

Vakuum-Lösungen

Applikations-
Unterstützung

Service



LEYBOLD VAKUUM

KA 01.691/3



Komplett - Set zur TRIVAC E

D 5 E - D 10 E

Komplett-Set für:

- Ölabscheidung (Formfilter)
- Abdichtung komplett
- Verschleißteile

Complete Kit for TRIVAC E

D 5 E - D 10 E

Complete Kit for:

- Oil separator
(internal demister)
- All seals
- Wearing parts

Kurzanleitung

Brief Instructions

Component Item Number	Component Item Description	D5E			D10E		
		20040038KIT			20040039KIT		
		Qty	Fig. No.	Item No.	Qty	Fig. No.	Item No.
320118	O'RING,VITON,119X3 MM	1	1	1	1	1	1
360052	COUPLER,SLEEVE,VITON	4	1	2	4	1	2
320119	O'RING,VITON,39.5X3 MM	1	1	4	1	1	4
440023	RING,SPACER,STL.,35X29X1MM	1	1	5	1	1	5
310049	SEAL,SHAFT,LIP,W/ DUST LIP	1	1	6	1	1	6
200091	ROTOR,OIL PUMP	1	1	11	1	1	11
580038	VALVE,STOPPER,STEEL	1	1	12	1	1	12
490021	SPRING,COMPRESSION,STEEL	1	1	13	1	1	13
400063	SCREW,SHCS,M5X20MM,S/S	4	2	1	4	2	1
420033	WASHER,FLAT,M5,S/S	6	2	2	6	2	2
P23955165	GASKET,RING,VITON	2	2	3	2	2	3
20010289	O'RING,VITON,27 X 3 MM	2	2	5	2	2	5
400062	SCREW,SHCS,M5X40MM,S/S	1	2	8	1	2	8
640013	INSERT,TUBE,VITON	4	2	9	4	2	9
720011	FILTER,DEMISTER	1	2	14	1	2	14
440022	RING,SPACER,ALUM,11.5X8X1MM	1	2	17	1	2	17
300045	GASKET,RING,VITON,17X22X1.5MM	1	2	20	1	2	20
400065	SCREW,SHCS,FLAT HD,M5X6MM,STL.	1	2	21	1	2	21
580037	VALVE,HOLDER,S/S	1	2	22	1	2	22
490020	RETAINER,RESTRICTOR,SPRING	1	2	23	1	2	23
490022	SPRING,COMPRESSION,STEEL	1	2	24	1	2	24
580032	VALVE,NIB,SEALING ELEM.,VITON	1	2	25	1	2	25
580035	VALVE,BRACKET,S/S	1	2	26	1	2	26
40050135	VALVE	1	2	27	1	2	27
490026	SPRING,COMPRESSION,CONICAL,S/S	1	2	29	1	2	29
34861028	VALVE,NON-RETURN	1	2	30	1	2	30
420032	WASHER,ORFICE,G.B.,S/S	1	2	31	1	2	31
23970436	O'RING,VITON,27 X 2.5 MM	1	2	32	1	2	32
400064	SCREW,SHCS,M5X10MM,S/S	2	2	34	2	2	34
420033	WASHER,FLAT,M5,S/S	6	2	35	6	2	35
300044	GASKET,SIGHT GLASS,VITON	1	2	38	1	2	38
300050	GASKET,OIL BOX,VITON	1	2	39	1	2	39
P23955165	GASKET,RING,VITON	2	2	41	2	2	41
23970211	O'RING,VITON,50 X 3 MM	1	3	2	1	3	2
23973146	SEAL,FLOAT,VITON	1	3	4	1	3	4
310050	SEAL,SHAFT,LIP,W/O DUST LIP	1	3	6	1	3	6
300048	GASKET,FLAT SEAL,VITON	1	3	7	1	3	7
580033	VALVE,TANDEM,STEEL	1	3	8	1	3	8
490023	SPRING,COMPRESSION,STEEL	1	3	9	1	3	9
580036	VALVE,SPACER,S/S	1	3	10	1	3	10
20010289	O'RING,VITON,27 X 3 MM	2	3	12	2	3	12
230049G	VANE,G11,1ST STAGE,HV	2	3	16	2	3	16
490024	SPRING,COMPRESSION,STEEL	1	3	17	1	3	17
450031	PIN,VANE,GUIDE,S/S	1	3	18	1	3	18
230050G	VANE,G11,2ND STAGE,LV,FV VANE	2	3	19	2	3	19
400060	SCREW,SHCS,M5X90MM,S/S	1	3	20	1	3	20

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The references to diagrams, e.g.(1/2), consist of the Fig. No. and the Item No. in that order.

Warning Indicates procedures that must be strictly observed to prevent hazards to persons.



Caution Indicates procedures that must be strictly observed to prevent damage to, or destruction of the pump.

LEYBOLD-Service

If a pump is returned to LEYBOLD, indicate whether the pump is free of substances damaging to health or whether it is contaminated.

If it is contaminated also indicate the nature of hazard. LEYBOLD must return any pumps without a declaration of contamination to the sender's address.

