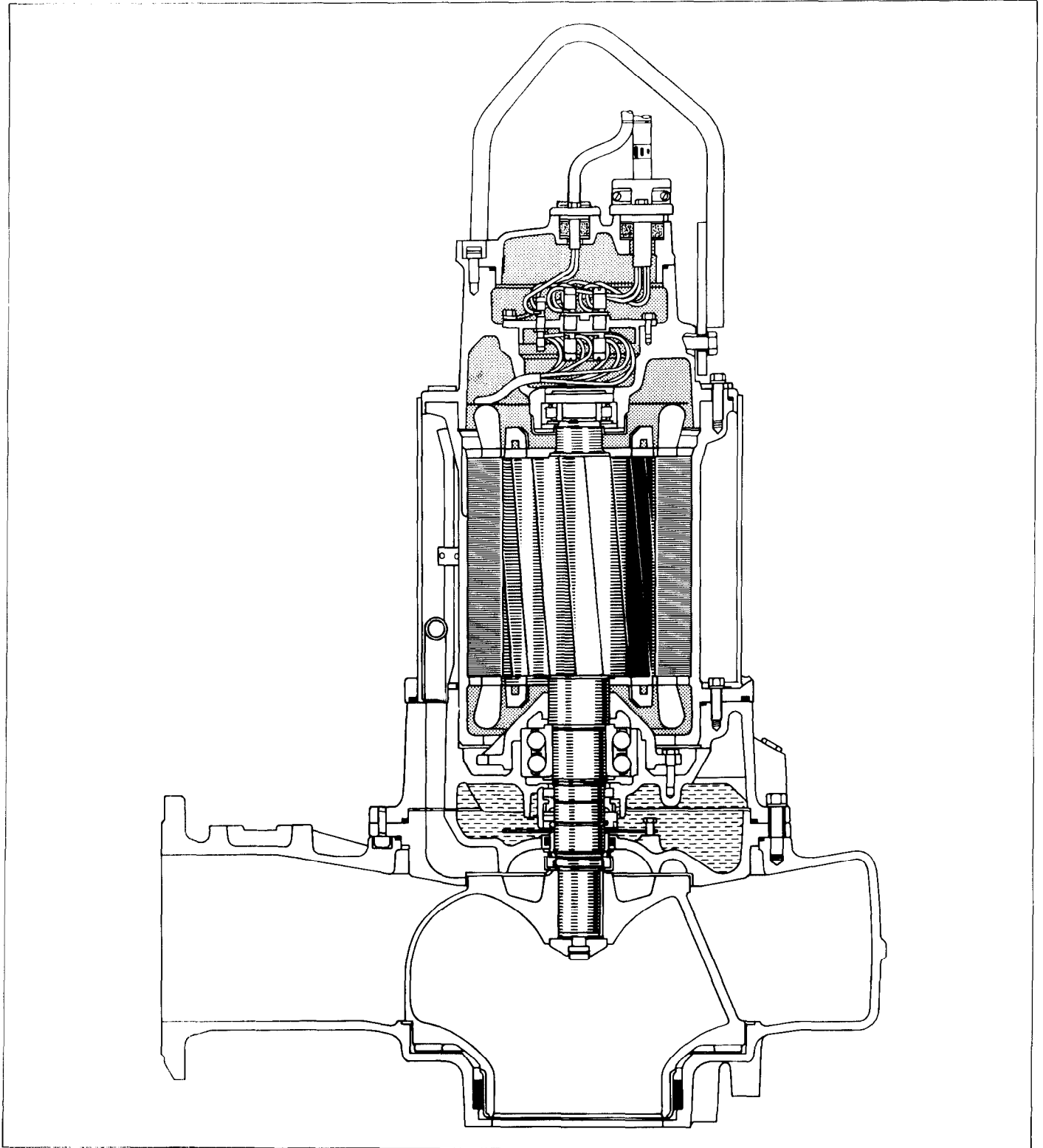


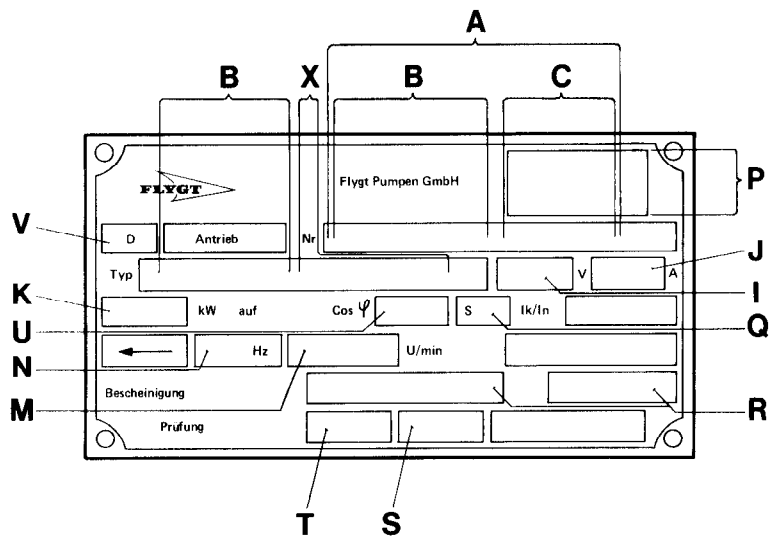
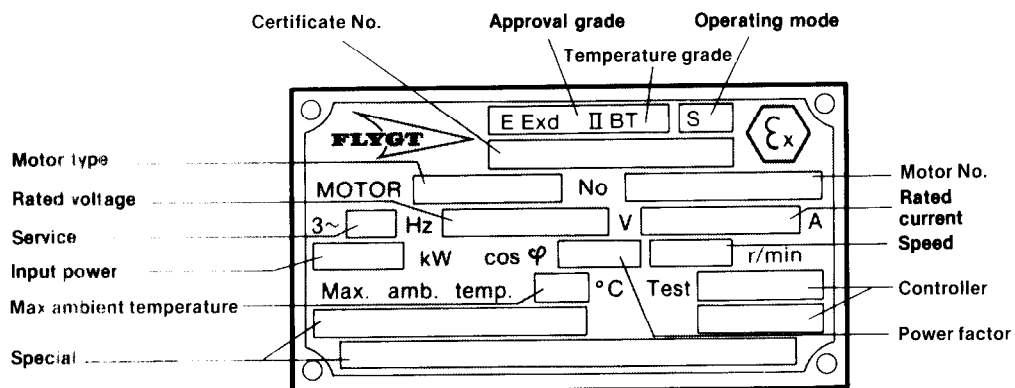
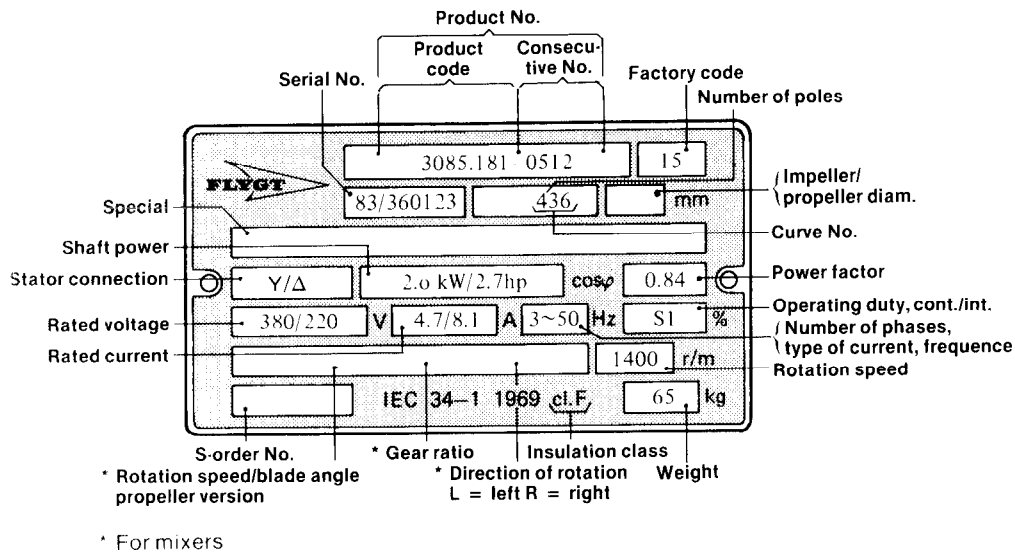
3201, 3300



Workshop manual



DATA PLATE INTERPRETATION



- | | | | |
|----|-----------------|----|-------------------------------|
| A. | Pump No. | P. | Approval grade |
| B. | Product code | Q. | Operating mode |
| C. | Consecutive No. | R. | Approval authority and number |
| I. | Design voltage | S. | Pressure tester |
| J. | Amperage | T. | Meas. controller |
| K. | Input power | U. | Power factor |
| M. | Speed | V. | Starting mode |
| N. | Service | X. | Starter data |

This workshop manual describes a dismantling and assembly sequence. The best work procedure for pump service may be different. The construction of the pump, recommended techniques and special tools are shown here.

NOTE! This workshop manual also describes the specially approved variants of the 3201 and 3300 pumps. For identification, see the pump's data plate and approval plate.

In order for the pump to meet the requirements and obtain the approval of the authorities, genuine Flygt parts shall always be used for repairs.

Only Flygt or workshops/personnel authorized by Flygt are allowed to work on specially approved pumps.

Dimensions shall always be checked on critical parts before assembly, see the section entitled "Specially approved pumps".

The assembled pump shall always be insulation-tested and test-run before delivery.

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Technical data

For weights, amperages, voltages, power ratings, rpm, see the pump's data plate.

Tightening torques

For 3201: bolts or screws 17 mm (0.67") across flats	10—20 Nm (7.38—14.75 ft lb)
bolts or screws 24 mm (0.95") across flats	50 Nm (36.88 ft lb)
For 3300: OIL	10—20 Nm (7.38—14.75 ft lb)
INSP	10—20 Nm (7.38—14.75 ft lb)
For 3201.090, INSP	100 Nm (73.76 ft lb)
For 3300.090, INSP	100 Nm (73.76 ft lb)

Oil volumes

For 3201:	10 l (10.6 US quarts)
For 3300:	15 l (15.9 US quarts)

Winding resistances at 20°C (68°F)

Stator No.	ohms per phase	Stator No.	ohms per phase	Stator No.	ohms per phase
319 74 28	0.041Ω	384 50 28	0.059Ω	415 75 28	0.125Ω
319 74 30	0.122Ω	384 50 29	0.069Ω	415 75 29	0.272Ω
319 74 32	0.047Ω	384 50 30	0.210Ω	415 75 30	0.400Ω
319 74 34	0.057Ω	384 50 32	0.081Ω	415 75 32	0.316Ω
319 74 35	0.135Ω	384 50 34	0.087Ω	415 75 34	0.360Ω
319 74 38	0.163Ω	384 50 35	0.232Ω	415 75 37*	0.096Ω
319 74 39	0.181Ω	384 50 37*	0.049Ω	415 75 38	1.090Ω
319 74 40	0.147Ω	384 50 38	0.280Ω	415 75 39	1.210Ω
319 74 44	0.193Ω	384 50 39	0.312Ω	415 75 40	0.981Ω
319 74 52	0.300Ω	384 50 40	0.252Ω	415 75 50	0.873Ω
319 74 58	0.489Ω	384 50 44	0.350Ω		
		384 50 50	0.439Ω	427 39 28	0.046Ω
319 79 28	0.093Ω	384 50 55	0.588Ω	427 39 30	0.015Ω
319 79 30	0.260Ω	384 50 58	0.840Ω	427 39 32	0.061Ω
319 79 32	0.114Ω			427 39 34	0.070Ω
319 79 35	0.290Ω	384 54 28	0.930Ω	427 39 35	0.174Ω
319 79 38	0.370Ω	384 54 30	0.330Ω	427 39 37*	0.038Ω
319 79 39	0.411Ω	384 54 32	0.119Ω	427 39 38	0.210Ω
319 79 40	0.333Ω	384 54 34	0.129Ω	427 39 40	0.189Ω
319 79 52	0.650Ω	384 54 35	0.340Ω	427 39 44	0.260Ω
319 79 58	1.080Ω	384 54 37*	0.084Ω	427 39 52	0.395Ω
		384 54 38	0.410Ω	427 39 58	0.650Ω
319 98 28	0.025Ω	384 54 39	0.455Ω		
319 98 30	0.075Ω	384 54 40	0.369Ω		
319 98 32	0.029Ω	384 54 44	0.510Ω		
319 98 34	0.035Ω	384 54 50	0.630Ω		
319 98 35	0.085Ω	384 54 55	0.850Ω		
319 98 38	0.100Ω	384 54 58	1.230Ω		
319 98 39	0.109Ω				
319 98 40	0.090Ω	415 74 28	0.098Ω		
319 98 44	0.123Ω	415 74 32	0.125Ω		
319 98 50	0.165Ω	415 74 34	0.142Ω		
319 98 55	0.192Ω	415 74 35	0.357Ω		
319 98 58	0.300Ω	415 74 38	0.430Ω		
		415 74 40	0.387Ω		
		415 74 44	0.530Ω		
		415 74 50	0.670Ω		
		415 74 55	0.920Ω		
		415 74 58	1.290Ω		

* Per half phase.

Tools

Order No.	Description
82 30 90	Lifting eyebolt M10
82 30 91	Lifting eyebolt M12
82 30 92	Lifting eyebolt M16
83 95 40	Oil-drainage pump
84 13 60	Puller, for 3201
84 13 61	Puller, for 3201
84 13 62	Puller, for 3300
84 13 63	Puller, for 3300
84 13 64	Hydraulic unit, for 3300
216 68 00	Seal tool
332 91 00	Seal tool
385 66 00	Assembly-disassembly head for insp. screw
394 70 00	Stator lifting device
398 54 00	Seal tool for 3201
398 59 00	
398 60 00	
398 39 00	
398 40 00	Seal tool for 3300
398 47 01	
432 44 00	Crosspiece
453 30 00	Basic kit, bearing extraction
453 33 00	Bearing tool
462 30 00	LP gas torch

For 3300.
See instruction card 442 06 00.

Lubricants

Order No.	Description
90 20 53	Bearing grease 1 kg (2.2 lb) (Chevron Industrial Grease Heavy)
90 20 54	Bearing grease 1 kg (2.2 lb) (Esso Unirex N3)
90 17 51	Standard oil, see care and maintenance for further details
90 17 52	Mobile Whiterex or equivalent paraffin oil. For raw or clean water pumping. Oil volumes: 10 l (10.6 US quarts) for 3201 and 15 l (15.9 US quarts) for 3300.

Impeller pullers

Order No.	Fits impeller No.
249 92 02	384 77 00, 384 77 80, 384 77 90 384 78 00, 384 78 80, 384 78 90
344 48 00	344 50 00, 344 51 00
398 80 02	384 38 00, 384 40 00, 384 40 01, 398 88 06 398 88 07, 398 88 08, 398 88 09
398 80 03	384 31 00, 384 32 00, 384 33 00
398 80 04	384 26 00, 384 27 00, 384 29 00, 384 35 00 381 08 01, 412 37 00, 412 38 00
400 54 02	434 62 00, 434 62 01, 434 62 02, 434 62 03 434 62 04
400 54 04	319 40 00, 319 50 00, 408 55 00, 408 56 00 408 57 00
82 20 49	437 91 11, 437 91 15, 437 91 19, 437 91 23 437 91 26, 437 91 29
479 23 00	
479 24 00	437 84 01, 437 84 04, 437 84 07, 437 84 10 437 84 13, 437 84 16
82 20 49	
479 23 00	
479 25 00	

Specially approved pumps

Pumps with special approval shall be handled with extra care.

On a specially approved (Ex d) pump, the gaps between different parts, for example between the stator casing and the junction box, shall prevent any sparks from the interior of the pump from getting out and igniting surrounding gases.

All joint widths and gaps shall be measured with sufficiently accurate and well calibrated instruments. All joint surfaces shall be inspected. There may be no scratches, tool marks or the like.

Failure to meet the above requirements may render the special approval invalid. Note that the work requires experienced and trained personnel.

Disassembly

The parts for which dimensions are to be checked are noted in the parts list. It is very important that the joint surfaces on these parts are not damaged during dismantling.

Assembly

Measure gaps and joint widths.

Inspect the joint surfaces and smear them with grease to prevent corrosion.

If a part does not meet the requirements on dimensional accuracy or surface finish, it must be discarded and a new specially approved part procured. The new part must also be inspected.

Observe caution during assembly so that the joint surfaces are not damaged.

		Minimum width of joint	Gap
3201.090 3201.120 (3201.091)	1 A—B	17 mm, 0.67" (27 mm, 1.06")	≤0.194 mm, 0.0076" (≤0.194 mm, 0.0076")
	2 C—D	28 mm, 1.10"	≤0.169 mm, 0.0067"
	3 E—F	28 mm, 1.10" (28 mm, 1.10")	≤0.179 mm, 0.0070" (≤0.179 mm, 0.0070")
	4 G—H	27 mm, 1.06" (28 mm, 1.10")	≤0.179 mm, 0.0070" (≤0.179 mm, 0.0070")
	5 I—J	27 mm, 1.06" (28 mm, 1.10")	0.229—0.284 mm, 0.0090"—0.0112" (0.256—0.294 mm, 0.0101"—0.0116")
	6 K—L	26.5 mm, 1.04" (27.2 mm, 1.07")	≤0.169 mm, 0.0066" (≤0.188 mm, 0.0074")

3300.090	7 M—N	16 mm, 0.63"	≤0.189 mm, 0.0074"
	8 O—P	26 mm, 1.02"	≤0.169 mm, 0.0067"
	9 Q—R	26 mm, 1.02"	≤0.176 mm, 0.0069"
	10 S—T	26 mm, 1.02"	≤0.285 mm, 0.0112"
	11 U—V	16 mm, 0.63"	≤0.168 mm, 0.0066"
	12 X—Y	26 mm, 1.02"	≤0.189 mm, 0.0074"

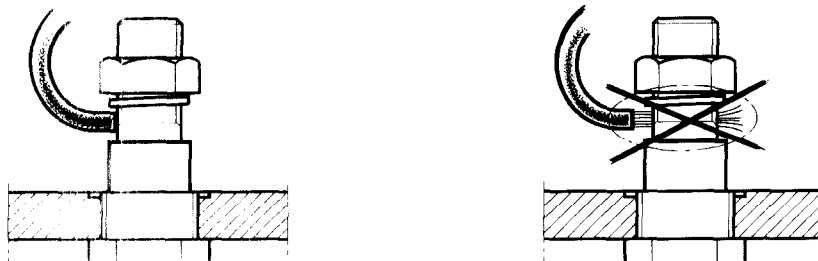
Electrical connections

In order to prevent flashover (arcing) and sparking when the motor cable is connected to the terminal board, it is important to observe the following points:

Make sure the insulation on the leads is whole, from the cable entry to the terminal.

Make sure that the bare copper wires on the leads are not too long.

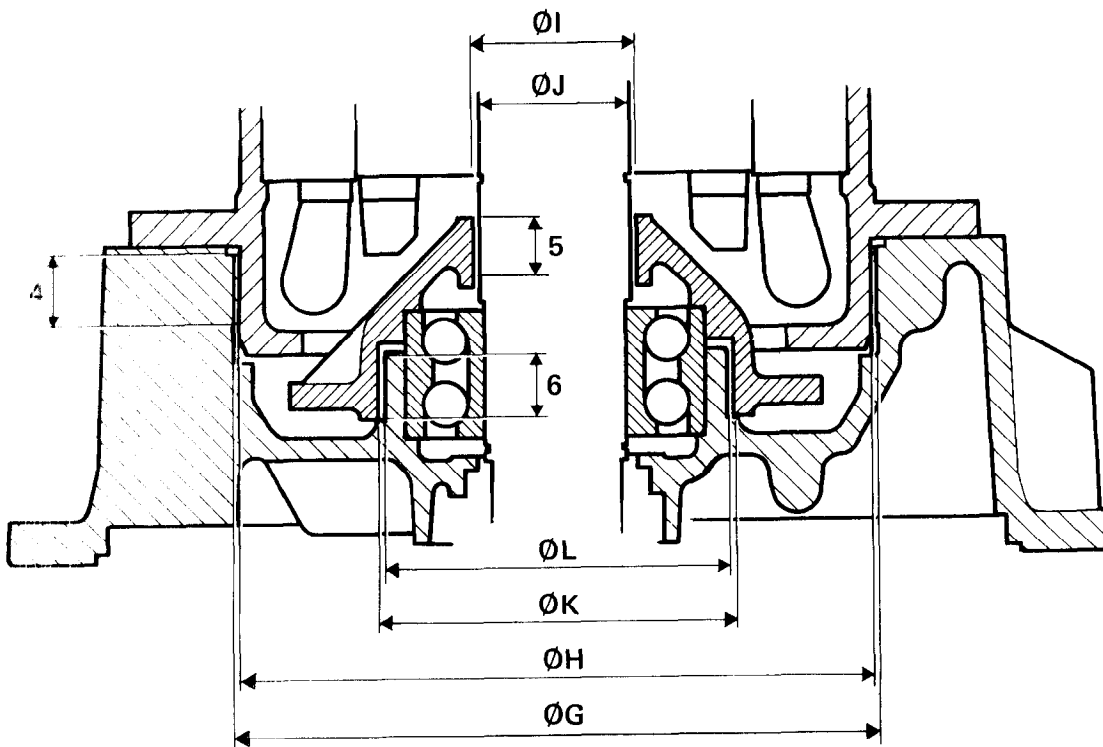
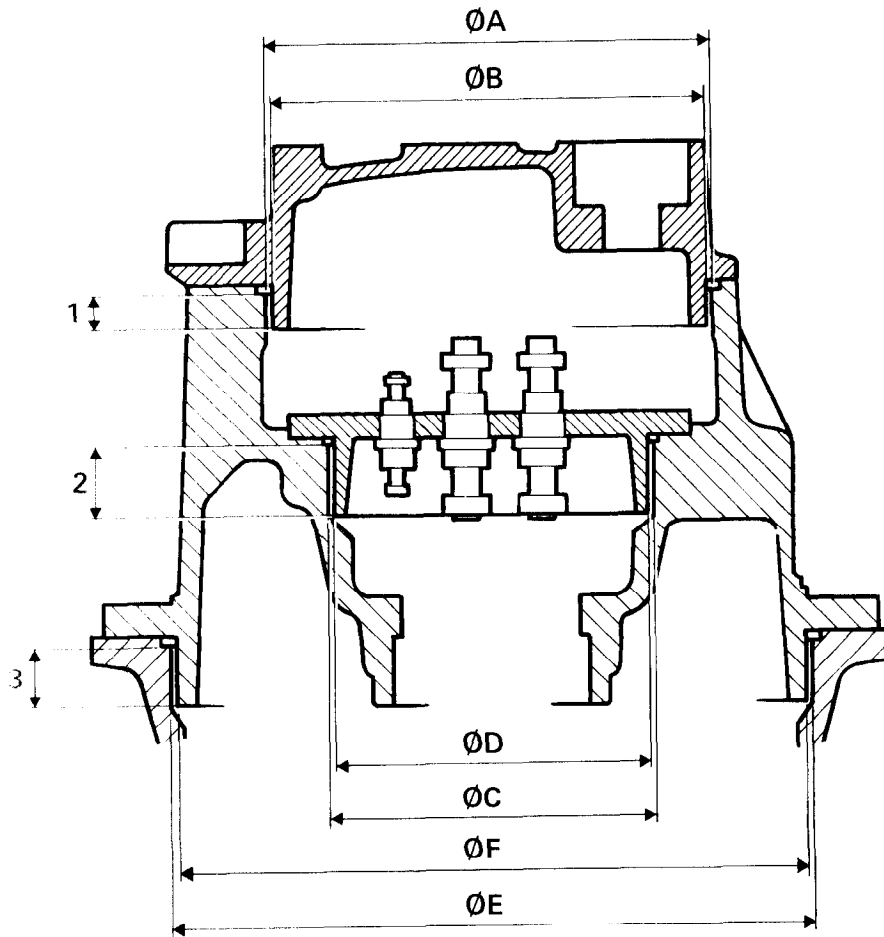
This also applies to stator and control leads.



