SERVICE MANUAL

DOC. NO. 438.9206-25/03 EDITION 49.2004

SU620, SU630, SU640, SU655, SU675 Emerald, Selecta

NOTICE TO SERVICE PERSONNEL

INSTALLATION

Improper installation of Wascomat laundry and wet cleaning equipment can result in personal injury and severe damage to the machine.

REFER INSTALLATION TO QUALIFIED PERSONNEL!

RISK OF ELECTRIC SHOCK

The equipment utilizes high Voltages. Disconnect electric power before servicing.
The use of proper service tools and techniques, and the use of proper repair procedures, is essential to the safety of service personnel and equipment users.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL!

RISK OF PERSONAL INJURY

This equipment contains moving parts, and some components that may have sharp edges. Improper or careless service procedures may result in serious injury to service personnel.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL!

ABOUT THIS MANUAL

This manual is intended to provide service guidance to qualified service personnel. Wascomat and its authorized dealers make no determination regarding the qualification of individuals requesting this service manual. The service provider assumes all risks inherent to the servicing of this equipment and any risks that arise as result of the lack of knowledge or ability of any person servicing this equipment.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL!

NOTE:

Improper installation or servicing of Wascomat equipment will void the manufacturer's warranty!

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Service Manual

SU620, SU630, SU640, SU655, SU675
Emerald, Selecta

WARNING: ALL OPERATING AND MAINTENANCE PROCEDURES SHOWN ON THE NEXT PAGE OF THIS MANUAL MUST BE FOLLOWED DAILY FOR PROPER OPERATION OF YOUR WASCOMAT MACHINE.

PLEASE ENTER THE FOLLOWING INFORMATION AS IT APPEARS ON THE MACHINE(S) DATA PLATE(S).

MACHINE TYPE OR MODEL	
MACHINE SERIAL NUMBER(S)	
ELECTRICAL CHARACTERISTICS: _____ VOLTS, _____ PHASE, _____ HZ.	

MAKE CERTAIN TO KEEP THIS MANUAL IN A SECURE PLACE FOR FUTURE REFERENCE.

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SAFETY AND WARNINGS SIGNS

Replace If Missing Or Illegible

One or more of these signs must be affixed on each machine as indicated, when not included as part of the front instruction panel.

LOCATED ON THE OPERATING INSTRUCTION SIGN OF THE MACHINE:

CAUTION

1. Do not open washer door until cycle is completed, operating light is off, and wash cylinder has stopped rotating.
2. Do not tamper with the door safety switch or door lock.
3. Do not attempt to open door or place hands into washer to remove or add clothes during operation. This can cause serious injury.

MACHINE MUST NOT BE USED BY CHILDREN

PRECAUCION

1. No abra la puerta de la máquina lavadora sino hasta que la máquina haya terminado su ciclo, la luz operativa esté apaga da y el cilindro de lavado haya completamento terminado de girar.
2. No interferia o manipule el switch o la cerradura de la puerta.
3. No trate de abrir la puerta o meta las manos dentro de la máquina para meter o sacar ropa mientras la máquina está en operación, pues puede resultar seriamento herido.

LAS MÁQUINAS NO DEBEN SER USADAS POR NIÑOS

LOCATED AT THE REAR OF THE MACHINE:

INSTALLATION AND MAINTENANCE WARNINGS – *AVERTISSEMENT*

1. **This machine MUST be securely bolted according to the installation instructions, to reduce the risk of fire and to prevent serious injury, or damage to the machine.**
   Pour reduire les risques d'incendie, fixer cet appareil sur un plancher beton sans revetement.
2. **If installed on a floor of combustible material, the floor area below this machine must be covered by a metal sheet extending to the outer edges of the machine.**
3. **This machine MUST be connected to a dedicated electrical circuit to which no other lightning unit or general purpose receptacle is connected. Use copper conductor only.**
   Utiliser seulement des conducteurs en cuivre.
4. **This machine MUST be serviced and operated in compliance with manufacturer's instructions. CHECK DOOR LOCK EVERY DAY FOR PROPER OPERATION TO PREVENT INJURY OR DAMAGE. IF THE DOOR LOCK FAILS TO OPERATE PROPERLY, PLACE THE MACHINE OUT OF ORDER UNTIL THE PROBLEM IS CORRECTED.**
5. **Disconnect power prior to servicing of machine.**
   Deconnecter cet appareil del'alimentation avant de proceder a l'entretien.
6. **To remove top panel, first remove screws at the rear. When remounting the top, reinstall them. To remove the top panel on models on which it is secured by one or two keylocks, use the keys provided in the drum package. Be certain to relock after remounting the top panel.**

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DISTRIBUTED BY WASCOMAT, INWOOD, NEW YORK, USA

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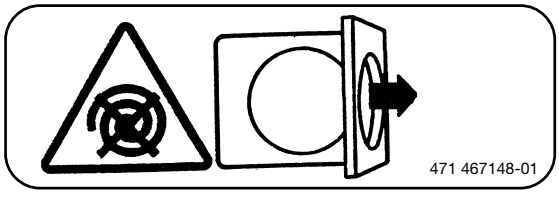
LOCATED ON THE DOOR:

If you need to order more safety or warning signs, call Wascomat's parts department at 516-371-2000, or call your local dealer.



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NOTICE TO: OWNERS, OPERATORS AND DEALERS OF WASCOMAT MACHINES

IMPROPER INSTALLATION AND INADEQUATE MAINTENANCE, POOR HOUSEKEEPING AND WILLFUL NEGLECT OR BYPASSING OF SAFETY DEVICES MAY RESULT IN SERIOUS ACCIDENTS OR INJURY. TO ASSURE THE SAFETY OF CUSTOMERS AND/OR OPERATORS OF YOUR MACHINE, THE FOLLOWING MAINTENANCE CHECKS MUST BE PERFORMED ON A DAILY BASIS.

1. Prior to operation of the machine, check to make certain that all operating instructions and warning signs are affixed to the machine and legible. (See the following page of this manual for description and location of the signs.) Missing or illegible ones must be replaced immediately. Be sure you have spare signs and labels available at all times. These can be obtained from your dealer or Wascomat.

2. Check the door safety interlock, as follows:

   (a) OPEN THE DOOR of the machine and attempt to start in the normal manner:

   For CLARUS microprocessor models, choose a program and press the START button.

THE MACHINE(S) MUST NOT START !

   (b) CLOSE THE DOOR to start machine operation and, while it is operating, attempt to open the door without exerting extreme force on the door handle. The door should remain locked!

   If the machine can start with the door open, or can continue to operate with the door unlocked, the door interlock is no longer operating properly. The machine must be placed out of order and the interlock immediately repaired or replaced. (See the door interlock section of the manual.)

3. DO NOT UNDER ANY CIRCUMSTANCES ATTEMPT TO BYPASS OR REWIRE ANY OF THE MACHINE'S SAFETY DEVICES, AS THIS CAN RESULT IN SERIOUS ACCIDENTS.

4. **Be sure to keep the machine(s) in proper working order**: Follow **all** maintenance and safety procedures. Further information regarding machine safety, service and parts can be obtained from your dealer or from Wascomat through its Technical Support Department - 516/371-0700.

All requests for assistance must include the model, serial number and electrical characteristics as they appear on the machine identification plate. Insert this information in the space provided on the previous page of this manual.

5. **WARNING**: DO NOT OPERATE MACHINE(S) WITH SAFETY DEVICES BYPASSED, REWIRED OR INOPERATIVE! DO NOT OPEN MACHINE DOOR UNTIL DRUM HAS STOPPED ROTATING!

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Safety Precautions

- The machine is only intended for washing with water.
- Do not allow minors to operate the machine.
- Installation and maintenance work should only be done by authorized persons.
- Do not bypass the door lock of the machine.
- Any leaks, e.g. a worn-out door seal, should be repaired immediately.
- Prior to repairs or maintenance, be sure to read the corresponding handbooks and service manuals.
- Do not flush the machine with water.

Warnings

The service manual includes the following warnings that warn of possible injuries. Next to each warning text, a page reference refers to the page where the warning can be found in the manual.

DANGER

Be careful when measuring the electric components in the motor control. All components have a potential difference of approx. 300 V in relation to protective earth and neutral. When the green LED on the motor control card is lit, the components carry dangerous voltages. The motor control lose all voltage about 10-30 seconds after the voltage has been disconnected and the motor has stopped.

Chapter 30, pages 2 and 5.

