



# Workshop Manual

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3153



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# SAFETY PRECAUTIONS



In order to minimize the risk of accidents in connection with service work, the following rules should be followed:



- Before starting work on the pump, make sure that the pump is isolated from the power supply and cannot be energized.
- Bear in mind the risk of accidents. Make sure that the machine or parts of the machine cannot roll or fall over and injure people or damage property.
- Make sure that the lifting equipment can handle the weight you want to lift and that it is in good condition.
- Make continuously sure that, in the course of the work, the pump and / or pump components stand steadily and cannot fall down and cause damage.
- Don't work under suspended load.
- Carry out the work on a sturdy workbench.
- Bear in mind the danger of electrical accidents.
- Bear in mind health hazards. Observe strict cleanliness. When carrying out repair work take care to avoid injury by cutting or pinching.
- Make sure you have a first-aid box near at hand.
- Check that tools and other equipment are in good condition.

## General rules

Wash the outside of the pump thoroughly.

Clean all parts thoroughly - particularly O-ring grooves - before assembly.

Always change all O-rings, gaskets, washers and seals.

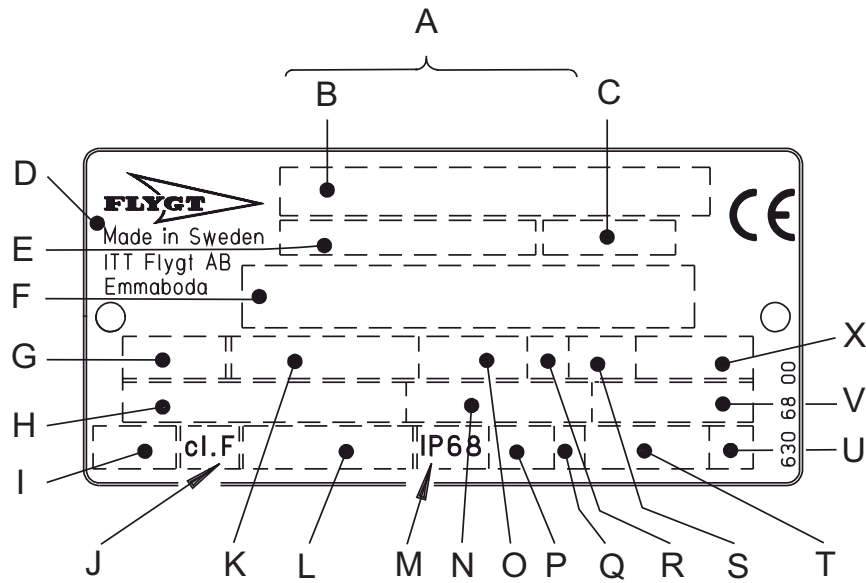
Lubricate all moving parts and O-rings with grease.

**ITT Flygt disclaims all responsibility for work done by untrained, unauthorized personnel.**

Follow all other health and safety regulations, local codes and ordinances.

# DATA PLATE INTERPRETATION

## General data plate



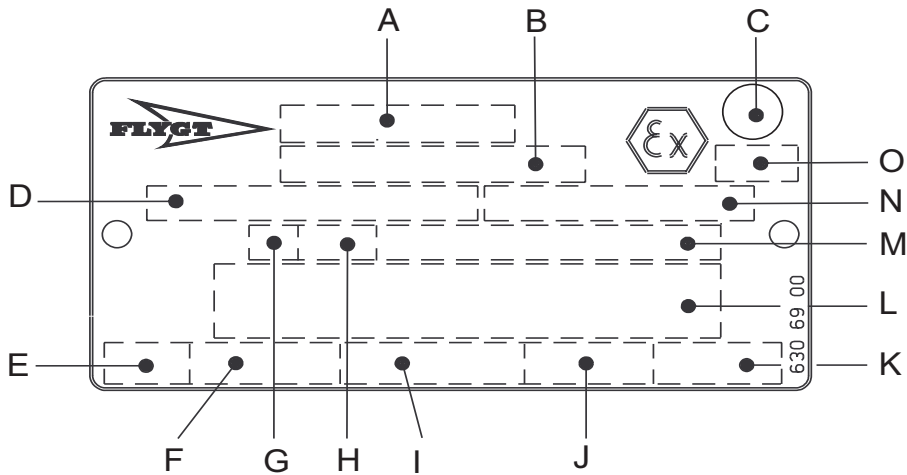
A	Serial number	M	Degree of protection
B	Product code + Number	N	Rated current
C	Curve code / Propeller code	O	Rated speed
D	Country of origin	P	Max. submergence
E	Product number	Q	Direction of rotation: L=left, R=right
F	Additional information	R	Duty class
G	Phase; Type of current; Frequency	S	Duty factor
H	Rated voltage	T	Product weight
I	Thermal protection	U	Locked rotor code letter
J	Thermal class	V	Power factor
K	Rated shaft power	X	Max. ambient temperature
L	International standard		

# DATA PLATE INTERPRETATION

## Approval plates

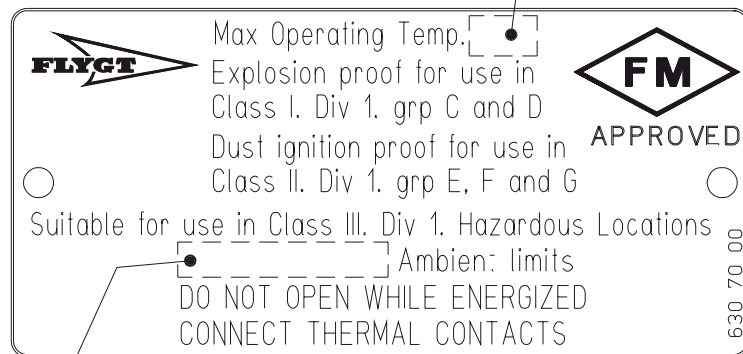
These approval plates apply to an explosion-proof submersible Flygt pump. The plates are used together with the general data plate on the pump.

**EN:** European Norm  
 ATEX Directive  
 EN 50014, EN 50018, EN 1127-1  
 Ⓔ II 2 G EEx d II B T3 for ambient temperatures ≤ 40°C  
 EEx d II B T4 for ambient temperatures ≤ 25°C



- |  |                            |
|--|----------------------------|
| A Approval                             | I Input power              |
| B Approval authority + Approval Number | J Rated speed              |
| C Approval for Class I                 | K Controller               |
| D Approved drive unit                  | L Additional information   |
| E Stall time                           | M Max. ambient temperature |
| F Starting current / Rated current     | N Serial number            |
| G Duty class                           | O ATEX marking             |
| H Duty factor                          |                            |

**FM:** Factory Mutual  
 Class I Div. I Grp C and D  
 Class II and III Div. I Grp E, F and G  
 Temperature class



Max. ambient temperature

# TECHNICAL DATA

## Weights

The weight varies depending on the version:

3153 176 - 417 kg (388 - 919 lb)

For the pump's specific weight, current, voltage, power ratings and speed, please refer to the data plate of the pump.

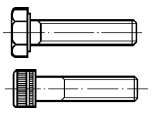
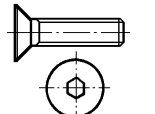
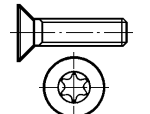
## Coolant

A mix of waterstabilized monopropylene glycol in a mixture ratio of 70/30 % (volume part). Known trade marks of monopropylene glycol are: Dowcal N (individual components are approved by FDA), Dowcal 20. These are non-poisonous, heat-and-cold resistant and inhibiting of corrosion. Use of other type of glycol will jeopardize the function of the pump. If there is no frost risk, even clean water with anti-corrosive is acceptable as coolant.

## Tightening torques

### RECOMMENDED TIGHTENING TORQUE FOR FLYGT STANDARD SCREWS IN Nm AND ft-lb

Chart valid only for lubricated screws. Use lubricant 90 18 00 or 90 20 59.

Material Thread	Stainless (A2, A4)					
	Property class					
	70			80		
	Nm	ft-lb	Nm	ft-lb	Nm	ft-lb
<b>M5</b>	4,1	3	2,0	1,5	5,4	4
<b>M6</b>	7	5,2	4,1	3	9,3	6,9
<b>M8</b>	17	12,5	7	5,2	22	16
<b>M10</b>	33	24,3	17	12,5	44	32
<b>M12</b>	57	42	33	24,3	76	56
<b>M16</b>	140	103	57	42	187	138
<b>M20</b>	273	201	100	74	364	268
<b>M24</b>	472	348	140	103	629	464
Type of screw						

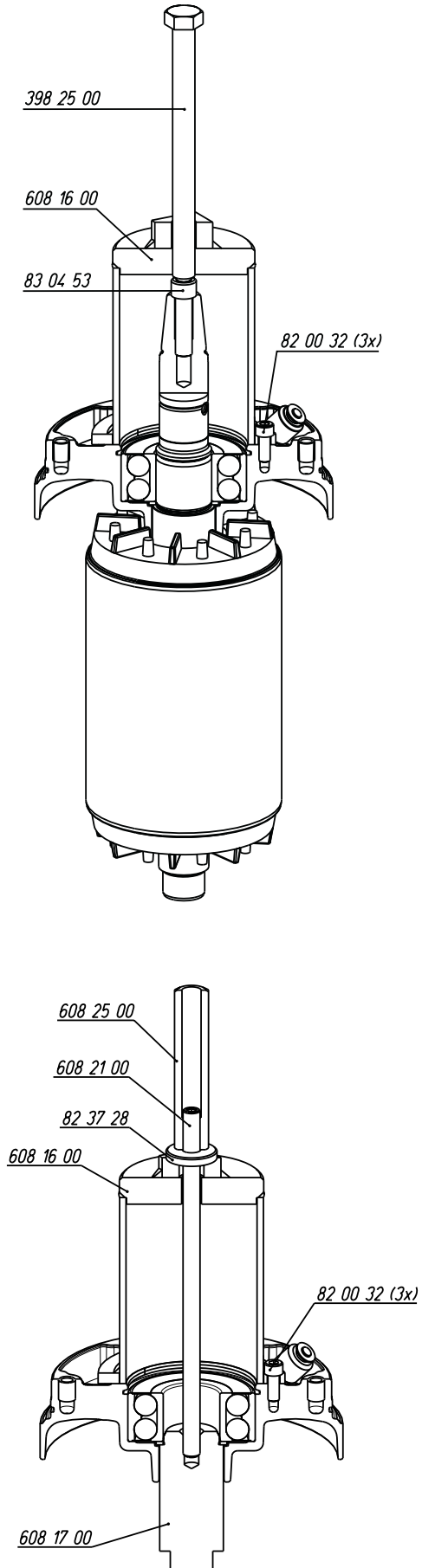
All Flygt standard screws are made of stainless steel. Size M6 belongs to Property class 70 while all other sizes belong to class 80.

# TOOLS

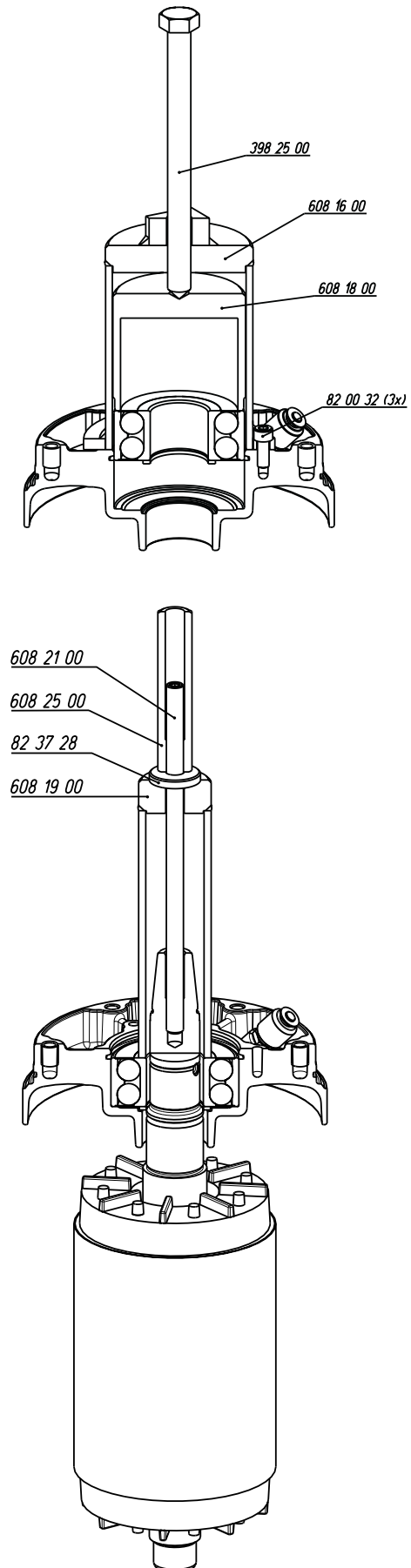
<u>Partno</u>	<u>Denomination</u>	<u>Range of use</u>
83 95 42	Pump	Inspection room
84 08 02	Circlip plier (SGA 19-60 mm)	Mechanical seal unit
84 08 11	Circlip plier (SGH 85 165 mm)	Outer bearing
84 08 60	Crow bar (2x)	Mechanical seal unit
84 10 16	Ratchet handle	Sockets
84 11 40	Combination wrench	Level switch
84 13 03	Hexagon bit adapter	Terminal's rail, earthing
84 13 05	Hexagon bit adapter	Plugs, connection cover, lift handle
84 13 06	Hexagon bit adapter	Impeller screw, cable entry, pump housing
84 13 62	Puller	Inner bearing
84 14 77	Hexagon bit adapter	Seal housing cover
84 14 80	Hexagon bit adapter	Impeller
84 14 89	Allen keys set (9x)	Mechanical seal unit
84 15 55	Extension bar (L= 125 mm)	Sockets
332 91 00	Puller	Spring
398 31 00	Mounting sleeve	Mechanical seal unit
608 20 00	Mounting/dismounting tool	Main bearing
608 23 00	Stand	Pump fixation

## Dismantling/Assembling tool 608 20 00

### Dismantling



### Assembling





# SERVICE AND INSPECTION

## Service/Inspection

ITT Flygt recommends a preventive maintenance program based on Intermediate and Major Services at regular intervals. For standard sewage applications where the temperature of the pumped liquid is 40°C (104°F) or less an *Intermediate Service* should be performed every 8000 hours or every 2 years, whichever occurs first.

The time between *Major Service* could vary considerably depending on operating conditions and the

need for a Major Service will be determined during the regular Intermediate Services.

However, a minimum of 20 000 hours of operation could be anticipated.

For other applications than sewage water or for specific operating conditions, other service intervals may be recommended.