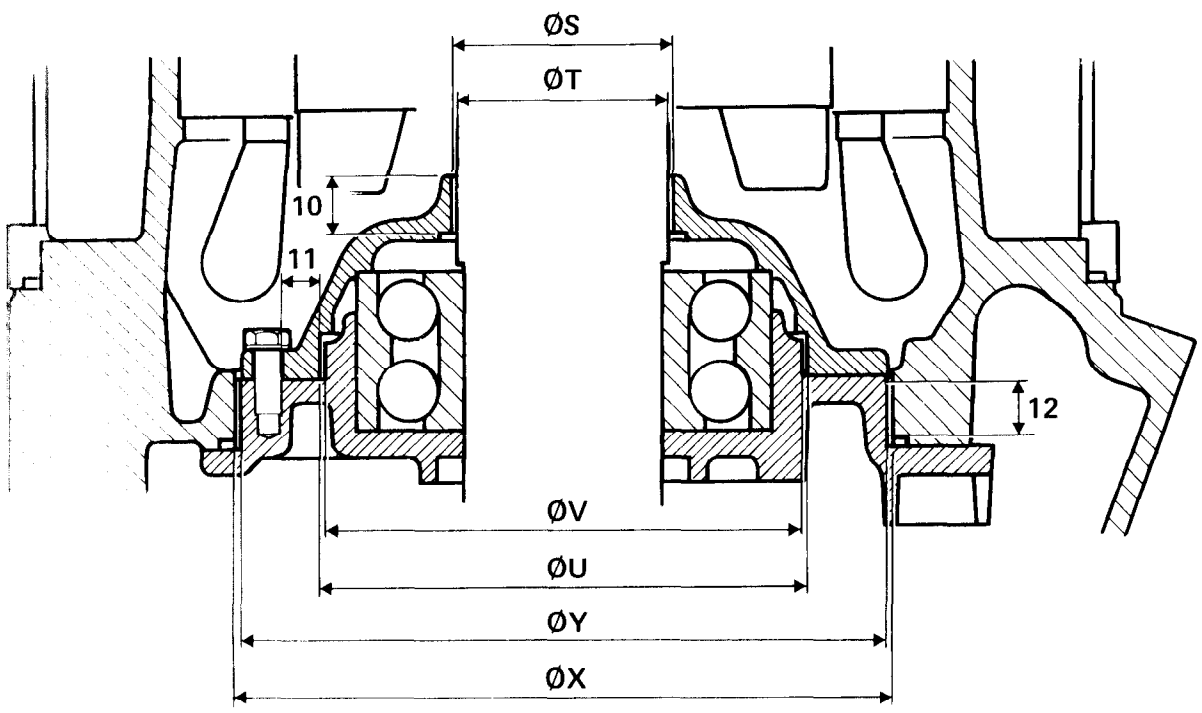
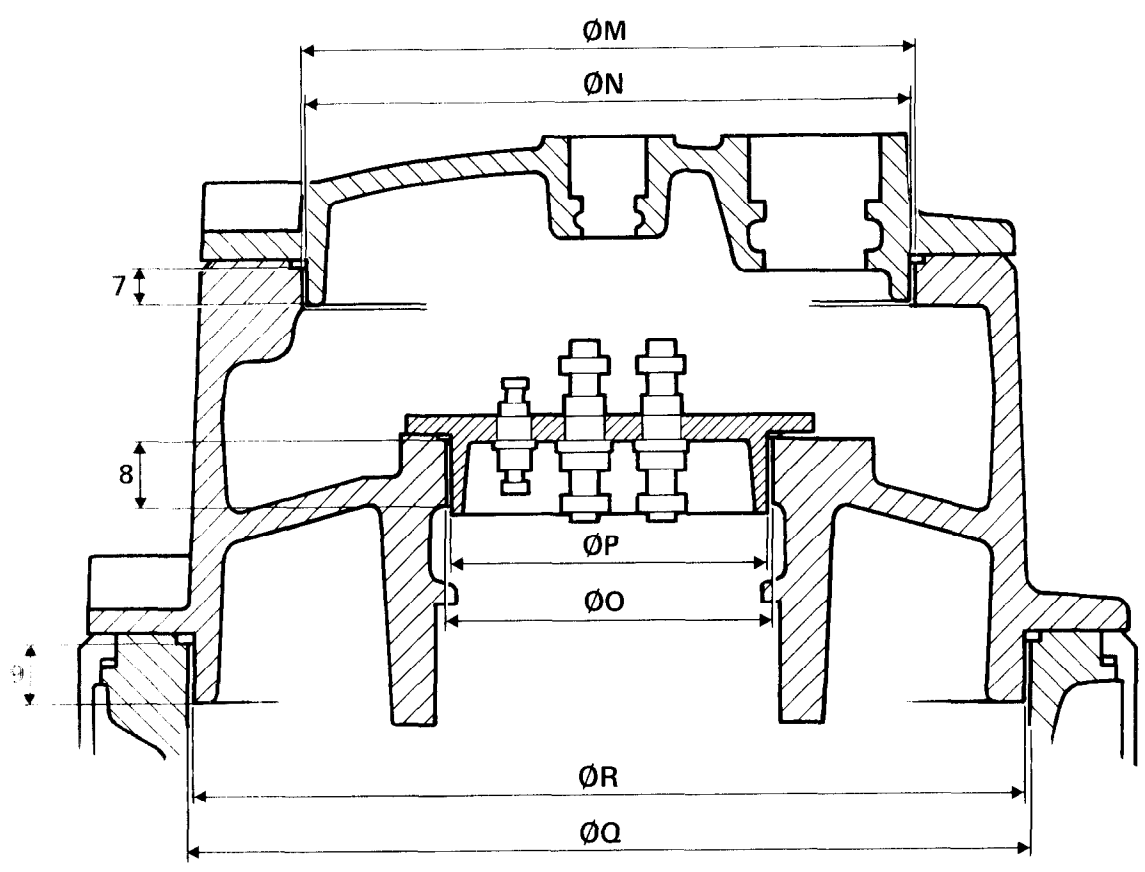
When the pump is assembled, check the insulation resistance of the stator.

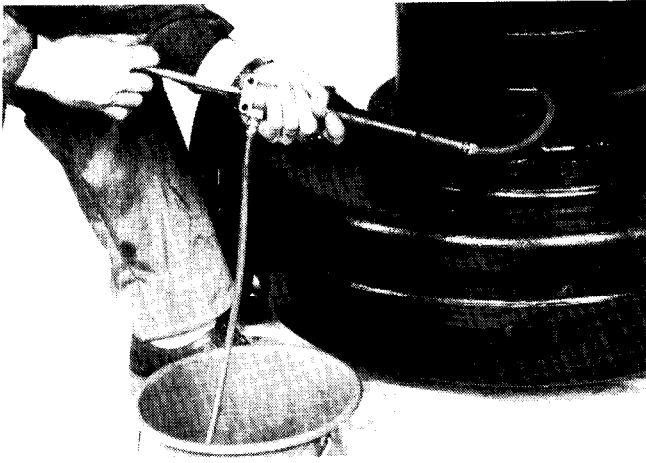
Use an insulation tester. With a 1000V megger, the insulation between the phases and between any phase and earth shall be $\geq 1\text{M}\Omega$.

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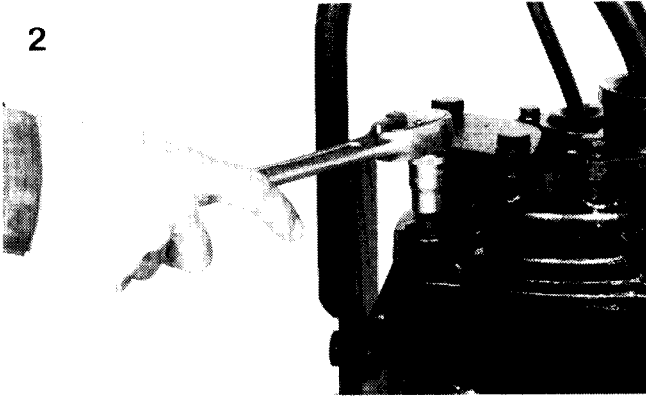


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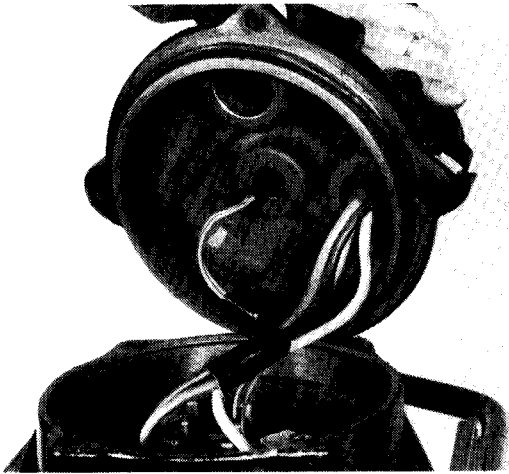




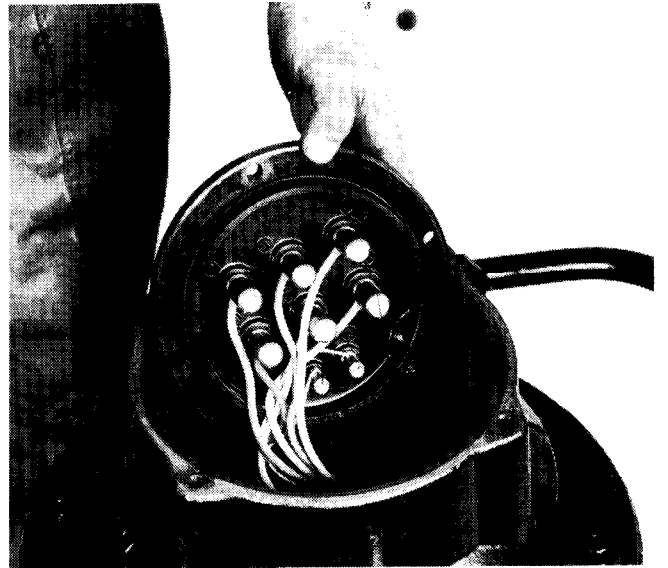
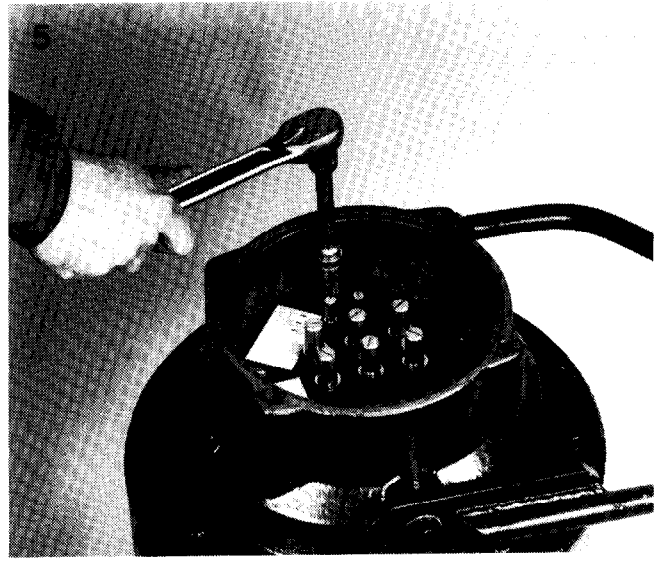
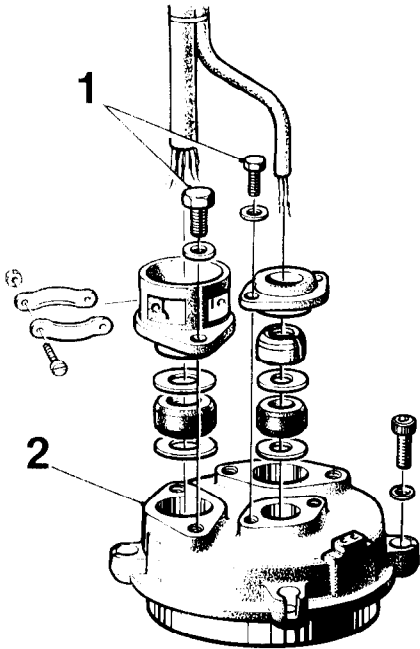
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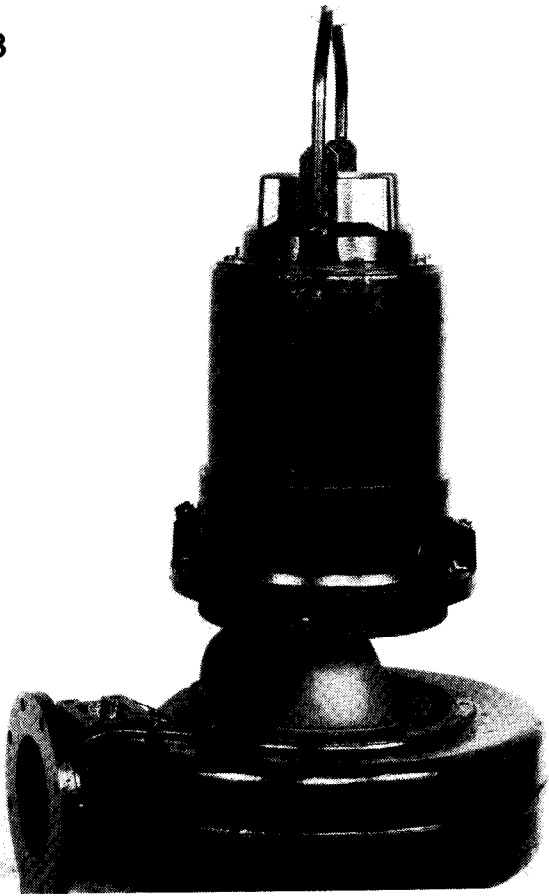


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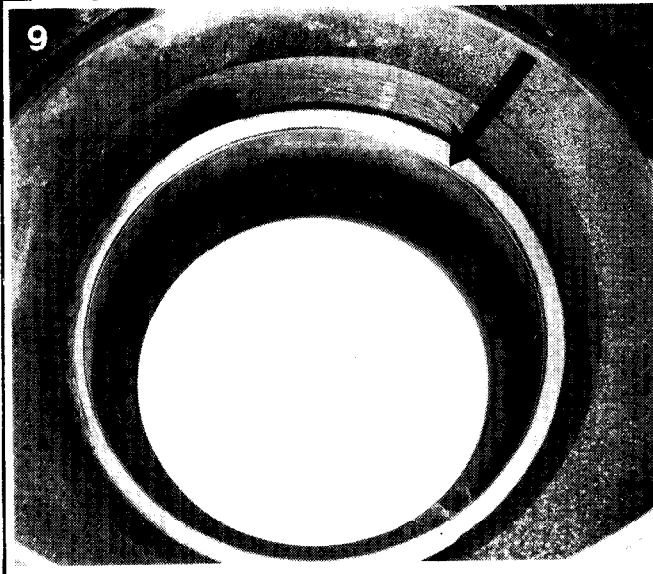
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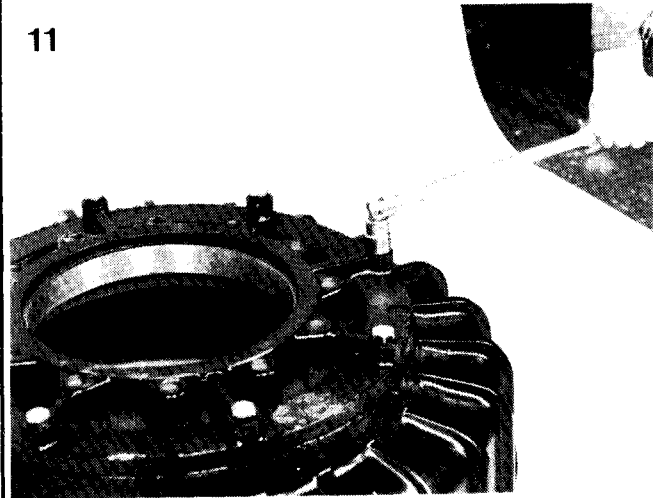


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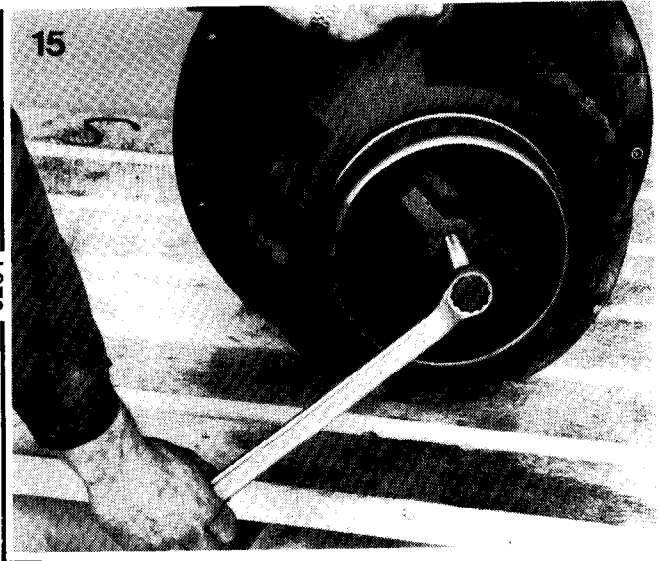
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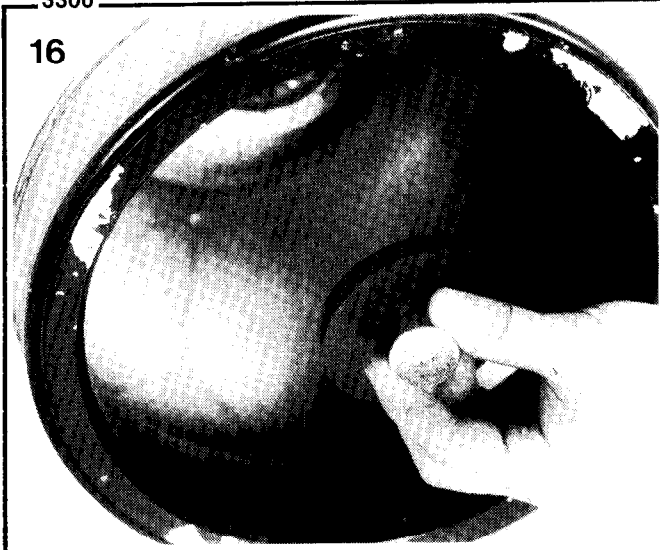
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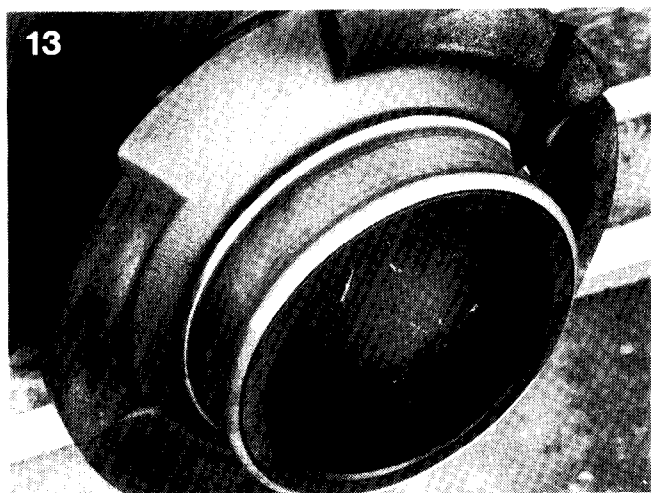


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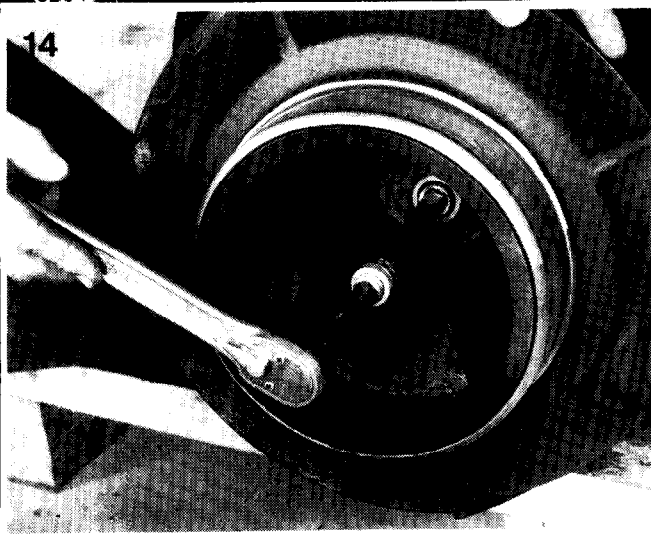