Disposal of Waste Oil

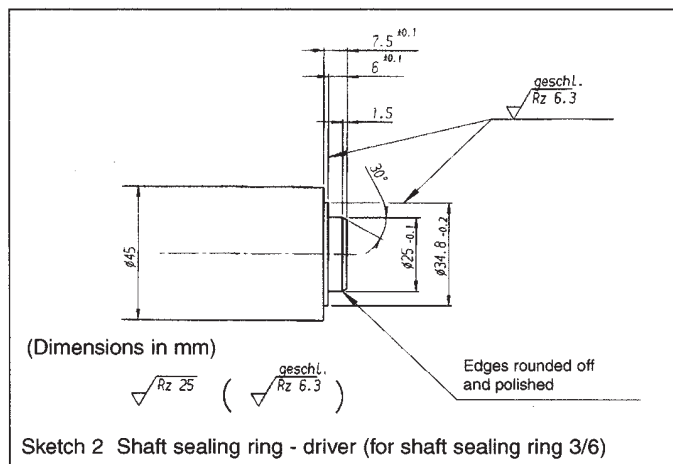
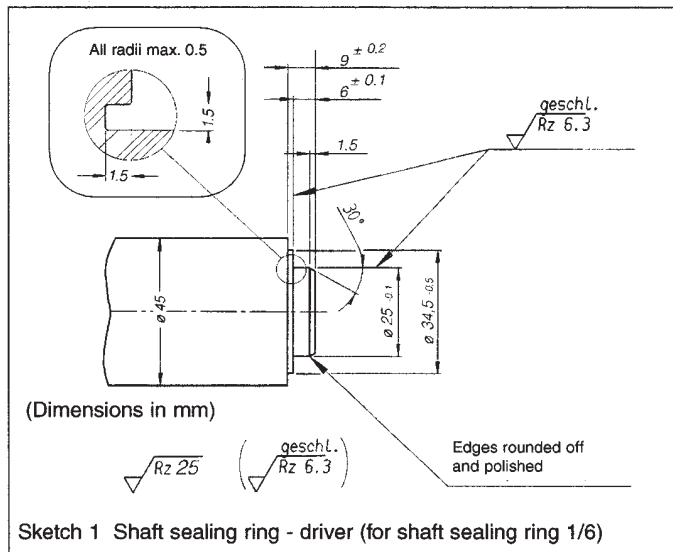
Owners of waste oil are entirely self-responsible for proper disposal of this waste.

Waste oil from vacuum pumps must not be mixed with other substances or materials.

Waste oil from vacuum pumps (Leybold oils which are based on mineral oils) which are subject to normal wear and which are contaminated due to the influence of oxygen in the air, high temperatures or mechanical wear must be disposed of through the locally available waste oil disposal system.

Waste oil from vacuum pumps which is contaminated with other substances must be marked and stored in such a way that the type of contamination is apparent. This waste must be disposed of as special waste.

European, national and regional regulations concerning waste disposal need to be observed. Waste must only be transported and disposed of by an approved waste disposal vendor.



Ref. No. for the complete kits	Type of pump
200 40 038	D 5 E
200 06 348	D 5 E TVT
200 40 039	D 10 E

Required tools:

Spanner size 8, securing ring pliers, Hex. socket screw key 4, 6, 8, as well as special tool (200 02 760) for tie rods.

Shaft sealing ring driver - see sketch 1 and 2.

This repair kit contains the following parts:

Fig. 1 / Page 22

Item	Qty.	Designation
1	1	O-ring (119.5x3)
2	4	Coupling sleeves
3	1(TVT)	Shaft sealing ring sleeve
4	1	O-ring (40x3)
5	1	Spacing disk
6	1	Shaft sealing ring with dust lip (25x35x6)
6	1(TVT)	Shaft sealing ring
11	1	Oil pump
12	1	Stopper
13	1	Compression spring (0.63x3.55x22)
17	1(TVT)	Shaft sealing ring without spring (25x35x6)

Fig. 2 / Page 23

Item	Qty.	Designation
1	4	Hex. socket bolt (M 5 x 20)
2	4	Washer
3	1	Sealing ring (15.1x22x2)
5	1	Sealing ring (27x3)
8	1	Hex. socket bolt (M 5 x 40)
9	4	Rubber insert
14	1	Internal demister
17	1	Flat seal, Alu (8x11.5x1)
20	1	Flat seal (17x22x1,5)
21	1	Hex. socket bolt (M 5 x 6)
22	1	Valve holder
23	1	Stroke restrictor
24	1	Compression spring (0.6x7.95x17.3)
25	1	Sealing element
26	1	Valve bracket
27	1	Bypass valve
29	1	Compression spring (conical)
30	1	Non-return valve
31	1	GB orifice
32	1	O-ring (27 x 2.5)
34	2	Cylinder head bolt (M 5x10)
35	2	Washer
38	1	Contoured seal (oil level glass)
39	1	Contoured seal (oil box)
41	1	Sealing ring (15.1x22x2)

Fig. 3 / Page 24

Item	Qty.	Designation
2	1	O-ring (50x3)
4	1	Sealing nipple
6	1	Shaft sealing ring without dust lip (25x35x6)
7	1	Flat seal
8	1	Tandem valve
9	1	Compression spring (0.75x4.55x25)
10	1	Spacer
12	1	O-ring
16	2	High vacuum vane
17	1	Compression spring (0.4x2.4x14.9)
18	1	Guide pin
19	2	Forevacuum vane
20	1	Hex. socket bolt (M 5x90)

1 Disassembly

Caution Before starting work on the pump make sure that the pump is cold.

Warning Before starting work on the pump be sure to always disconnect the motor from the mains power. Remove the mains connection (three-phase motors) or pull the mains plug.



1.1 Disassembly of the Motor

Drain out the oil as described in the Operating Instructions for the pump.

Then place the pump on the side with the oil level glass of the oil box.

Disassemble the pump's base (1/15).

Disassemble the fan cowl (1/7) (2 or 4 bolts respectively).

Unscrew the tie rods (1/8).

Evenly lift out the electric motor.

Lift out the sleeve of the shaft sealing ring (1/3) (with the aid of a magnet, for example).

Remove the coupling sleeves (1/2) from the shaft of the motor.

Press the shaft sealing ring out of the sleeve for the shaft sealing ring.

Caution In the case of the TVT version, the shaft sealing ring will **not** need to be pressed out of the bushing for the shaft sealing ring.

Do not damage the sleeve for the shaft sealing ring.

Take the stopper (1/12) and the compression spring (1/13) out of the high vacuum bearing plate (1/14).

Remove the oil pump (1/11). Place the pump module on to the high vacuum bearing plate (1/14).

Caution Residual oil may flow out of the high vacuum bearing plate (1/14).