Pump	Intermediate Service running 8 000 h or 2 years
Junction box	Check that it is clean and dry.
Terminal board	Check that the connections are properly tightened.
Isolation check	Check that the resistance between earth and phase lead is more than 1 M $\Omega$ .
Cable	Check that the rubber sheathing jacket is undamaged.
Seal housing	Fill up with new coolant if necessary. Check freezing point (lower than -13°C/9°F).
Inspection chamber	Drain all liquid if any. Check the resistance. Normal value approx. 1200 $\Omega$ , alarm approx. 430 $\Omega$ .
O-rings	Always replace the O-rings of the filling plugs and at the junction cover.
Thermal contacts	Check the resistance. Normally closed circuit; interval 0 - 1 $\Omega$ .
Thermistor	Check the resistance 20-250 $\Omega$ , (measuring voltage max 2 V DC).
Impeller	Check impeller clearance and adjust if necessary.
Lifting handle	Check the screws and the status of the lifting handle.

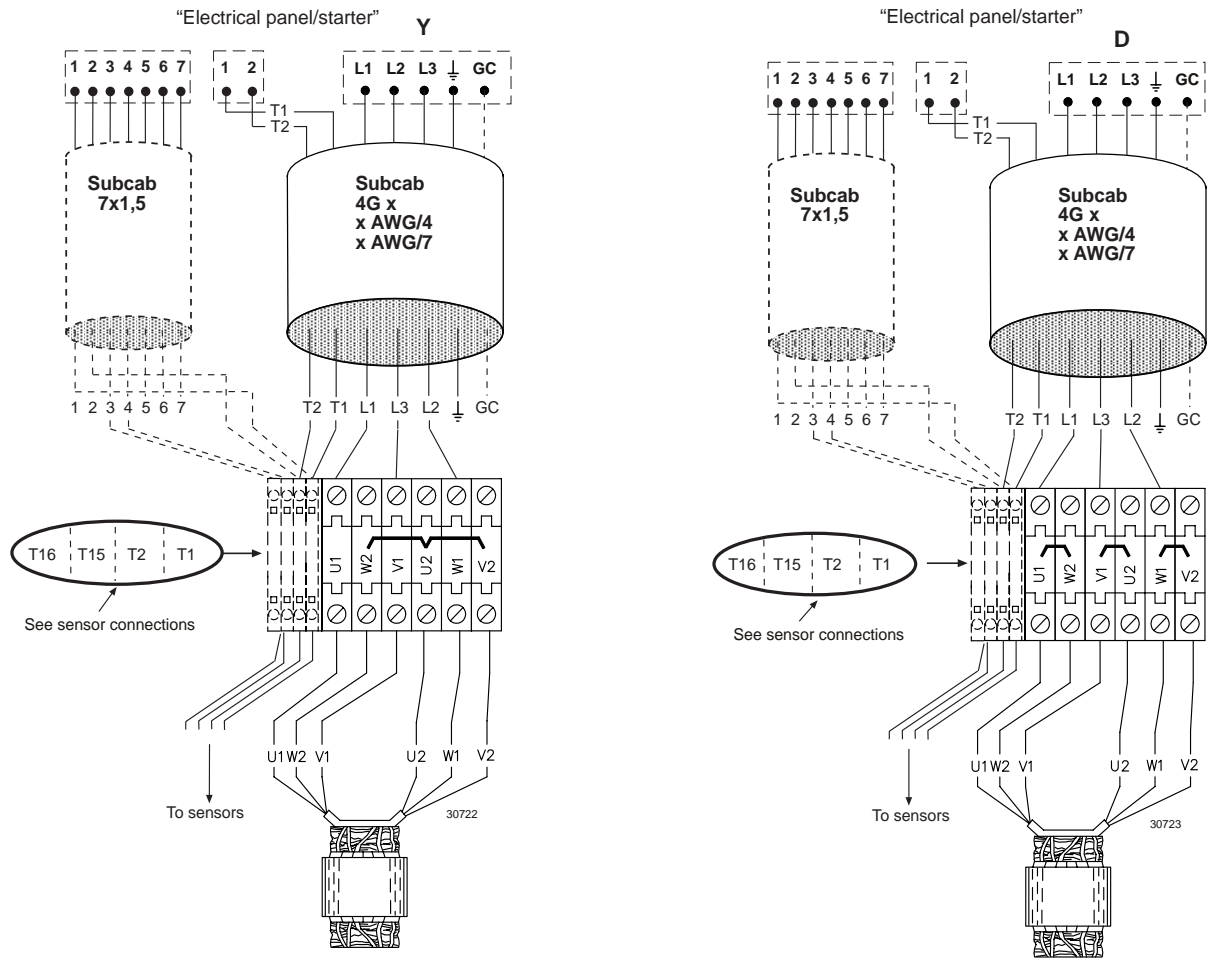
Rotation direction	Check the rotation of the impeller.
Lifting device	Check that local safety regulations are followed.
Voltage and amperage	Check running values.
Pumpstation	Intermediate Service running 8 000 h or 2 years
Electrical cabinets/panels	Check that they are clean and dry.
Connection to power	Check that the connections are properly tightened.
Overload and other protections	Check correct settings.
Personnel safety	Check guard rails, covers and other protections.
Level regulators	Check condition and function.

## SERVICE AND INSPECTION

If any indication of alarm between inspections, please see instructions below.	Actions
FLS10	<p>Drain the fluid in the inspection chamber. Fill up with new coolant if necessary. Check freezing point (lower than <math>-13^{\circ}\text{C}/9^{\circ}\text{F}</math>).</p> <p>Check the inspection chamber again after one week of operation. If leakage has occurred, drain the fluid and change the mechanical seal unit and replace with new coolant.</p>
Thermistor/Thermal-contact	<p>Check coolant level. (pump with cooling jacket)</p> <p>Check start and stop levels.</p>
Overload protection	<p>Check that the impeller can rotate freely.</p>

# ELECTRICAL CONNECTIONS

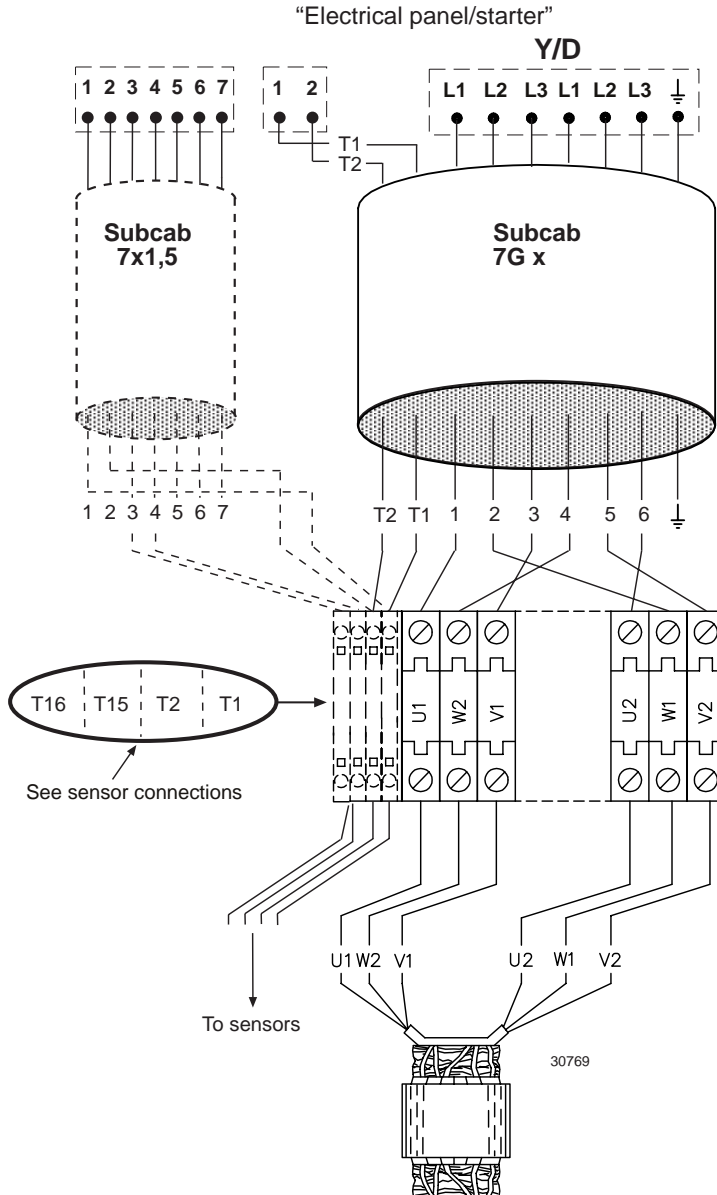
## SUBCAB 4G/SUBCAB AWG\*



\* SUBCAB AWG

Mains	Lead	Pump terminal board	Stator leads connection: Stator lead	Pump terminal board
L1	Brown/(Red*)	U1	U1, red	U1
L2	Blue (White*)	W1	W2, black	W2
L3	Black (Black*)	V1	V1, brown	V1
Earth (Ground)	Yellow/Green	⊥	U2, green	U2
Groundcheck (GC)	Yellow		W1, yellow	W1
			V2, blue	V2
Control	Cable lead			
T1	T1/orange*			
T2	T2/blue*			

# ELECTRICAL CONNECTIONS

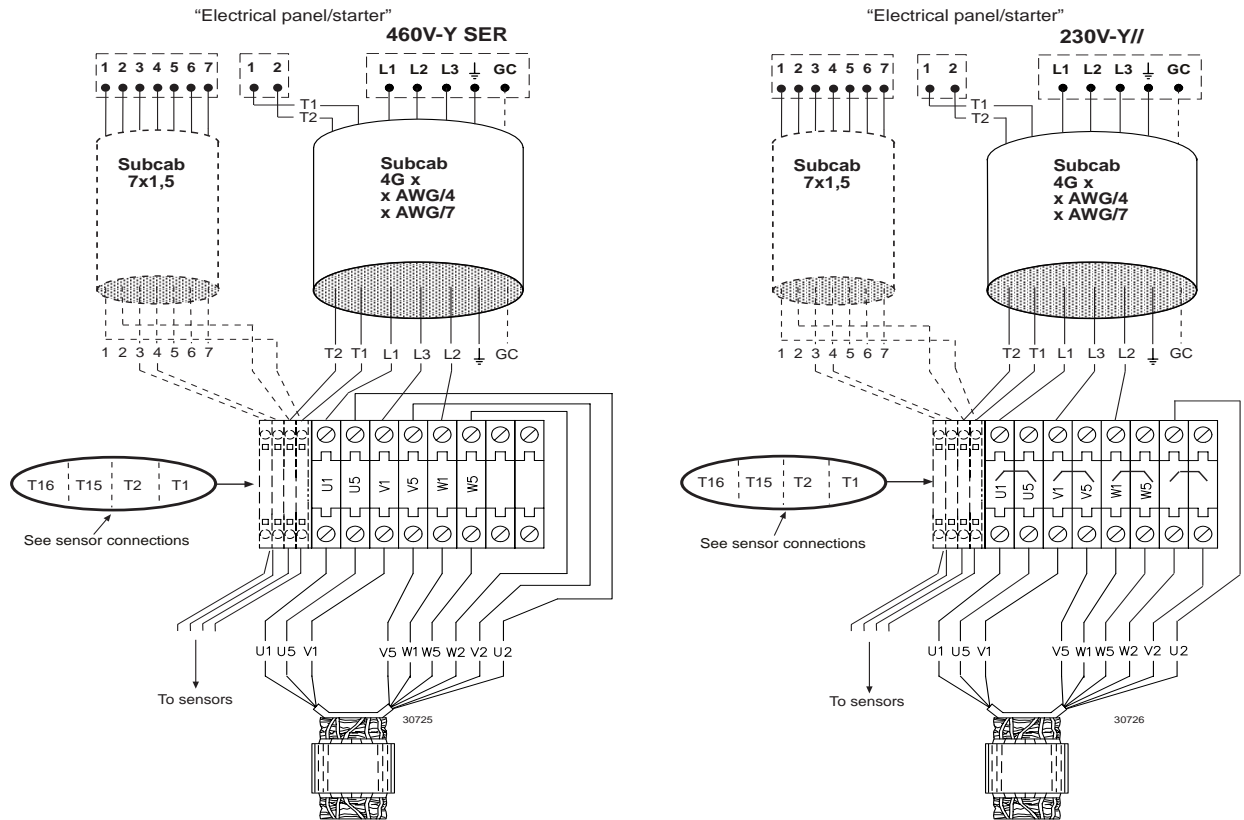


\* SUBCAB

Mains	Lead	Pump terminal board	Stator lead	Pump terminal board
L1	1 black	U1	U1, red	U1
L2	2 black	W1	W2, black	W2
L3	3 black	V1	V1, brown	V1
L1	4 black	W2	U2, green	U2
L2	5 black	V2	W1, yellow	W1
L3	6 black	U2	V2, blue	V2
Earth (Ground)	Yellow/Green	⊥		
Control	Cable lead			
T1	T1 black			
T2	T2 black			

# ELECTRICAL CONNECTIONS

## SUBCAB 4G/SUBCAB AWG\*



\* SUBCAB AWG

Mains	Lead	Pump terminal board	Mains	Lead	Pump terminal board
L1	Brown/(Red*)	U1	L1	Brown/(Red*)	U1
L2	Blue (White*)	W1	L2	Blue (White*)	W1
L3	Black (Black*)	V1	L3	Black (Black*)	V1
Earth (Ground)	Yellow/Green	⊥	Earth (Ground)	Yellow/Green	⊥
Groundcheck (GC)	Yellow		Groundcheck (GC)	Yellow	
Stator leads <b>460V-Y SER</b> connection:			Stator leads <b>230V-Y//</b> connection:		
Stator lead		Pump terminal board	Stator lead		Pump terminal board
U1, red		U1	U1, red		U1
W2, black		W2	U5, red		U5
V1, brown		V1	V1, brown		V1
U2, green		U2	V5, brown		V5
W1, yellow		W1	W1, yellow		W1
V2, blue		V2	W5, yellow		W5
V5, brown			U2, green		
W5, yellow			V2, blue		
U5, red			W2, black		
Control	Cable lead				
T1	T1/orange*				
T2	T2/blue*				

# SENSOR CONNECTIONS

## Monitoring equipment

The **FLS10** sensor is installed in the inspection chamber and consists of a small float switch.

The FLS10 sensor is connected in series with the stator thermal contacts. They should be connected to an alarm relay, type Mini CAS II, in accordance with the following diagram.

**Thermal contacts** are incorporated into the stator and may be used for voltages up to 250 V, rated current 10 A ( $\cos \varphi = 1$ ) / 6.3 A ( $\cos \varphi = 0.6$ ). ITT Flygt recommends that they are connected to 24 V over separate fuses to protect other automatic equipment.

The label in the junction box shows if the pump is equipped with optional sensors.

For a **PTC-thermistor** (PTC = Positive Temperature Coefficient), there is a significant increase in resistance at a certain temperature, that can be utilized for monitoring the temperature.