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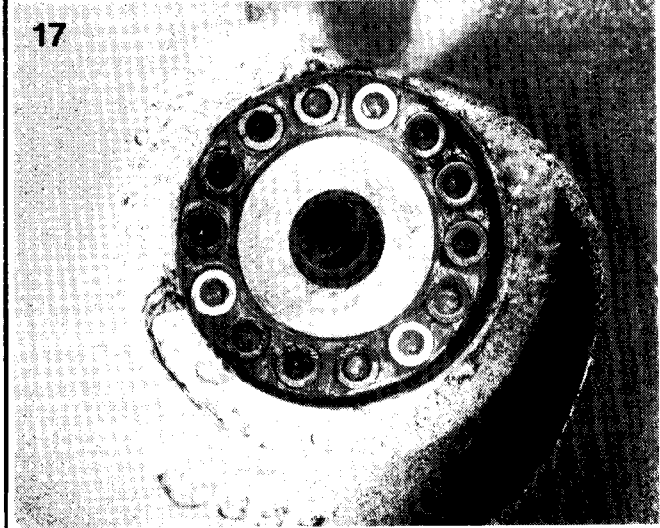


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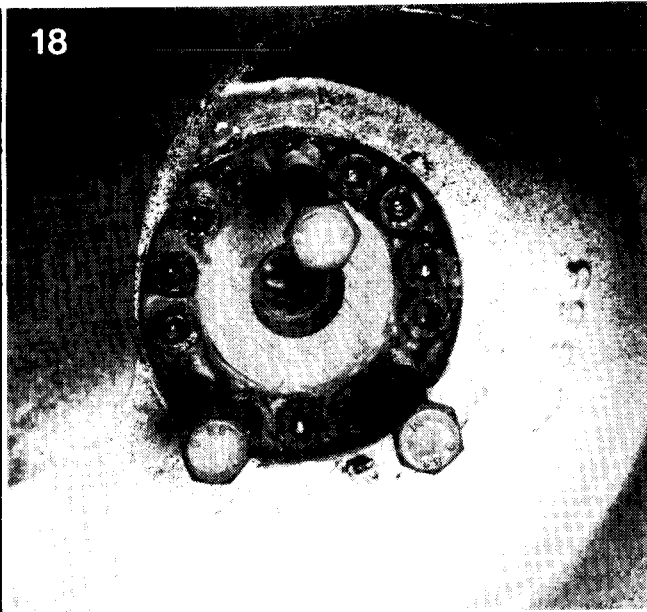
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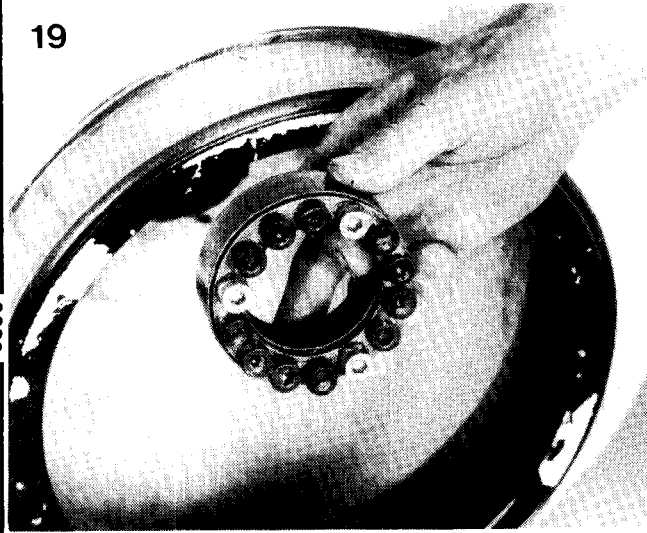
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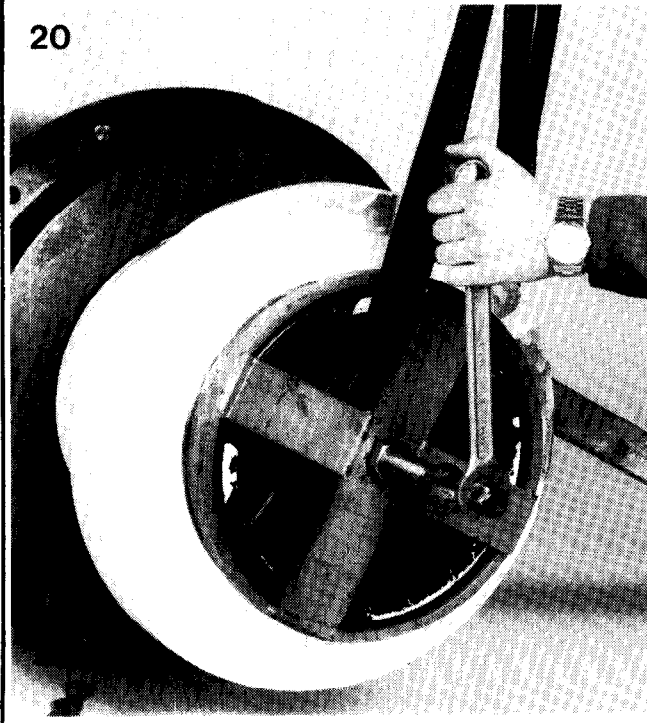
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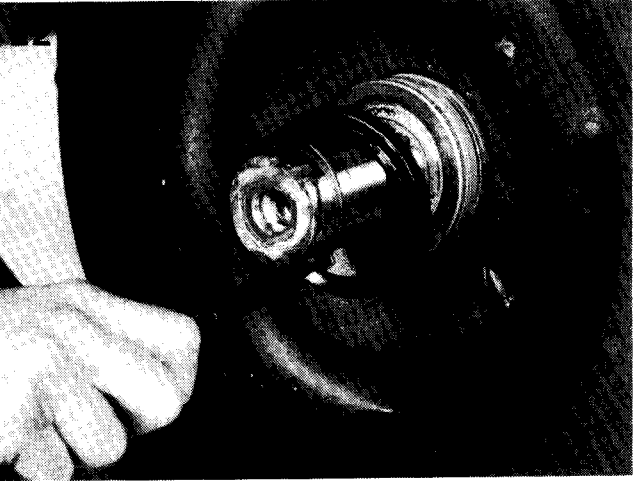
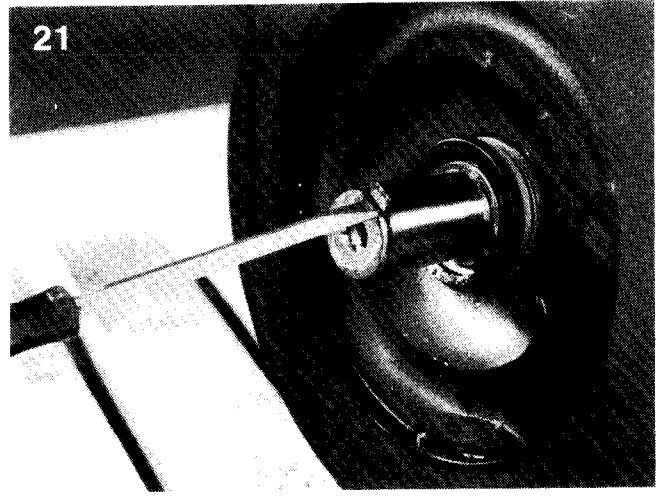
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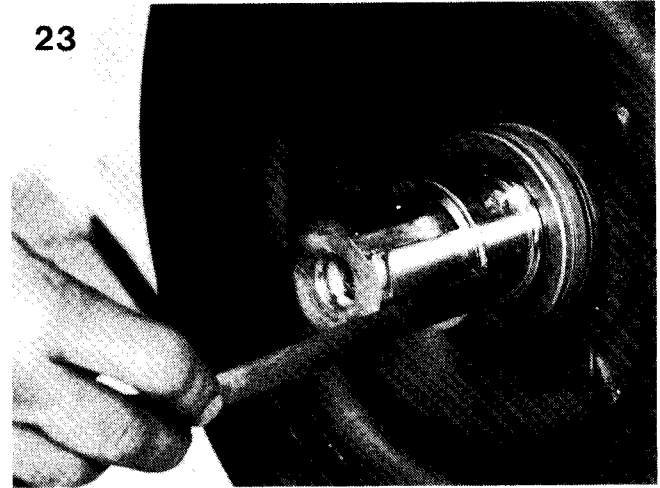
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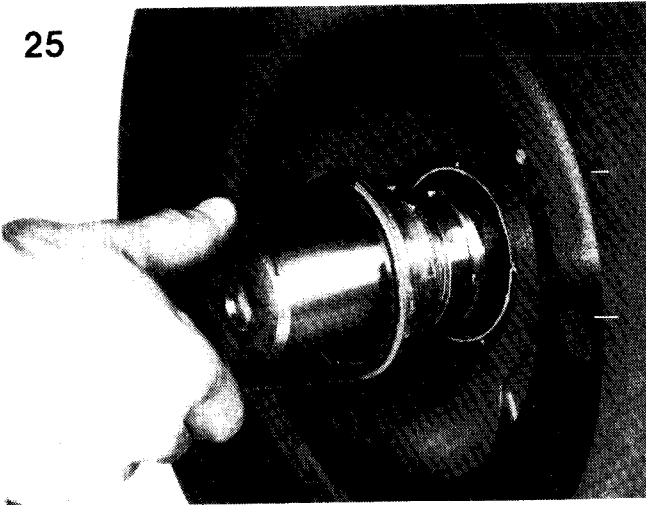


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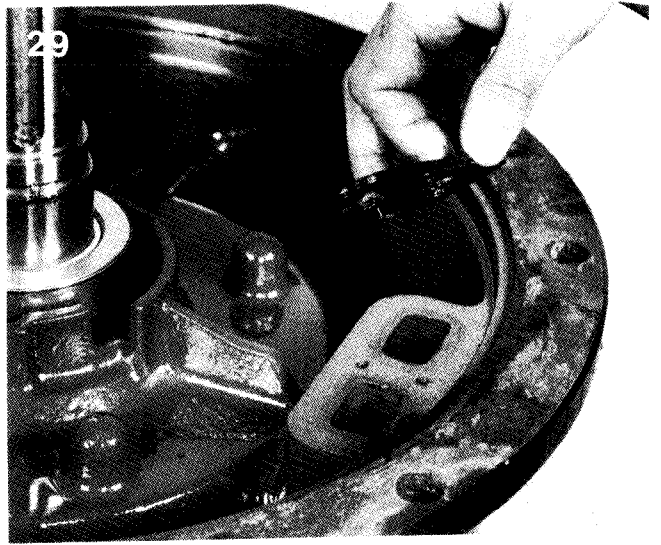


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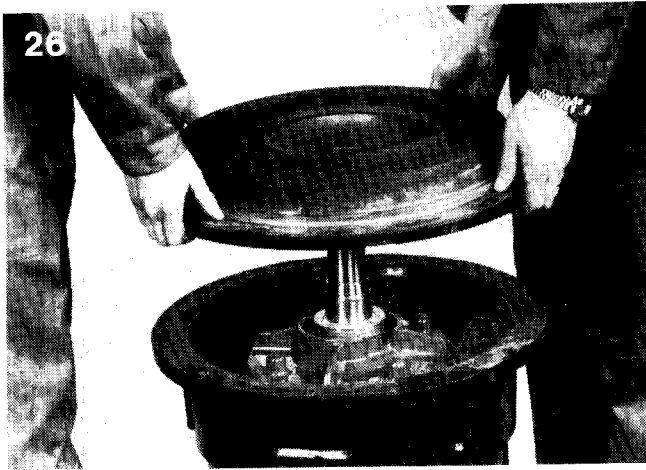
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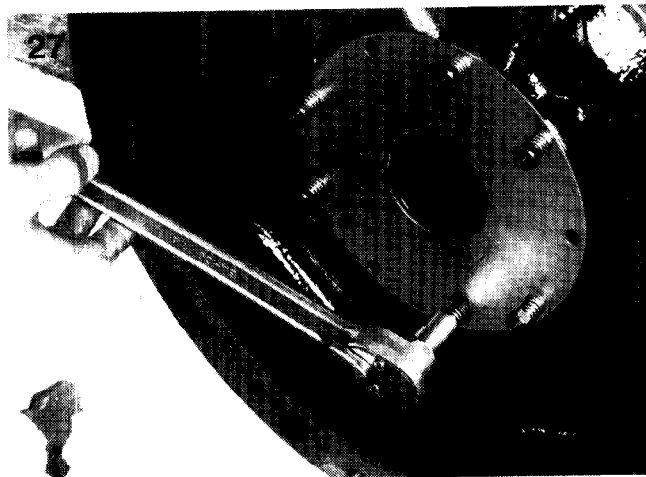


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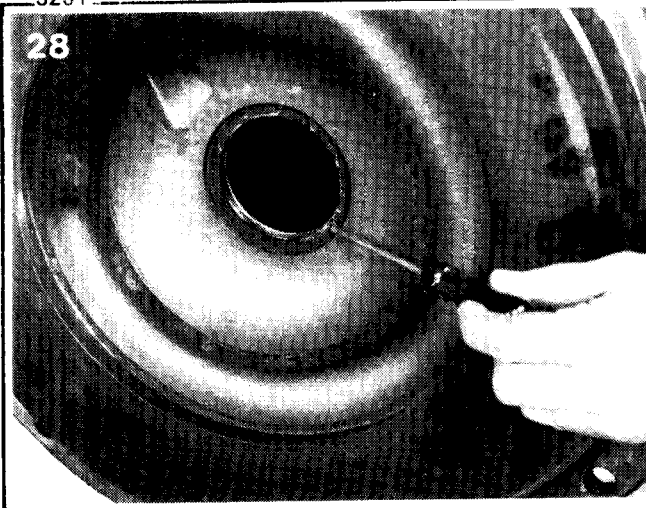


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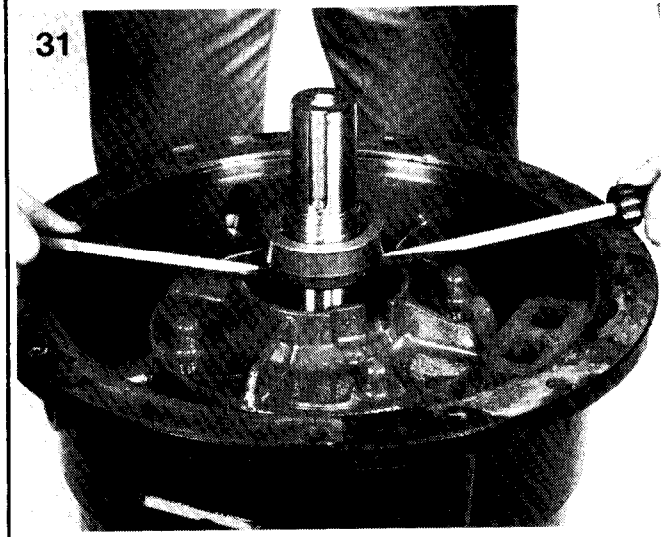


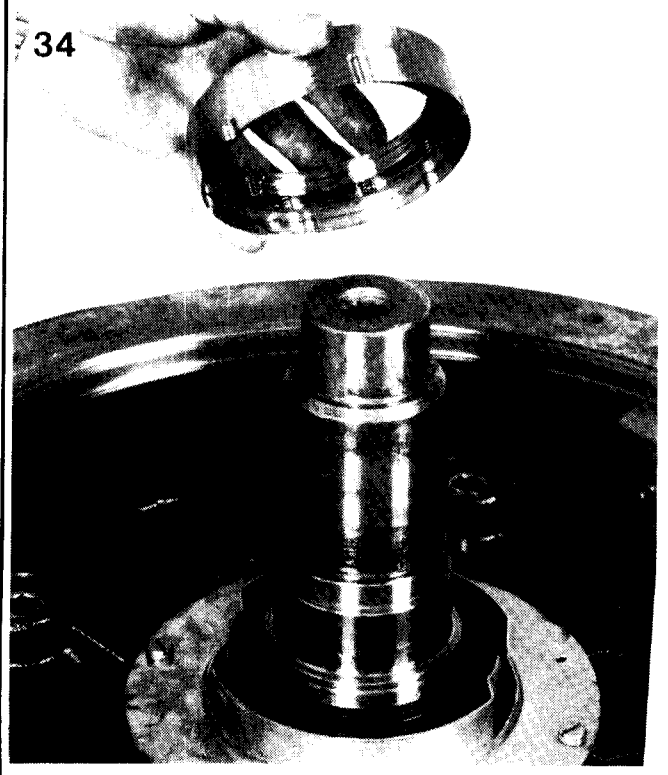
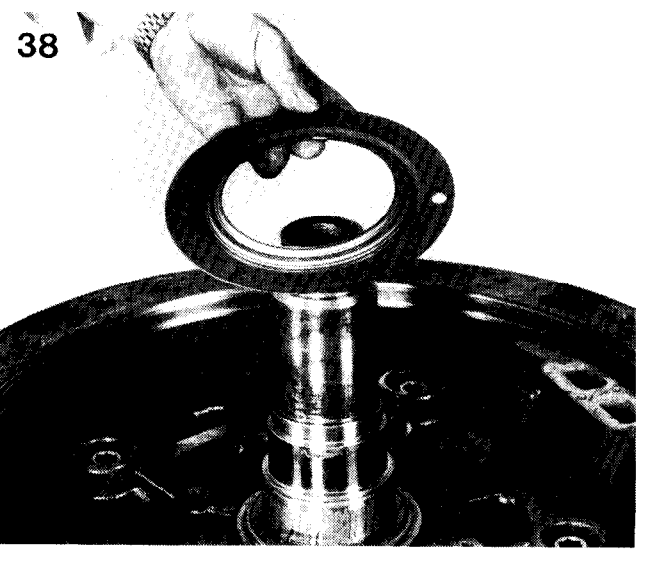
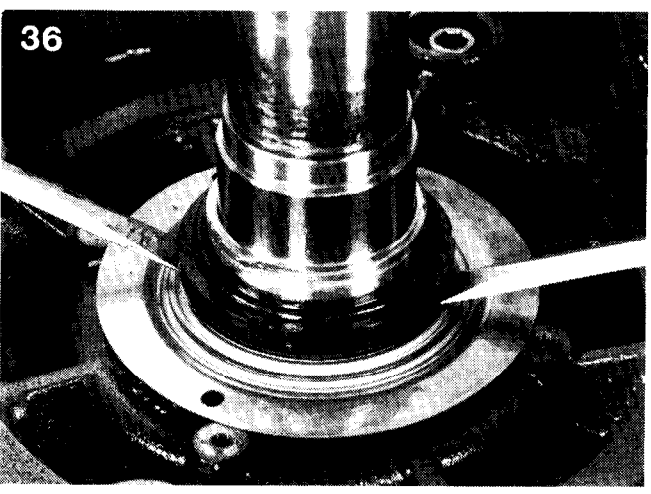
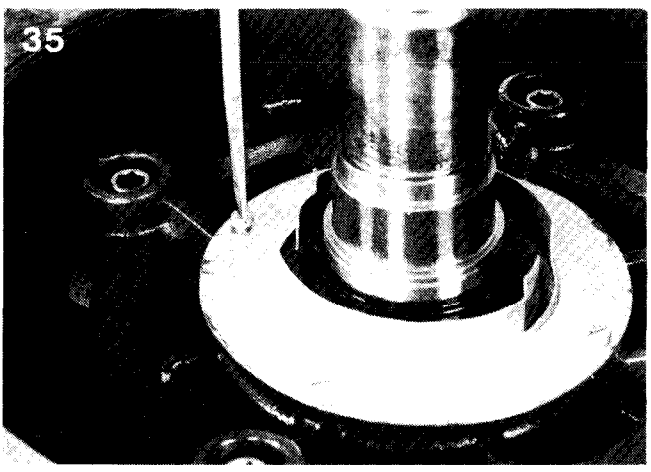
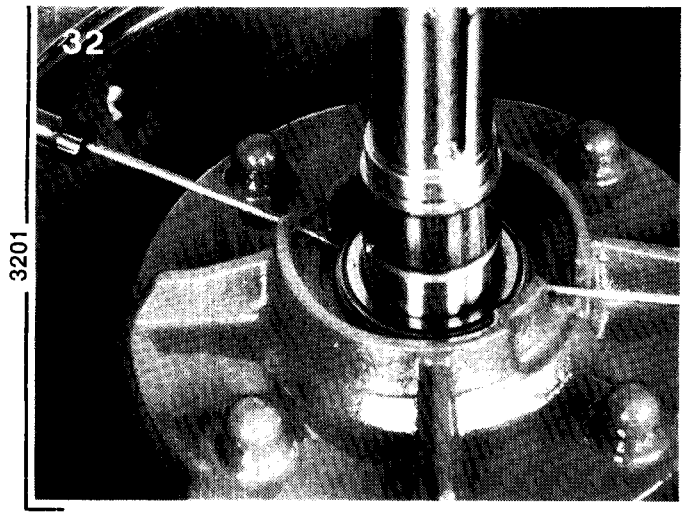
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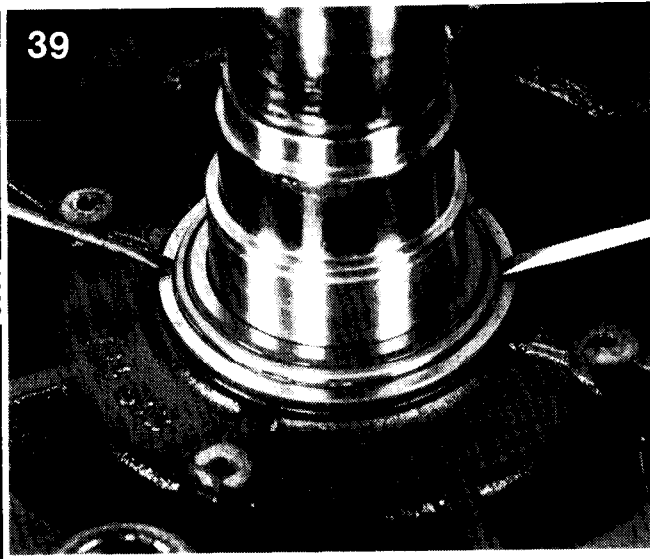
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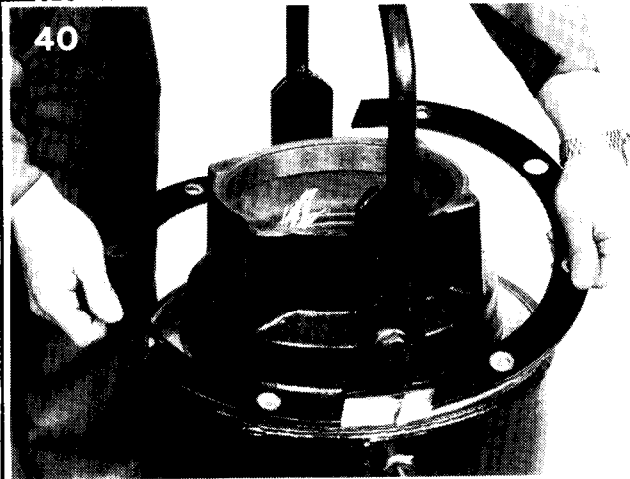
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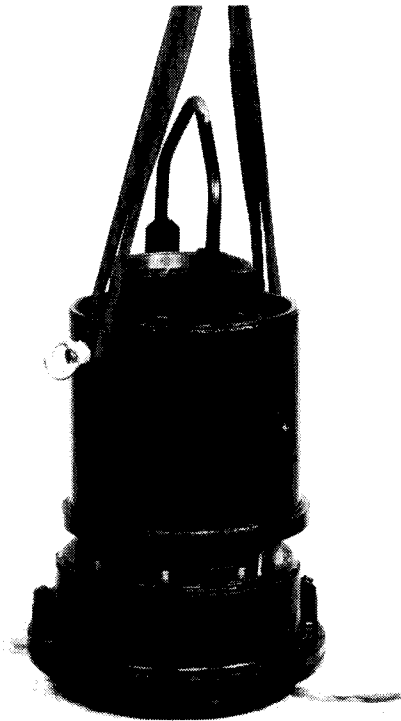