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Technical data

		SU620	SU630	SU640	SU655	SU675
Innerdrum						
volume	litres/ft³	85/3.0	130/4.6	180/6.4	250/8.8	330/11.7
diameter	mm/inch	520/20 1/2	595/23 7/16	650/25 9/16	725/28 9/16	795/31 5/16
Drum speed						
wash	rpm	52	49	44	44	42
extraction	rpm	528/694*	494/649*	471/619*	446/587*	427/561*
Heating						
electricity	kW	5.4/7.5	7.5/10	13	18	23
steam		x	x	x	x	x
hot water		x	x	x	x	x
G-factor		81/140*	81/140*	81/140*	81/140*	81/140*
Weight, net	kg/lbs	136/300	175/386	228/503	287/633	330/727

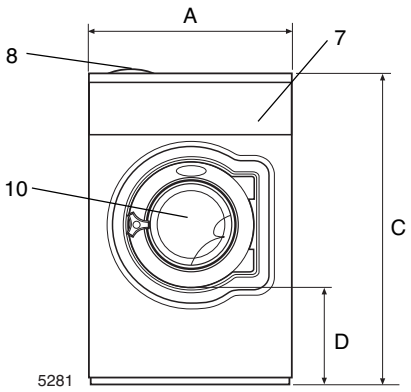
* SU-model

Connections

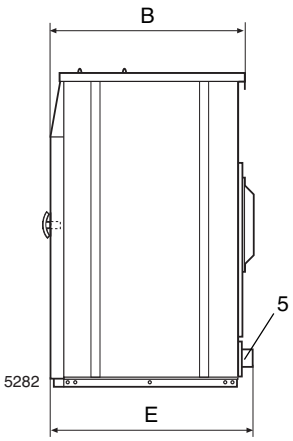
		SU620	SU630	SU640	SU655	SU675
Water valves connection		DN20 3/4"	DN20 3/4"	DN20 3/4"	DN20 3/4"	DN20 3/4"
Rec. water pressure	psi	30-90	30-90	30-90	30-90	30-90
	kPa	200-600	200-600	200-600	200-600	200-600
Functioning limits for water valve	psi	8-145	8-145	8-145	8-145	8-145
	kPa	50-1000	50-1000	50-1000	50-1000	50-1000
Capacity at 45 psi (300 kPa)	gallon/min	5	5	5	15	15
	l/min	20	20	20	60	60
Drain valve	inch	3	3	3	3	3
	outer Ø mm	75	75	75	75	75
Draining capacity	gallon/min	45	45	45	45	45
	l/min	170	170	170	170	170
Steam valve connection		DN15 1/2"	DN15 1/2"	DN15 1/2"	DN15 1/2"	DN15 1/2"
Rec. steam pressure	psi	45-90	45-90	45-90	45-90	45-90
	kPa	300-600	300-600	300-600	300-600	300-600
Functioning limits for steam valve	psi	8-115	8-115	8-115	8-115	8-115
	kPa	50-800	50-800	50-800	50-800	50-800

1	Electrical connection
2	Cold water
3	Hot water
4	Steam connection
5	Drain
6	Liquid detergent supply
7	Control panel
8	Soap box
9	Water reuse
10	Door opening, SU620: ø310, SU630: ø365, SU640: ø395, SU655, SU675: ø435

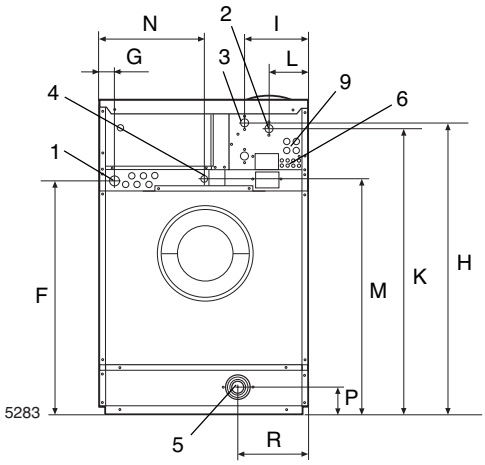
	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R
SU620	660	730	1115	355	765	825	45	1030	215	1010	130	830	385	-	100	210
SU630	720	790	1200	365	825	910	45	1115	215	1095	130	910	420	-	100	235
SU640	750	830	1325	365	825	1035	45	1245	130	1225	210	1040	325	295	100	225
SU655	830	955	1410	435	915	1120	45	1330	160	1290	245	1125	325	325	100	265
SU675	910	1040	1445	500	1075	1155	45	1365	160	1325	245	1155	280	325	100	210



Front

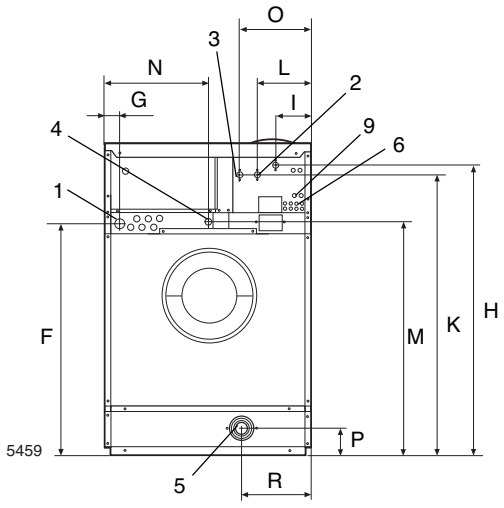


Right side



Rear side

SU620-SU630



Rear side

SU640-SU675

	620	630	640	655	675
Frequency of the dynamic force Hz	11.6	10.8	10.3	9.8	9.4
Max floor load at extraction lbs force	269±585	382±832	495±1056	629±1304	854±1551
kN	1.2±2.6	1.7±3.7	2.2±4.7	2.8±5.8	3.8±6.9

SU620

Uppvärmnings-alternativ	Spännings-alternativ	Totaleffekt kW	Säkring A
Utan uppvärmning eller Ångupp-värmning	120 V 1 AC	0.65	16
	200 V 3 AC	0.95	10
	208-240 V 1 AC	0.75	10
	208-240 V 3 AC	0.75	10
	400-415 V 3/3N AC	0.75	10
	440 3/3N AC	0.75	10
Eluppvärmning	230-240 V 1 AC	5.7	32
	230-240 V 1 AC	7.8	40
	208-240 V 3 AC	4.9	16
	208-240 V 3 AC	6.6	20
	230-240 V 3 AC	5.7	16
	230-240 V 3 AC	7.8	25
	400-415 V 3/3N AC	5.7	10
	400-415 V 3/3N AC	7.8	16
	440 V 3/3N AC	5.7	10
	440 V 3/3N AC	7.8	16

SU630

Uppvärmnings-alternativ	Spännings-alternativ	Totaleffekt kW	Säkring A
Utan uppvärmnig eller Ångupp-värmning	200 V 3 AC	1.1	10
	208-240 V 1 AC	1.1	10
	230-240 V 1 AC	1.1	10
Eluppvärmning	208-240 V 3AC	1.1	10
	208-240 V 3 AC	7.9	25
	208-240 V 3 AC	10.4	32
	400-415 V 3/3N AC	7.9	16
	400-415 V 3/3N AC	10.4	20
	440 V 3/3N AC	7.9	16
	440 V 3/3N AC	10.4	16

SU640

Uppvärmnings-alternativ	Spännings-alternativ	Totaleffekt kW	Säkring A
Utan uppvärmning eller Ångupp-värmning	208-240 V 1 AC	1.7	16
Eluppvärmning	208-240 V 3 AC	13.5	40
	400-415 V 3/3N AC	12.5	25
	440 V 3/3N AC	13.2	25

SU655

Uppvärmnings-alternativ	Spännings-alternativ	Totaleffekt kW	Säkring A
Utan uppvärmnig eller Ångupp-värmning	208-240 V 3 AC	2.2	16
Eluppvärmning	208-240 V 3 AC	18.6	63
	400-415 V 3/3N AC	17.3	32
	440 V 3/3N AC	18.6	32

SU675

Uppvärmnings-alternativ	Spännings-alternativ	Totaleffekt kW	Säkring A
Utan uppvärmnig eller Ångupp-värmning	208-240 V 3 AC	3	10
Eluppvärmning	208-240 V 3 AC	26	80
	400-415 V 3/3N AC	26	40
	440 V 3/3 N AC	26	40

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Description

General

Fig. 1 The machines covered in this manual include the following models:

Drum volume (gallon)	Model type
22.5	SU620
34.4	SU630
47.6	SU640
66	SU655
87.2	SU675

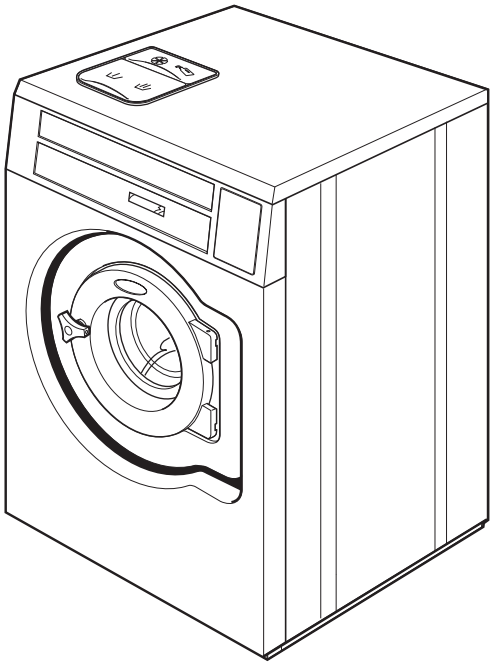
The machines feature an electronic programme unit with fixed washing programmes that may be changed using optional accessories. The programme unit also has an in-built self-diagnosis programme, which increases the possibilities for quick troubleshooting.