Data: PTC-thermistor

$T=25\text{ }^{\circ}\text{C}$   $R \leq 100\text{ Ohm}$

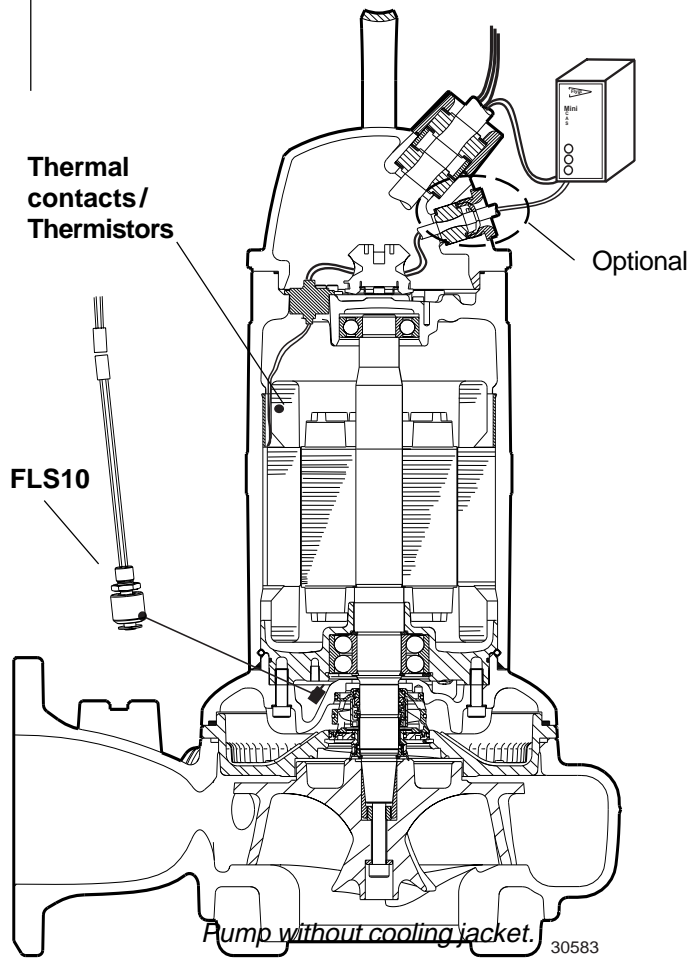
$T=135\text{ }^{\circ}\text{C}$  ( $T_{REF} - 5\text{ }^{\circ}\text{C}$ )  $R \leq 550\text{ Ohm}$

$T=145\text{ }^{\circ}\text{C}$  ( $T_{REF} + 5\text{ }^{\circ}\text{C}$ )  $R \geq 1330\text{ Ohm}$

Three thermistors are connected in series have a resistance of approx. 150-300 ohms at room temperature.



**Warning!** Be careful when dismantling the pump motor unit not to damage the sensor leads. Disconnect the leads before the rotor assembly. Separate the stator casing completely. Be careful not to damage the sensor. Make sure the sensor leads are not pinched during assembly.

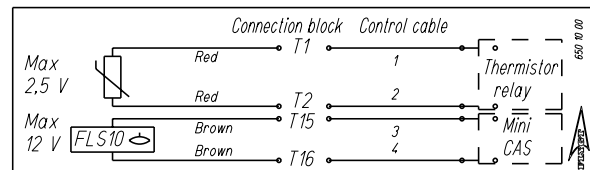
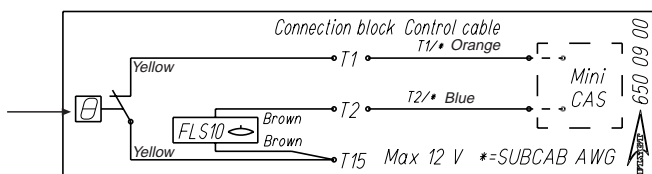


## Sensor connection for standard configuration

The pump is as standard equipped with either thermal contacts or thermistors.

### A) Thermal contacts

### B) Thermistors



# SENSOR CONNECTIONS

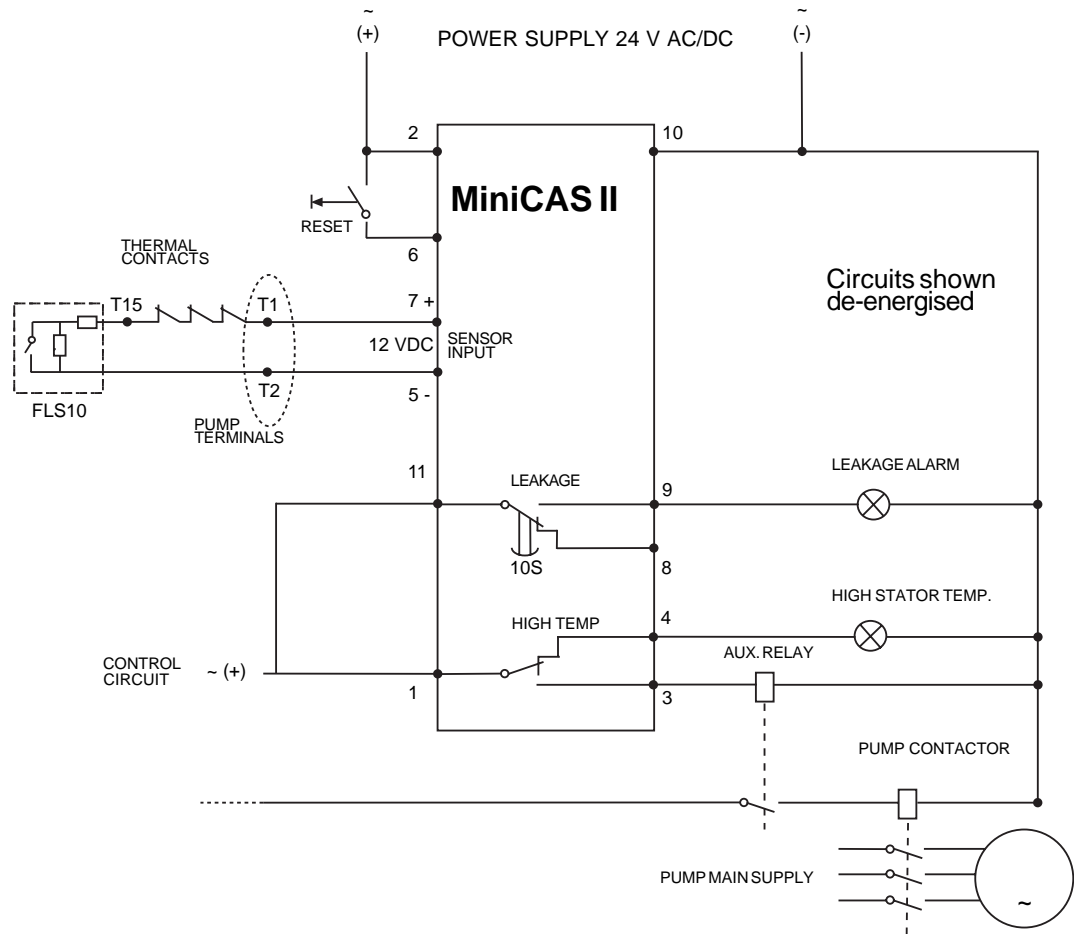
FLS10 + thermal contacts

0 mA = *Overtemperature*

10 mA = *OK*

28 mA = *Leakage*

Tolerance 10%



### Sensor Connection Table

(For further information please contact Flygt representative.)

Sensor	Sensor lead	Thermal connection	Control cable	Connected to
Thermal contacts + FLS10	White Brown White+Brown	T1 T2 T15	T1/*Orange T2/*Blue = SubCab /* SubCabAWG	Mini CAS II Mini CAS II
Thermistors + FLS10	Red Red Brown Brown	T1 T2 T15 T16	1 2 3 4	Thermistor relay Thermistor relay Mini CAS II Mini CAS II

# DESIGN OF THE PUMP

## 3153 without cooling jacket

### Motor

Squirrel-cage 3-phase induction motor for 50 Hz or 60 Hz. The motor is started by means of direct on-line or star delta start.

The motor can be run continuously or intermittently with a maximum of 15 evenly spaced starts per hour. Flygt motors are tested in accordance with IEC 34-1.

The stator is insulated in accordance with class H (180° C, 355° F). The motor is designed to supply its rated output at  $\pm 5\%$  variation of the rated voltage. Without overheating the motor,  $\pm 10\%$  variation of the rated voltage can be accepted provided that the motor does not run continuously at full load. The motor is designed to operate with a voltage imbalance of up to 2 % between the phases.

### Bearings

The support bearing of the shaft is a single row ball bearing.

The main bearing of the shaft is a double row angular contact ball bearing.

### Mechanical seal unit

The pump has one mechanical seal consisting of two independent operating seals:

- |                      |  |
|----------------------|--|
| Alt I. Inner seal:   | Carbon/Aluminum Oxide (CSb)/(Al <sub>2</sub> O <sub>3</sub> )                                |
| Outer seal:          | Corrosion resistant cemented carbide (WCCR)/(WCCR)   |
| Alt II. Inner seal:  | Corrosion resistant cemented carbide/Aluminum Oxide (WCCR)/(WCCR)                            |
| Outer seal:          | Corrosion resistant cemented carbide (WCCR)/(WCCR)   |
| Alt III. Inner seal: | Corrosion resistant cemented carbide/Aluminum Oxide (WCCR)/(Al <sub>2</sub> O <sub>3</sub> ) |
| Outer seal:          | Silicon Carbide (RSiC)/(RSiC)  |

### Monitoring equipment

The stator incorporates three thermal contacts connected in series that activate an alarm at overtemperature.

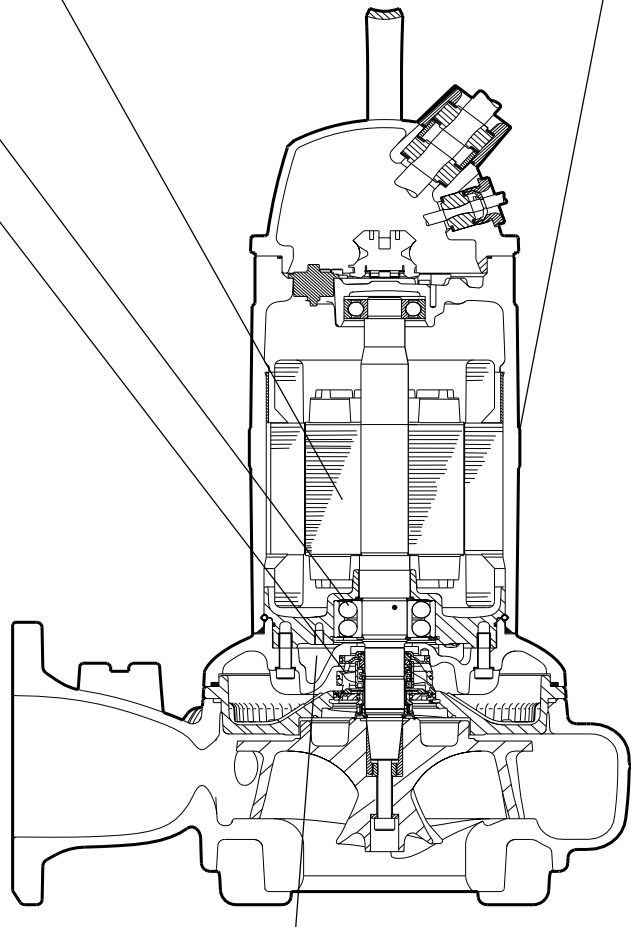
The thermal contacts: open at 140° C (285 F). The sensors shall be connected to Flygt's monitoring unit MiniCAS II or equivalent unit.

The monitoring equipment shall be of a design that makes automatic restart impossible.

The 3153 is as standard supplied with leakage sensor FLS10 for sensing the presence of any liquid in the inspection chamber.

### Cooling (without cooling jacket)

The pump is cooled by ambient liquid. For lowest liquid level, see dimensional drawing.



### Seal housing

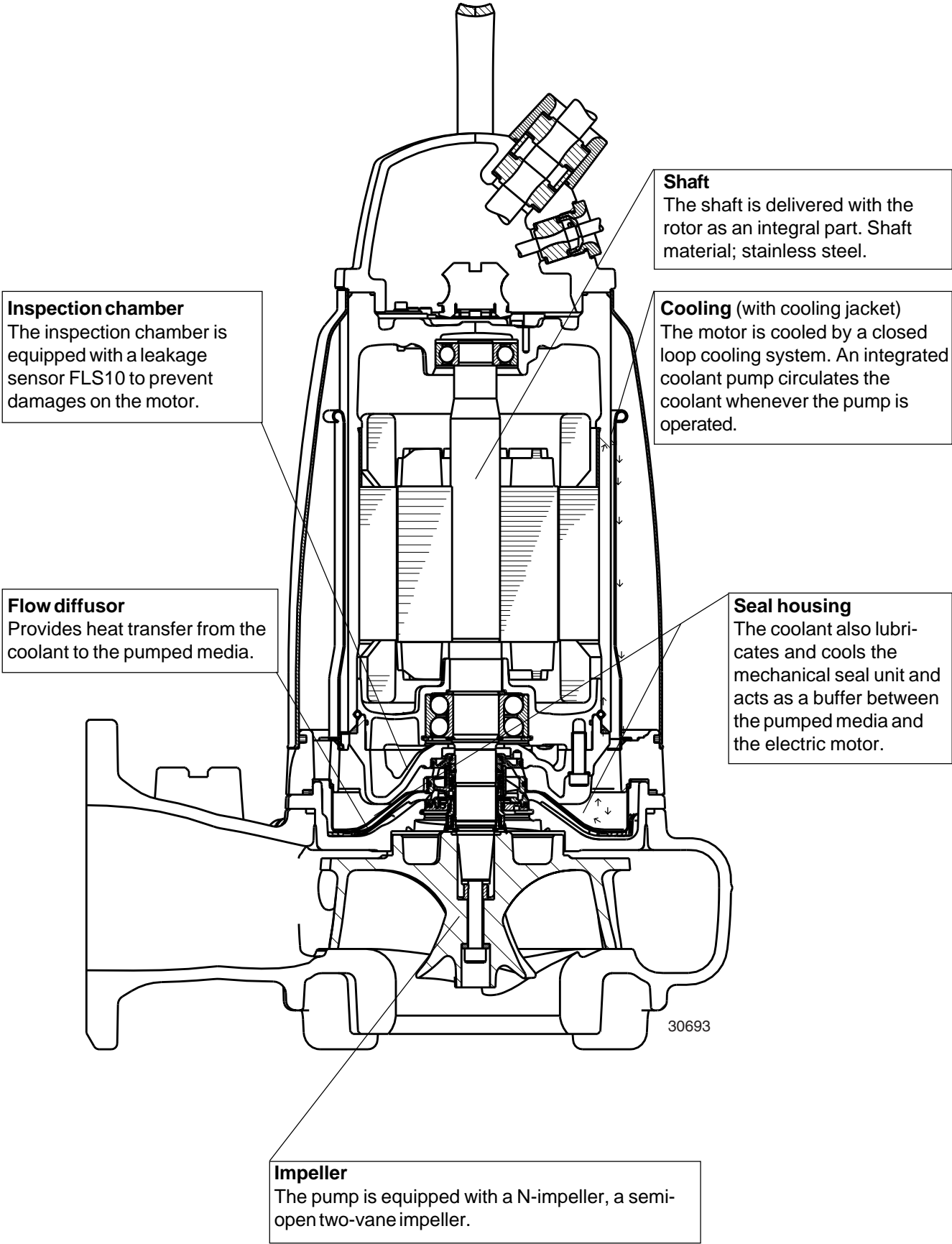
A coolant fluid, lubricates and cools the mechanical seal unit and acts as a buffer between the pumped media and the electric motor.