1.2 Disassembly of Oil Box and Valves (Pumps with Gas Ballast Option)

Unscrew the 4 hex socket bolts (2/1) of the oil box (2/40).

Remove both the oil box and the seal for the oil box (2/39).

Loosen the two bolts (2/8) at the diaphragm valve (2/32). Pull out the diaphragm valve with the oil and the gas ballast pipe (2/10).

Remove the O-ring (2/32), the gas ballast orifice (2/32) as well as the non-return valve (2/30) and the compression spring (2/29).

Caution Do not disassemble the diaphragm valve further. Do not clean the valve in liquids.

Pull off the spring clip (2/11).

Remove the holding frame (2/13) and the internal demister (2/14).

Loosen the hex. socket bolt (2/21) and remove it together with the valve bracket (2/26).

Completely remove the exhaust valve (items 2/22 to 2/25) and the bypass valve (2/27).

Loosen the hex. socket bolt (2/16) and disassemble the gas ballast valve.

Take out the flat seals (2/17 and 2/20).

Unscrew the exhaust port (2/6) and remove the sealing ring (2/5).

Remove the cylinder head bolt (2/34) together with the washer (2/35).

Remove the bracket (2/36), the oil level glass (2/37) and the contoured seal (2/38).

1.3 *Disassembly of Oil Box and Valves (Pumps without Gas Ballast Option)*

Unscrew the 4 hex socket bolts (2/1) of the oil box (2/40).

Remove both the oil box and the seal for the oil box (2/39).

Pull off the spring clip (2/11).

Remove the holding frame (2/13) and the internal demister (2/14).

Loosen the hex. socket bolt (2/21) and remove it together with the valve bracket (2/26).

Completely remove the exhaust valve (items 2/22 to 2/25) and the bypass valve (2/27).

Unscrew the exhaust port (2/6) and remove the sealing ring (2/5).

Remove the cylinder head bolt (2/34) together with the washer (2/35).

Remove the bracket (2/36), the oil level glass (2/37) and the contoured seal (2/38).

1.4 *Disassembly of the Pump Module*

Unscrew the hex. socket bolts (3/20).

Remove the end plate (3/1) and the O-ring (3/2).

Lift off the forevacuum pot (3/3).

Remove the sealing nipple (3/4) from the forevacuum pot.

Pull off the oil guiding panel (3/14) from the high vacuum bearing plate.

Fully remove the rotor (3/5) with the vanes (3/16 to 3/20) from the high vacuum bearing plate, remove the vanes.

Remove the flat seal (3/7) from the high vacuum bearing plate.

Take the tandem valve (3/8) with the compression spring (3/9) and the spacer (3/10) out of the high vacuum bearing plate.

Unscrew the intake port (3/11) out of the high vacuum bearing plate and remove the O-ring (3/12).

Press the shaft sealing ring (3/6) out of the high vacuum bearing plate.

Caution Make sure that the seat for the shaft sealing ring in the high vacuum bearing plate is not damaged.
Look for a free air intake nozzle (view "G", page 24).

2 *Assembly (Pumps with Gas Ballast Option)*

Clean all parts, check that they are in perfect condition and replace any defective parts as required.

2.1 *Assembly of the Pump Module*

Screw the intake port (3/11) with the O-ring (3/12) into the high vacuum bearing plate.

Caution Slightly oil the seat of the shaft sealing ring, the bore for the tandem valve and the high vacuum pump chamber.

Press the shaft sealing ring (3/6) right up to the stop using a matching shaft sealing ring driver (see sketch 2, page 14).

Place the spacer (3/10) into the high vacuum bearing plate.

Caution Note the orientation, see enlarged details C and D (fig. 3, page 24).
D = with gas ballast.

Insert the compression spring (3/9) into the tandem valve (3/8) and insert it fully into the bore in the high vacuum bearing plate.

Place the flat seal (3/7) on to the high vacuum bearing plate.

Insert the high vacuum vane (3/16), slightly oiled with the guide pin (3/18) and compression spring (3/17) into the rotor (3/5).

Caution Note the orientation of the HV vanes. See enlarged details F (fig. 3, page 24).

Insert the complete rotor into the high vacuum bearing plate (3/13).

Press the sealing nipple (3/4) into the forevacuum pot (3/3) (see sketch 3, page 21).

Fit the forevacuum pot on to the high vacuum bearing plate.

Push the oil guiding panel (3/14) on.

Caution The sealing nipple (3/4) must be located above the tandem valve (3/8).
When fitting, the forevacuum pot must not be turned as otherwise there is the danger that the sealing nipple might be damaged or even forced out. To maintain the position, a screw may be screwed in.

Provide the forevacuum vane (3/19) with a bezel (see sketch 4, page 21) and insert it with the guide pin (3/18) and the compression spring (3/17), slightly oiled into the rotor.

Place the O-ring (3/2) into the forevacuum pot.

Fit the end plate (3/1) and bolt home with the hex. socket bolts (3/21) (torque 5.5 Nm, $\pm 10\%$).

2.2 Assembly of the Gas Ballast Valve

Place the flat seal (2/20) into the high vacuum bearing piece (2/15). Slightly oil the gas ballast valve (2/19) and push on the cap of the gas ballast valve (2/18).

Insert the assembled parts of the gas ballast valve into the bore in the high vacuum bearing piece provided for this purpose.

Insert the flat seal (2/17) and mount the gas ballast valve with the hex. socket bolt (2/16) (torque = 11 Nm)

The gas ballast valve should be fitted so that the letters "GB" point in the direction of the oil box.

2.3 Assembly of Exhaust and Bypass valves

Insert the bypass valve (2/27) into the valve seat of the forevacuum pot (2/28), see view A for correct orientation.

Assemble sealing element (2/25), spring (2/24) and stroke restrictor (2/23) and insert the thus assembled parts into the valve seat of the forevacuum pot (2/28).

Position the valve holder (2/22) on the stroke restrictor (2/23).

Fit the valve bracket (2/26) and tighten it with the hex. socket bolt (2/21) (torque = 5.5 Nm).