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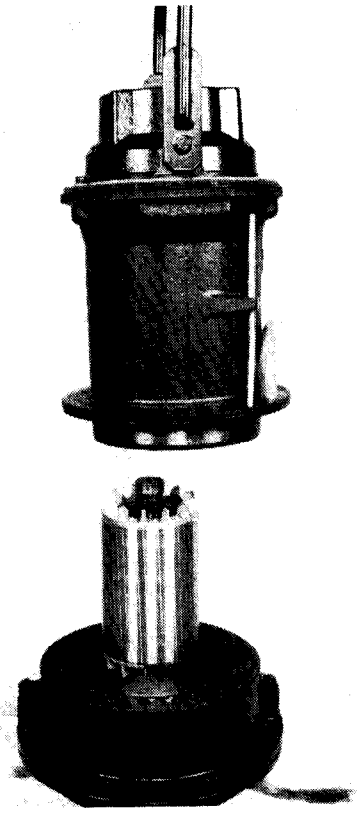


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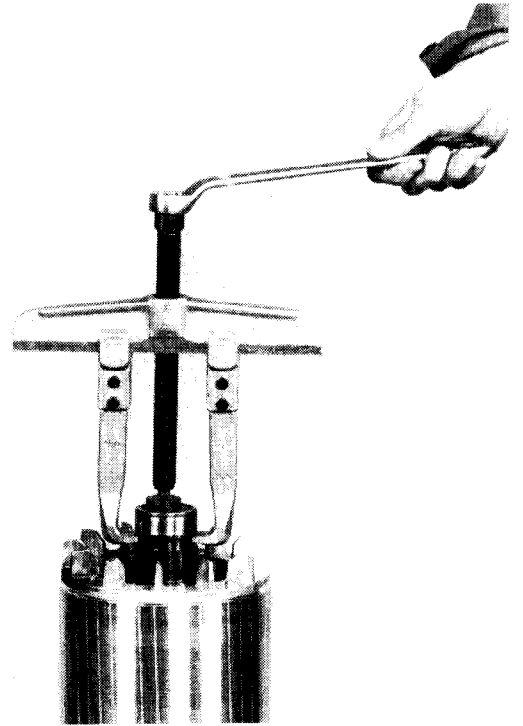


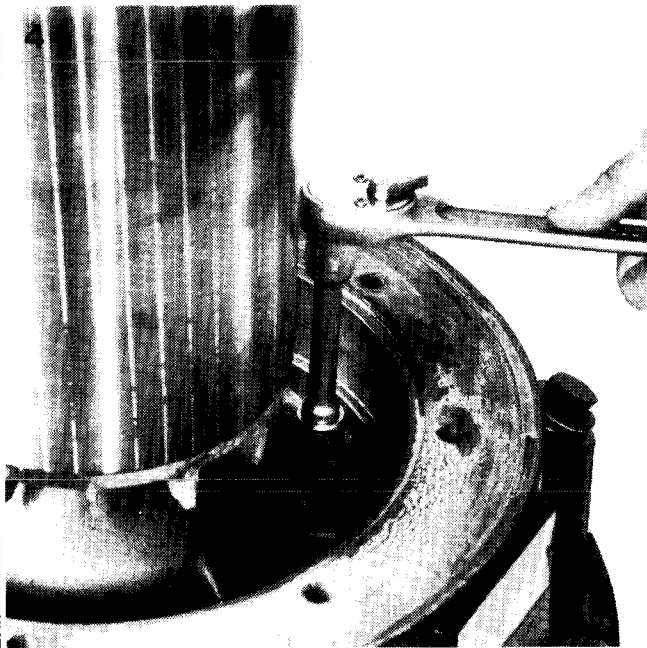
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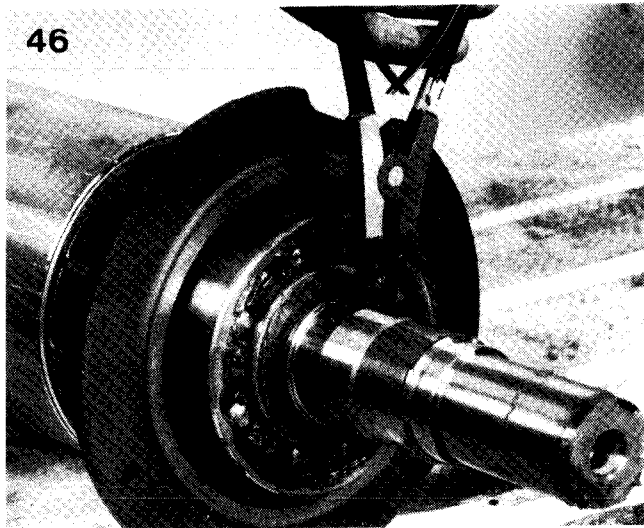


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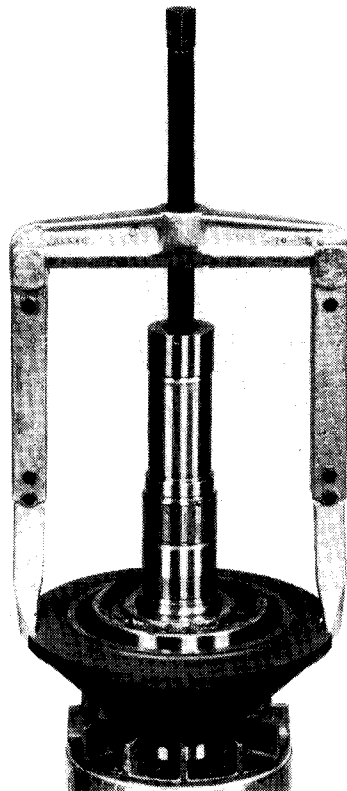




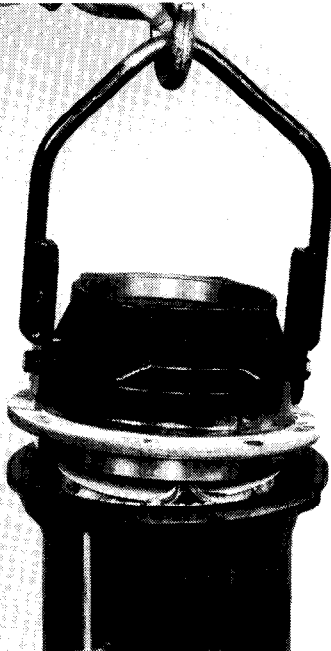
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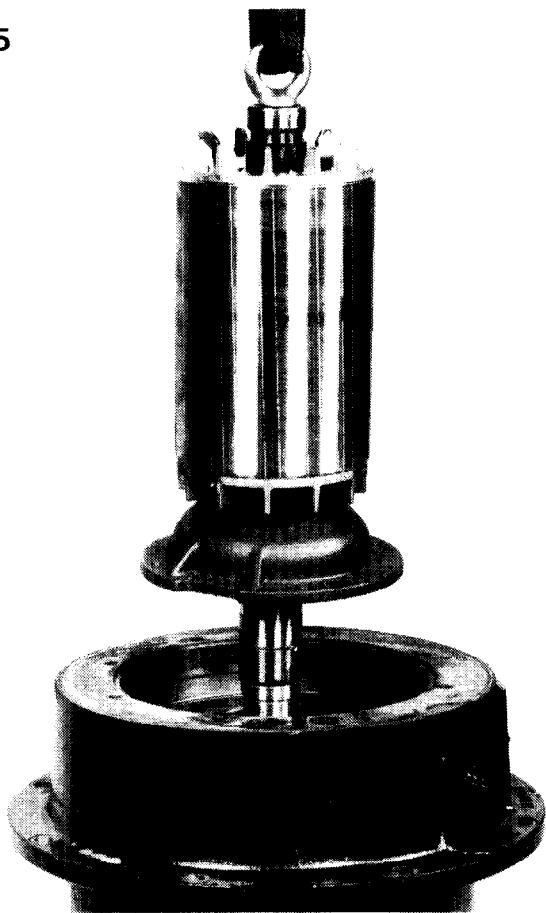
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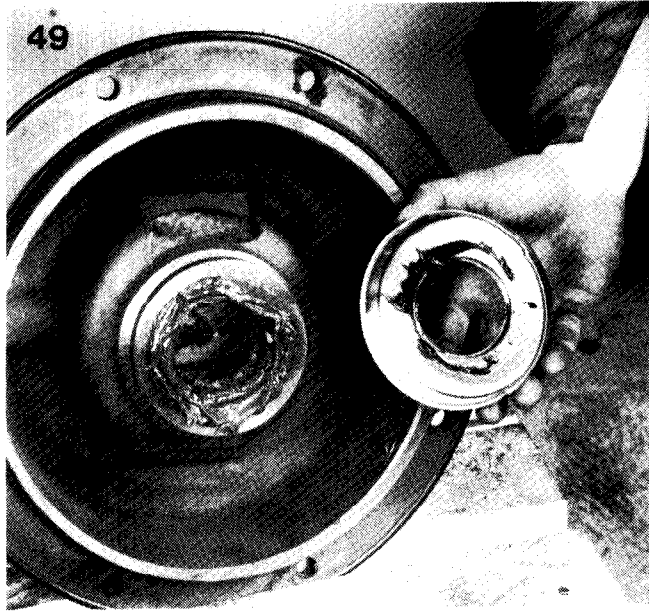
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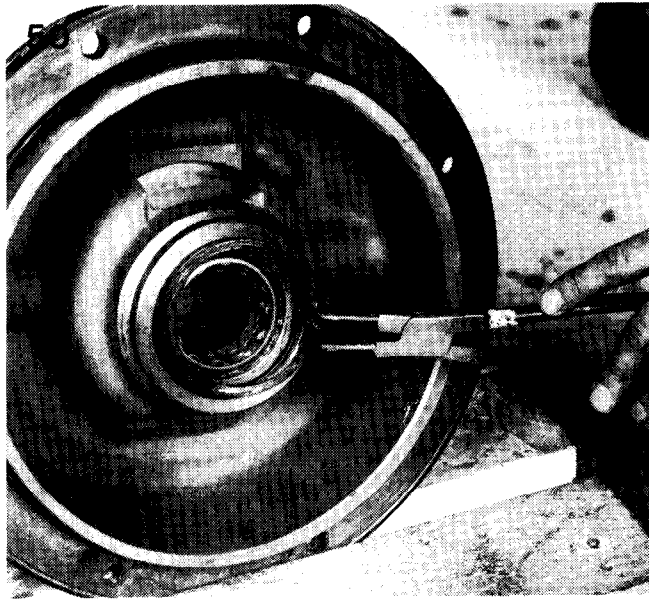
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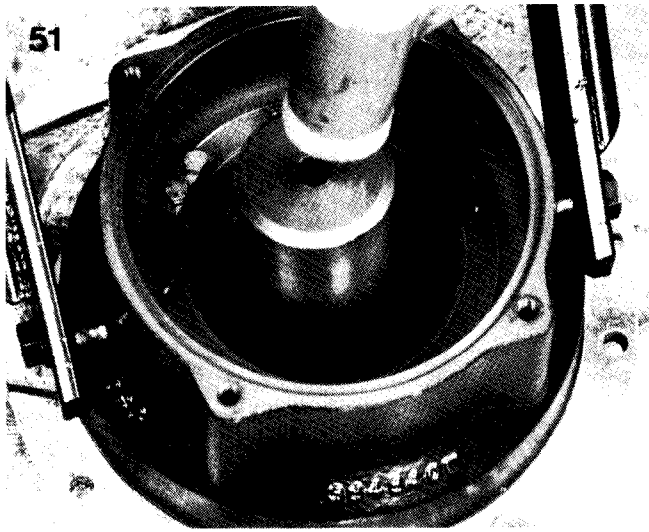
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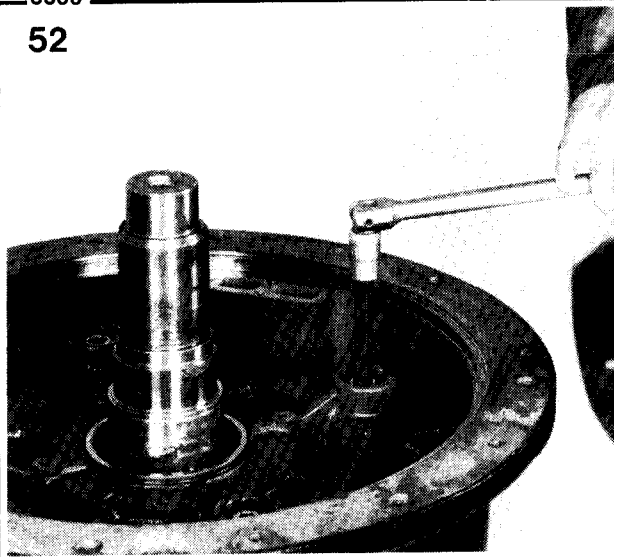
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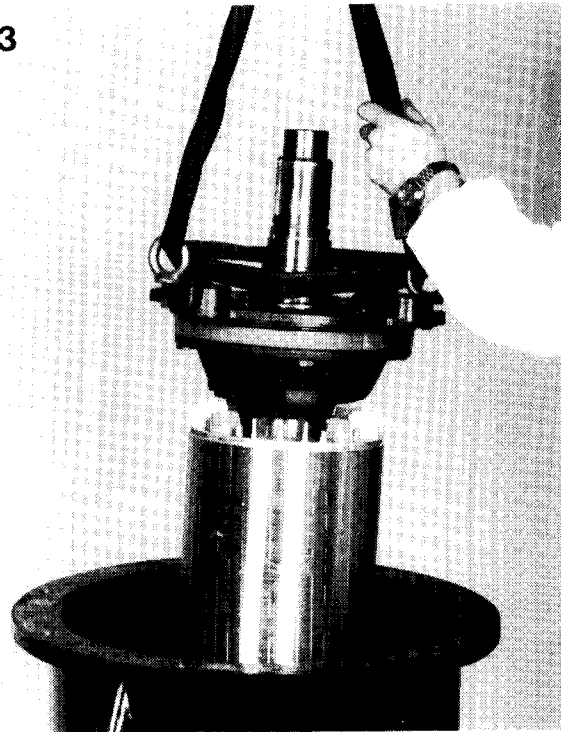
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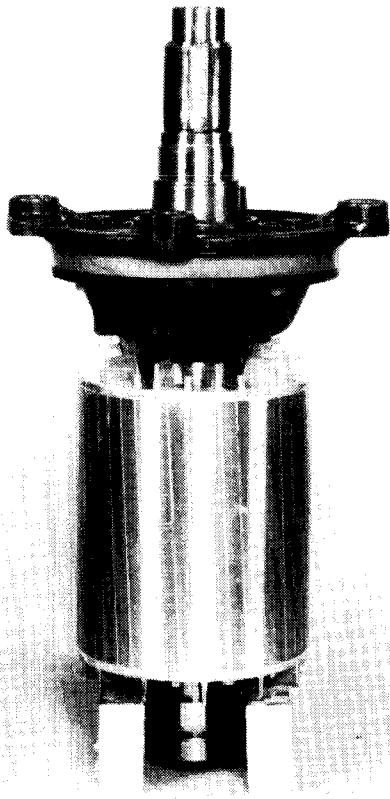
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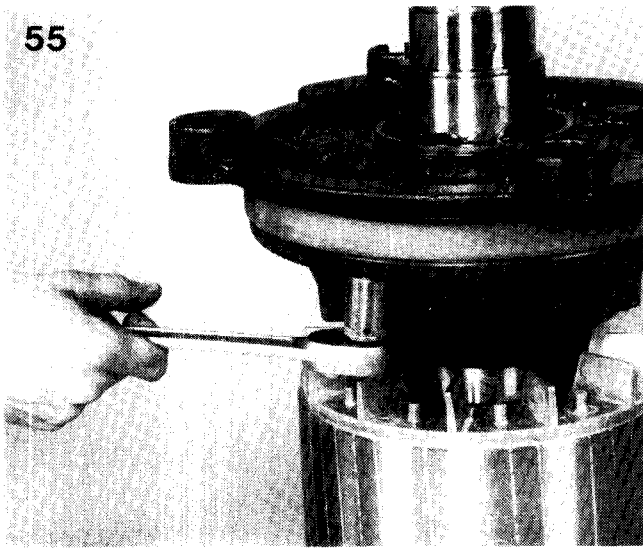


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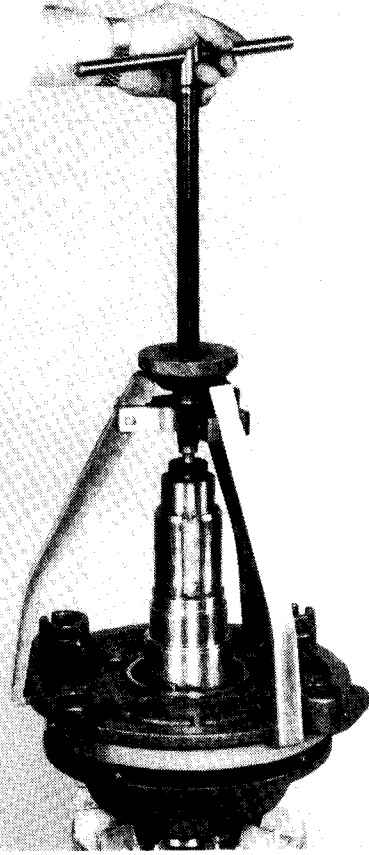


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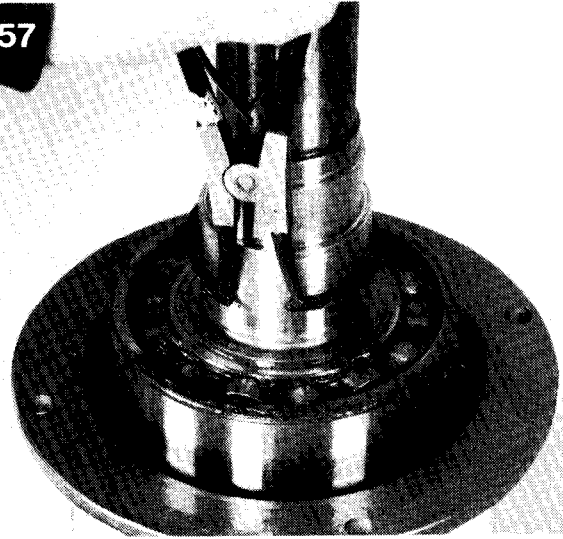


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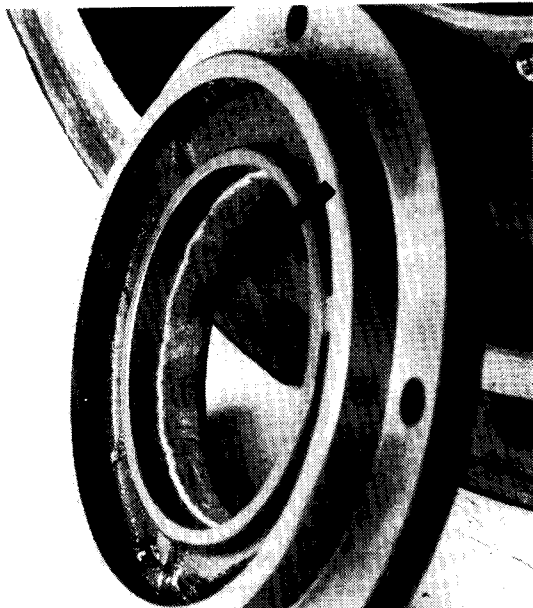