30720



# DESIGN OF THE PUMP

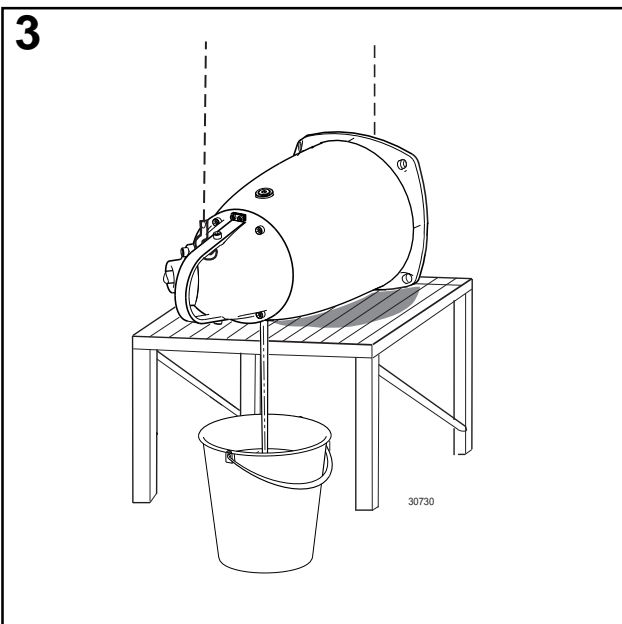
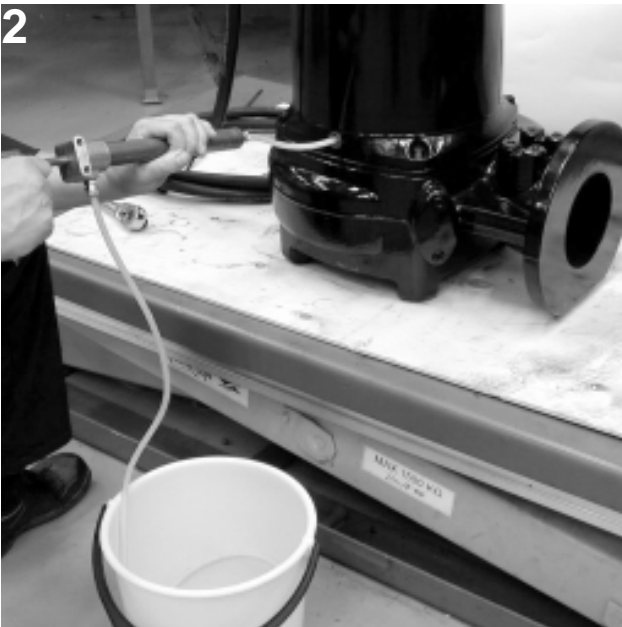
## 3153 with cooling jacket



## DISMANTLING

### Emptying of coolant Version with cooling jacket (Fig 1 - 3)

1. Remove the inspection plug.
2. Pump out any coolant from the inspection chamber. Refit the inspection plug and tighten it (44 Nm).
3. Place the pump in a horizontal position. Place a container under the pump (about 10,5 litres /11,2 US quarts). Remove the coolant filling plug. Remove the vent plug and empty the coolant.

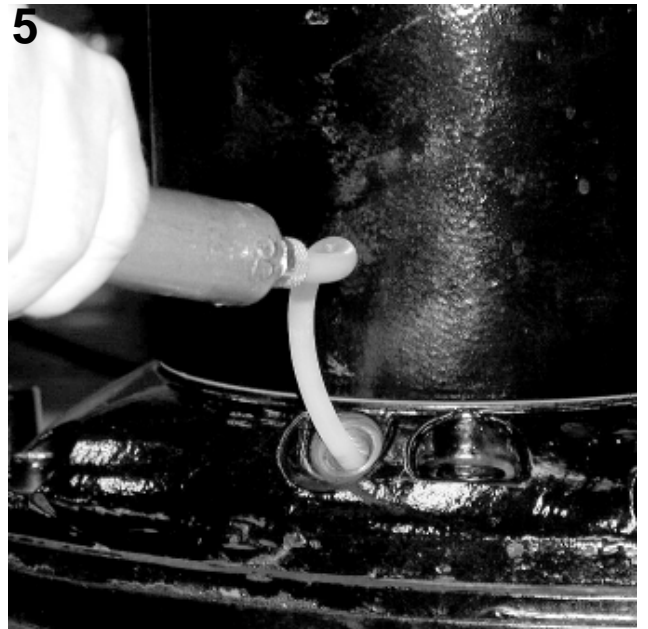


**Emptying of coolant**  
**Version without cooling jacket**  
 (Fig. 4 -7)

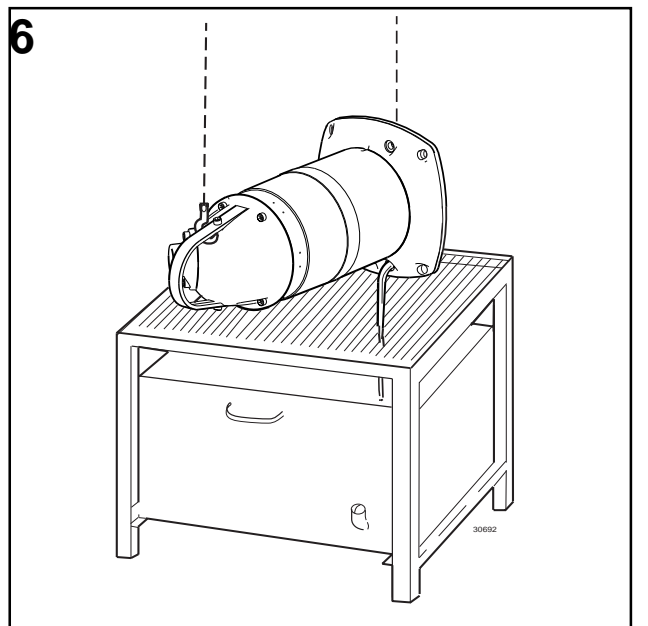
4. Remove the inspection plug.



5. Pump out any coolant.



6. Place the pump in a horizontal position. Unscrew the two filling plugs. Drain the pump.





7. Alt: If pump is upright, pump out the coolant.

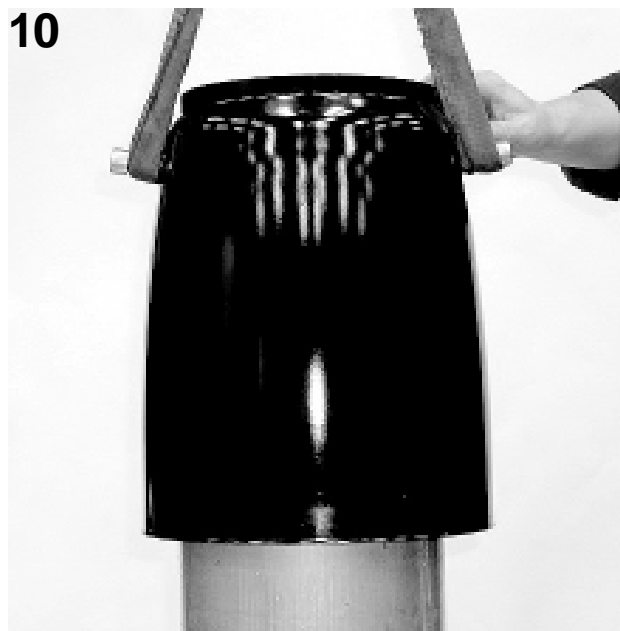


8. Remove the connection cover screws.



9. Lift off the connection cover. Disconnect the motor cable leads.

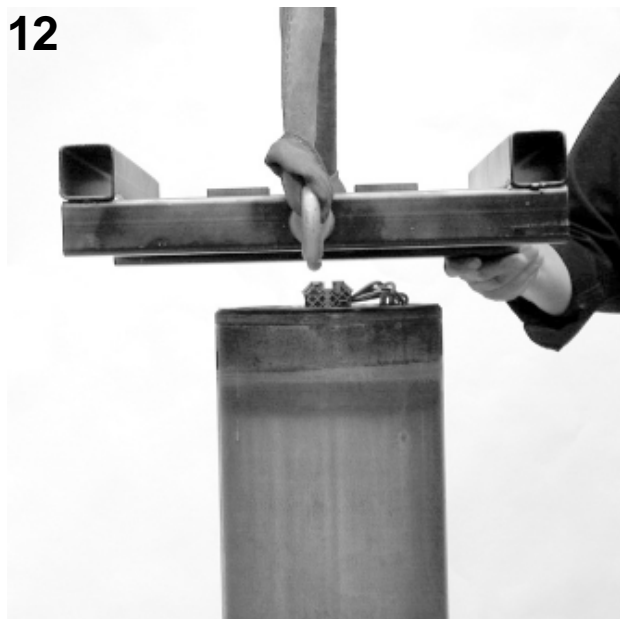
10. Remove the coolant filling plugs. Screw two M16 screws (about 50 mm long) into the coolant filler holes of the cooling jacket. Lift off the outer cooling jacket.

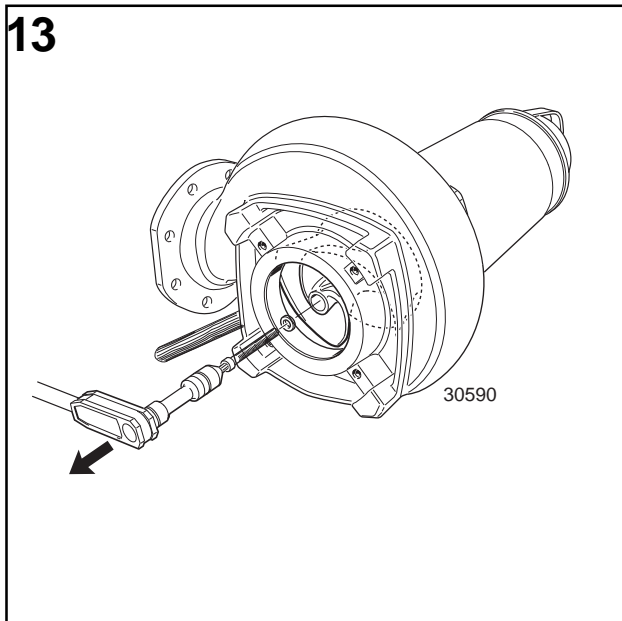


11. Remove the screws and washers retaining the inner cooling jacket. Lift off the inner cooling jacket.



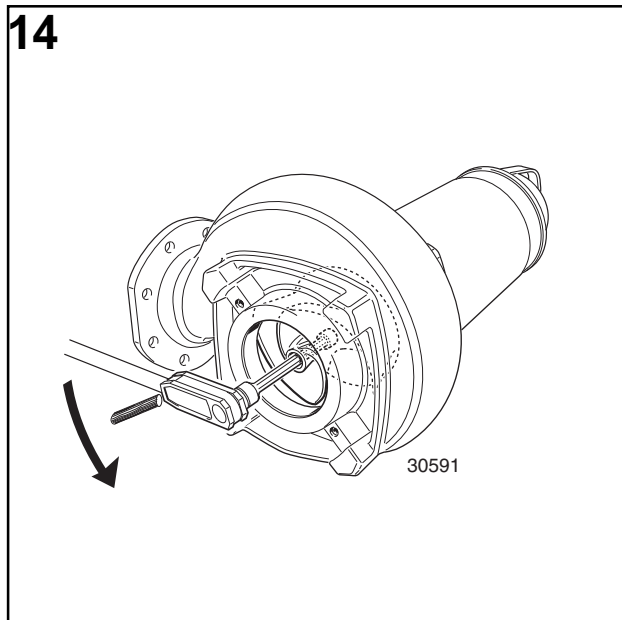
12. Bolt the assembly/dismantling stand in position. Secure it by means of the screws for the connection cover.



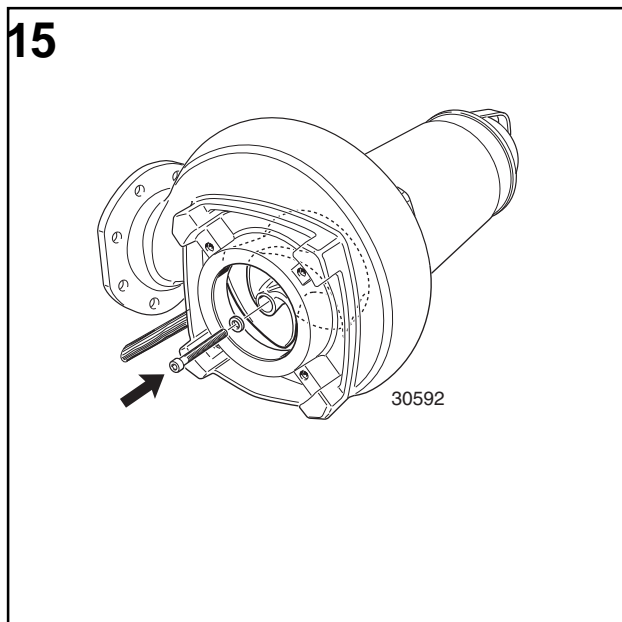
**13**

13. Place the pump horizontally. Remove the flush valve cover and insert a rod (wooden or plastic) through the hole. Remove the impeller screw.

## Procedure for CT-version, see pages 53-57

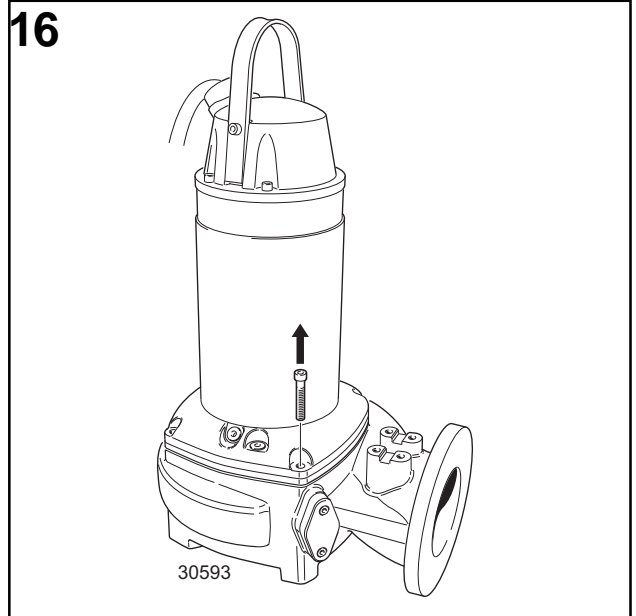
**14**

14. Turn the trim screw counter clockwise until the impeller is free from the shaft. Use a 12 mm hexagon bit adapter with a length of min. 100 mm.