2.4 Assembly of the Diaphragm Valve

2.4.1 Assembly of the Non-return Valve

Insert the non-return-valve (2/30) into the conical compression spring (2/29) and insert this together with the gas ballast orifice (2/31) into the hole in the end piece.

Insert the O-ring (2/32).

Caution Make especially sure that the non-return valve (2/30) has been fitted in the correct orientation.

2.4.2 Full Assembly

Oil the 4 new rubber inserts (2/9) and insert these into the holes provided.

Oil the oil and gas ballast pipe (2/10) at the ends.

Insert both pipes into the rubber inserts in the diaphragm valve (2/33).

Insert the pre-assembled diaphragm valve with the pipes into the end piece (2/12) and tighten it with the 2 hex. socket bolts (2/8) (torque = 5.5 Nm).

2.5 Assembly of the Internal Demister

Place the internal demister (2/14) in the holding frame (2/13) and position it above the exhaust and bypass valves so that the spring clip (2/11) rests - when fitted - against the center console of the holding frame.

The holding frame (2/13) must be pushed right against the stop on the forevacuum pot (2/28) in the direction of the high vacuum bearing plate (2/15).

Fit the spring clip (2/11) using the securing ring pliers.

2.6 Assembly of the Oil Box

Place the seal for the oil box (2/39) into the groove in the oil box, see enlarged detail B (fig. 2, page 23).

Fit the oil box (2/40) and tighten with four hex. socket bolts (2/1) with washers (2/2) (torque = 5.5 Nm).

3 Assembly

(Pumps without Gas Ballast Option)

Clean all parts, check that they are in perfect condition and replace any defective parts as required.

3.1 Assembly of the Pump Module

Screw the intake port (3/11) with the O-ring (3/12) into the high vacuum bearing plate.

Caution Slightly oil the seat of the shaft sealing ring, the bore for the tandem valve and the high vacuum pump chamber.

Press the shaft sealing ring (3/6) right up to the stop using a matching shaft sealing ring driver (see sketch 2).

Place the spacer (3/10) into the high vacuum bearing plate.

Caution Note the orientation, see enlarged details C and D (fig. 3, page 24).
C = without gas ballast.

Insert the compression spring (3/9) into the tandem valve (3/8) and insert it fully into the bore in the high vacuum bearing plate.

Place the flat seal (3/7) on to the high vacuum bearing plate.

Insert the high vacuum vane (3/16), slightly oiled with the guide pin (3/17) and compression spring (3/18) into the rotor (3/5).

Caution Note the orientation of the HV vanes. See enlarged details F (fig. 3, page 24).

Insert the complete rotor into the high vacuum bearing plate (3/13).

Press the sealing nipple (3/4) into the forevacuum pot (3/3) (see sketch 3, page 21).

Fit the forevacuum pot on to the high vacuum bearing plate.

Push the oil guiding panel (3/14) on.

Caution The sealing nipple (3/4) must be located above the tandem valve (3/8).
When fitting, the forevacuum pot must not be turned as otherwise there is the danger that the sealing nipple might be damaged or even forced out. To maintain the position, a screw may be screwed in.

Provide the forevacuum vane (3/19) with a bezel (see sketch 4, page 21) and insert it with the guide pin (3/20) and the compression spring (3/18), slightly oiled into the rotor.

Place the O-ring (3/2) into the forevacuum pot.

Fit the end plate (3/1) and bolt home with the hex. socket bolts (3/21) (torque 5.5 Nm, $\pm 10\%$).

3.2 Assembly of Exhaust and Bypass valves

Insert the bypass valve (2/27) into the valve seat of the forevacuum pot (2/28), see view A for correct orientation.

Assemble sealing element (2/25), spring (2/24) and stroke restrictor (2/23) and insert the thus assembled parts into the valve seat of the forevacuum pot (2/28).

Position the valve holder (2/22) on the stroke restrictor (2/23).

Fit the valve bracket (2/26) and tighten it with the hex. socket bolt (2/21) (torque = 5.5 Nm).

3.3 Assembly of the Internal Demister

Place the internal demister (2/14) in the holding frame (2/13) and position it above the exhaust and bypass valves so that the spring clip (2/11) rests - when fitted against the center console of the holding frame.

The holding frame (2/13) must be pushed right against the stop on the forevacuum pot (2/28) in the direction of the high vacuum bearing plate (2/15).

Fit the spring clip (2/11) using the securing ring pliers.

3.4 Assembly of the Oil Box

Place the seal for the oil box (2/39) into the groove in the oil box, see enlarged detail B (fig. 2, page 23).

Fit the oil box (2/40) and tighten with four hex. socket bolts (2/1) with washers (2/2) (torque = 5.5 Nm).

4 General Assembly Work

4.1 Assembly of the Coupling / Oil Pump

Clean all parts, check that they are in perfect condition and replace any defective parts as required.

Insert the oil pump (1/11) into the high vacuum bearing plate (1/14).

Insert the stopper using a new compression spring (1/12 and 1/13) also into the high vacuum bearing plate.

Caution Make sure that the spring (1/13) is seated straight.

Insert the O-ring (1/1) into the centering seat of the high vacuum bearing plate (1/14).

4.2 Assembly of the Motor

Insert the spacing disk (1/5) into the sleeve of the shaft sealing ring (1/3). Moisten the shaft sealing ring at its outside diameter with a 50:50 solution consisting of water and spirit of wine (please do not use any oil) and use a suitable shaft sealing ring driver (see sketch 1, page 14) to slowly press the shaft sealing ring into the sleeve.

Lightly oil the shaft sealing ring on its inside all along around the sealing lip.

Caution The mixture of spirit of wine and water must not come into contact with the sealing lip of the shaft sealing ring.

Note the installation orientation of the shaft sealing ring (1/10).

Place the O-ring (1/4) on to the sleeve of the shaft sealing ring (1/3) and insert the thus completed assembly into the A bearing plate (1/9).