The motor is frequency-controlled and is controlled by an advanced motor control. This allows precise and flexible control of the motor rpm for any application.

The machines are supplied to customer specifications with e.g. electric or steam heating or no heating, and may be connected to various combinations of cold, warm and hard water.

The machines are designed for installation in hotels, laundries (such as apartment buildings and coin laundries), factories, hospitals, various institutions, etc.

1



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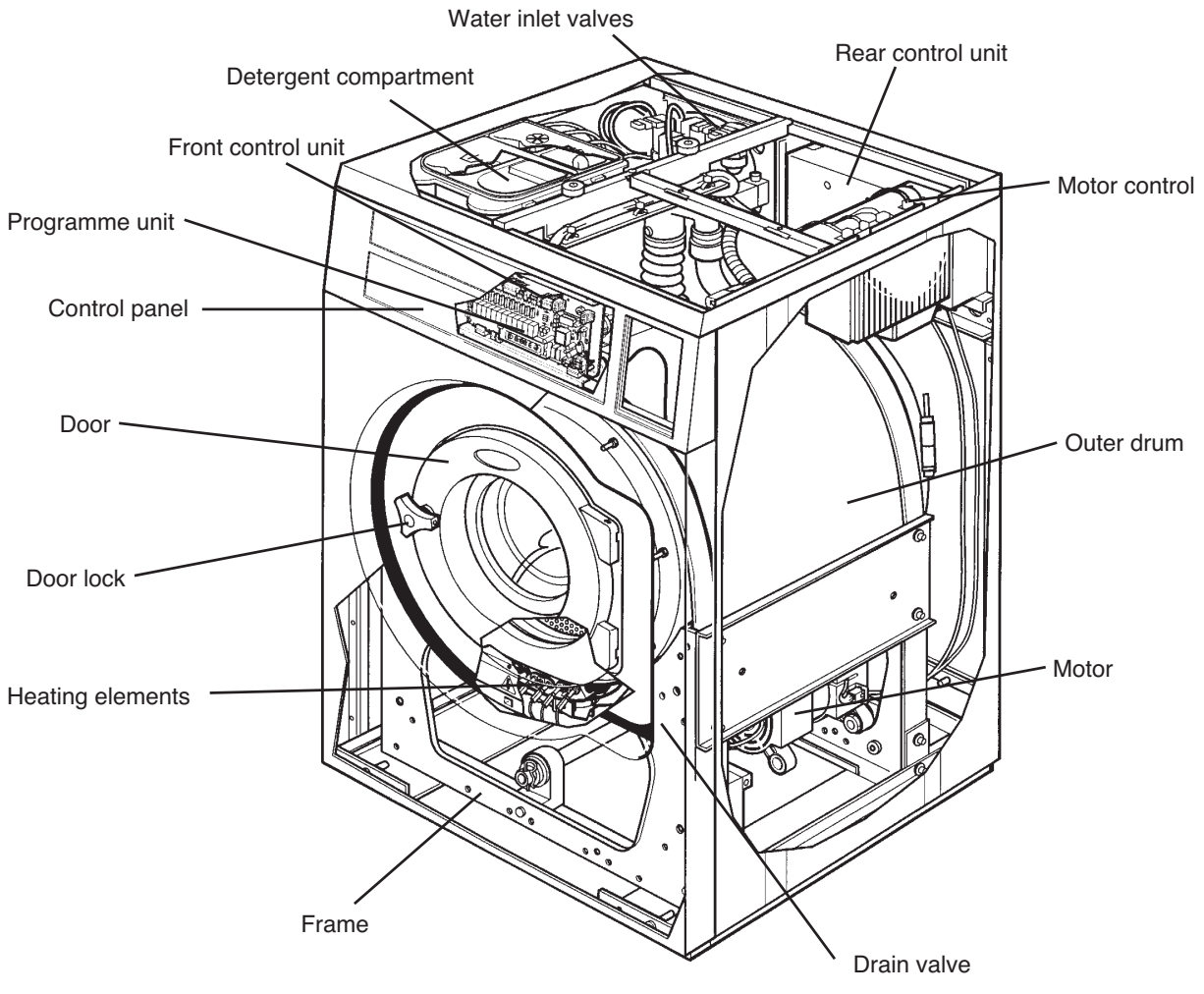
Function

General

Fig. 2 This section presents a general overview of the functions of the machine. Most functions are then presented in detailed in separate chapters later on in this service manual.

2



Programme unit

Fig. 3

The control panel has seven buttons for selection of fixed machine programmes, two or four optional buttons and a combined start/pause button with rapid advance. The panel also has six symbols and ten LEDs, which indicate the progress of the selected programme. Furthermore, there is a display for water temperature, remaining programme time and error indications.

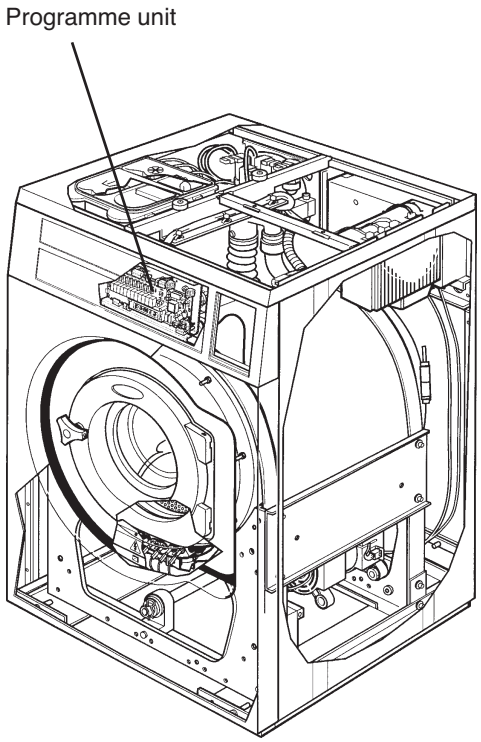
Using the instantaneous values from the motor, the machine weighs the loaded laundry prior to each wash and then adapts the amount of water to the laundry in the machine.

Fig. 4

The programme unit controls the water valves, drain valve and heating via the communication card in the rear control unit. This unit can also be connected to send control signals to external units for detergent pumps and external water valves.

The programme unit of the machine is described in detail in section **23. Programme unit**.

3



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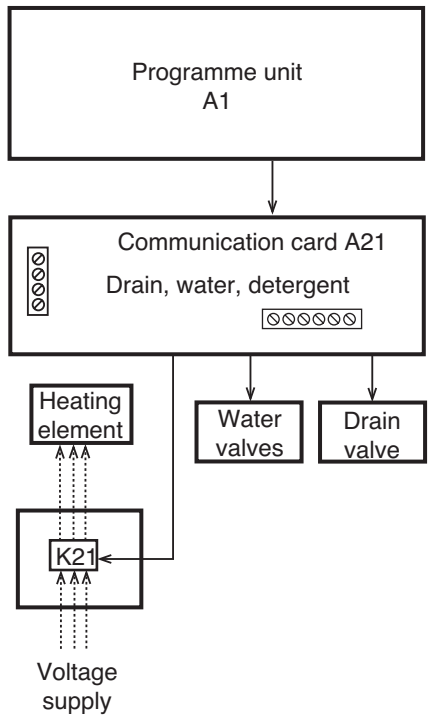

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Motor and motor controller

Fig. 5 A frequency-regulated motor using a drive belt drives the drum. The motor is situated on a motor shelf, under the outer drum with a tensioner device for the drive belt.

Fig. 6 The motor control relies on microcomputer-control and controls acceleration, rpm and retardation of the laundry drum with high precision. Further, the motor control can supply simultaneous values that can be used as warnings for unbalanced loads and to calculate the weight of the load.

The motor control communicates with the programme unit through a serial interface.

The motor and motor control is described in detail in section **30. Motor and motor control**.