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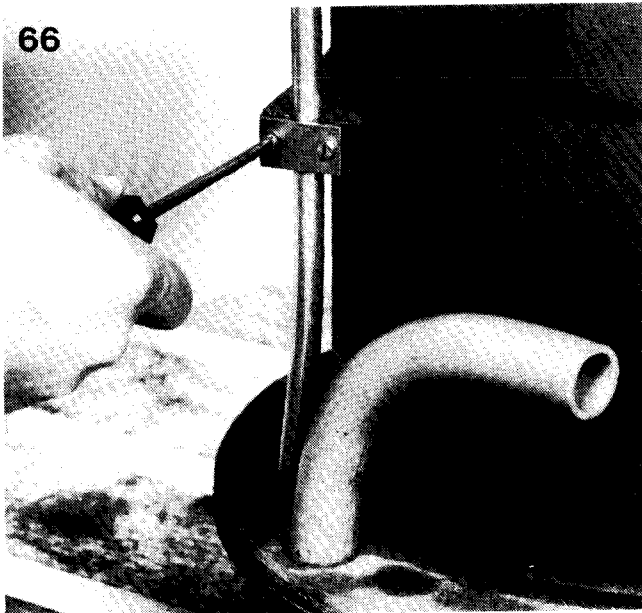
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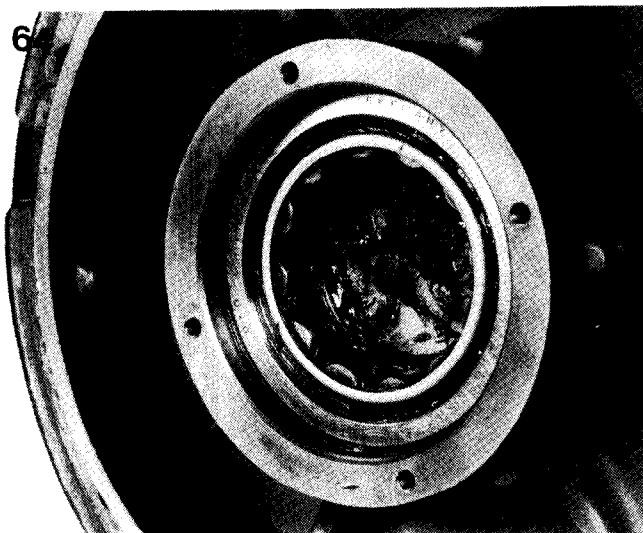
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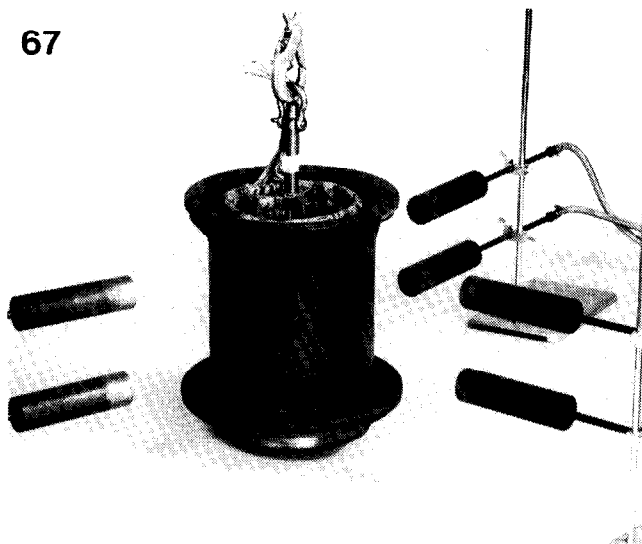
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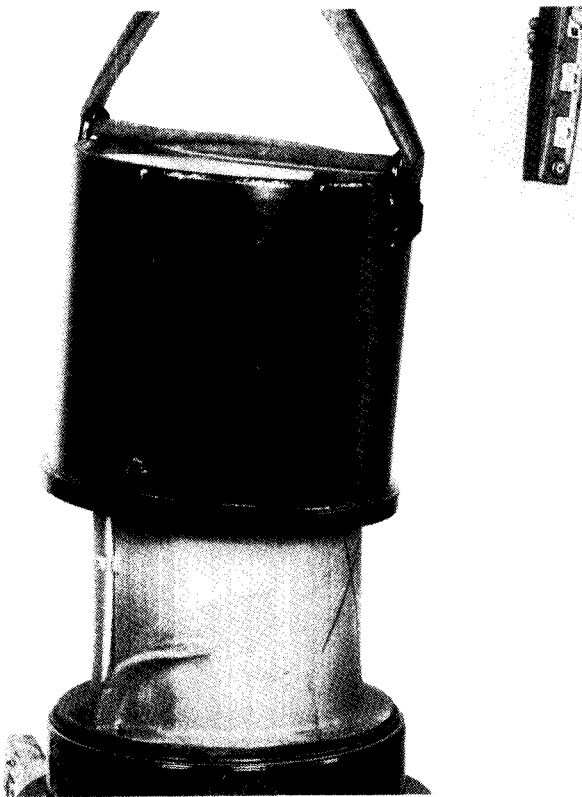


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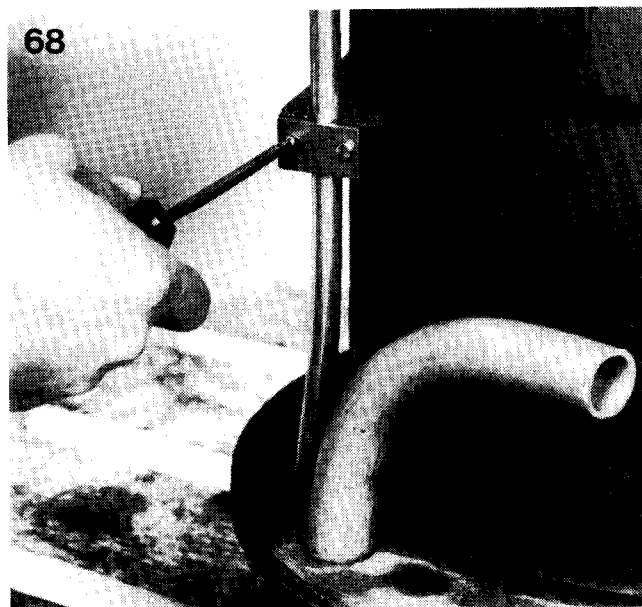


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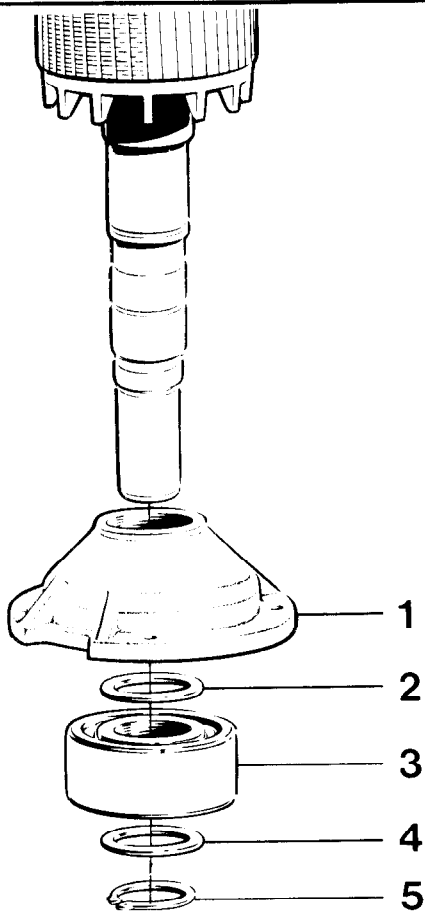
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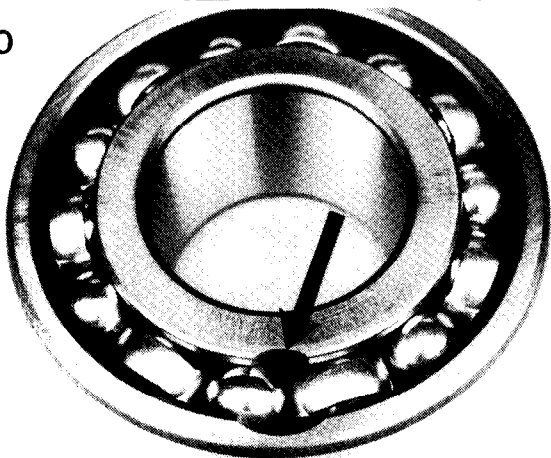
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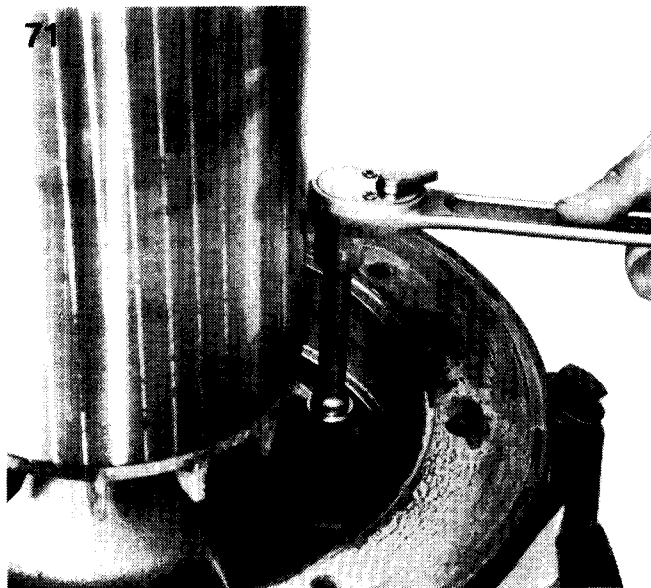
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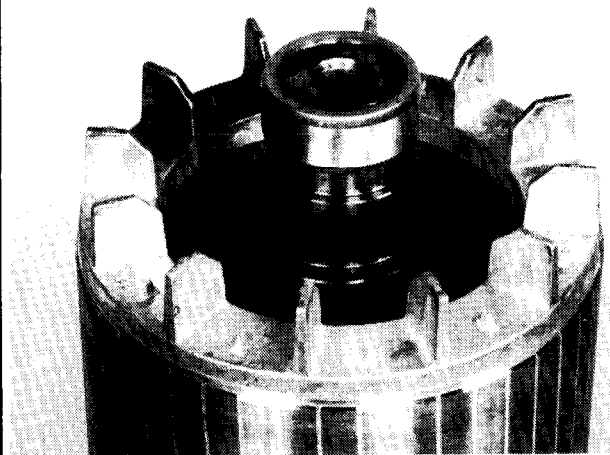
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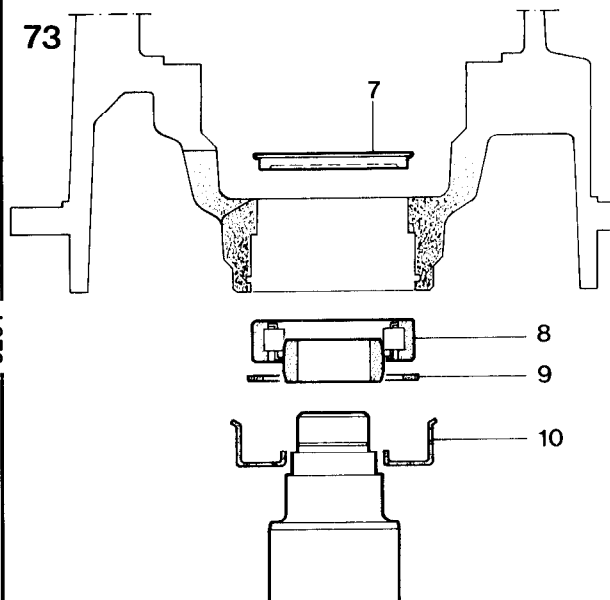
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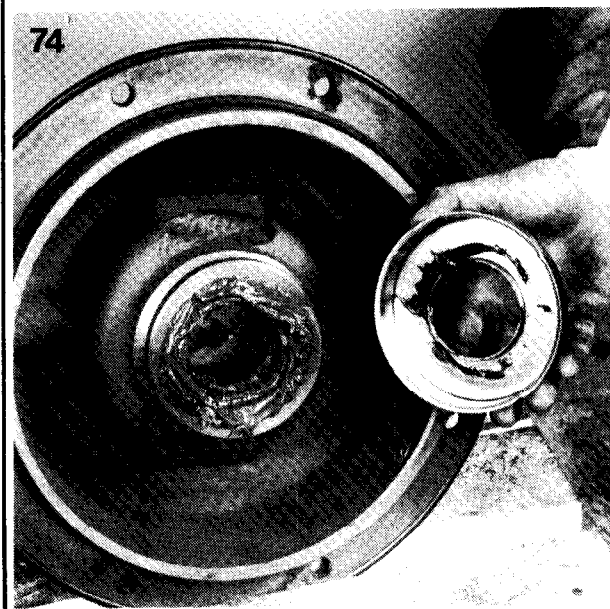


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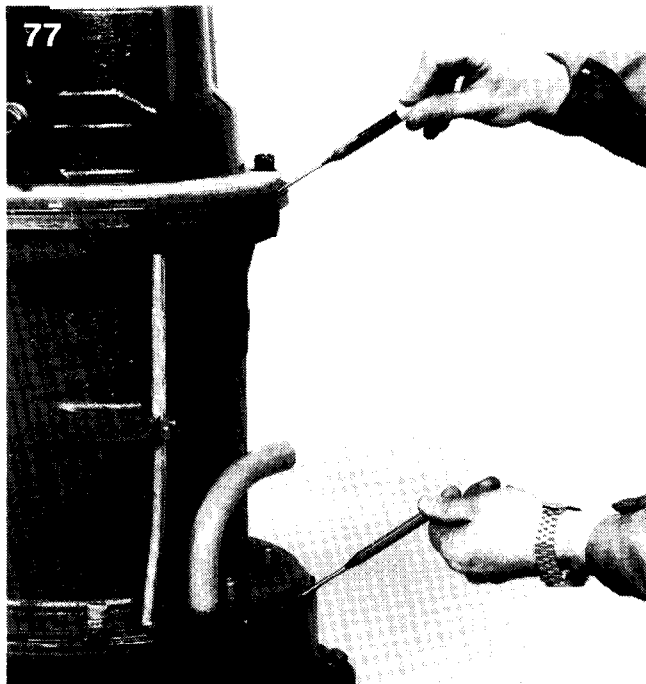
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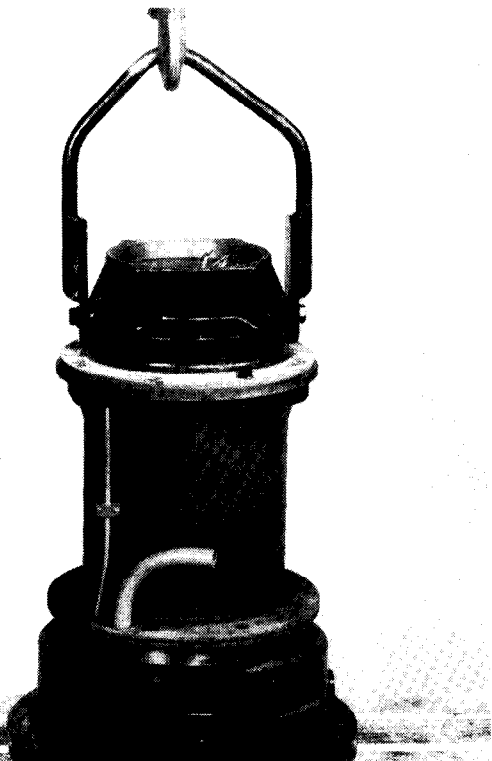
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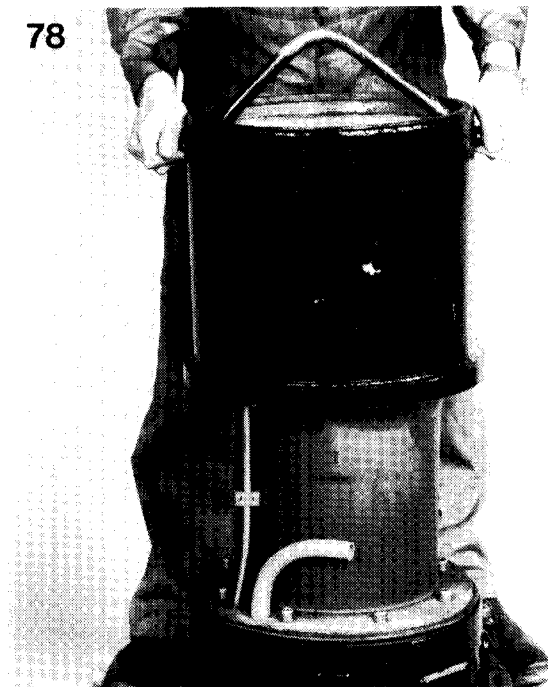


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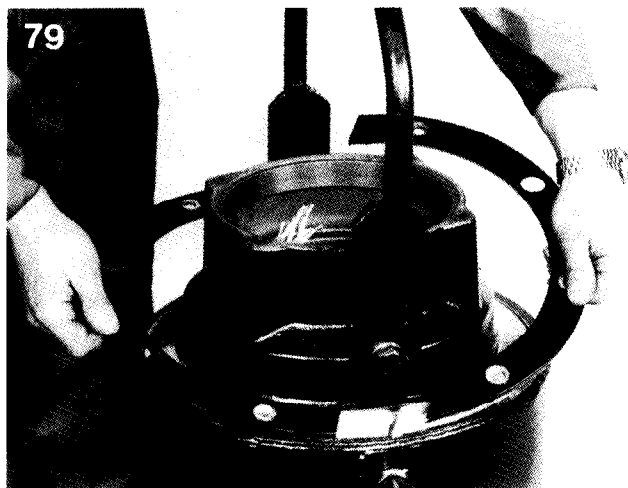


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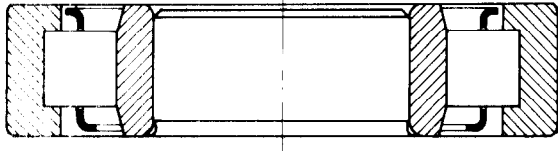


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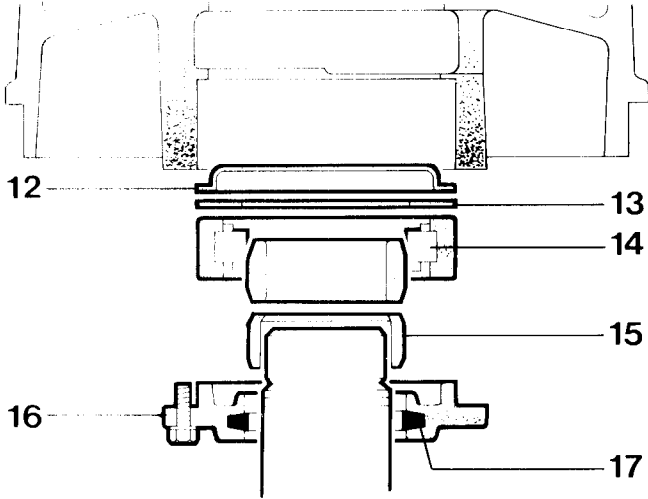