Insert - without applying any oil - the 2 coupling sleeves (1/2) into the shaft of the motor.

Place the motor on to the high vacuum bearing plate (1/14) whereby the coupling pins must align with the bores in the shaft of the motor.

Caution During assembly make sure that the air can escape from the bores for the coupling pins. Thus place the motor slowly onto the coupling. When fitted correctly, the motor can be turned slightly in the high vacuum bearing plate so that the tie rods can be fitted.

Affix the motor with the 4 tie rods and tighten these crosswise (torque = 4 Nm, $\pm 10\%$).

Fit the fan cowl (1/7).

4.3 Assembly of the Pump's Base

Attach the pump's base (1/15) with the hex. socket bolts (1/16) (torque = 5 Nm, $\pm 10\%$).

Caution Before starting up the pump again you must under all circumstances fill in oil again. For this refer to the Operating Instructions for the pump.

In the case of three-phase motors you must check the direction of rotation immediately after having reconnected the motor and each time after having made any changes to the wiring. For this, the exhaust line needs to be open.

For this, switch the motor on briefly and determine whether a suitable seal (a blank flange, for example) is sucked towards the intake flange. If this is not the case, switch the pump off immediately and interchange two mains phases.

Note the direction indicating arrow on the fan cowl.

Warning During all electrical work ensure that the power supply lines have reliably been switched off. The electrical connections may only be made by an electrician as defined by VDE 0105 in accordance with the VDE 0100 guidelines.



4.4 Fitting the "double shaft sealing ring" for the TRIVAC D 5 E-TVT

Check the "double shaft sealing ring" for damage and clean it if required.

Moisten on both sealing rings the sealing / dust protection lip all around with oil (do not allow droplets to form).

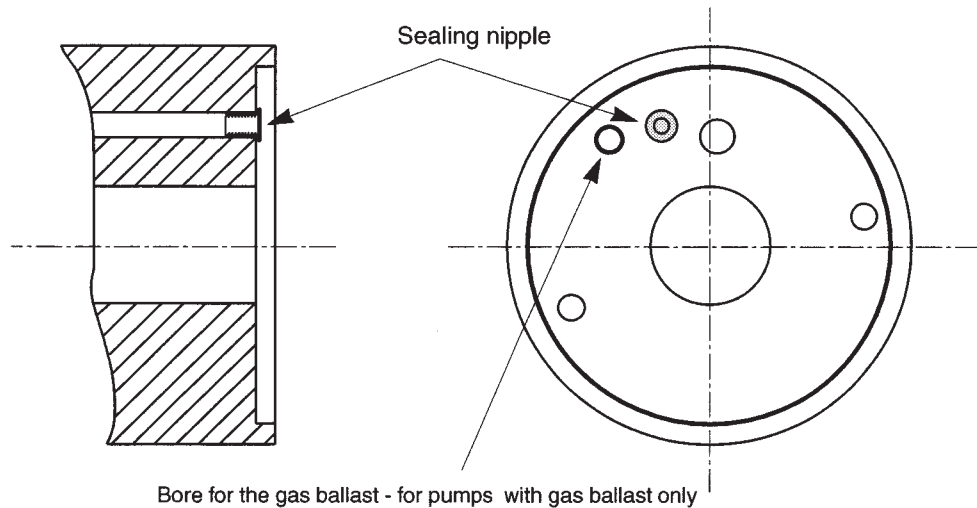
Place the O-ring (Fig. 1 / Item 4) on to the bushing (1/3) for the shaft sealing ring.

Push the shaft sealing ring pack vertically onto the shaft of the motor until the first sealing ring is "seated" correctly.

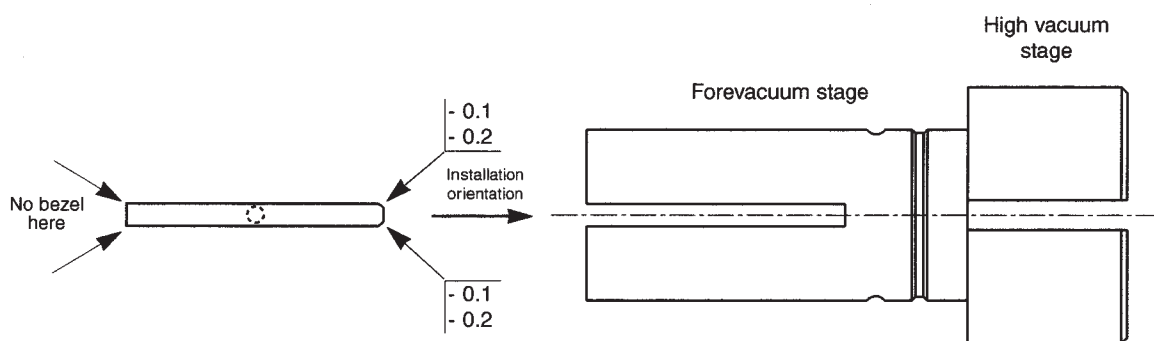
The slit between the two shaft sealing rings (see Fig. 1) should be filled with oil (pump oil).

Caution Take care that no excess oil will drop into the bores of the coupling sleeves (1/2).