**15**

15. Refit the impeller screw by hand, just to prevent the impeller from falling off.

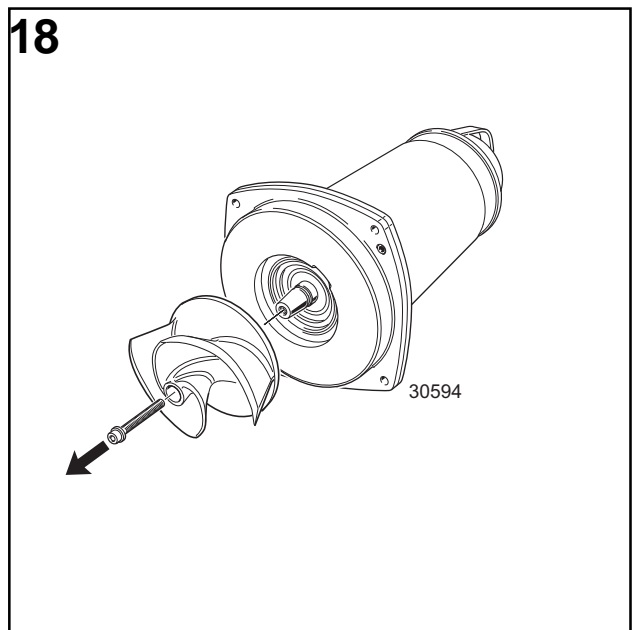
16. Remove the rod and raise the pump. Remove the pump housing screws.



17. Lift the drive unit out of the pump housing.



18. Place the drive unit horizontally. Remove the impeller screw.



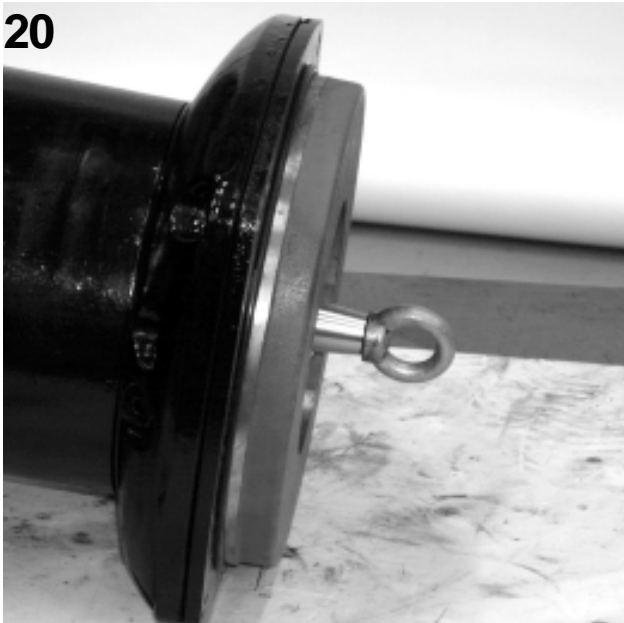




19. Remove the impeller.



Worn impellers can  
have very sharp edges.  
Use protective gloves!



20. Screw in an M12 lifting eyebolt (55 mm long) into  
the shaft end.



21. Place the drive unit upside down on the stand.



22. Remove the screws retaining the seal housing cover.



23. Remove the seal housing cover.



24a. Remove the circlip (picture shows version without cooling jacket).



**24b**

24b. Remove the circlip (version with cooling jacket).

**25a**

25a. Remove the mechanical seal unit (version without cooling jacket).

**25b**

26b. Remove the mechanical seal unit (version with cooling jacket).

26. Remove the flow diffuser.

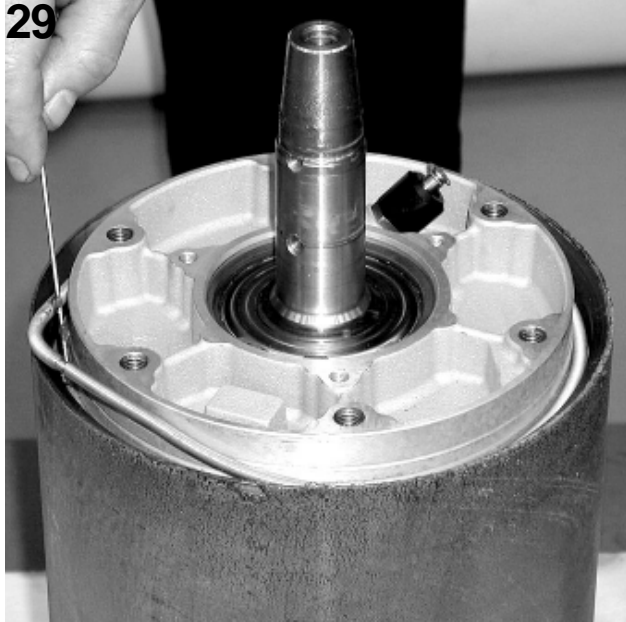


27. Remove the screws and sealing washers for the adapter.

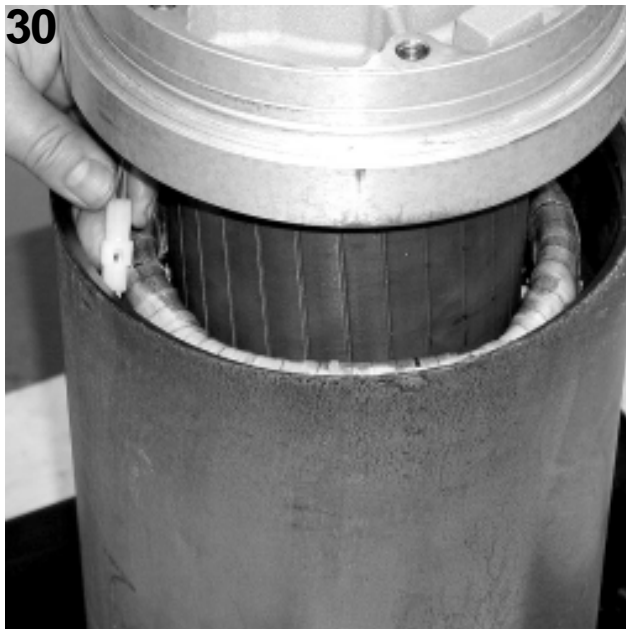


28. Lift off the adapter.





29. Remove the spring.

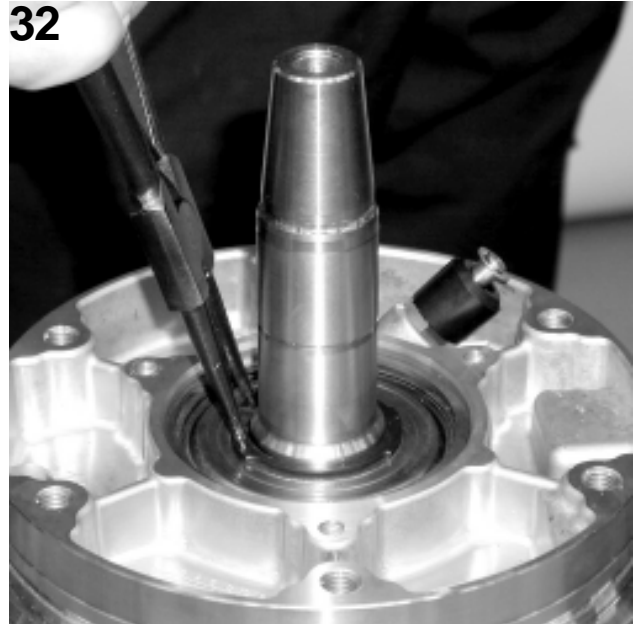


30. Screw the lifting eyebolt into the shaft end. Carefully lift out the shaft unit. Disconnect the sockets for FLS10.

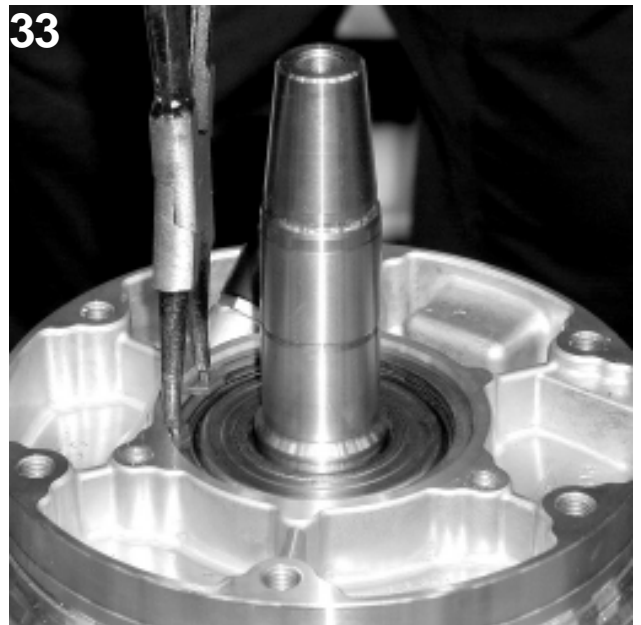


31. Place the rotor/shaft unit with the bearing holder on a suitable piece of tube.

32. Remove the inner circlip.



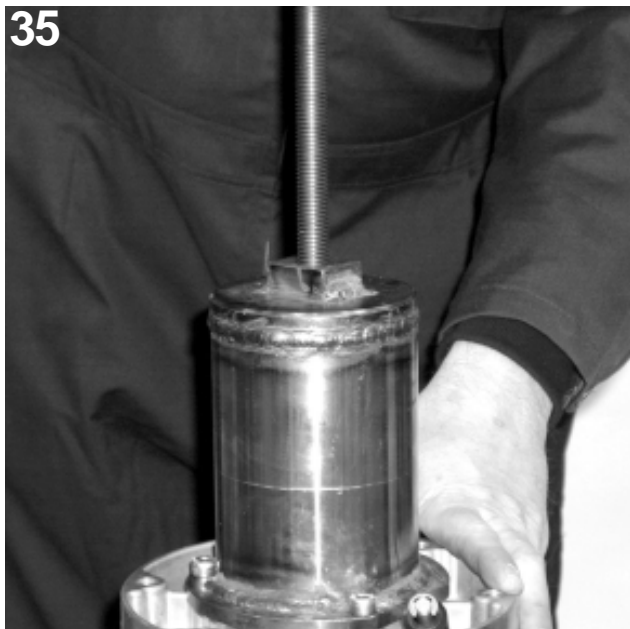
33. Remove the outer circlip.



34. Bolt the puller cylinder onto the bearing holder.







35. Oil the puller screw and screw it in.

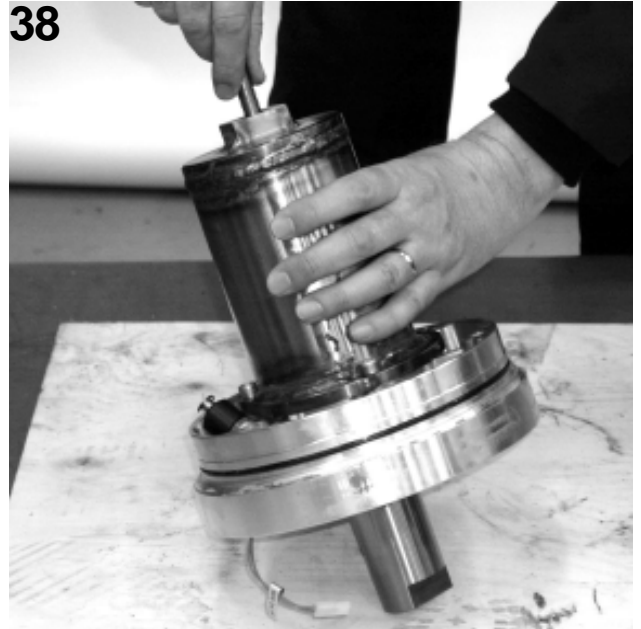


36. Withdraw the bearing holder with bearing.



37. Turn the bearing holder so that its bottom faces upwards. Place the puller drift against the bearing.

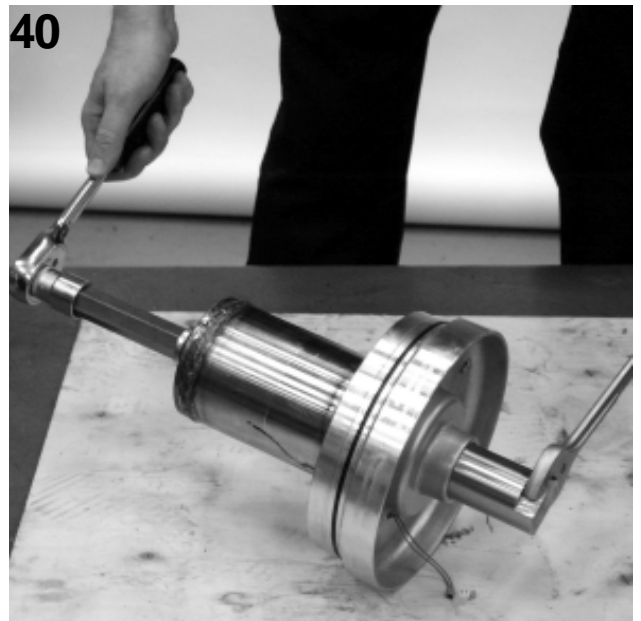
38. Screw in the threaded rod by hand until it bottoms.



39 . Fit the washer and screw on the long hexagonal nut.