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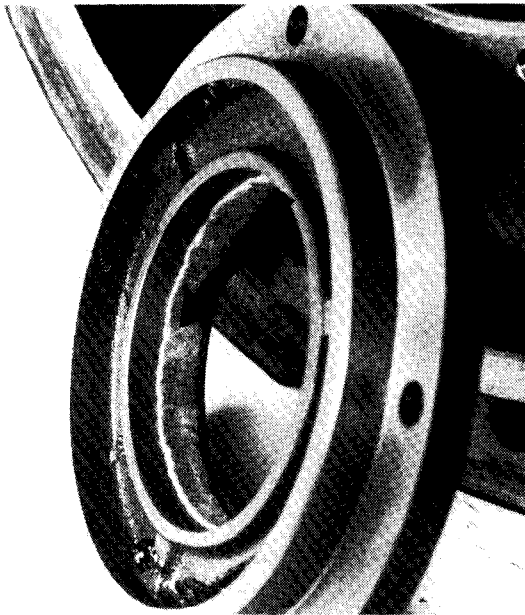
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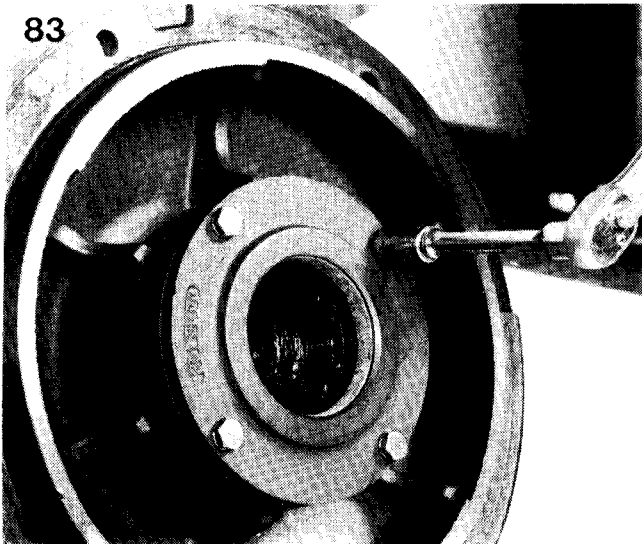
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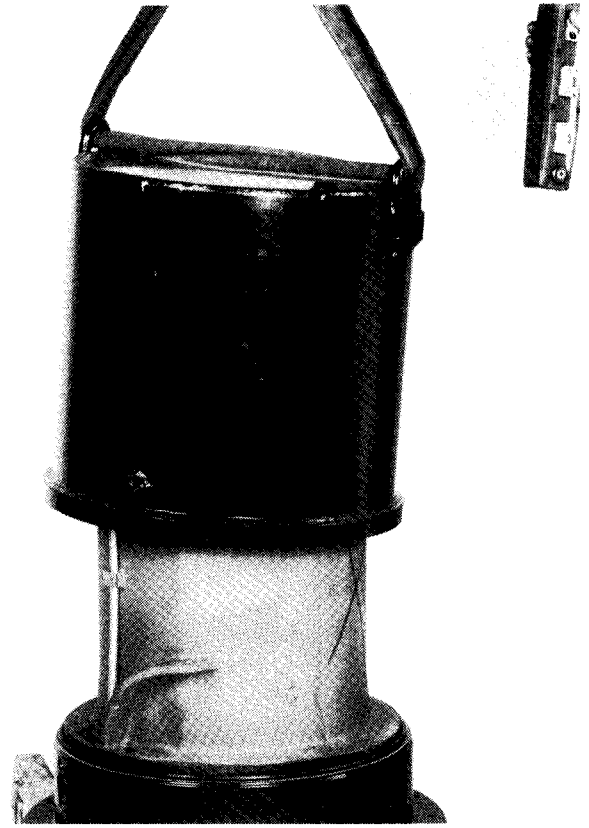
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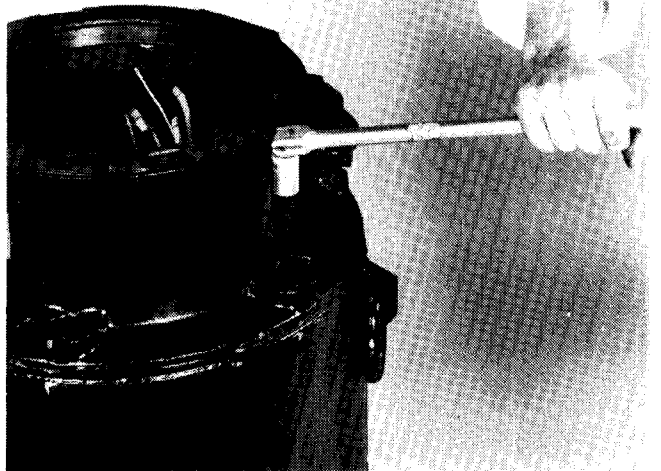
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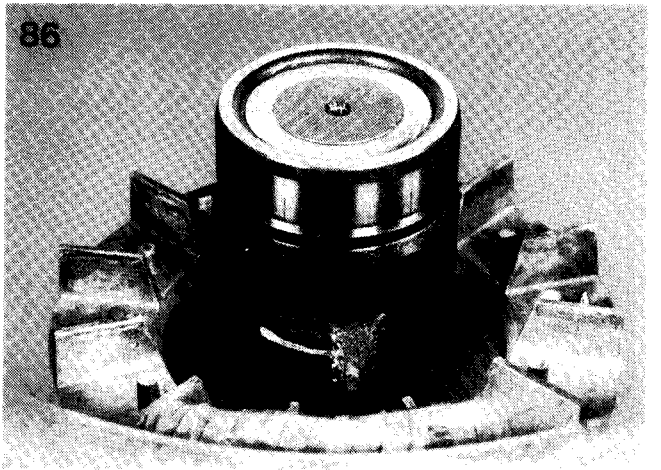
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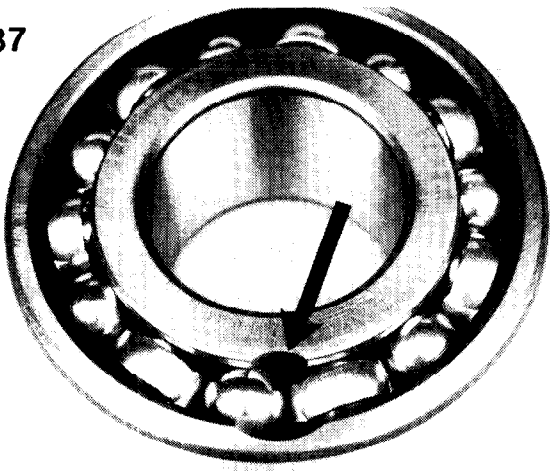
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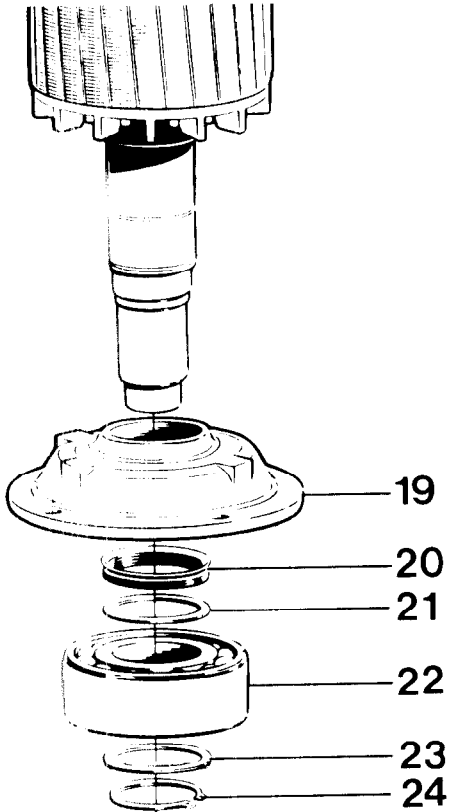
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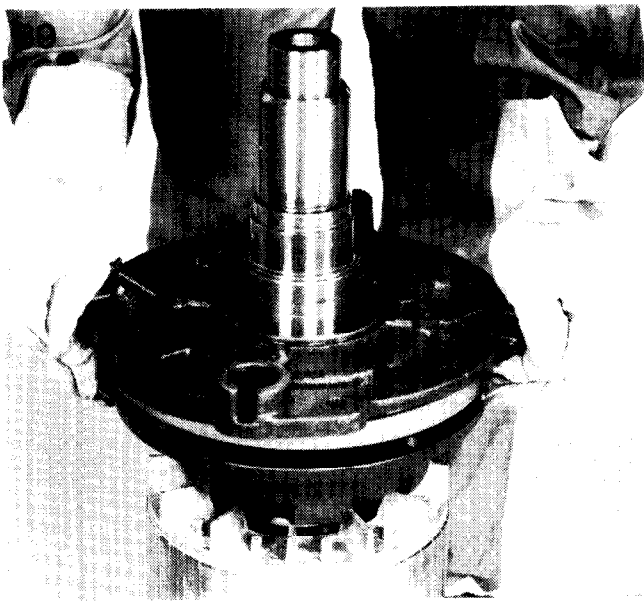
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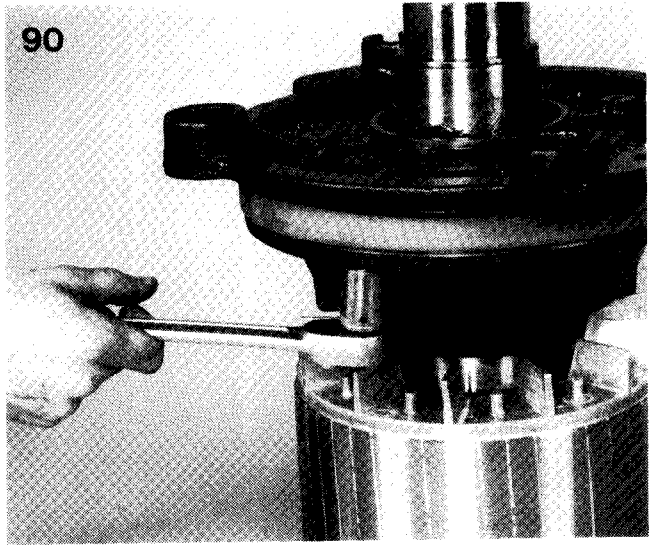
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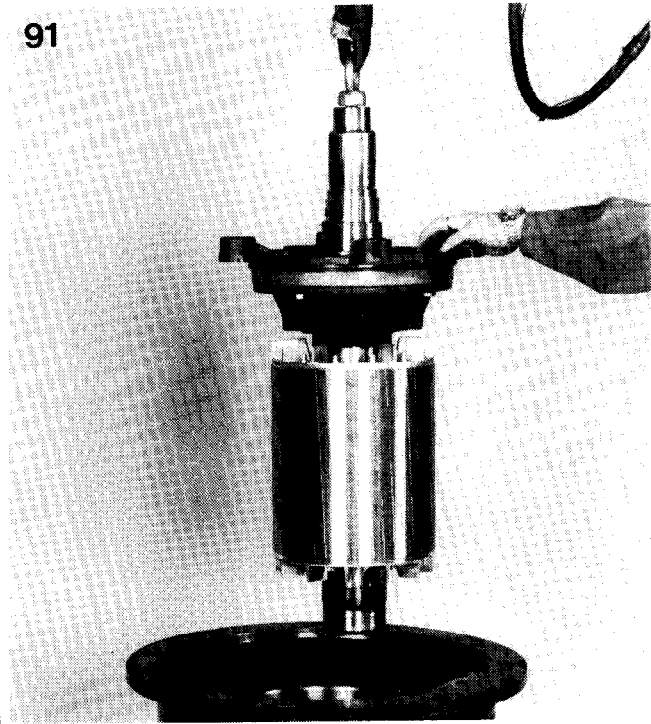
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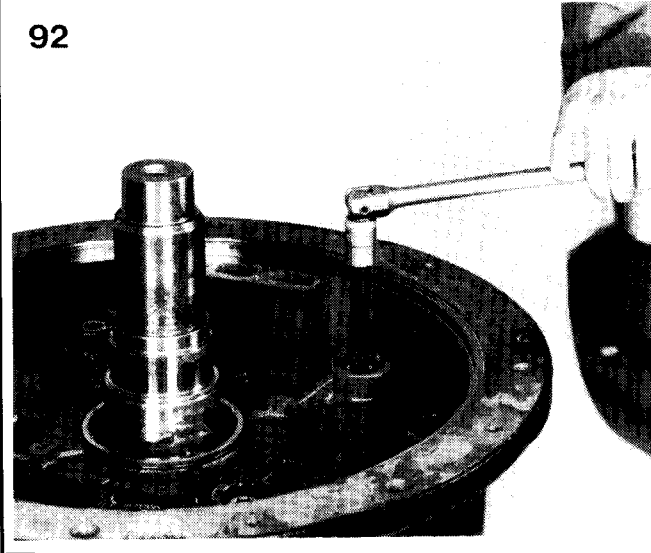


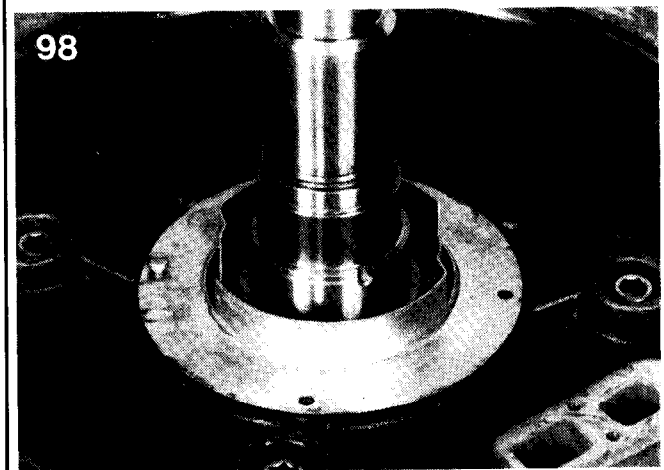
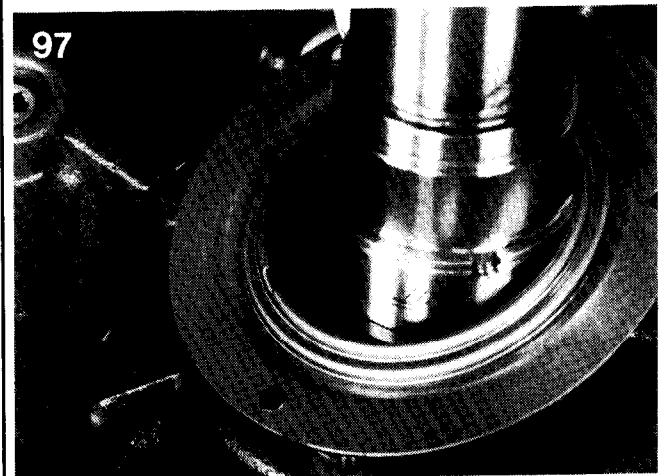
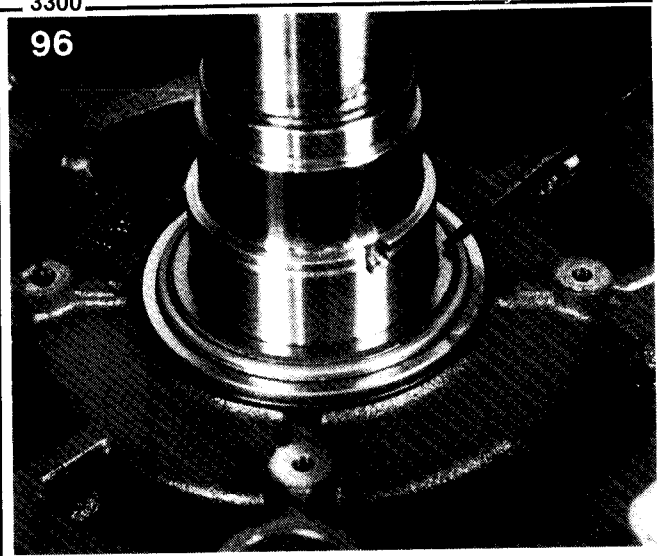
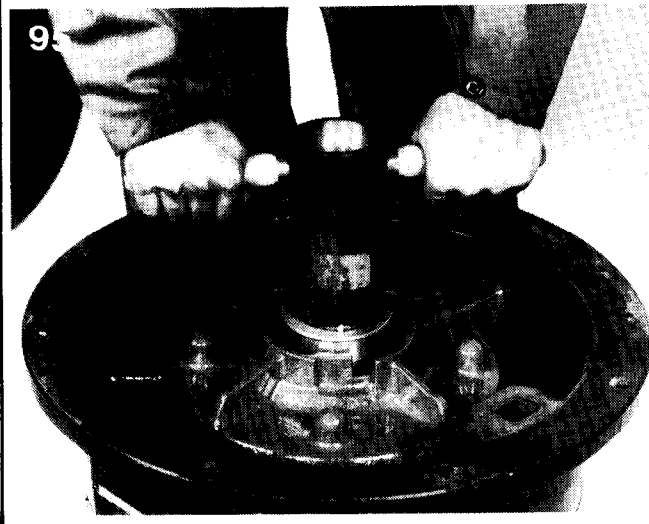
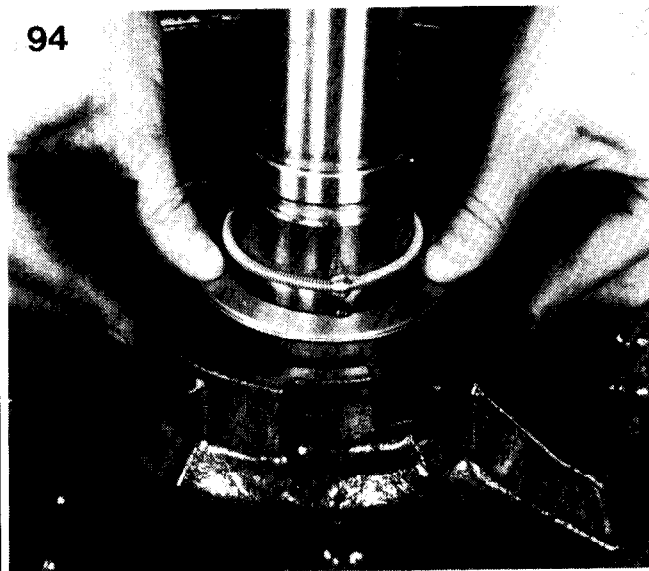
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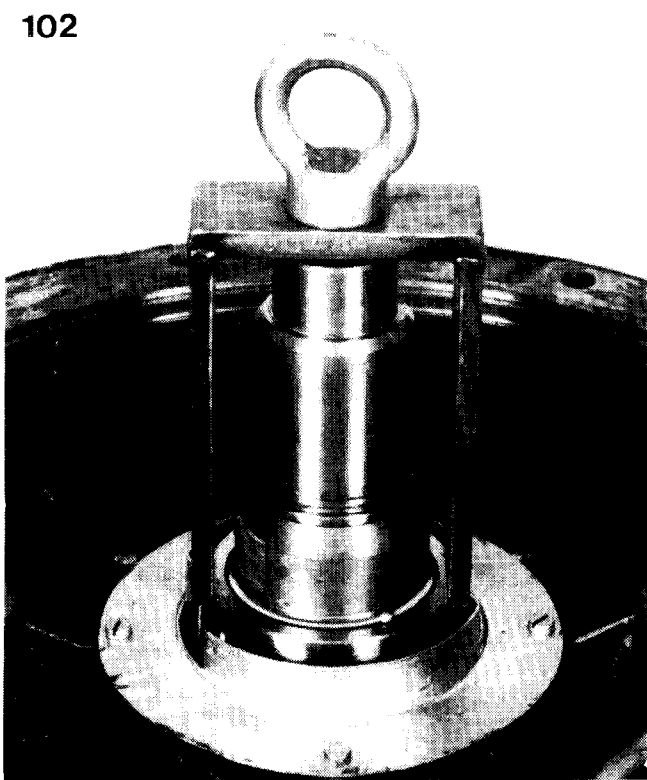
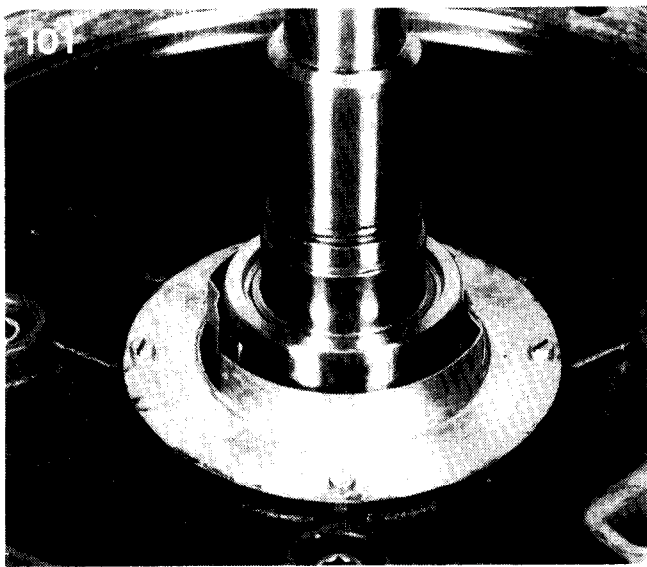
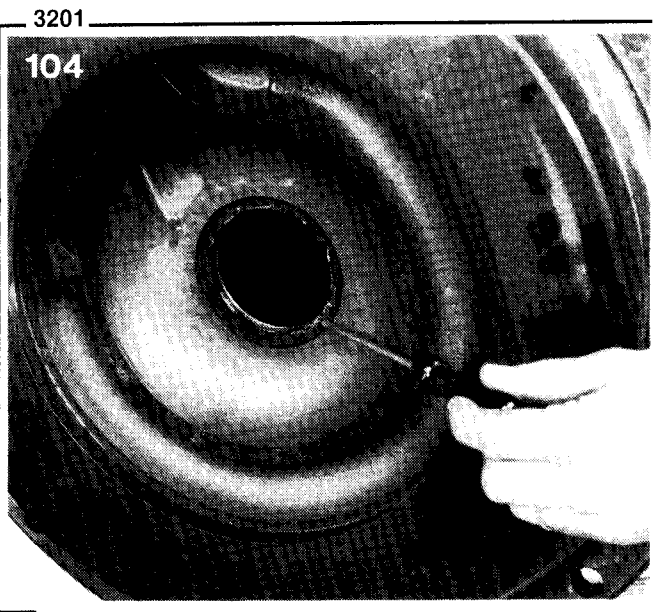
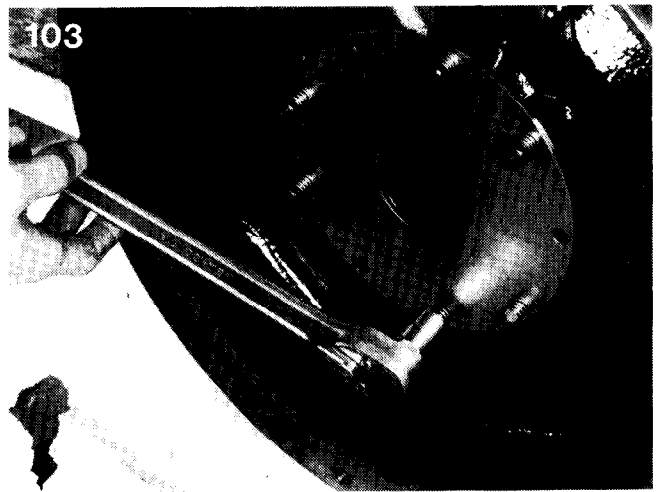