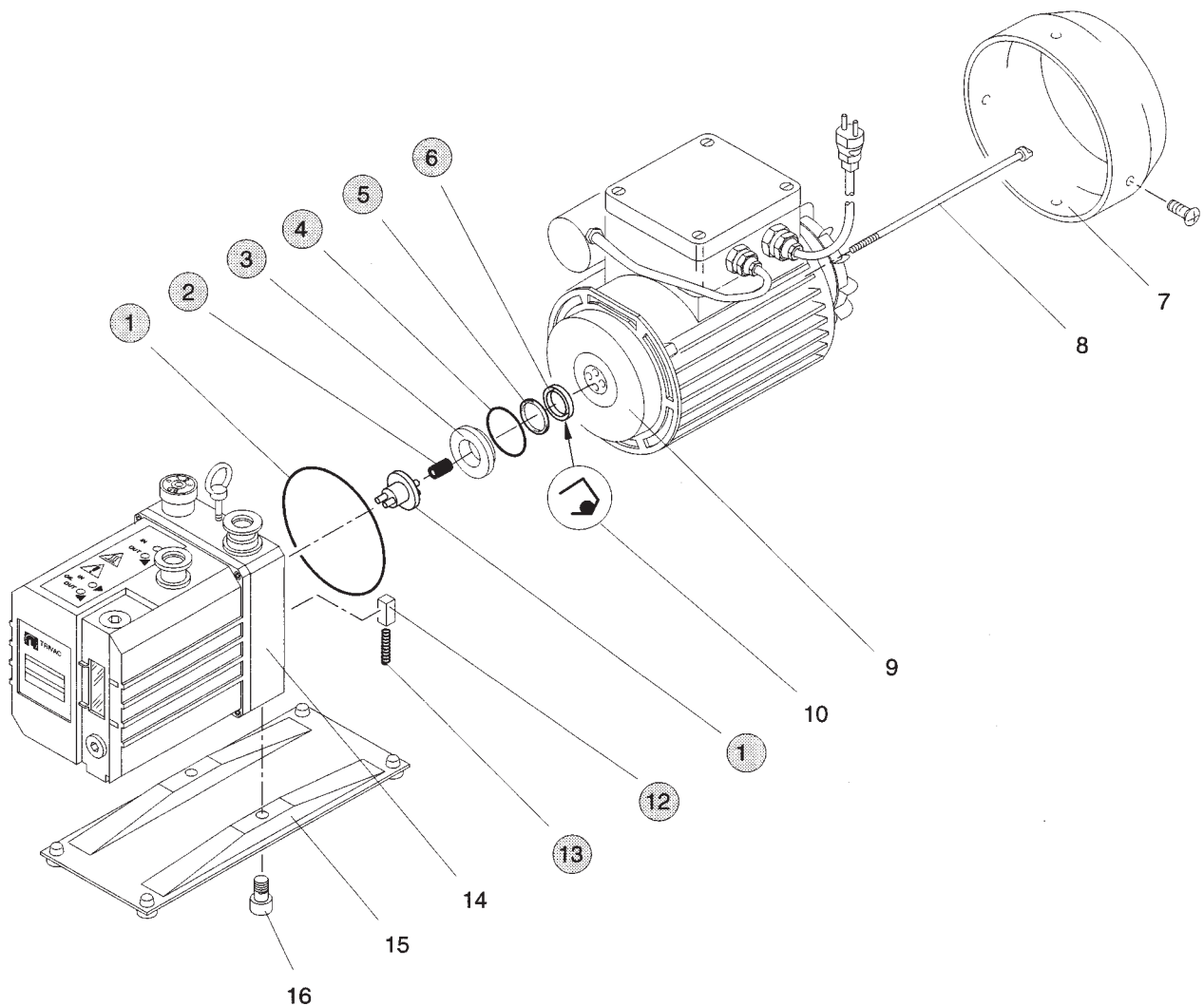
Fully insert the bushing (1/3) for the shaft sealing rings into the A bearing plate (1/9).



Sketch 3 Position of the sealing nipple and the bore for the gas ballast



Sketch 4 How to provide the bezel on the forevacuum vanes

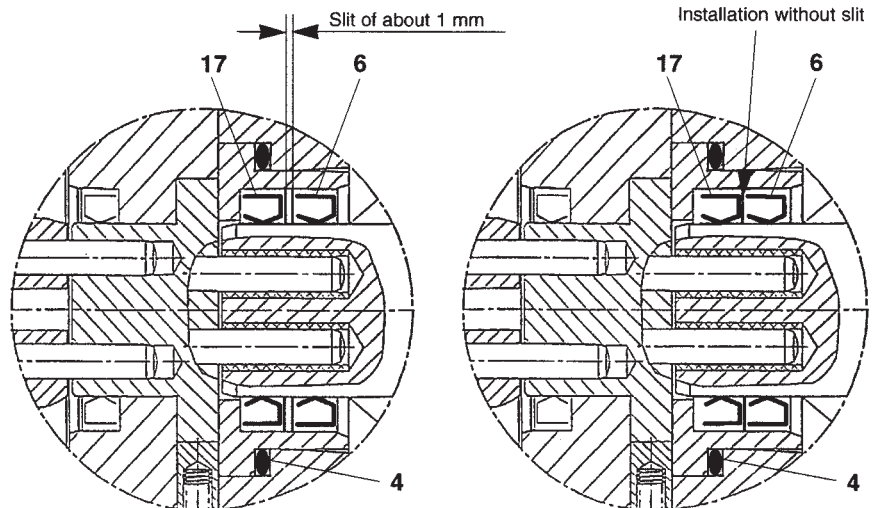


Key to Fig. 1

- 1 O-ring
- 2 Coupling sleeve
- 3 Shaft sealing ring sleeve
- 4 O-ring
- 5 Spacing disk
- 6 Shaft sealing ring
- 7 Fan cowl
- 8 Tie rods (4x)
- 9 A-bearing plate
- 10 Position of the shaft sealing ring
- 11 Oil pump
- 12 Stopper
- 13 Compression spring
- 14 High vacuum bearing plate
- 15 Pump's base
- 16 Hex. socket bolt
- 17 Shaft sealing ring without spring (only TVT version)