40. Withdraw the bearing.



**41**

41. Place the rotor/shaft unit in the rotor support.  
Use a bearing puller to remove the support bearing.



## ASSEMBLY

42. Place the rotor/shaft unit on a suitable piece of tube. Oil the shaft end.

**42**

43. Place the support bearing on the shaft end, regardless of which face is up.

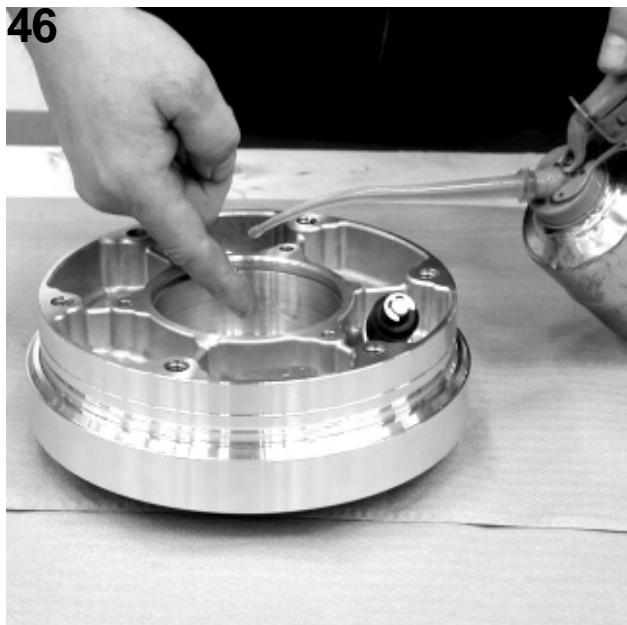
**43**

44. Use the bearing fitting tool (SKF) to hammer down the bearing.

**44**



45. Place the support washer in the bearing holder.



46. Oil the bearing seat.



47. Place the bearing in position, irregardless of which face is up.

48. Place the tool piston on the bearing.



49. Place the puller cylinder over the piston.



50. Bolt the puller cylinder to the bearing holder.





51. Oil the puller screw and use it to press the bearing into place.

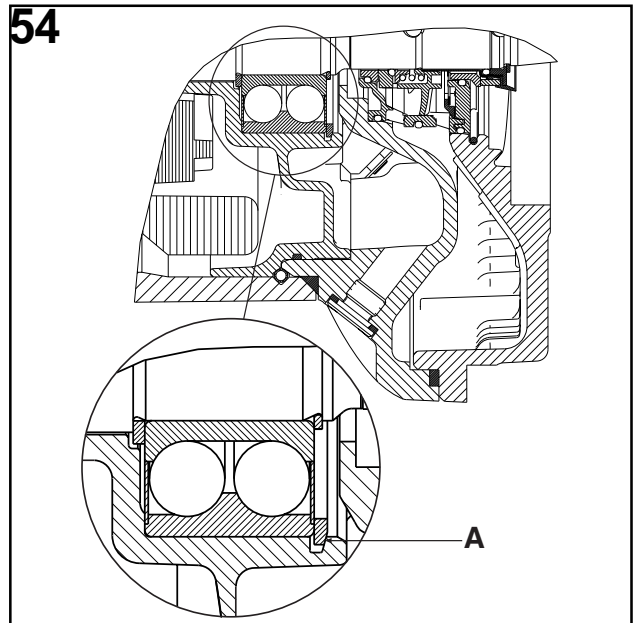


52. Check that the support washer is in its right position.

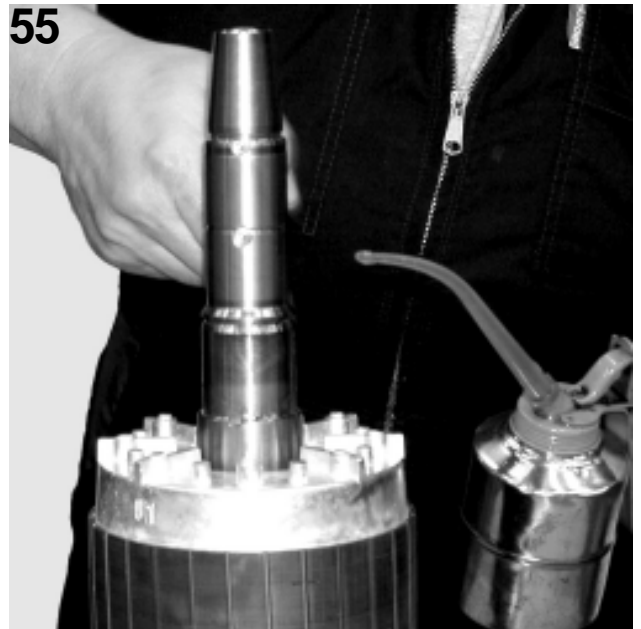


53. Fit the outer circlip. N.B. Check that the circlip taper is in contact with the corresponding taper surface on the bearing holder (A).

54. Bearing holder taper.



55. Oil the rotor shaft.



56. Place the bearing holder on the shaft.







57. Place the puller tube against the bearing holder.

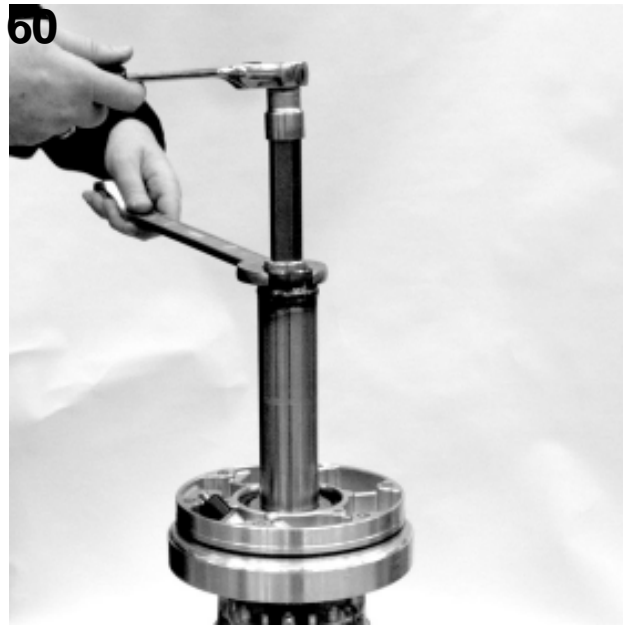


58. Screw in the threaded rod by hand until it bottoms.

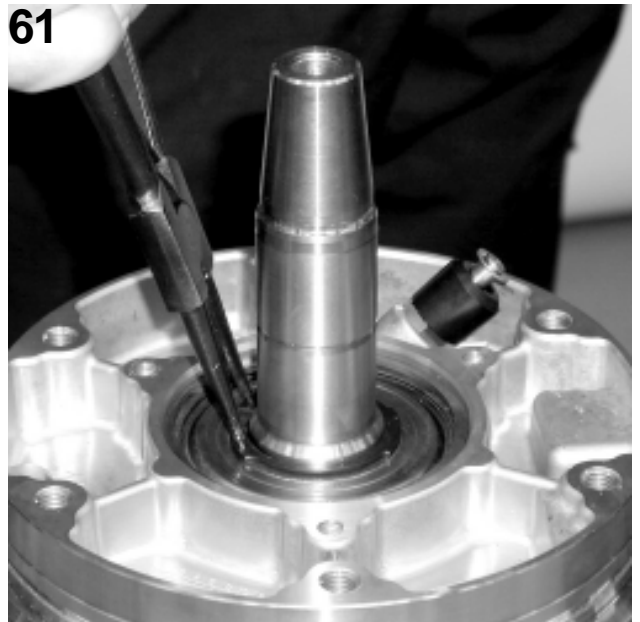


59. Fit the washer and the long hexagonal nut.  
Tighten the nut by hand until it bottoms.

60. Fit the bearing and the bearing holder.

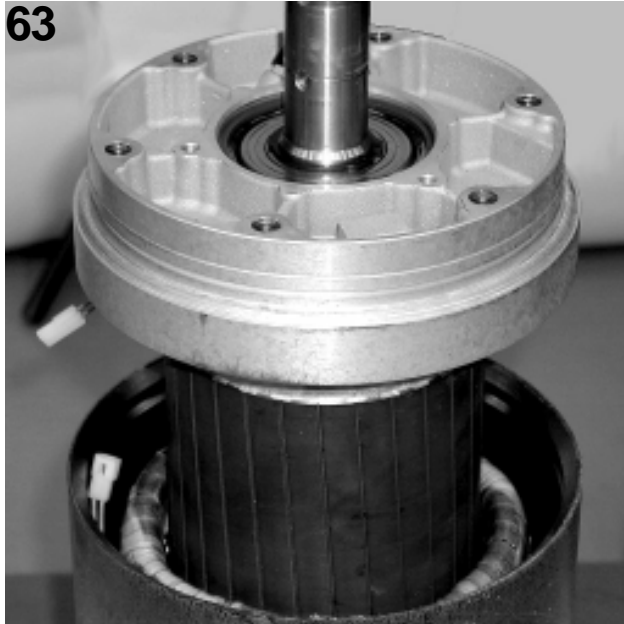


61. Fit the inner circlip.

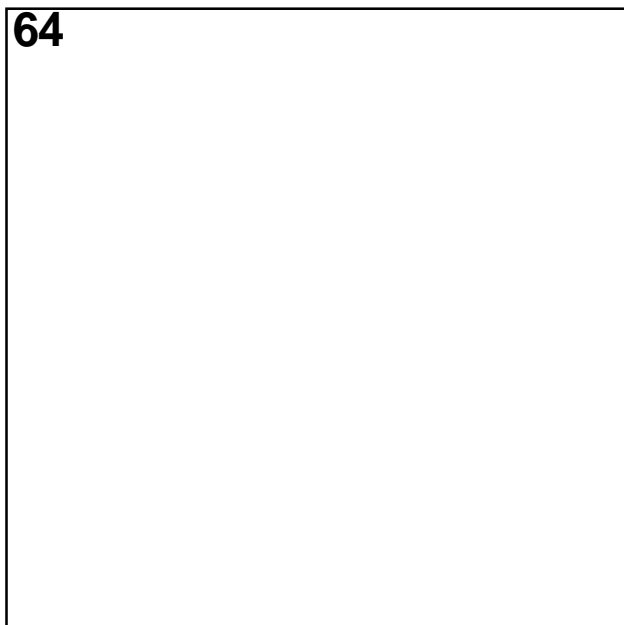


62. Fit a new, greased O-ring on the bearing holder.





63. Screw the lifting eyebolt into the shaft end. Carefully lower the rotor/shaft unit with bearing holder partly. Connect the sockets for the FLS10. Lower the rotor/shaft unit the last part, at the same time turning the bearing holder clockwise to the index mark. Check that the switch is between the coil end and the stator housing.



64. Bearing holder index. B = in line with the mark in the stator housing.



65. Grease the spring and fit it in position.



66. Fit a new, greased O-ring on the adapter.

**66**



67. Fit the adapter. Fit the screws with new sealing washers. Tighten diametrically opposite screws alternately by hand.

**67**



68. Place the flow diffuser in position. Press it down until it bottoms.

**68**





69a. Grease the shaft. Fit a new mechanical seal unit (oiled). N.B. Check that the drive pin engages in the drive groove in the shaft.  
(Picture shows version without cooling jacket)



69b. See 69a. (Picture shows version with cooling jacket)



70a. Fit the circlip (version without cooling jacket).

70b. Fit the circlip (version with cooling jacket).

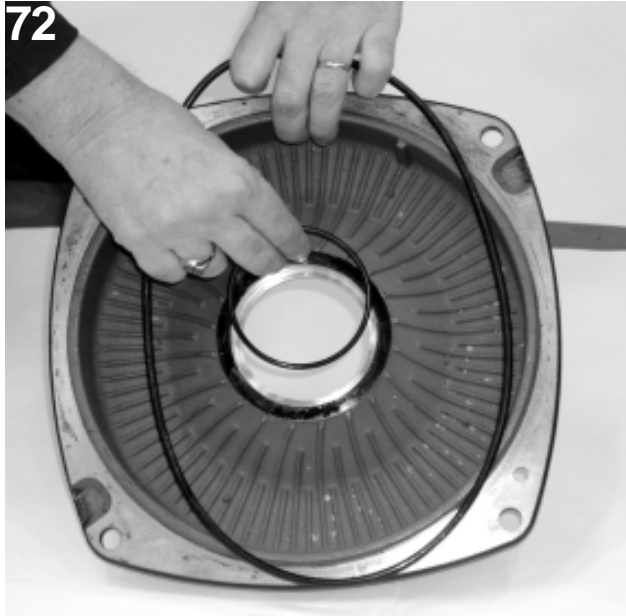


71a. Use a suitable sleeve to press down the circlip (version without cooling jacket).



71b. Press down the circlip (version with cooling jacket).





72. Fit new, greased O-rings to the cooling bottom.



73a. Fit the cooling bottom (version without cooling jacket).



73b. Fit the cooling bottom (version with cooling jacket).

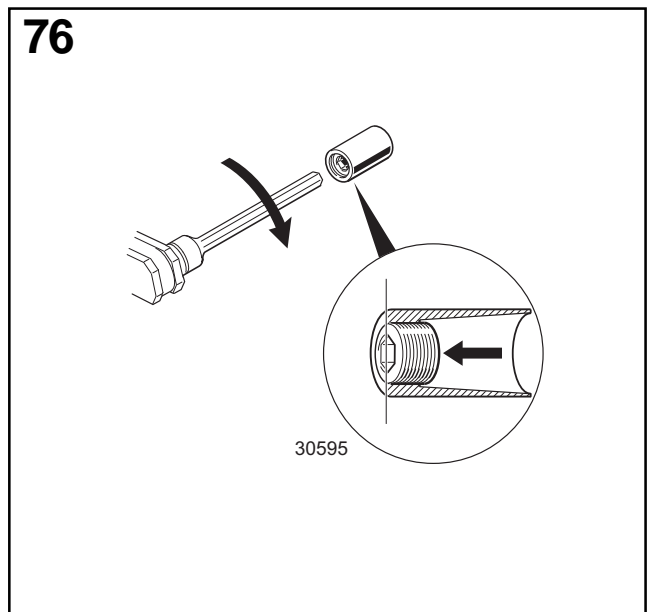
74. Tighten the screws alternately (22Nm).



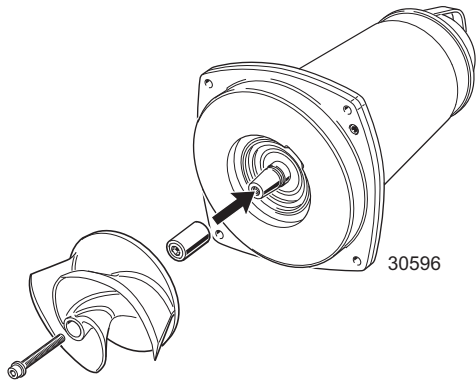
75. Grease the shaft end.



76. Grease the conical sleeve and the threads of the gland screw. Adjust the gland screw so that it is flush with the sleeve.





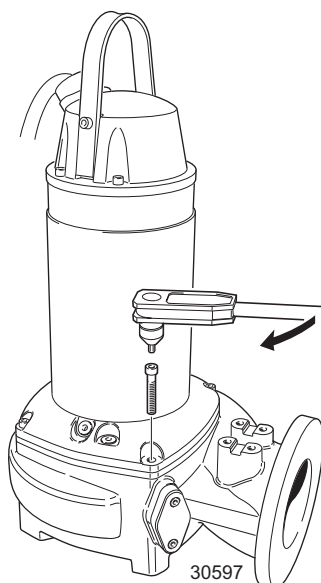
**77**

77. Fit the sleeve and impeller to the shaft. Fit the impeller screw by hand just to prevent the impeller from falling off.