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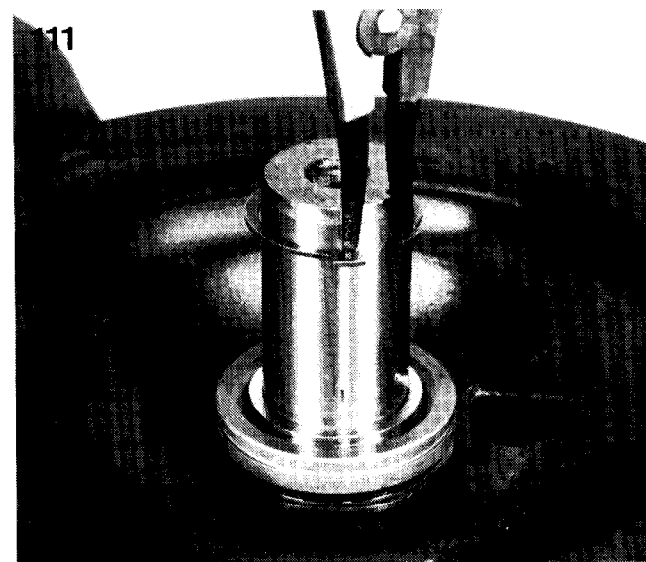
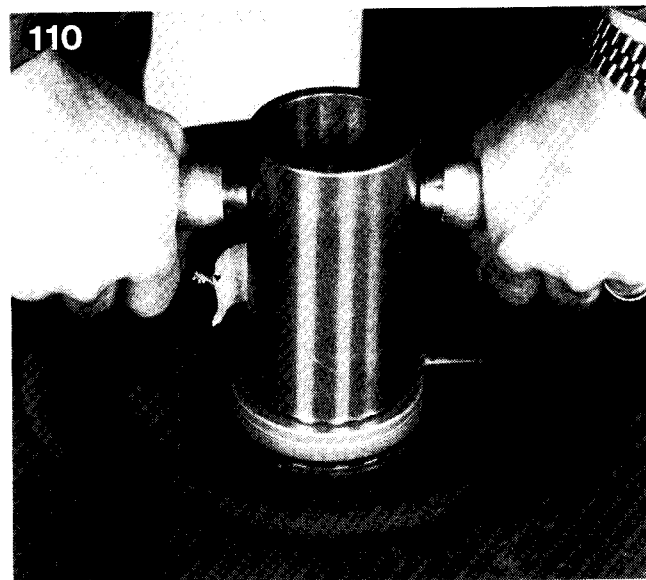
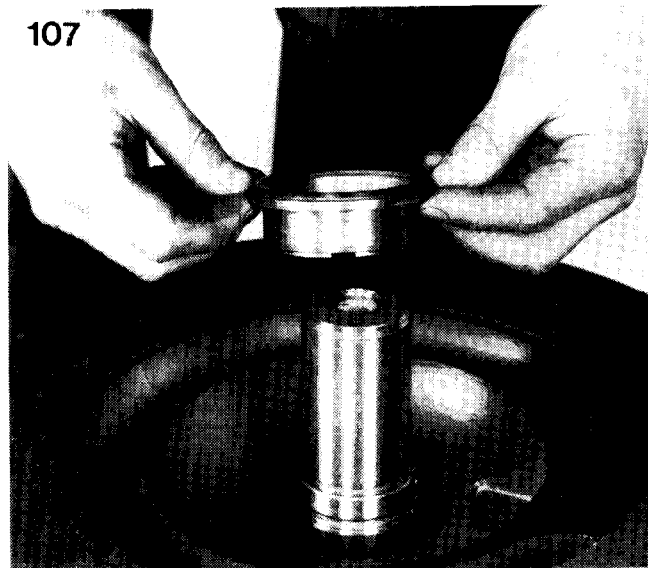
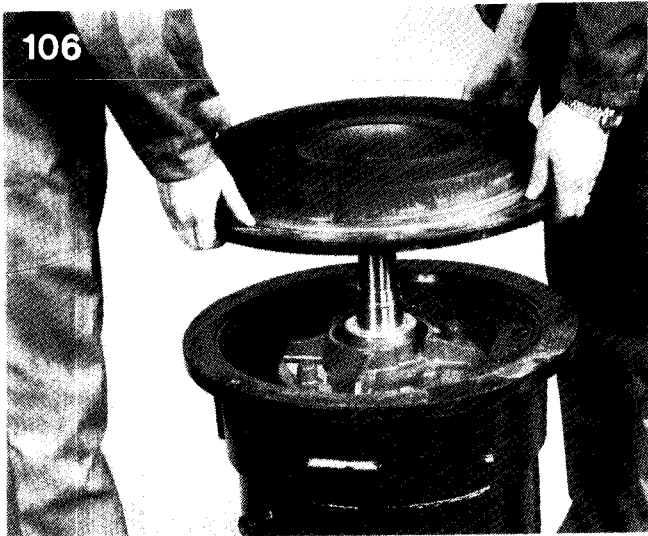
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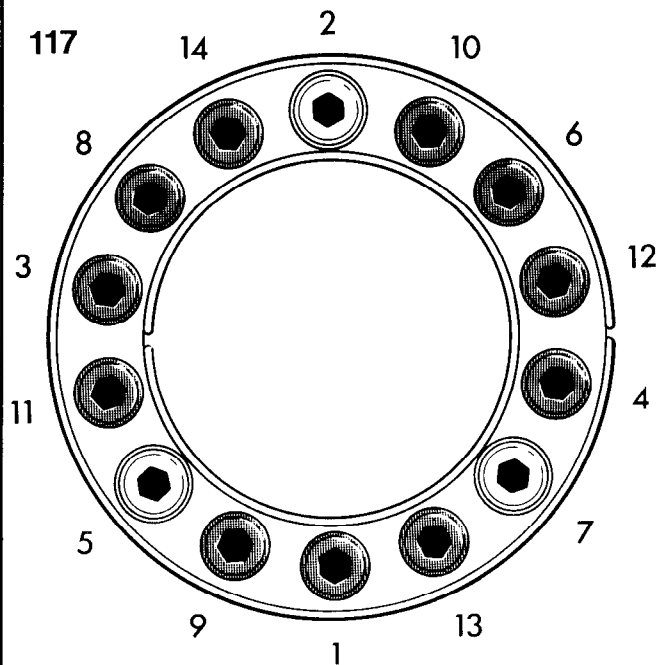
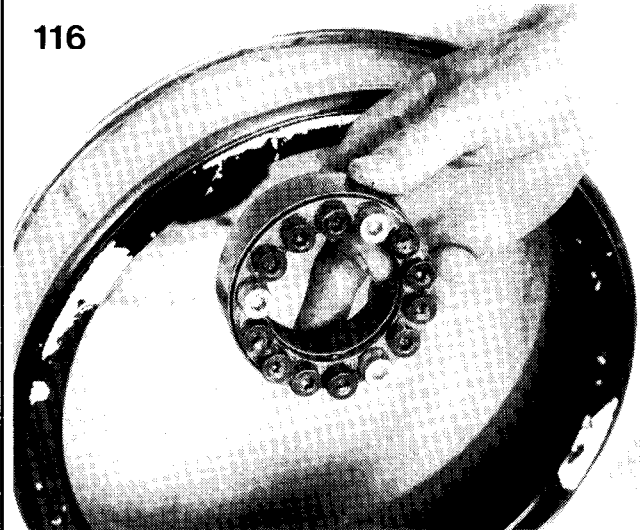
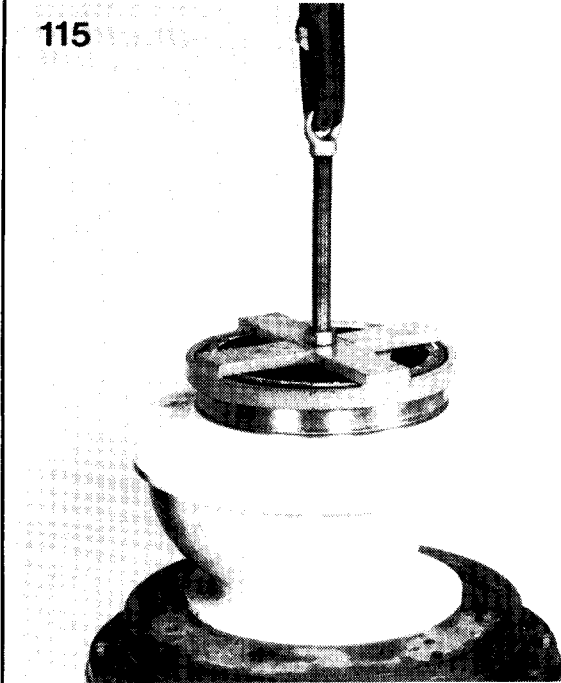
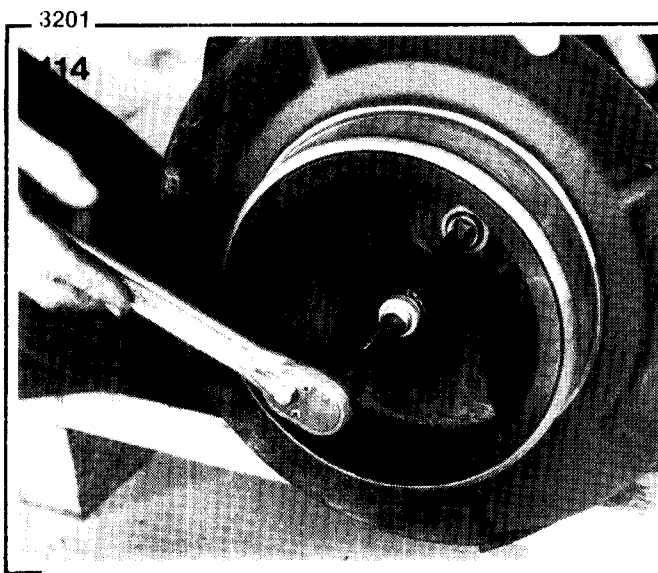
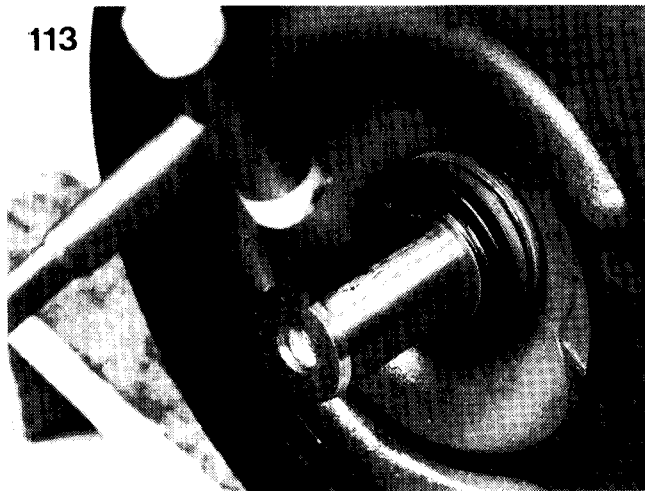






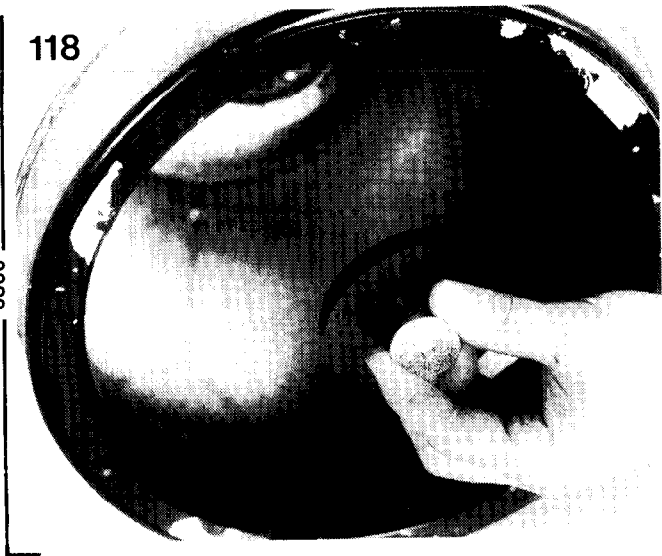
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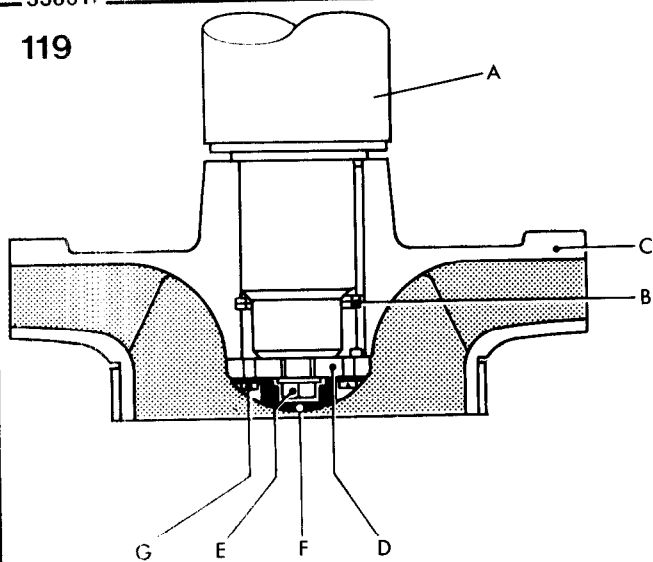
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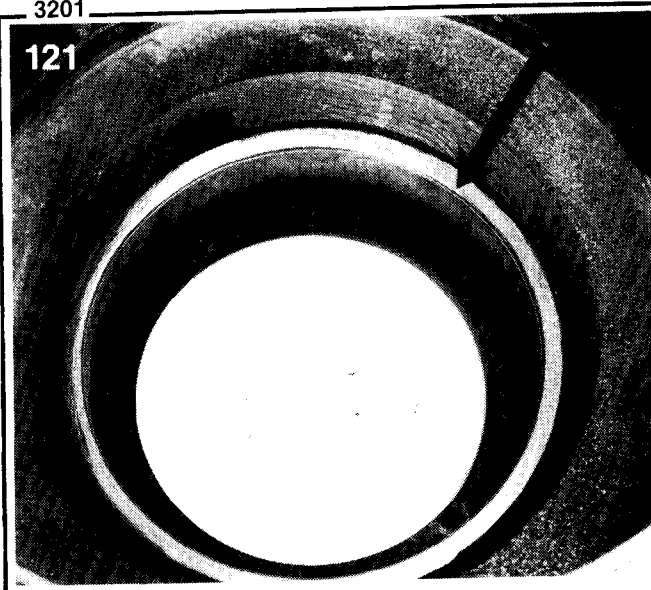
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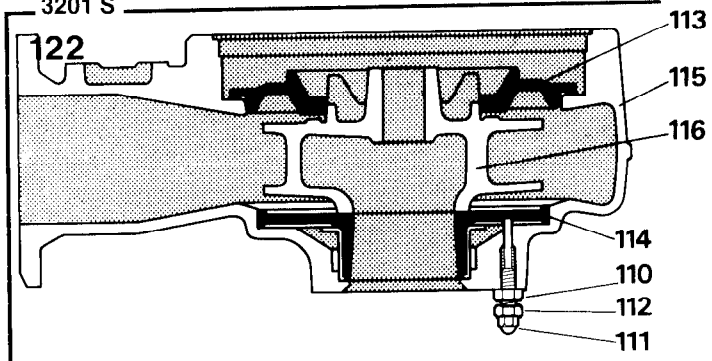
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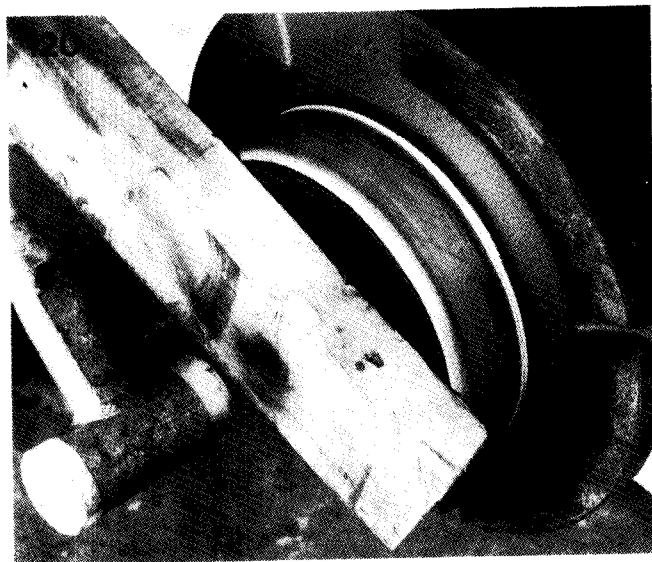
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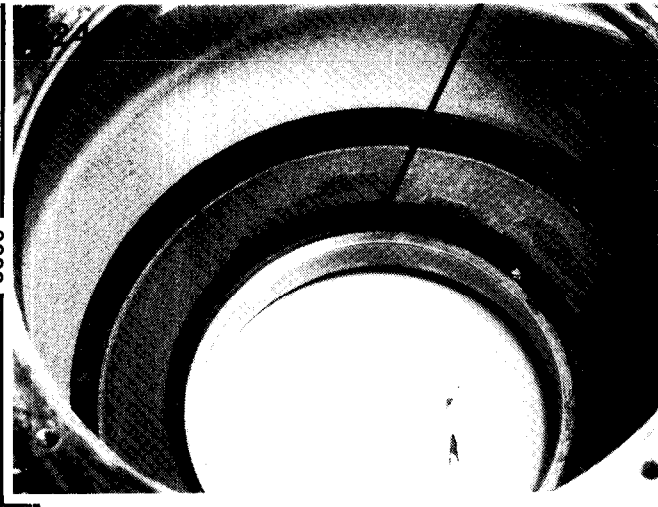


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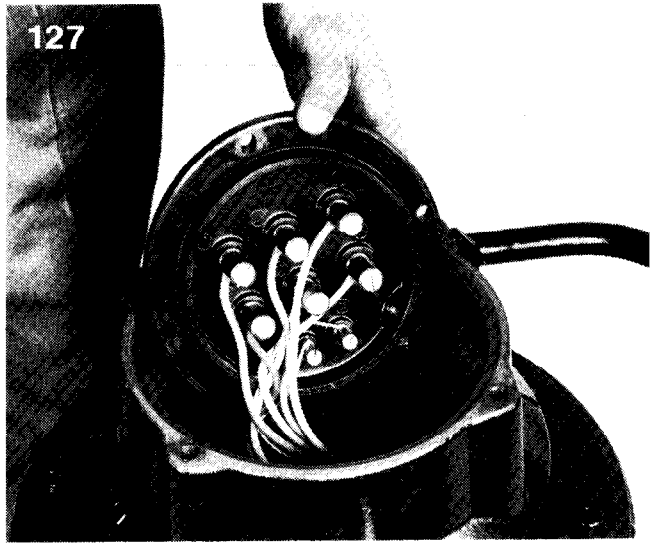
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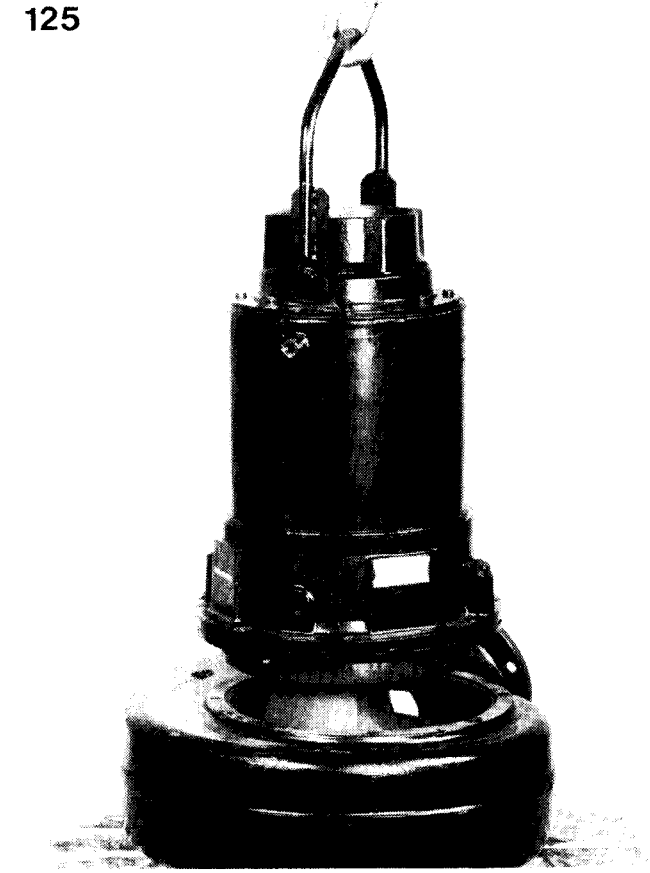
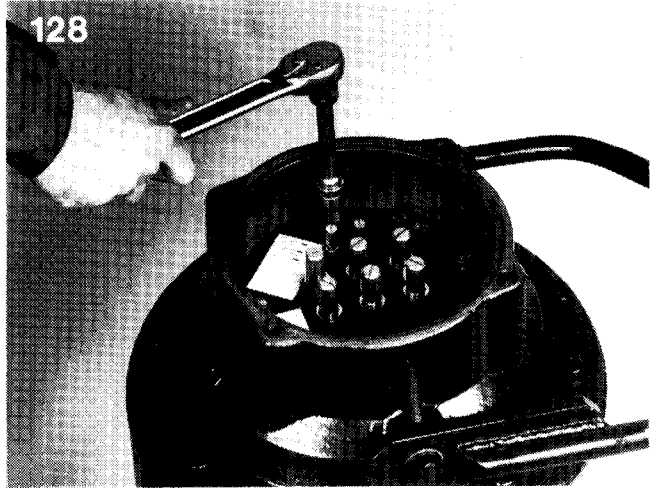


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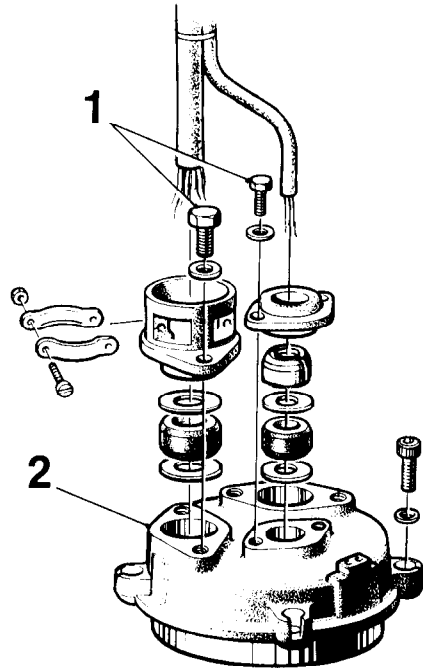
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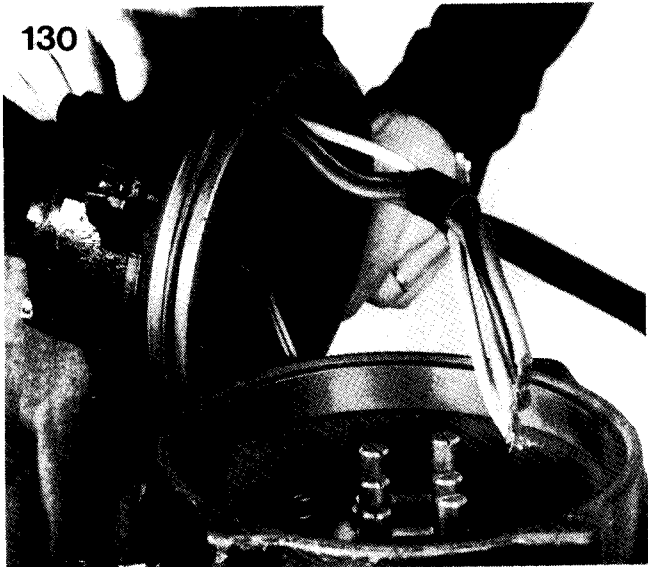


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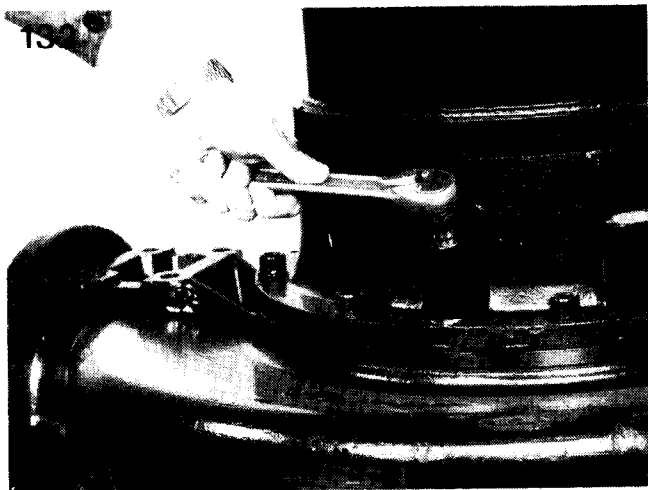
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Dismantling

The following is a complete description of the dismantling of a pump. When figure and text describe the 3201, the steps are also practically applicable to the 3300. When the dismantling procedure is different for the different pumps, both the 3201 and the 3300 are described.

In order to facilitate later assembly, it is a good idea to note during dismantling how the different parts are assembled in relation to each other and where screws, bolts and O-rings are located. Be careful not to damage threads, O-ring grooves and seals. Make sure seals are not scratched or touched.

If the pump is specially approved, certain parts must be handled with particular care, see the section entitled "Specially approved pumps".