● - Parts included in the complete kit

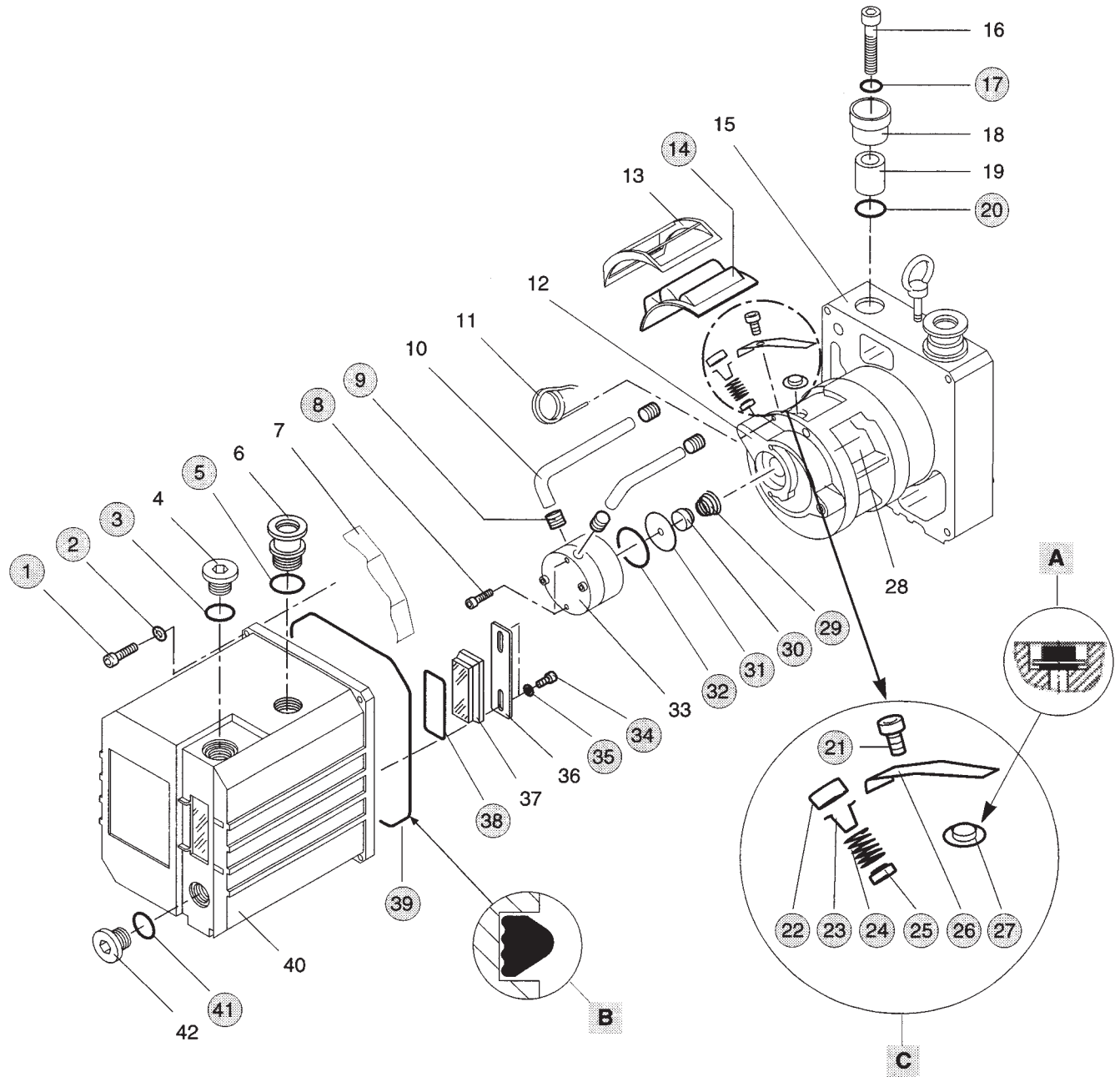
Shaft sealing ring - Arrangement in the TVT version (see item 6)



Shaft sealing ring pack in the series pump

Shaft sealing ring pack in the service set

Fig. 1 Complete kit (for D 5 E - D 10 E)



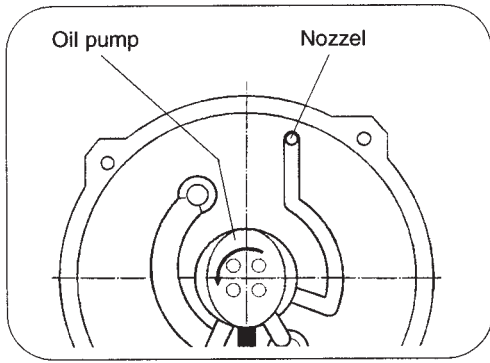
Key to Fig. 2

- | | | |
|--|------------------------------|--------------------------|
| 1 Hex. socket bolt | 15 High vacuum bearing plate | 30 Non-return valve |
| 2 Washer | 16 Hex. socket bolt | 31 Gas ballast - orifice |
| 3 Sealing ring | 17 Flat seal | 32 O-ring |
| 4 Oil-fill plug | 18 Gas ballast valve - cap | 33 Diaphragm valve |
| 5 Sealing ring | 19 Gas ballast valve | 34 Cylinder head bolt |
| 6 Exhaust port | 20 Flat seal | 35 Washer |
| 7 Guide panel | 21 Hex. socket bolt | 36 Holding panel |
| 8 Hex. socket bolt | 22 Valve holder | 37 Oil level glass |
| 9 Rubber insert (4x) | 23 Stroke restrictor | 38 Contoured seal |
| 10 Oil or gas ballast pipe | 24 Compression spring | 39 Seal for the oil box |
| 11 Spring clip | 25 Sealing element | 40 Oil box |
| 12 End plate | 26 Valve bracket | 41 Sealing ring |
| 13 Holding frame for internal demister | 27 Bypass valve | 42 Oil drain plug |
| 14 Internal demister | 28 Forevacuum pot | |
| | 29 Compression spring | |
- - Parts included in the complete kit