## Procedure for CT-version, see pages 53-57

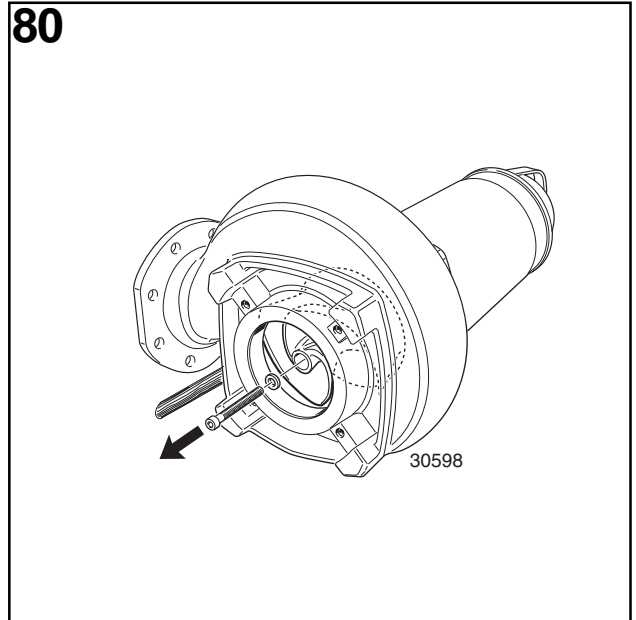
**78**

78. Fit a new greased O-ring on the cooling bottom.

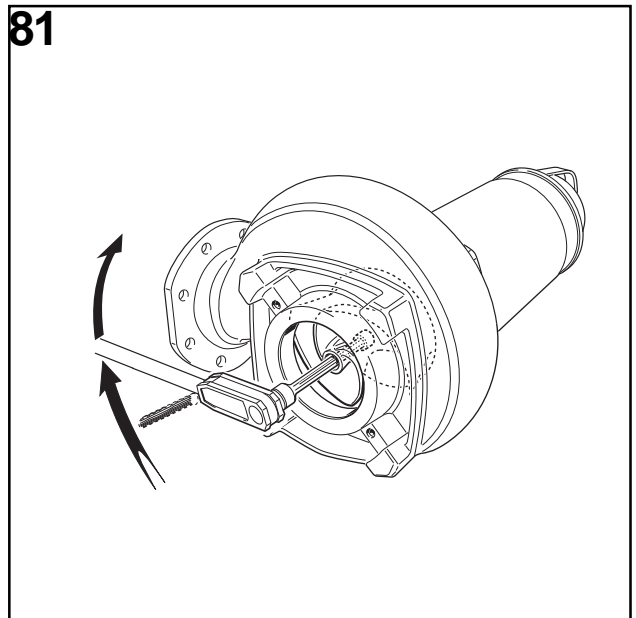
**79**

79. Fit the drive unit to the pump housing. Adjust its position so that the inspection hole is on the same side as the hole for the flush valve. Tighten the screws in diagonally opposite pairs (76 Nm).

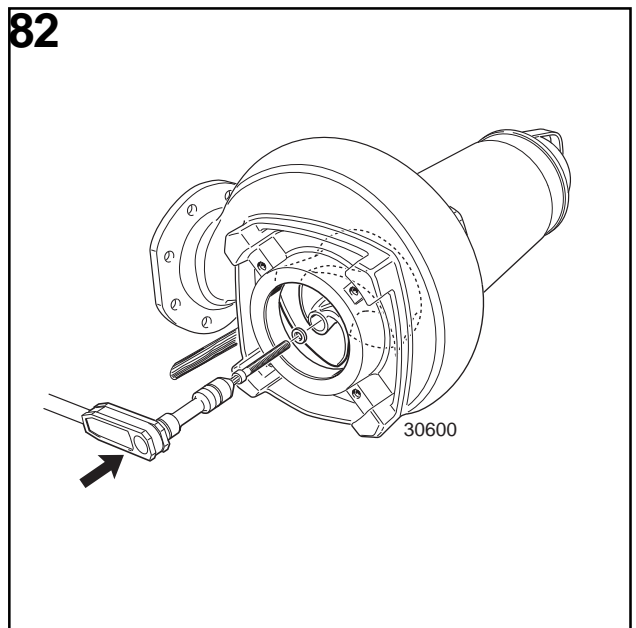
80. Remove the flush valve cover. Insert a rod (wooden or plastic) through the hole. Remove the impeller screw.



81. Turn the gland screw clockwise until the impeller makes contact with the pump housing. Tighten it a further 1/8 turn.



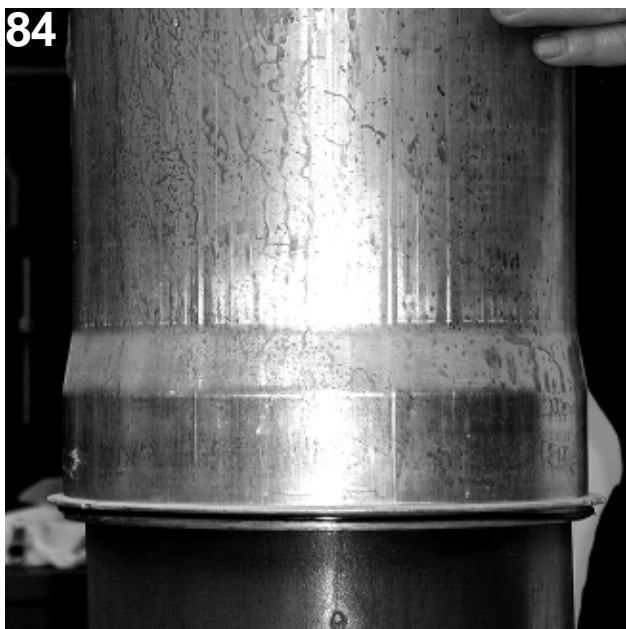
82. Fit the washer and the greased impeller screw and tighten it (76 Nm). Check that the impeller rotates freely.





**83**

83. Raise the pump. Remove the stand. Fit a new greased O-ring to the inner cooling jacket.

**84**

84. Fit the inner cooling jacket.

**85**

85. Fit the washers and screws and tighten alternately in diagonally opposite pairs (7 Nm).

86. Fit a new greased O-ring to the adapter.



87. Fit the outer cooling jacket.



88. Fit a new greased O-ring between the stator housing and the outer cooling jacket.





89. Fit a new greased O-ring to the connection cover.



90. Connect the motor cable leads in accordance with the wiring diagram on the inside of the connection cover (see Fig. 89).



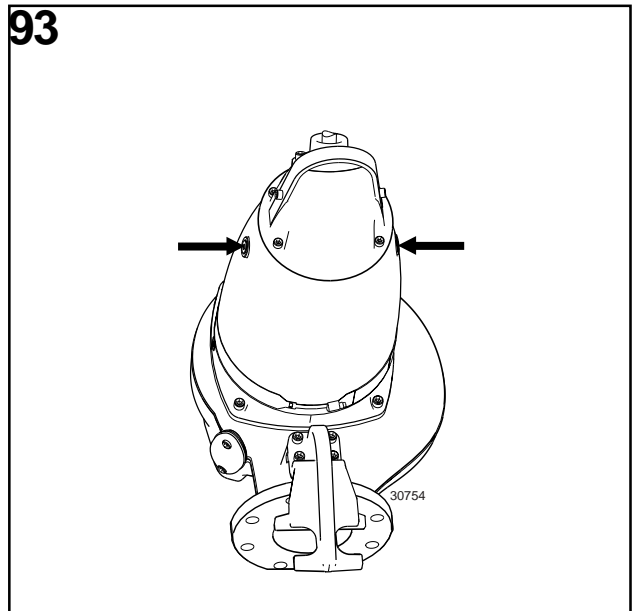
91. Fit the connection cover. Tighten the screws alternately in diagonally opposite pairs (44 Nm).

**Filling with coolant**  
**Version with cooling jacket**  
 (Fig. 92-93)

92. Fill with coolant until it overflows through the opposite hole (approx. 10,5 litres/ 11,2 US quarts).



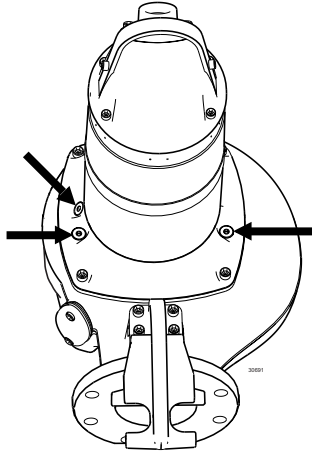
93. Tighten the coolant filling plugs (44 Nm).



**Filling with coolant**  
**Version without cooling jacket**  
 (Fig. 94-95)

94. Fill with coolant until it overflows through the opposite hole (approx. 2.2 litres/2,3 US quarts).



**95**

95.. Tighten the inspection and coolant filling plugs (44 Nm).

## REMOVING/INSTALLING/TRIMMING THE IMPELLER, DRY INSTALLED VERSION

96. Remove the drive unit from the pump housing.



97. Remove the impeller and the conical sleeve.



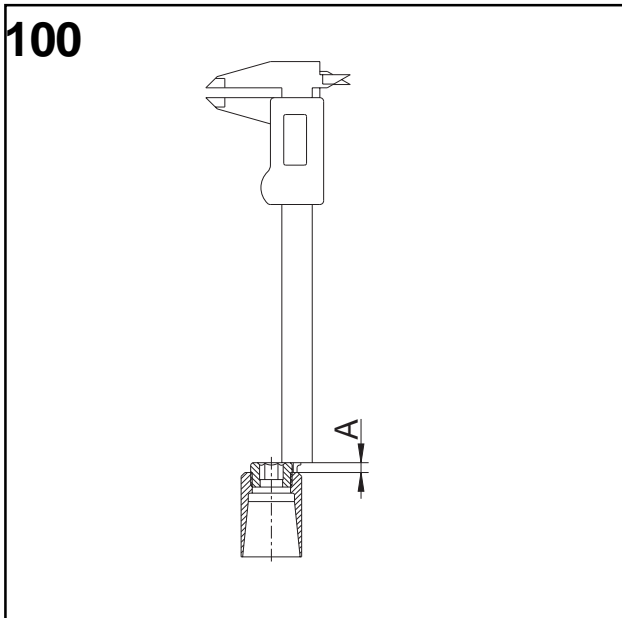
98. Grease the sleeve and the shaft end.



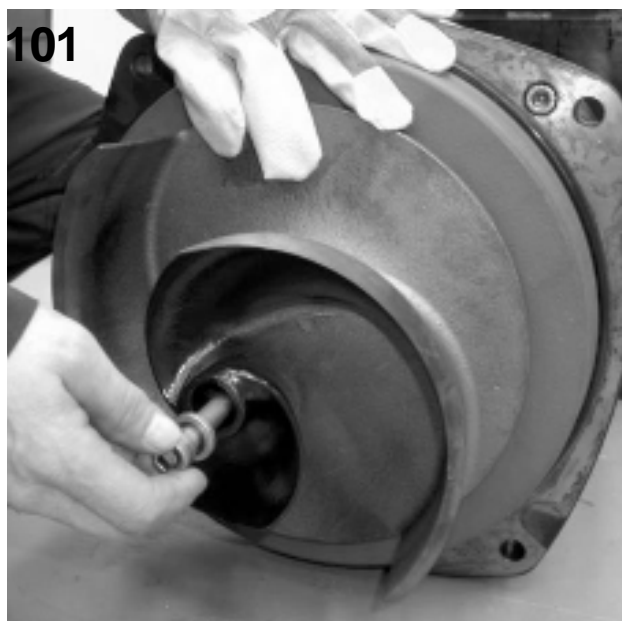




99. Unscrew the trim screw approximately 5 mm.



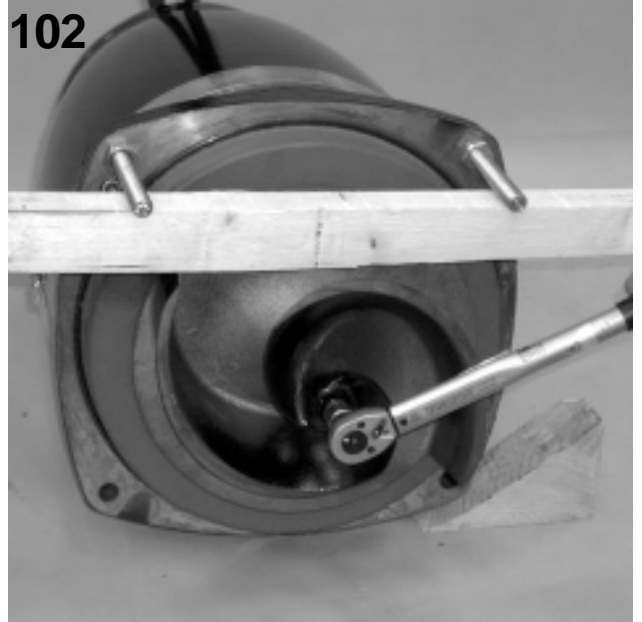
100. Measure and note the distance A. See. fig.



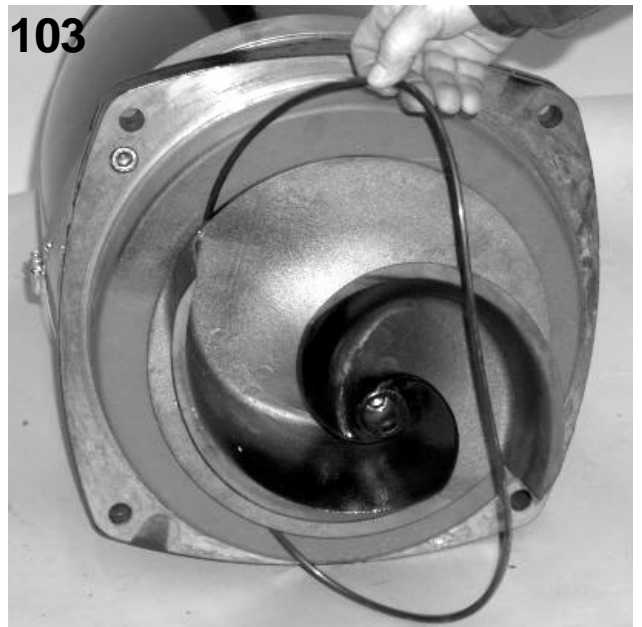
101. Fit the sleeve and the impeller to the shaft.



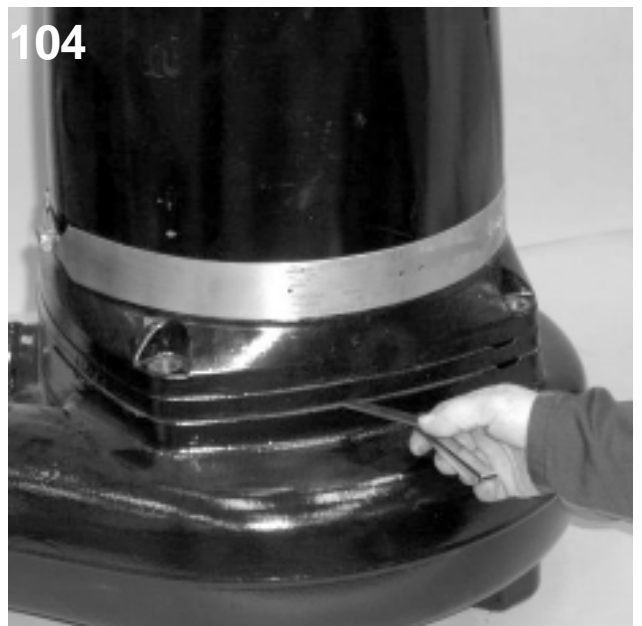
102. Fit the impeller screw with washer and tighten (76Nm).