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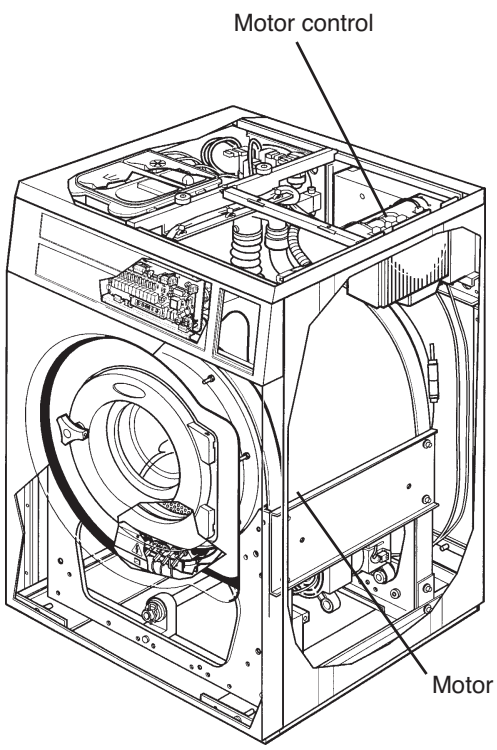

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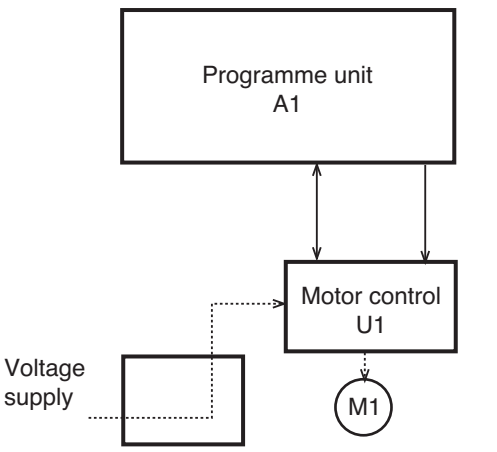

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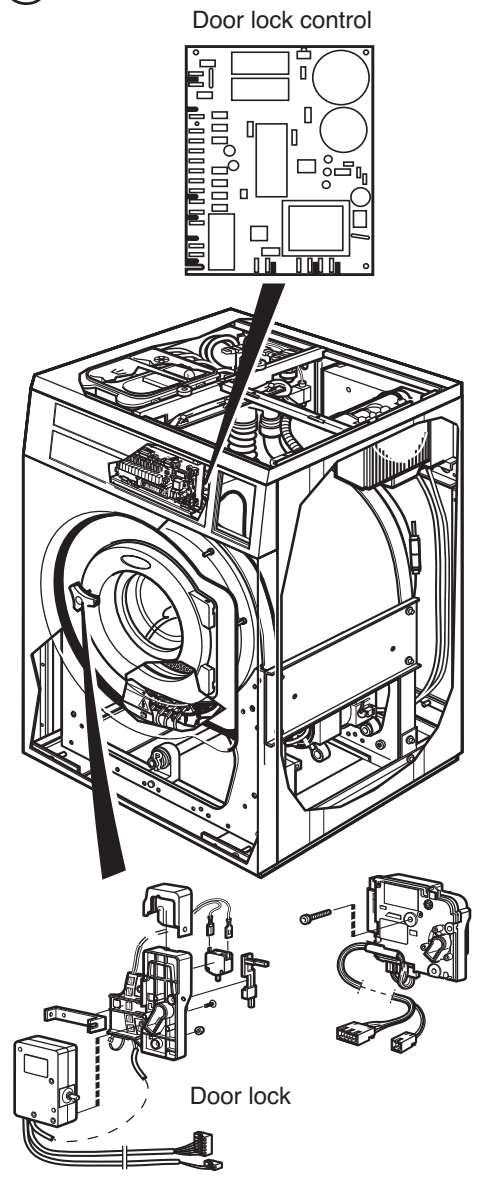
Door lock

Fig. 7 The door lock is an electro-mechanical type with double safety switches. The lock is bi-stable, i.e., it needs to receive an active pulse from the control in order both to lock and unlock the door.

Fig. 8 A separate printed circuit board, called door lock control, can be fitted onto the programme unit. This board controls locking and unlocking. The card has separate checks for empty drum and stopped drum. Together with the checks built into the programme unit, this guarantees that the door cannot be opened by a mistake.

The door lock on the machine is described in detail in section **29. Door and door lock**.

7



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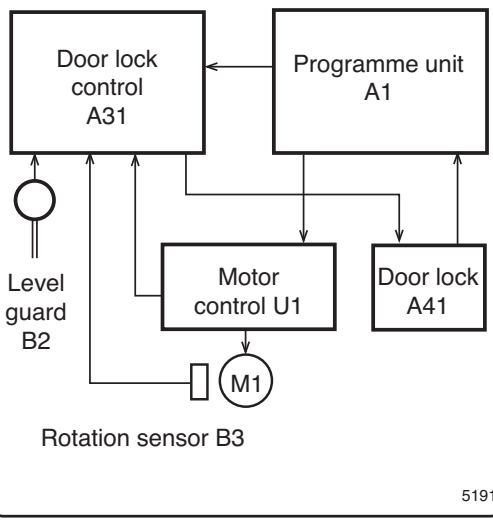


Heating

Fig. 9 When using electric heating, the water for washing is heated by three heating elements accessible from the front of the machine.

The machine can also be fitted with steam heating using a steam valve fitted on the rear of the machine.

The heating system of the machine is described in detail in section **40. Heating**.

Water connections

Fig. 9 Depending on the machine size and customer specifications, the machine has one, two, three or four inlet valves.

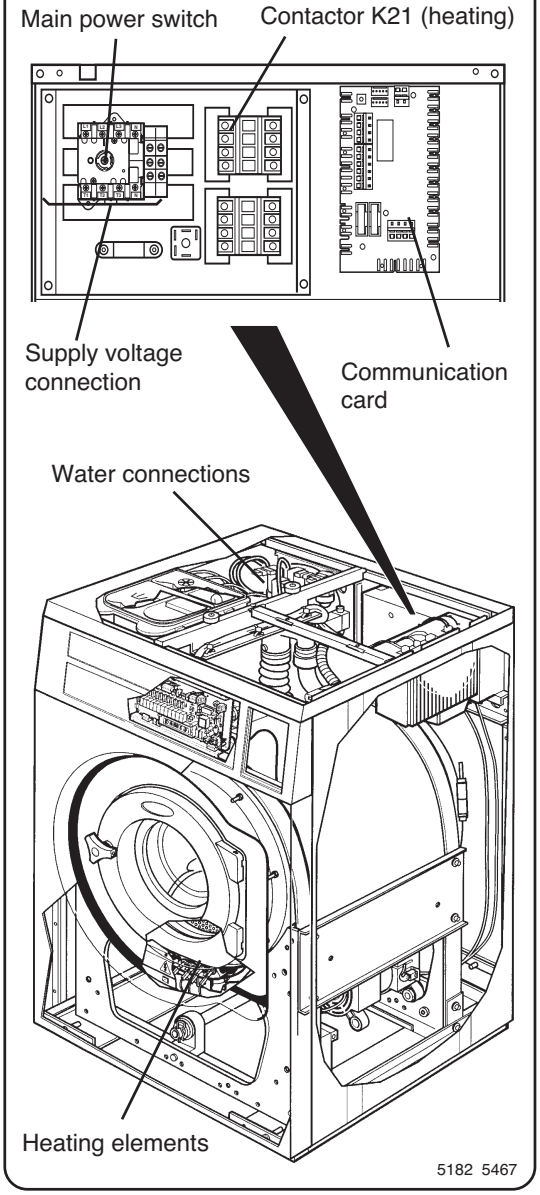
This unit also holds eight connectors for external detergent supply.

Rear control unit

Fig. 9 This box contains the main power switch or a connection block for the input voltage, heating contactor and a communication card with outputs that control the water and drain valves of the machine as well as the heating. There are also connection blocks for connection to e.g., an external detergent supply.

The rear electric box of the machines is described in detail in section **21. Control unit**.

9



Detergent compartment

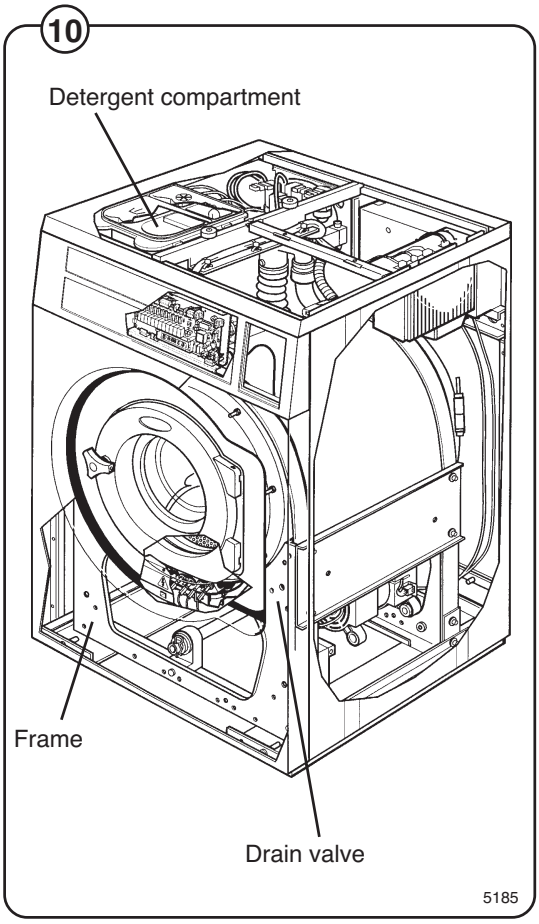
Fig. (10) The compartment is divided into four for pre-wash, main wash, rinse and bleaching-agent/ liquid detergent.

The detergent compartment of the machine is described in detail in section **39. Detergent compartment**.

Drain valve

Fig. (10) This valve is a diaphragm valve that opens and closes by way of the water pressure. The control valve is situated next to the water valves.

The drain valve of the machine is described in detail in section **38. Drain valve**.



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To keep your machine in proper working order, follow the preventive maintenance recommendations provided below.

The maintenance interval should be adjusted according to machine usage. The suggested schedule assumes an 8 hour work day, and a 5 day work week..

