given in the table, section 6.

## 7. Spare parts

When ordering spare parts the serial number of the C B C should be given. The serial number can be found on the cylinder between the ribs. If it is not possible to quote the serial number please send the old part to Desch with your written order.

The following spares are supplied as kits:

Kit description	Identification Number
Brake disc	6
Clutch disc (LKB, LKBBZ, LKBZU)	5, 19, 20, 22
Clutch disc (LKBZ, LKBZU)	5
12 Point suspension	19, 20, 22, 25, 26, 30
2 Point suspension (short strap)	36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48
2 Point suspension (long strap)	43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 56, 57
Hub	1, 7, 15
Cylinder:	
sizes 03-25	2, 33
sizes 30-75	2, 4, 8, 12, 16, 33, 34
Piston (sizes 65-75)	3, 27, 28, 29
Seals	9, 10, 11



## 8. Transportation and storage

During transportation the C-B-C must be secured so that it cannot slip, is not subjected to shock loading. The unit should be protected against high humidity.

During storage the unit should be kept dry. Temperature variations should be kept to a minimum.

When correctly stored the C-B-C can be stored for a period of up to one year. The moving parts have been treated with a lubricant-containing preservative.

**Attention:** On no account should additional preservative be used.

## 9.2 Switch device

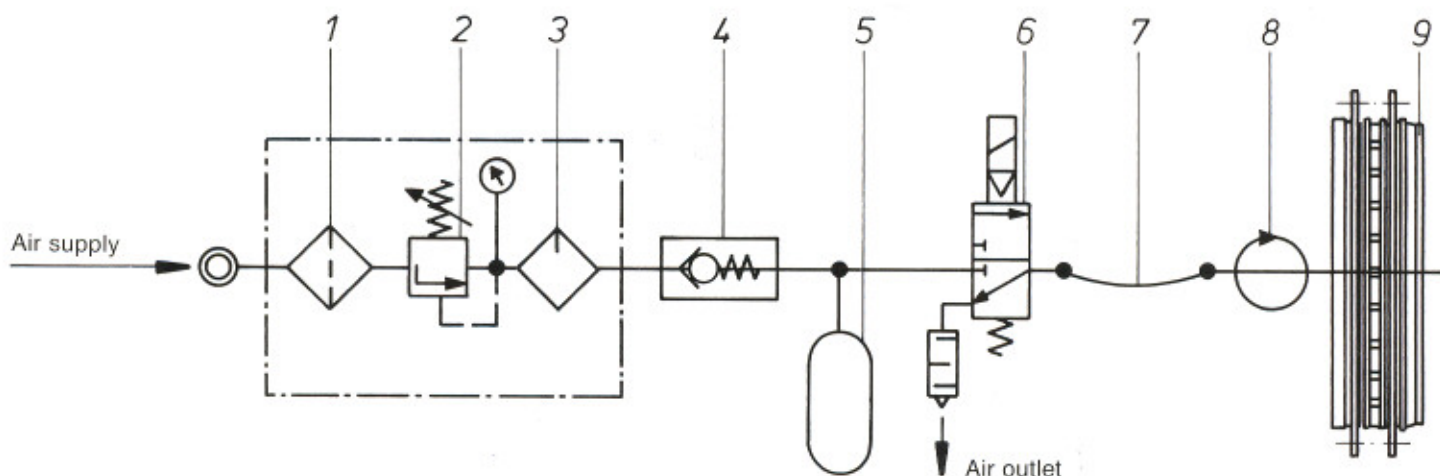


fig. 12

1 Compressed air filter  
2 Reduction valve  
3 Compressed air lubrication

4 Backpressure valve  
5 Air vessel  
6 Electromagnet valve 3/2 way  
or press safety valve

7 Flexible hose  
8 Rotor  
9 Lutex® C-B-C

In order to ensure at least trouble free operation of the Lutex® C-B-C a switching device as shown in fig. 12 is required.

The compressed air (1, 2 and 3) must be **dry, clean** and only **lightly lubricated**.

**Important!** Air lubrication should not exceed 3 drops per cubic meter of air. Excess oil will eventually penetrate the piston seals and contaminate the friction surfaces.

The 3/2 way valve (6) or the press safety valve (6) should be mounted between the air vessel (5) and the flexible hose (7) (see fig. 12). In order to avoid distortion of the tube it should be at least 300 mm long. If shorter operating times are required the 3/2 way valve (6) or the press safety valve (6) may be connected directly to the rotor (8). Care needs to be taken to ensure correct and airtight fitting.

When fitting compressed air accessories the appropriate safety regulations need to be observed.

## 9. Accessories

### 9.1 Rotor connectors

The rotor sizes (given in the table, section 5) can be supplied with the Lutex® C-B-C. In order to ensure a long rotor life they should be securely fitted to the shaft. They need to be air tight.

The quantity of air  $Q$  required to operate the C-B-C can be calculated using the following formula:

$$Q = 1.3 \text{ up to } 1.7 \times V \times p \times z \text{ [L/min]}$$

1.3–1.7 = Factor for leakage in the air supply system

$V$  = Cylinder volume, given in the table, point 4 plus the volume between the 3/2 valve and the C-B-C [L]

$p$  = Operating pressure of the C-B-C [bar]

$z$  = Operating rate per sec. of the C-B-C [min<sup>-1</sup>]

When operating at high switching rates on a "weak" air supply system it is advisable to use an air reservoir (5). The reservoir should have a volume of some 50 to 100 times that of the "worn" C-B-C cylinder volume " $V$ " (see table, section 4).



## 10 Fault finding guide

### 10.1 Clutch slips on load

Possible cause	Possible cure
Air pressure too low	Check supply pressure (max. 6,5 bar)
Friction linings are worn	Replace clutch disc (5), see section 4.1
Grease on the friction surfaces	Wash with acetone. Replace the clutch disc (5)

### 10.2 Braking angle too large Braking distance too long

Possible cause	Possible cure
Friction linings are worn	Replace friction disc (6), see section 4.1 Adjust airgap (size 30-75) see section 5.2
Grease on the friction surfaces	Replace friction disc (6) and wash metal friction surface with acetone

### 10.3 Clutch disc (5) gets hot when disengaged

Possible cause	Possible cure
Clutch disc (5) cannot move freely on its bolts	Ensure that the clutch disc (5) is free to move axially on its bolts

### 10.4 Brake disc (6) gets hot when clutch engaged

Possible cause	Possible cure
Brake disc (6) cannot move freely on its bolts	Ensure that the brake disc (6) is free to move axially on its bolts

### 10.5 C-B-C gets too hot when operating in the singly stroke mode. Friction surfaces temperature exceeds 110° C

Possible cause	Possible cure
Operating frequency too high	Reduce the operating frequency
Air pressure too low	Check supply pressure (max. 6,5 bar)
No ventilation holes in the flywheel or brake flange	Provide more holes in both parts
Speed too high	Reduce speed

Agencies in Europe and overseas on request.



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