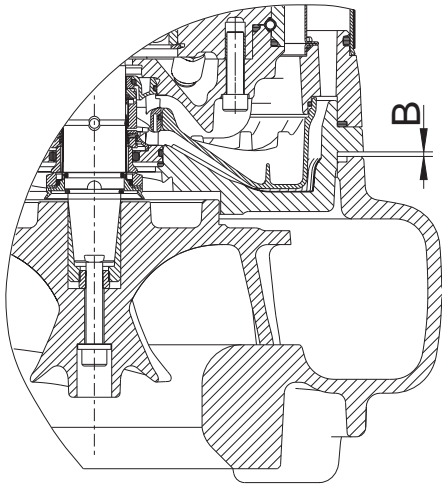
103. Make sure that the O-ring is removed from the seal housing cover.



104. Place the drive unit in the pump housing. Check the distance between the seal housing cover and the pump housing with a feeler gauge. Check diagonally at four spots.

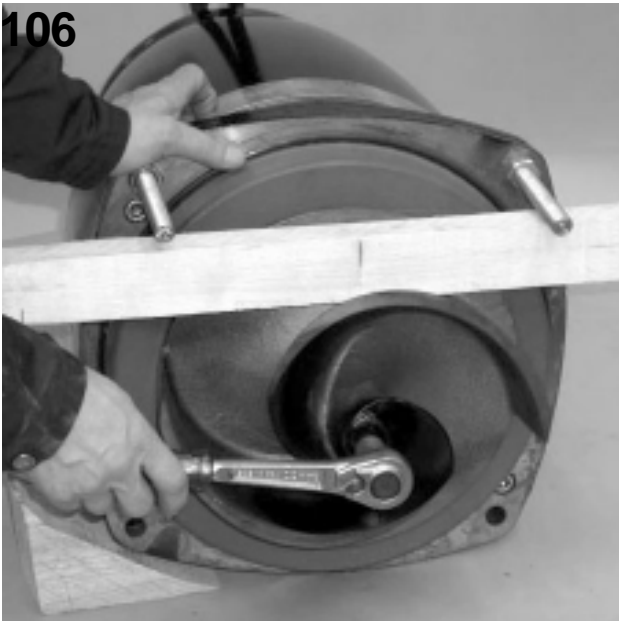


105



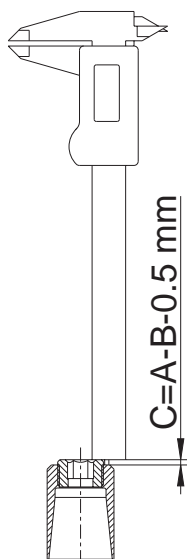
105. Note the largest measured distance, B. See fig.

106



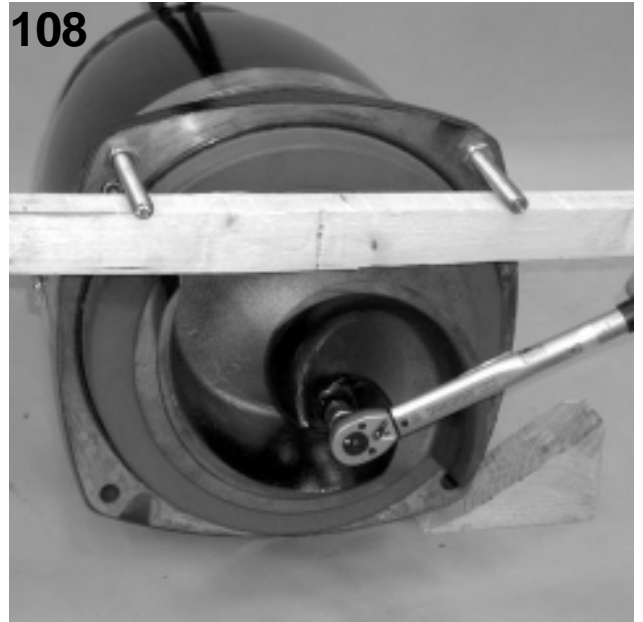
106. Lift the drive unit out of the pump housing and remove the impeller and conical sleeve.

107

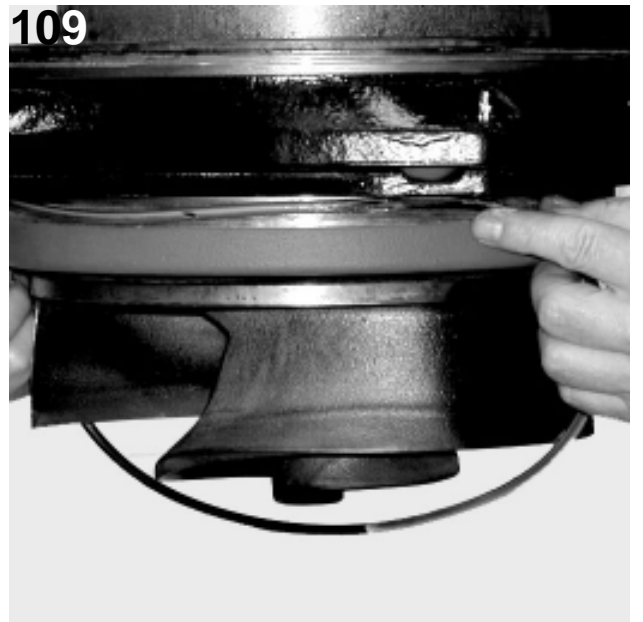


107. Calculate the measure C according to formula  $C = A - B - 0,5\text{mm}$ . Unscrew the trim screw until C is reached.

108. Fit the sleeve, impeller and impeller screw with washer and tighten (76 Nm).



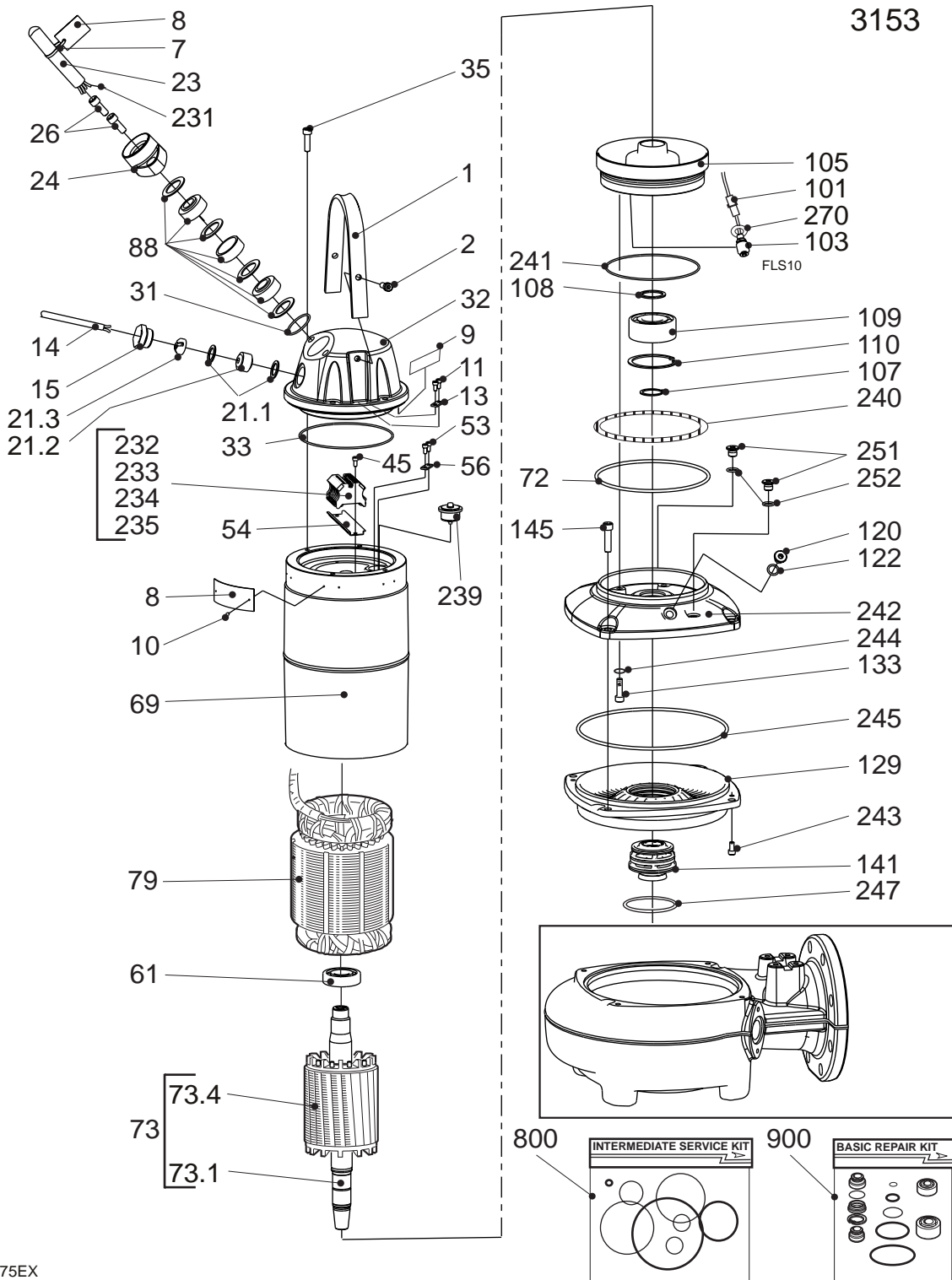
109. Fit a new greased O-ring to the seal housing cover.



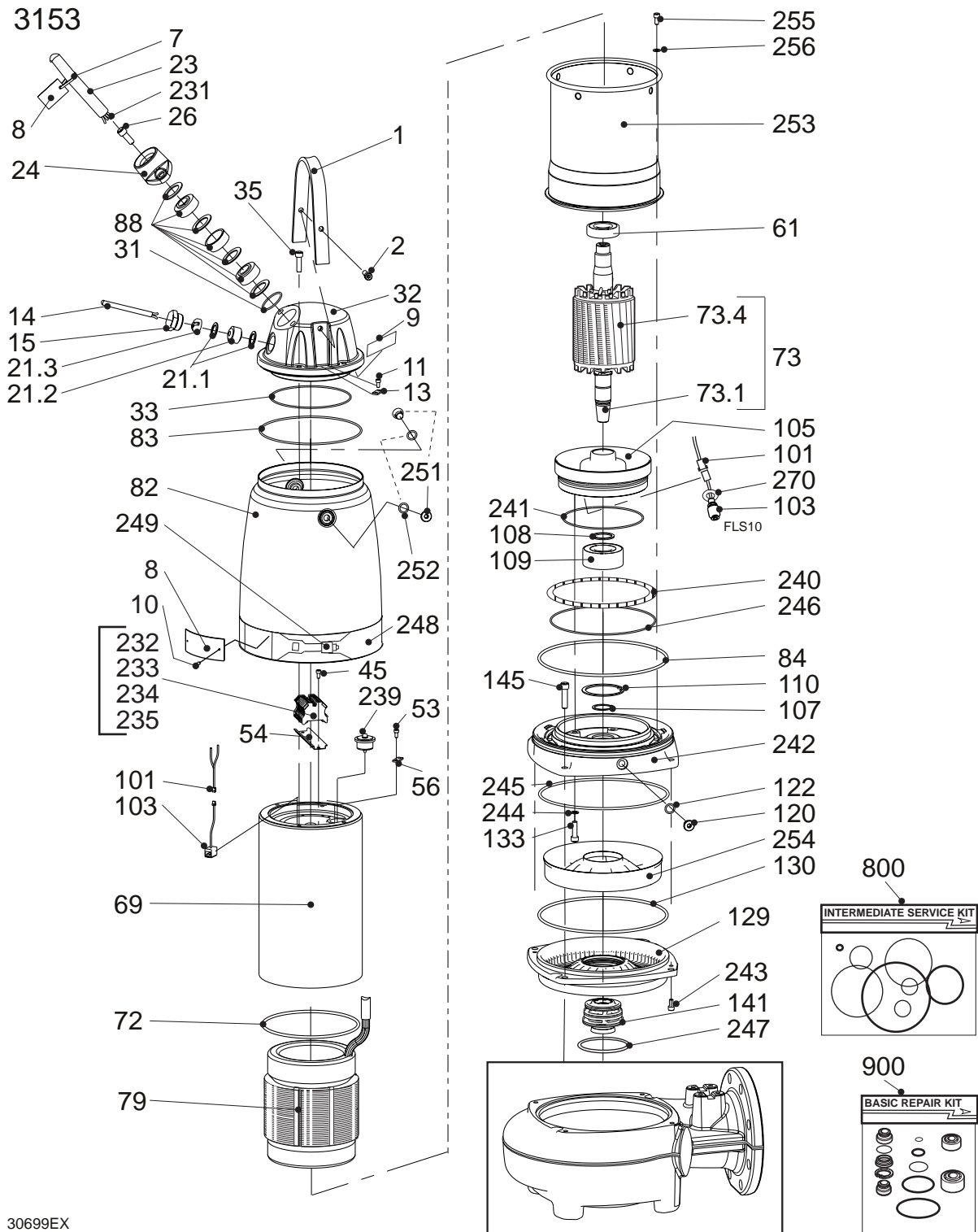
110. Place the drive unit in the pump housing. Adjust its position so that the inspection hole is on the same side as the hole for the flush valve. Tighten the screws diagonally (76 Nm).



# Exploded view, version without cooling jacket



# Exploded view, version with cooling jacket



30699EX

## Items description

<u>Item no</u>	<u>Denomination</u>	<u>Item no</u>	<u>Denomination</u>
1	Lifting handle	109	Ball bearing
2	Socket head screw	110	Retaining ring (circlip)
7	Cable tie	120	Inspection plug (screw)
8	Data plate	122	O-ring
9	Instruction plate	129	Seal housing cover
10	Drive screw alt. rivet	130	O-ring
11	Socket head screw	131	O-ring
13	Earthing plate (Ex-version only)	133	Socket head screw
14	Control cable (Ex-version only)	141	Mechanical seal unit
15	Gland screw	145	Socket head screw
21.1	Washer	231	Shrink hose
21.2	Seal sleeve	232	Terminal clamp
21.3	Clamp	233	Terminal clamp
23	Motor cable	234	Cross connection
24	Entrance flange	235	End support
26	Socket head screw	239	Lead through unit
31	O-ring	240	Spring
32	Connection cover	241	O-ring
33	O-ring	242	Adapter
35	Socket head screw	243	Socket head screw
45	Socket head screw	244	Seal ring
53	Socket head screw	245	O-ring
54	Rail	246	O-ring
56	Earthing plate	247	O-ring
61	Ball bearing	248	Strip
69	Stator housing	249	Clamp
72	O-ring	251	Inspection plug
73	Shaft unit	252	O-ring
73.1	Shaft	253	Cooling jacket (inner)
73.4	Rotor	254	Flow diffuser
79	Stator	255	Socket head screw
82	Cooling jacket (outer)	256	Washer
83	O-ring	270	Lock washer (Ex-version only)
84	O-ring		
88	Cable entry unit		
101	Cable unit		
103	Level sensor		
105	Bearing holder		
107	Retaining ring (circlip)		
108	Supporting washer		

# SERVICE LOG

Most recent service date	Pump No.	Hours of operation	Remarks	Sign.



# NOTES

A large rectangular area for writing notes, featuring horizontal dashed lines for text entry.