Daily

- Check the door and door lock:
  - Open the door and try starting the machine. The machine MUST NOT START.
  - Close the door, start the machine and try opening the door. It MUST NOT BE POSSIBLE TO OPEN THE DOOR WHILE THE MACHINE IS OPERATING!
  - Check that the door does not leak.
  - Clean the door seal, removing any detergent and fluff.
- Check that the drain valve does not leak during the wash cycle.
- Clean out any detergent remaining in the detergent compartment. Rapid advance through a program and let the water rinse the compartment.
- Inspect liquid chemical tubing and connections for leaks. Repair as necessary.

Every third month (refer this service to qualified personnel)


May only be carried out by authorized personnel.

- Check that the door does not leak.
- Check the drain valve and remove any lint.
- Inspect the interior of the machine (during an actual wash cycle to ensure that no leaks are noticed) by:
  - Turning of the main power switch of the machine.
  - Remove the top cover and the protective front and rear plates.
  - Cover the detergent dispenser to prevent water from splashing inside the machine.
  - Start a wash program.
  - KEEP CLEAR OF MOVING PARTS WHILE MACHINE IS OPERATING!!

- Inspect all internal hoses, seals and gaskets for signs of leakage. Repair as necessary.
- Check that water inlet screens are clean of debris. Dirty screens result in longer fill times, which reduce productivity.
- Inspect the drive belt. Adjust the tension or replace if necessary (see section 30. Motor).
- Check that there are no signs of leakage on the floor beneath the machine. Locate and repair any leak.
- On heated machines, if the heating time is unusually long, check the heating elements (see section 40. Heating). If the water is very hard, check whether there are lime deposits on the heating elements. Decalcify the elements if necessary. Adapt the amount of deliming agent to the manufacturer's guidelines.
- Never switch on the heating elements when there is no water in the machine. This will cause the slow-blow fuse to trigger.
- Inspect the shock absorbers and coil springs. (Only EX- and H-model).

Contents

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General information about troubleshooting

The troubleshooting section is used to pinpoint a fault on the machine to a specific defective component or unit.

If the power supply is interrupted, the programme memory will keep the select programme in its memory for approx 3-5 minutes.

Within this time period, the machine automatically restarts after the power interruption.

Precautions

Only authorized personnel is allowed to troubleshoot the machine.

Prior to commencing troubleshooting, pay close attention to the precautions in section 1.

If the power is on, be very careful when working on the the machine.

DANGER

Be very careful when measuring the motor controller since all components have a potential difference of about 300 V compared to Ground and Neutral.
When the green LED is lit, all components are powered with dangerous voltage.
When the power supply to the machine is interrupted and the motor has stopped, the motor controller will not lose power until after 10-30 seconds.

Measurements

For information about measurement points, components and voltages, please refer to the wiring diagrams for the machine.

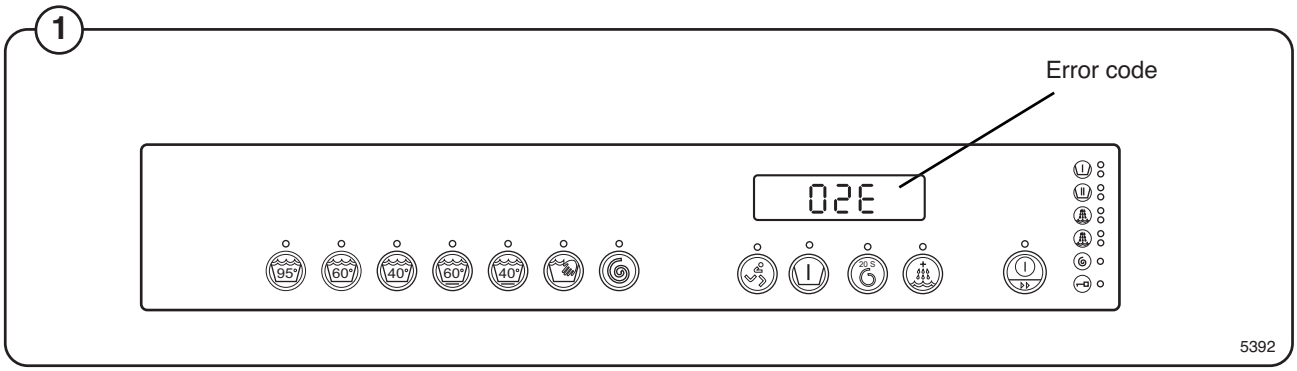
Errors with no error codes

This section includes troubleshooting charts for errors for which no error code is generated.

Errors with error codes

Error indication

Fig. (1) An error in the programme or the machine is indicated in the display window by a blinking error code and the letter "E".



Error codes

A brief summary of all error codes and the possible cause for each error is presented below. Troubleshooting charts for all errors are presented on the following pages.

Error code	Cause
01E	Water level ACK not received within the prescribed time.
02E	No signal from the **"Door closed"** switch during programme operation.
03E	No signal from the **"Door locked"** switch at programme start or during programme operation.
04E	The temperature sensor indicates a temperature below -5°C or interruption in sensor.
05E	The temperature sensor indicates a temperature above 98°C or short-circuit in sensor.
06E	The water level is too high at programme start (above the safety level).
07E	The water level is too high during programme operation (above the measurable level).
08E	The water level rises too slowly.
10E	The water level is above the safety level after the drain sequence.
11E	Mechanical unbalance always activated.
12E	The programme unit cannot read the programme memory (EPROM).
13E	The programme unit cannot communicate with the motor controller.
14E	The water level system has not been calibrated (hardware calibration).
17E	The signal from the **"Door locked"** switch is present although there is no signal from the **"Door closed"** switch.
18E	CALCAD 4400 doesn´t allow start of selected program.
19E	Communication between CALCAD 4400 and the programme unit card has been interrupted.
21E	Microprocessor error (Configuration register).
22E	The level system indicates such a wrong value at program start that the automatic level calibration cannot correct the fault.
31E	The motor controller indicates the temperature is too high on the motor controller heat dissipator.
32E	The motor controller indicates the thermal protector of the motor has triggered.
33E	The motor controller receives a start command from the programme unit without receiving an interlock ACK ("**Door locked**" signal).
35E	The motor controller indicates a short-circuit in the motor windings, cabling or internally in the motor controller.
36E	The motor controller indicates an error in the interlock receiving circuit.
37E	The motor controller indicates the DC voltage
38E	The motor controller indicates the DC voltage level is too high.
41E	The motor controller indicates an error in the thermal protection circuits of the motor.
45E	The RDC card indicates tacho pulses missing at requested revolutions.

Service programme

Enter the service mode

Fig. 2 To enter and exit the service mode, use the service switch as follows:

- Switch off the main power switch. Unscrew the cover of the rear electric module.

Fig. 3
- Switch on the main power switch again. Press the service switch on the communication card. “SE” is displayed in the display window.

  When the door is closed, it automatically locks. When leaving the service mode, the door opens again.

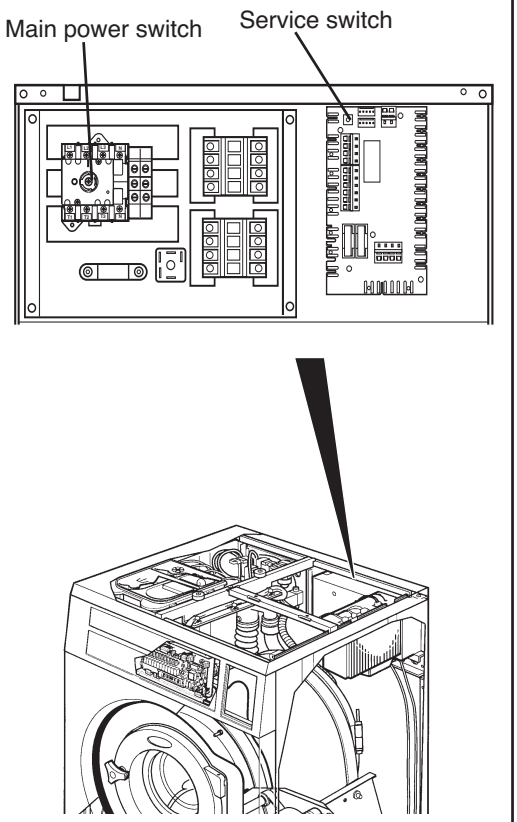
The various functions can now be simulated by entering number codes with the pushbuttons. Use the **ON/OFF switch to switch on/off the selected function.**

Fig. 4 By observing the LEDs, it is also possible to verify certain input signals to the programme unit.

Exit the service mode

Press the service switch once again or switch off power to the machine. IN order to be able to replace the cover of the rear electric module, the main power switch must be set to "0".