- 1 Isolate the pump from the mains power supply.
Unscrew the oil casing screws (oil) and pump out the oil, tool 83 95 42.
- 2—3 Remove the junction box cover. Mark and disconnect the motor cable and control cable leads from the terminal board.
- 4 Disconnect the motor cable and the control cable from the junction box cover.
- 5—6 Unscrew the terminal board. Mark and disconnect the stator leads.
- 7—8 Remove the screws to the pump casing. Lift off and lay the motor section on its side.

3201 Pump casing

- 9 Knock the wear ring off using a chisel.

3300 Pump casing

- 10 Turn the pump casing over and knock out the wear ring.
- 11—12 The lower diffuser is interchangeable to fit different types of impeller.
- 13 Tap off the impeller's wear ring. Saw a slit in the wear ring with a hacksaw, if necessary, or heat with an LP gas torch.

3201 Impeller

- 14 Undo and remove the impeller screw and the washer, O-ring, packing or sleeve (LT version).
- 15 Pull off the impeller using an impeller puller (see tools).

3300 Impeller

- 16 Undo and remove the impeller screw, washer and spacer sleeve, if any.
- 17 Undo the screws on the locking assembly in a diagonal pattern and a little at a time.
- 18 Replace the three light-coloured screws with three M10 screws.
- 19 Carefully tap the dark screw heads and remove the locking assembly.
- 20 Pull off the impeller using an impeller puller (see tools).
In the R version, the locking assembly has been replaced with a hex screw, which is undone, after which the impeller is pulled off.
- 21 Knock off the key.
- 22 Remove the circlip and seal ring.
- 23 Remove the ring, tool 216 68 00.
- 24 Remove the rotating seal ring and the O-ring. Use a couple of screwdrivers and prize up the seal carefully.
- 25 Remove the stationary seal ring and the O-ring that seals against the oil casing bottom in the same manner.
- 26 Undo and lift off the oil casing bottom, use the prizing grooves between the stator casing and the oil casing bottom.
- 27 Remove the screws, springs and the washer.

3201 Wear protection

- 28 If necessary, carefully tap off the wear protection in the oil casing bottom on the 3201.
- 29 Remove the gasket.

3201 Inner seal

- 30 Push down the rotating seal assembly and remove the tension spring, tool 332 91 00.
- 31 Carefully prize up the rotating seal assembly and its O-ring with a couple of screwdrivers.
- 32 Remove the stationary seal assembly and its O-ring in the same manner.

3300 Inner seal

- 33 Push down the rotating seal assembly, tool 399 47 01.
Remove the tension spring, tool 332 91 00.
- 34 Remove the spring housing.
- 35 Undo and remove the washer.
- 36 Carefully prize up the seal ring.
- 37 Remove the seal ring and the O-ring.
- 38 Undo and remove the washer.
- 39 Carefully prize up the stationary seal assembly and its O-ring.

3201 Bearing and motor

- Turn over the pump and place it on a couple of planks to protect the shaft.
- 40—41 Remove the retainers and the cooling jacket.
- 42 Undo and lift off the junction box and the stator casing.
- 43 Fit off the roller bearing's inner race, tool 84 13 60.
- 44—45 Undo the screws to the bearing cover. Lift off the rotor unit and lay it on its side.
- 46 Remove the lock ring and the thrust washer.
- 47 Remove the ball bearing by pulling it with a puller in the bearing cover, tools 84 13 60, 84 13 61.
Remove the thrust washer located under the bearing.
- 48 Undo and lift off the junction box.
- 49 Remove the protective disc under the bearing.
- 50 Remove the lock ring.
- 51 Remove the cover and knock out the bearing with a suitable sleeve.

3300 Bearing and motor

- 52 Undo the screws to the bearing housing.
- 53—54 Lift up the rotor unit and place it on a couple of planks.
- 55—56 Undo the screws and pull off the bearing housing, tool 84 13 63.
- 57 Remove the circlip and the thrust washer.
- 58—59 Fit the tool as described on instruction card 442 06 00 and pull off the ball bearing. Remove the thrust washer and the seal ring located between the bearing and the bearing cover.
- 60 Turn over the rotor unit.
Pull off the roller bearing's inner race and the ring located under the roller bearing using a puller, tool 84 13 62.
- 61 Undo and lift off the junction box. Lay it on its side.
- 62 Undo and remove the lower bearing cover.
- 63 Replace the sealing strip if necessary.
- 64 Knock out the roller bearing in the same manner as on the 3201, figure 51. First prize off the cover.
Remove the washer under the bearing.
- 65 Lift off the cooling jacket.
- 66 Undo and remove the cooling parts (pipe bend lacking on 3300).
- 67 Fit tool 394 70 00 and lift the stator casing a few cm (about one inch) from the floor. Heat the stator casing rapidly (to about 150°C, 302°F) until the stator lets go. Lift out the stator.

Assembly

This section is organized in the same manner as the dismantling section.

Always replace O-rings and worn parts. Clean threads and O-ring grooves. Grease screws and smear the O-rings with oil.

Do not touch or scratch the sealing surfaces.

- 67 Check the stator's winding resistance.
Heat the stator casing to about 150°C (302°F). Fit tool 394 70 00 in the stator.
Lift the stator. There is a pin that prevents the stator from rotating; make sure it fits into the groove in the stator casing.
Fit protective plate, if any, and insulating tube.
Note! If the stator has been rewound, voltage testing shall be carried out in accordance with local regulations.

68 Fit cooling parts (pipe bend lacking on 3300).

3201 Bearing and motor

69 Fit bearing cover (1) and thrust washer (2) on the shaft-rotor unit. Take about 150 g (5 ounces) of grease, pack the bearing and distribute the rest in the spaces on both sides of the bearing. Heat the bearing (3) to 80—90°C (176—194°F) and put it in place.
IMPORTANT! Make sure that the bearing is oriented with the filling slot (figure 70) downwards (towards the impeller)

Fit thrust washer (4) and circlip (5).

If the pump is specially approved, the gap between the bearing cover and the shaft shall be measured as described in the section "Specially approved pumps".

71 Fit the shaft-rotor unit on the bearing cage.

If the pump is specially approved, the gap between the bearing cover and the bearing cage shall be measured as described in the section "Specially approved pumps".

72 Heat the roller bearing's inner race and put it in place.

Take the junction box and heat, for example using an LP gas flame, the part where the bearing is to be seated (the shaded area in figure 73).

73 Fit the roller bearing (8) and the circlip (9) in the junction box. The bearing shall have 20 g (0.7 ounces) of grease. Place 40 g (1.4 ounces) of grease in the space above the bearing and put the cover (7) in place.

74 Fit the protective disc (10).

75 Fit the junction box and the O-ring on the stator casing.

If the pump is specially approved, the gap between the junction box and the stator casing shall be measured as described in the section "Specially approved pumps".

76 Fit the stator casing and the O-ring on the bearing cage.

If the pump is specially approved, the gap between the stator casing and the bearing cage shall be measured as described in the section "Specially approved pumps".

77 Put on the two O-rings.

78—79 Lift on the cooling jacket and fit the retainers.

3300 Bearing and motor

Take the junction box and heat, for example using an LP gas flame, the part where the bearing is to be seated (the shaded area in figure 81).

80 Fit the bearing so that the bearing cage is bent towards the bearing's outer race on the top side.

81 Fit the cover (12), the washer (13) and the roller bearing (14) in the heated junction box. Grease the bearing and pack the space above it with 260 g (9 ounces) of grease.

82 Replace the sealing strip on the upper bearing cover if it is damaged.

83 Fit the upper bearing cover.

84 Lift and fit the cooling jacket and the two O-rings on the stator casing.

85 Fit the junction box on the stator casing. The metal pin on the underside of the junction box shall fit into a recess on the top of the stator casing.

If the pump is specially approved, the gap between the junction box and the stator casing shall be measured as described in the section "Specially approved pumps".

Take the shaft-rotor assembly.

86 Heat the ring and the roller bearing's inner ring to 80—90°C (176—194°F). Fit them on the top end of the shaft.

88 Fit the bearing cover (19), the seal ring (20) and the washer (21) on the bottom end of the shaft. See in the figure how the seal ring should be oriented.

Take 280 g (9.8 ounces) of grease. Pack the bearing and put the rest of the grease between the bearing and the bearing cover.

Heat the bearing to 80—90°C (176—194°F). Turn the bearing with the filling slot (figure 87) facing downwards towards the impeller.

Fit the bearing on the shaft.

Fit the washer (23) and the circlip (24).

If the pump is specially approved, the gap between the bearing cover and the shaft shall be measured as described in the section "Specially approved pumps".

89 Heat the bearing housing and press it down over the bearing.

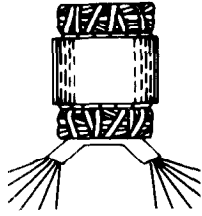
If the pump is specially approved, the gap between the bearing cover and the bearing housing shall be measured as described in the section "Specially approved pumps".

Electrical connection

Stator connection

The stator leads are colour-marked as follows:

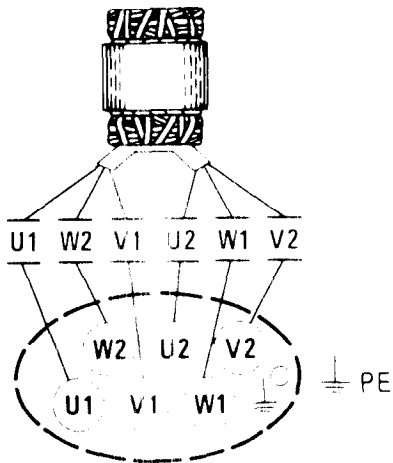
- U1 = Red
- V1 = Brown
- W1 = Yellow
- U2 = Green
- V2 = Blue
- W2 = Black
- U5 = Red
- V5 = Brown
- W5 = Yellow



Connect the thermal protectors to T1 and T2 on the terminal board.

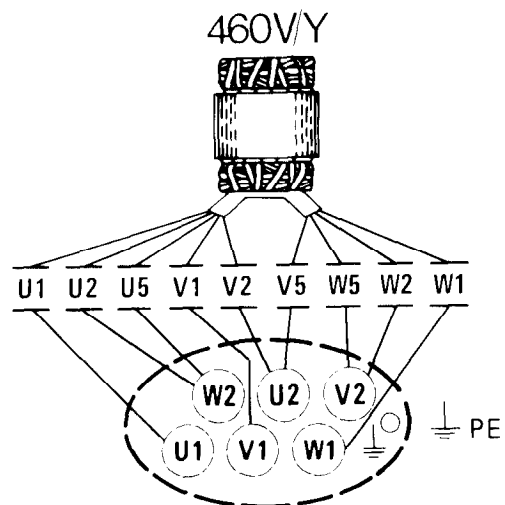
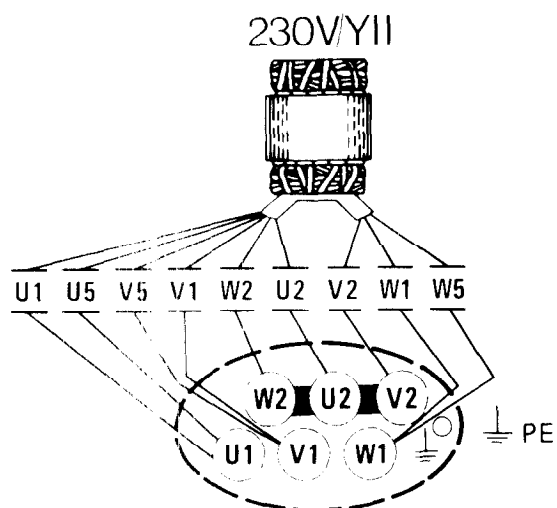
6 stator leads

The stator leads are connected to the terminal board as illustrated in the figure.



9 stator leads

The stator leads are connected to the terminal board as illustrated in the figures.



90 Fit the bearing housing and the bearing cover together.

If the pump is specially approved, the gap between the bearing housing and the bearing cover shall be measured as described in the section "Specially approved pumps".

91--92 Turn over the stator and the junction box.

Fit and fit the shaft-rotor unit and the O-ring.

If the pump is specially approved, the gap between the stator casing and the bearing housing shall be measured as described in the section "Specially approved pumps".

3201 Inner seal

93 Press down the stationary seal ring, with O-ring, into its seat.

Smear the sealing surfaces with oil.

94 Position the rotating seal assembly and the tension spring as shown in the figure.
Make sure that the slot in the shaft, the slot in the seal assembly and the ball are aligned.

95 Press down the seal assembly and the tension spring so that it is fixed in the right position, tool 398 54 00.

3300 Inner seal

96 Press down the stationary seal ring with the O-ring into its seat.

97 Fit the washer.

98 Fasten the washer.

Smear the sealing surfaces with oil.

99 Put on the seal ring as shown in the figure.

100 Fit the O-ring.

101 Position the spring housing as shown in the figure. Make sure that the slot on the spring housing is aligned with the slot in the shaft.

102 Press down the tension spring on the shaft. Make sure that the ball is positioned above the slot in the shaft.
Press down the spring housing, tool 398 47 01. Press down the spring so that it is seated in its groove.

Take the oil casing bottom.

103 Fit the screws, springs and washer. Be careful so that the screws do not break off when they are tightened home.

3201 Wear protection

104 If the wear protection has been removed, make sure that the seat for the wear protection is clean.
Carefully tap in a new wear protection and make sure that it bottoms out.

105 Fit the gasket.

106 Fasten the oil casing bottom with two screws on the 3201, with five screws on the 3300. Make sure that the channels for cooling water are properly aligned.

107 Fit the O-ring that seals against the oil casing bottom.
Fit the stationary seal ring. Make sure that the slots are positioned correctly.

Smear the sealing surfaces with oil.

108 Fit the rotating seal ring and the O-ring. Make sure that the slot in the seal ring is aligned with the pin on the shaft.

109 Place the ring on the seal assembly.

110 Press down the ring and the seal assembly so that the O-ring is seated properly, tool 398 54 00 (for the 3300, tool 398 40 00).

111 Fit the circlip in its groove.

112 Fit the seal ring.

113 Carefully tap the key in place.

3201 Impeller

Grease the end of the shaft and the impeller hub. Place the washer with the O-ring and the gasket on the impeller screw. LT version: place the sleeve on the impeller screw.

114 Press the impeller onto the shaft with the impeller screw. The impeller is easier to fit if it is first heated to about 100 °C (210 °F). Tighten the impeller screw. Tightening torque 200 Nm (148 lb ft).

3300 Impeller

Clean the end of the shaft.

Heat the impeller hub by means of, for example, a dowel that is heated with an LP gas flame and then placed in the space for the shaft. Grease the end of the shaft and the impeller hub.

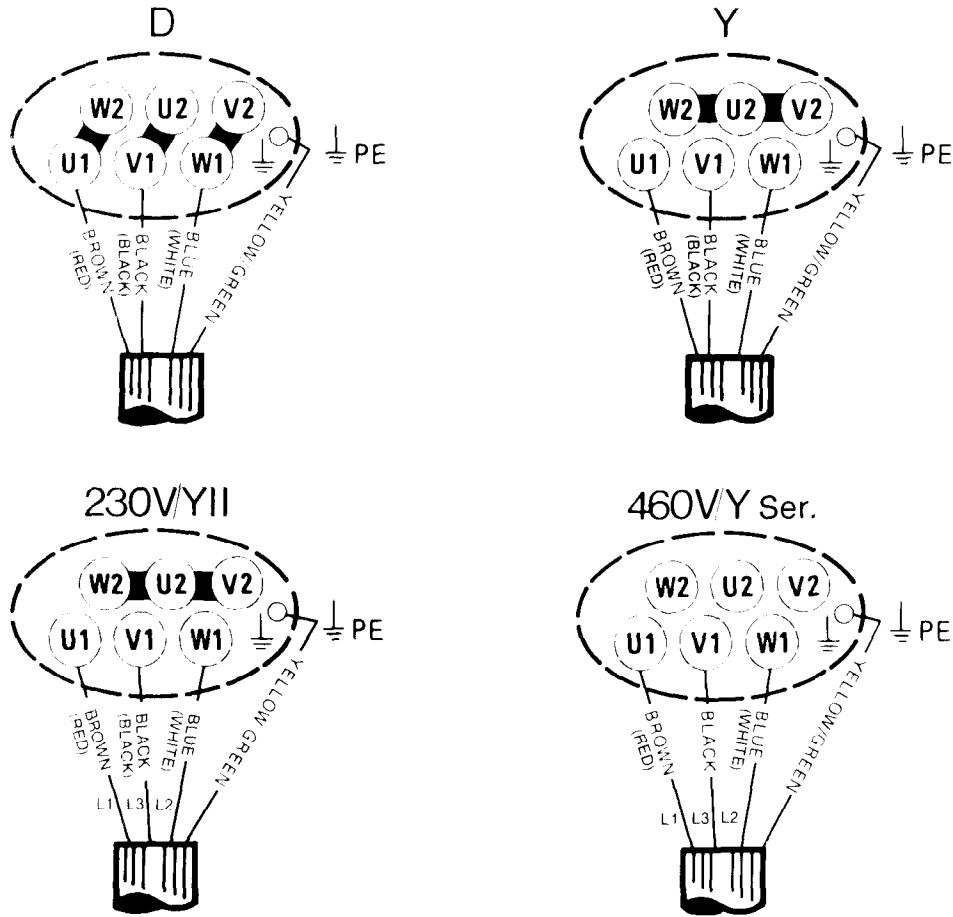
Connection of the motor cable

Connect the motor cable to the terminal board as illustrated in the figures.

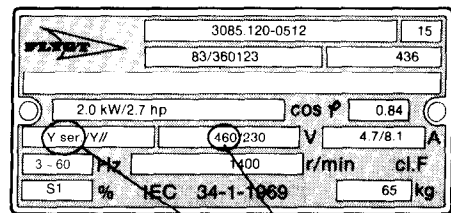
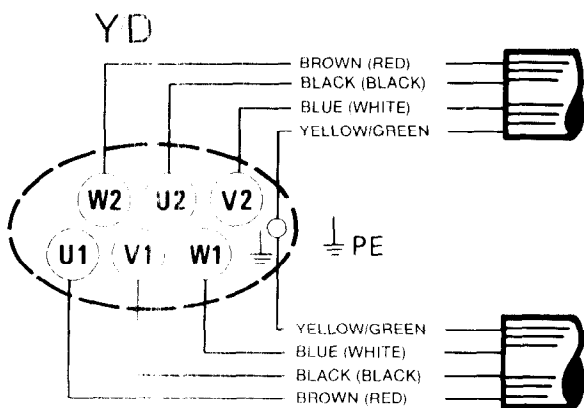
NOTE! For safety reasons, the earth lead should be approx 70 mm (2.76") (for 3300: 100 mm (3.94")) longer than the phase leads. If the motor cable is jerked loose by mistake, the earth lead should be the last lead to come loose from its terminal. This applies to both ends of the cable.

Connect the control lead from the motor control circuit T1 and T2.

Check on the data plate which connection Y or Δ is valid for the voltage supply. Then depending on voltage arrange the connection on the terminal board in accordance with the figure.



If star-delta start is used, both motor cables are connected as shown below. Closing links are not used with star-delta start.



* NOTE! When connecting pumps which have a 9 or 12 lead stator for 440—460 VY Ser., 60 Hz, no closing links should be used. For correct connection, see inside of junction box cover.

- 115 Lift the impeller onto the shaft.
Press the impeller onto the shaft with the impeller screw. Tightening torque 40—50 Nm (29.5—36.9 ft lb).
- 116 Grease the locking assembly internally. Do not use molybdenum sulphide (MoS₂).
- 117 Tighten the locking assembly screws evenly and in sequence to a torque of 35 Nm (26 lbf ft).
Fill the space under the locking assembly with grease.
- 118 Fit the impeller and the washer.

3300 Impeller, R version

- 119 Make sure that the key is seated in the keyway on the shaft (A). Make sure that the spring ring (B) is seated in place in the hub. Place the impeller (C) on the shaft. Fit washer (D) and press on the impeller using an M16 screw. Tighten the impeller and the washer using the impeller screw (E). Fasten the protective cowl (F) with the slotted screws (G). Tightening torque for impeller screw 150 Nm (110 lbf ft).
- 120 Heat the new wear ring and tap it into place.

3201 Pump casing

- 121 Drive in the new wear ring. Use a rubber mallet or wooden block to prevent deformation.

HS 3201 Running-in of wear protection

- 122 Pump type HS 3201 has two rubber wear protections (113 and 114), see figure. The lower wear protection (114) is rendered accessible when the motor section has been lifted away from the pump casing. Unscrew the four cap nuts (111) and pull the lower wear protection out of the pump casing. Before fitting the lower wear protection in the pump casing, unscrew the sleeve screws (112).
The upper wear protection (113) can be taken out after the impeller has been removed.
The clearance between the impeller and the wear protection (114) should be minimal. The clearance is adjusted by means of the sleeve screws (112).
Check that the impeller can easily be rotated by hand. Screw in the sleeve screws (112) evenly all around until the wear protection is flush against the impeller. Back off the sleeve screws a quarter turn. Tighten the lock nuts (110) evenly all around. Fit and tighten the cap nuts (111).
Check that the impeller can be rotated by hand.

3300 Pump casing

- 123 Fit the lower diffuser.
- 124 Drive in the new wear ring. Use a rubber mallet or wooden block to prevent deformation.
- 125—126 Fit the motor section and the O-ring on the pump casing. Make sure that the parts are correctly positioned in relation to each other. It is important that the handle be correctly located when the pump is to be lifted.
- 127 Connect the stator leads, see section "Electrical connections".
If the pump is specially approved, read the section "Specially approved pumps" before starting work on the electrical connections.
- 128 Fit the terminal board and the O-ring.
If the pump is specially approved, the gap between the terminal board and the junction box shall be measured as described in the section "Specially approved pumps".
- 129 Fit the motor and control cable in the junction box cover. Specially approved cable entries may have a different design. See parts list for pump in question.
- 130 Connect the motor cable and the control cable, see the section "Electrical connections".
- 131 Fit the junction box cover and the O-ring.
If the pump is specially approved, the gap between the junction box and the junction box cover shall be measured as described in the section "Specially approved pumps".
- Fill with oil. 10 l (10.6 US quarts) for the 3201 and 15 l (15.9 US quarts) for the 3300.
- 132 Fit the oil and inspection screws, use tool 385 66 01 for the .090 version. Make sure that the O-rings are flawless. Tightening torque for screws, see Technical data".