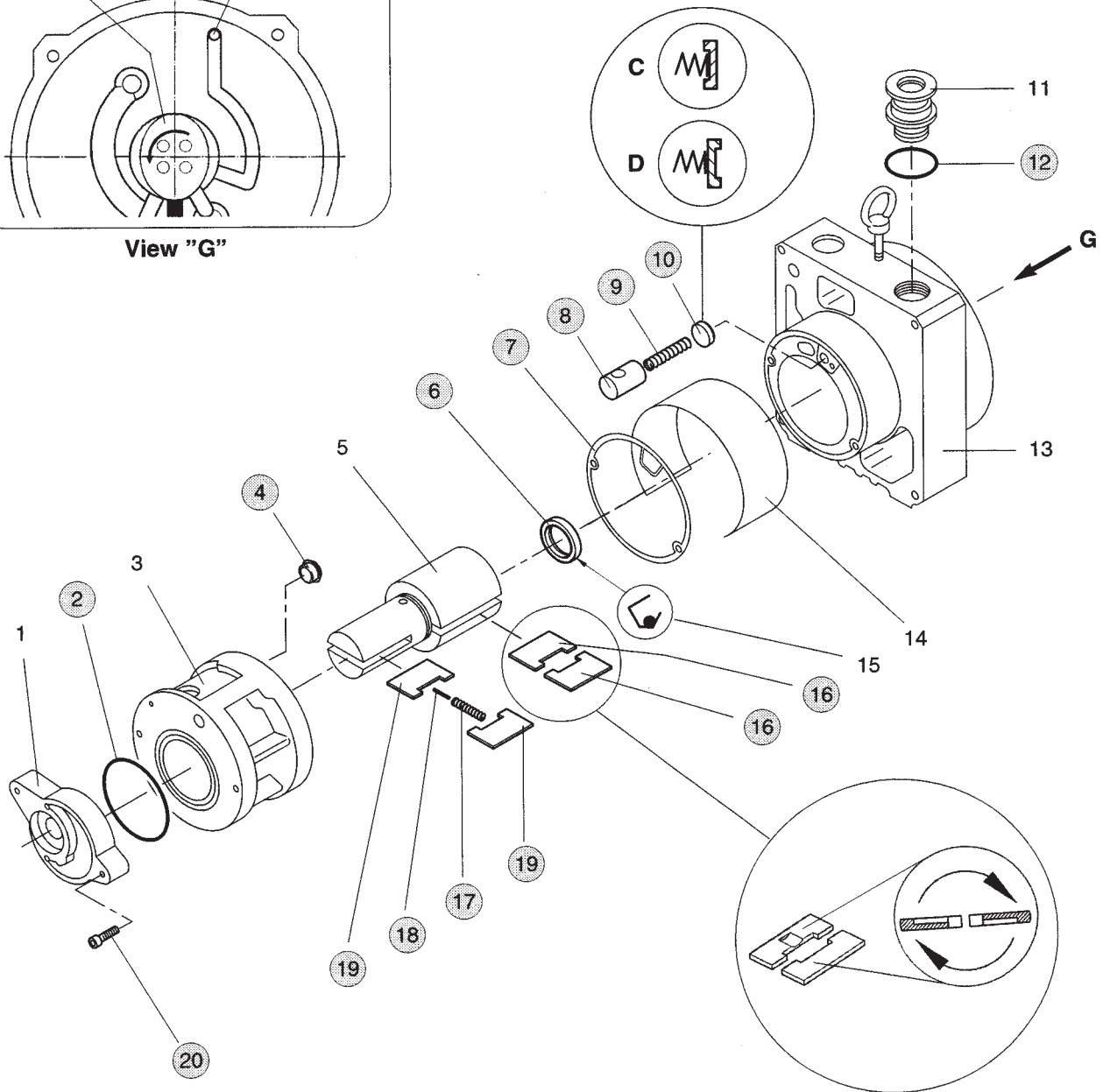
Enlarged views

- A** - Position of the bypass valve
B - Seal for the oil box
C - Components of the valves

Fig. 2 Complete kit for D 5 E - D 10



View "G"



Enlarged view F
Position of the HV vanes

Key to Fig. 3

- | | |
|----------------------|--------------------------------|
| 1 End plate | 12 O-ring |
| 2 O-ring | 13 High vacuum bearing piece |
| 3 Forevacuum pot | 14 Oil guiding panel |
| 4 Sealing nipple | 15 Position/shaft sealing ring |
| 5 Rotor | 16 Vane (HV) |
| 6 Shaft sealing ring | 17 Compression spring |
| 7 Flat seal | 18 Guide pin |
| 8 Tandem valve | 19 Vane (FV) |
| 9 Compression spring | 20 Hex. socket bolt |
| 10 Spacer | |
| 11 Intake port | |

Enlarged views

- C - without gas ballast
D - with gas ballast

● - Parts included in the complete kit

Fig. 3 Complete kit (for D 5 E - D 10 E)

5 Torque for the Bolts

Bolts at...	Fig. / Item	Quantity	Torque in Nm ($\pm 10\%$)
Diaphragm valve	2/8	2	5.5
Oil box	2/1	4	5.5
Gas ballast valve	2/16	1	11
Valve bracket	2/21	1	5.5
Pump's base	1/16	2	23
Tie rods	1/8	4	4
End plate	3/20	2	5.5

6 Overview on the Maintenance and Repair Kits

	Description	Maintenance/repair interval
Maintenance kit 1 for TRIVAC D 1.2 - 16 E	Simple maintenance for: - Oil separator (internal demister) - Seal for the oil box	1/year
Maintenance kit 2 for TRIVAC D 1.2 - 16 E	Full maintenance for: - Oil separator (internal demister) - All seals - Wearing parts	3 years
Repair kit 1 for TRIVAC D 1.2 - 16 E	Simple repair kit for: - Sealing of the motor side, as well as exchange of wearing parts, coupling sleeves and compression spring oil pump	as required
Repair kit 2 for TRIVAC D 1.2 - 16 E	Simple repair kit for: - Valves - Oils separator - Seal for the oil box	as required
Repair kit 3 for TRIVAC D 1.2 - 16 E	Complete repair kit for: - Exchanging the oil separator (int. demister) - Exchange of all seals - Exchange of wearing parts	as required

We reserve the right to alter the design or any data given in these Operating Instructions. The illustrations are not binding.