2



5182 5185

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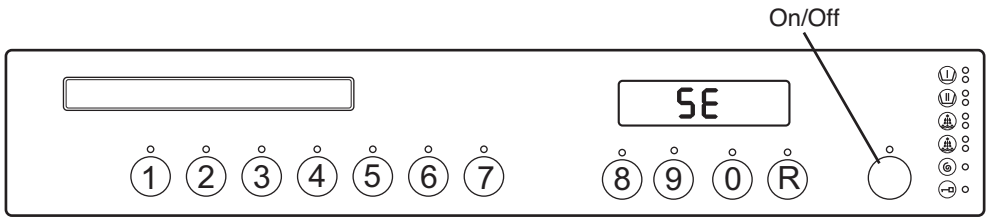

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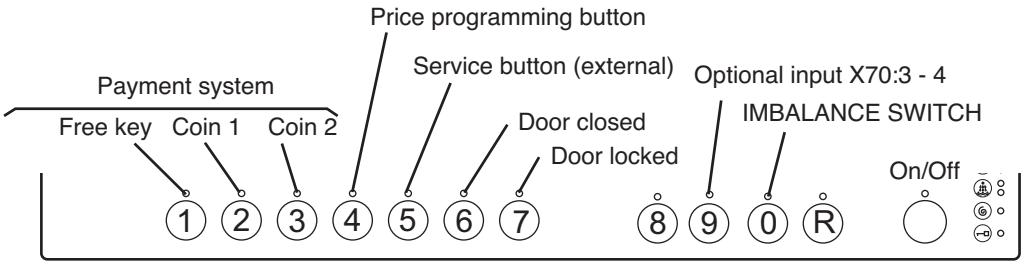

5192 A

Errors with no error codes

No indication in the display window (machine not responding or operates apart from this).

Verify that:

- the machine receives power.

If the power is on, be very careful when working on the machine.

Fig. 5

1. Inspect the fuses F11 and F12 on the communication card A21.

Fuses OK

Defective fuse

Replace the defective fuse. Reset the machine and verify it operates correctly.

Fig. 6

2. Verify that the voltage supply to the programme is as shown in the table below. Measure on card terminal X20.

X20:1 - 2	approx. 1.75 V
X20:2 - 3	approx. 1.75 V
X20:4 - 5	approx. 14.5 V
X20:6 - 7	approx. 13.5 V

One of the voltages is incorrect

All voltages are correct

Fig. 6

3. Verify that the three glass-tube fuses A1:F1-F3 on the programme unit are intact.

Fuses OK

Defective fuse

Replace the defective fuse.

Fig. 7

The programme unit is probably defective. Verify that the programme unit EPROM has been correctly installed.

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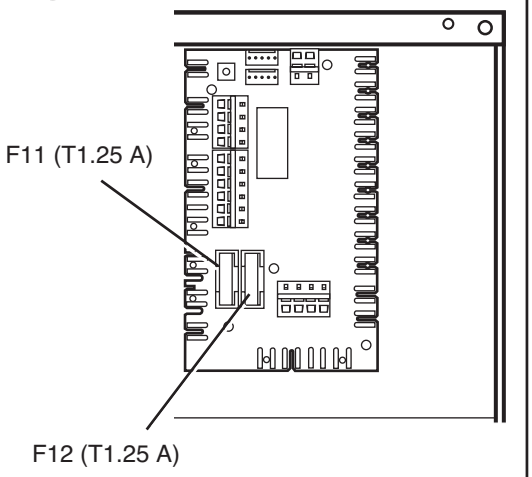
5



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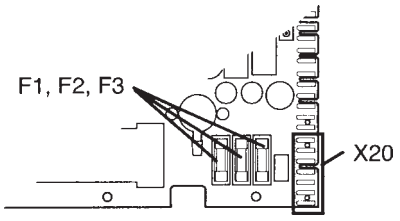

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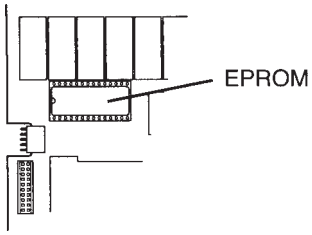

5566 B

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Fig. 8

4. Disassemble the contactor X172 on the transformer T10. Verify that the voltage supplies from T10 are as shown in the table below. Measure on card terminal X172.

X172:5 - 6	approx. 1.75 V
X172:6 - 7	approx. 1.75 V
X172:3 - 4	approx. 14.5 V
X172:1 - 2	approx. 13.5 V

One of the voltages is incorrect *All voltages are correct*

Troubleshoot the cabling between the transformer and programme unit.

Fig. 8

5. Verify the voltage supply to T10. Measure on contactor X178 (230 V).

Voltage OK *Voltage incorrect*

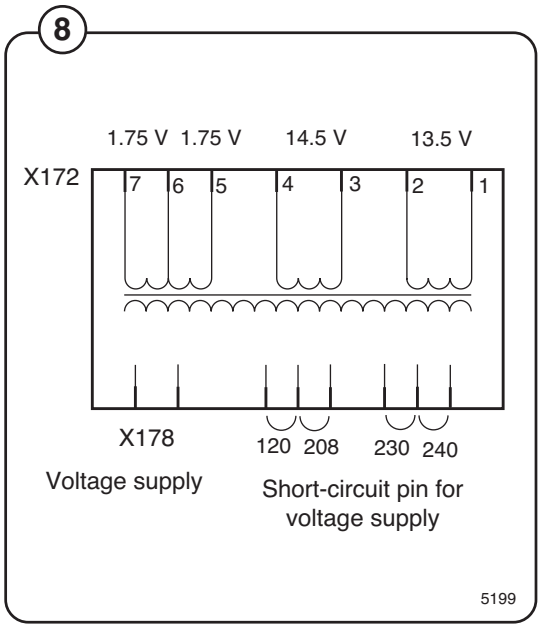
Troubleshoot the cabling for the voltage supply (between the main power switch Q1 and X178).

6. Check for correct placement of the short-circuit pin

Short-circuit pin OK *Short-circuit pin incorrectly set*

T1 probably defective

Change the position of the short-circuit pin



Errors with error codes

01E

Water level ACK not received within the prescribed time.

Each time the machine is filled, it expects the water level to reach the programmed level within 10 minutes. Otherwise error code 01E is generated.

First verify that:

- the inlet filter is not blocked
- all water faucets are open
- the drain is not leaking
- reset the error code by pressing the Start button quickly. Continue with troubleshooting if the error code appears again.

Fig. 9

1. Enter the service programme and activate the water valves on the machine, one after the other (water valves: code 11 - 18).

All valves fill up with water — *One of the valves does not fill up with water*

2. Activate the defective valve in the service programme and measure the voltage (230 V) at the water valve.

No voltage — *Voltage OK*

The valve is probably defective. Verify and remedy

Fig. 9

3. Depending on the valve, measure the supply voltage (230 V) of the water valve at switch X35 or X36 on the card.

No voltage — *Voltage OK*

Defective cables between the communication card A11 and the water valve, or programme unit card A21 defective. Verify and remedy.

The controller output on programme unit card A1 is probably defective.

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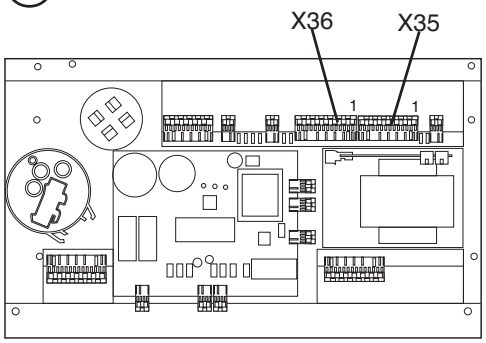


5183

Valve	Switch	Code	Relay
Y11, cold/warm, compartment 1	X35:5	11	2
Y12, cold/warm, compartment 2	X36:6	12	8
Y13, cold/warm, compartment 3	X35:3	13	4
Y15, cold, mixing compartment	X36:5	18	9
Y22, warm, compartment 1	X36:4	14	10
Y24, warm, compartment 4	X35:2	15	5
Y25, warm, mixing compartment	X36:3	17	11
Y35, hard water, mixing compartment	X35:1	19	6

Continued from previous page

5. Activate (close) the drain valve in the service programme (code 22). Activate another of the water valves and verify the drain valve function.

Drain valve OK *Drain valve defective*

Troubleshoot the drain valve according to the instructions under **Error code 06** later in this troubleshooting section.

Fig. 10

6. Verify that the level hose is not damaged, bent, blocked and has not come lose from the T-joint, drum, programme unit card A1 or level guard B2.

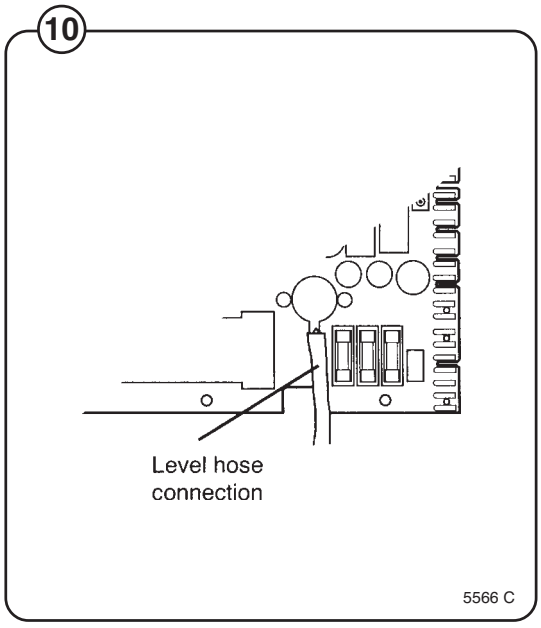
Level hose OK *Defective level hose*

Fit the hose correctly or replace it.

Level detector on programme unit card A1 probably defective.

- Enter the service programme, code 24 and verify that the level indication is stable.
- Blow into the level hose and check that the level indication increases.
- Check the level system for leakage.

10



02E

No signal from the ”Door closed” switch during programme operation.

If the input signal for ”Door closed” is lost during programme operation, error code 02 is immediately generated.

If the power is on, be very careful when working on the machine.

1. Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly.

Error message returns

No error message

Temporary error (probably defective contact)

Fig. (11)

2. Exit the programme using the Start button. Enter the service programme (if the door is locked, unlock it using service code 23). Verify that voltage supply is present between X30:1 - 4 when the door is closed.

Fig. (12)

No voltage

Voltage present but LED does not light

The programme unit card A1 is probably defective.

3. Verify that voltage supply is present between X30:1 - 3.

Voltage present

No voltage

Troubleshoot the cabling for the voltage supply (between the main power switch Q1 and X33).

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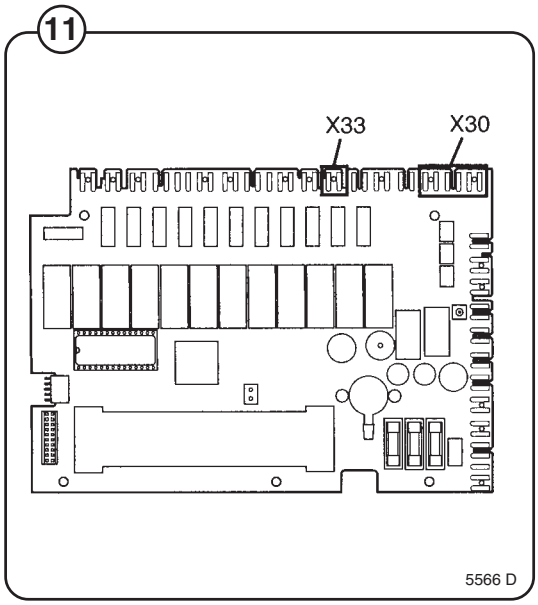

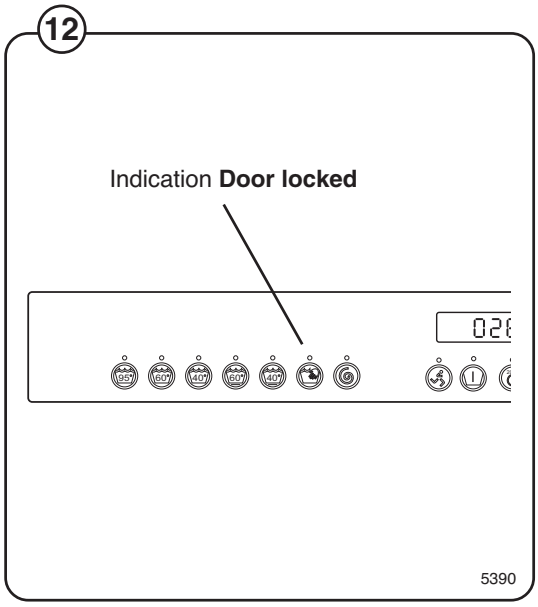

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Fig. 13

4. Disassemble the door lock and verify the function of S3 using an ohm meter.

Correct function

Incorrect function

Replace S3./Door lock.

5. Inspect the cabling between X30 and S3 using an ohm meter.

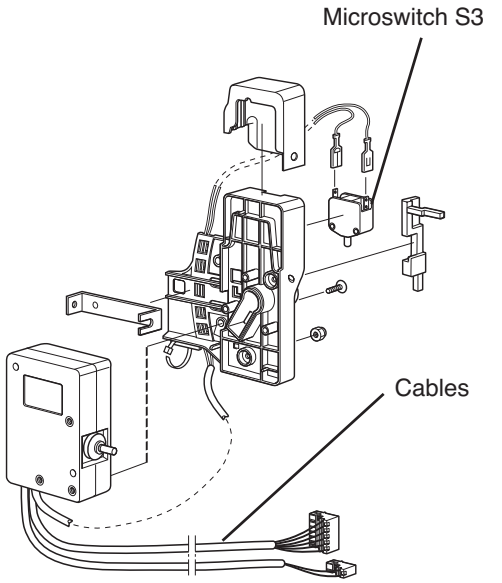
Cabling OK

Incorrect cabling

Remedy or replace the cables.

Inspect the mechanical function of the door lock. Replace any defective components or replace the door lock.

13



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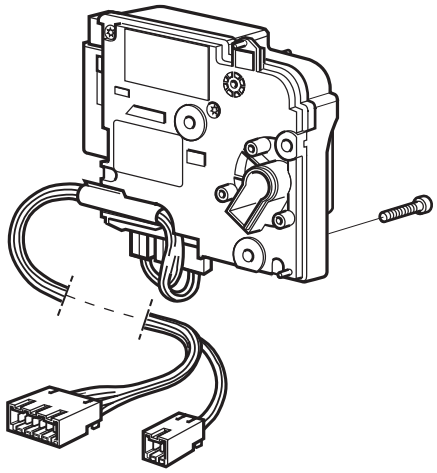


6112

03E

No signal from the ”Door locked” switch at programme start or during programme operation.

At programme start, this error code is suppressed for 10 seconds.

If the power is on, be very careful when working on the machine.

1. Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly.

Error message returns

No error message

Temporary error in the door lock or programme unit

Fig. 14

2. Exit the programme using the Start button. Enter the service programme and verify that there is voltage between X30:2 - 6 when the door lock is engaged (code 23 in the service programme).

Fig. 15

No voltage

Voltage present but LED does not light

The programme unit card A1 is probably defective.

3. Verify that there is voltage supply between X30:1 - 5 when the door lock is switched on.

Voltage present

No voltage

Troubleshoot the cabling for the voltage supply (between the main power switch Q1 and X33).

Fig. 16

4. Is the lock command present? Measure X:92 on the door lock controller.

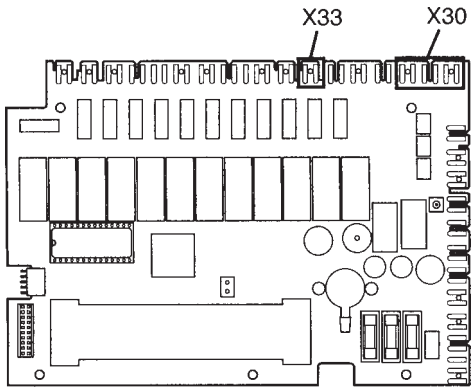
Yes

No

Troubleshoot according to the error codes in section 29.

Troubleshoot cabling between X30 and the actuator. The actuator/door lock could be defective.

14



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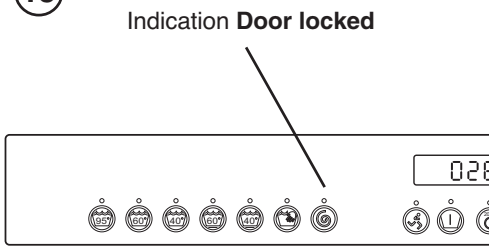
15



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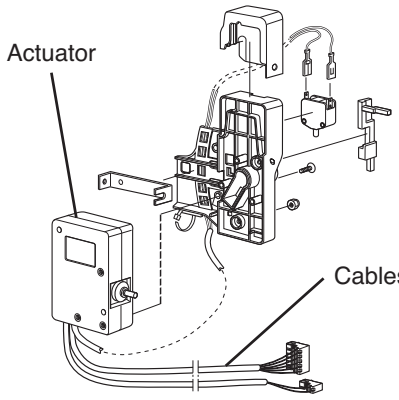

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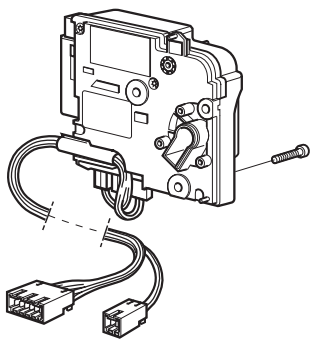


6112

04E

The programme unit indicates interruption with the temperature sensor or the temperature is below -5 °C.

Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly.

Fig. 17

1. Undo the temperature sensor connections and measure the resistance of the sensor. The resistance should be as in the table below:

Approximate values for a fully functional temperature sensor

T (°C)	R (ohm)
19	6100
20	5850
21	5600
22	5350
23	5100

Resistance OK

Incorrect resistance

The temperature sensor is probably defective.

Fig. 18

2. Enter the service programme and enter code 21 (240°C is displayed). Short-circuit inputs 1 and 2 on card switch X23. Verify that the display window shows 100°C.

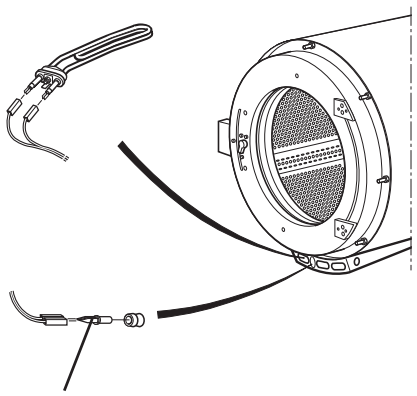
Yes

No

Incorrect temperature sensing on the programme unit card. Replace the card.

Incorrect cabling to the temperature sensor.Verify and replace if necessary.

17



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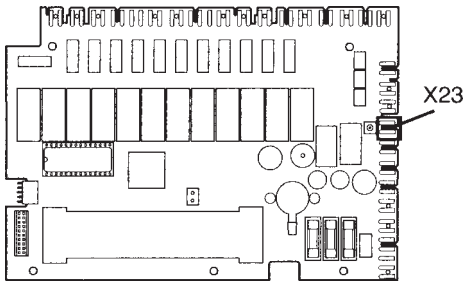
18



5566 E

05E

The programme unit indicates a short-circuit with the temperature sensor or the temperature exceeds 98°C.

Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly.

Fig. 19

1. Undo the temperature sensor connections and measure the resistance of the sensor. The resistance should be as in the table below:

Approximate values for a fully functional temperature sensor

T (°C)	R (ohm)
19	6100
20	5850
21	5600
22	5350
23	5100

Resistance OK

Incorrect resistance

The temperature sensor is probably defective.

Fig. 20

2. Reset the sensor connection, enter the service programme and enter code 21. Disconnect one of the inputs 1 or 2 on the card switch X23. Verify that 240 is displayed.

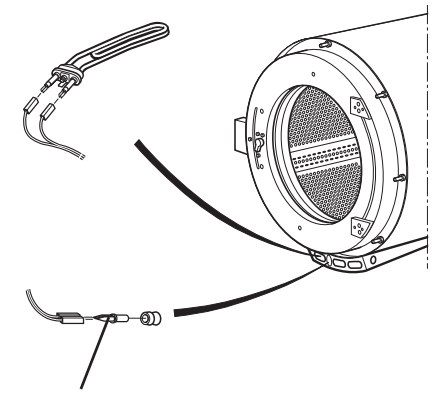
Yes

No

Incorrect temperature sensing on the programme unit card.

Incorrect cabling to the temperature switch. Verify and replace if necessary.

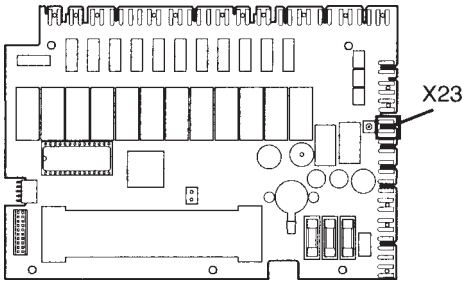
19



Temperature sensor

5204

20



5566 E

06E

The water level is too high at programme start (above the safety level).

First verify that:

- the drain is not blocked by fluff or foam
- the same error appears again following resetting of the error code
- the level hose and air box are not blocked (blow into the level hose)
- for machines with a drain pump, verify correct operation.

Pay attention to temperature extremes in the surrounding which may affect the level system, generating this error code.

1. Verify whether there is any water in the drum.

Water in drum

Verify the operation of the drain valve using the service programme (code 22). Remedy or replace the defective drain valve if necessary.

No water in drum

2. Enter the service programme and enter code 24 (level control). Record the value. Disconnect the level hose from the programme unit card A1.

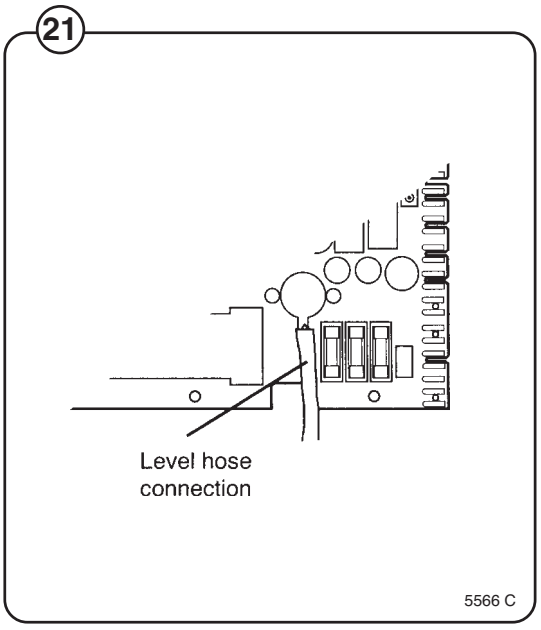
Level value does not change

Level detector on programme unit card A1 is defective.

Level value falls

The level hose is probably blocked by fluff or due to incorrect installation. Verify and clean, or replace the hose.

Fig. 21



07E

The water level is too high during programme operation (above the measurable level).

If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly. If the error returns, first make sure that:

- the level hose and air box are not blocked (blow into the level hose)
- that none of the water valves has locked (i.e. water pours in continuously).

1. Visually inspect. Is there too much water in the machine?

No — *Yes*

Exit the programme and drain the machine.

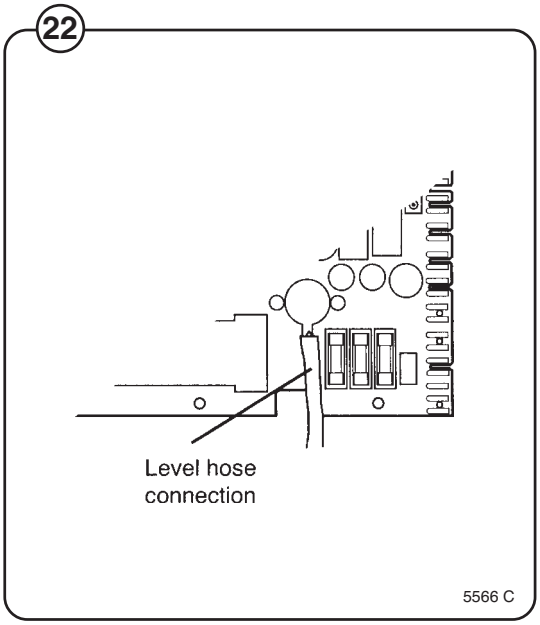
2. Exit the programme. Enter the service programme and activate code 24. Read the display. Undo the level hose from the programme unit and verify whether the level falls.

No — *Yes*

Inspect the level system (hoses, nipples and air box).

3. Inspect whether the level input on the programme unit is blocked. If this is not the case, then the programme unit is probably defective.

Fig. 22



08E

The water temperature rises slowly (less than 5°C each 10 minutes).

If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly. If the error returns, first make sure that:

- the heat supply is intact (all phases OK and the steam or gas boiler is operating)
- the drain does not leak.

1. Enter the service programme and fill up with water (code 24) to at least the 80 level. Start heating (code 21). Does the heating contactor go high?

Yes

No

Troubleshoot the operating circuits of the contactor

Fig. 23

2. Measure the operating voltage across each element.

No voltage

Voltage present

3. Use a clip-on ammeter and verify that all phases draw current (6 - 25 A depending on the element rating) or, alternatively, switch off the voltage with the wall-mounted power switch and measure the resistance of the elements, which should be 20 - 25 ohms (2.5 kW) or 40 - 50 ohms (1 kW).

Resistance OK

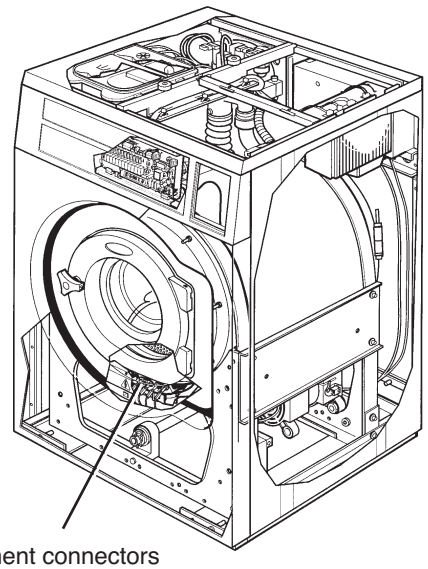
Inspect the elements for lime deposits. Decalcify if necessary.

Incorrect resistance

Replace the defective element

4. Troubleshoot the voltage supply circuit for the elements.

23



Element connectors

5467

10E

The drain cycle is too long.

Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly.
If the error returns, first verify these items:

- Is the drain blocked by fluff or foam?
- Are the the level hose and air box blocked (blow into the level hose)?
- For machines with a drain pump, verify correct operation.
- Does water run out when the power switch on the machine is switched off?
- Verify the operation of the drain using the service programme.
- Is the drain in the room capable of receiving the water from the machine?

12E

The programme unit cannot read the programme memory (EPROM).

If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly.
If the error returns, troubleshoot as follows:

Fig. 24

1. Disassemble the programme unit. Remove, then reinstall the programme memory (EPROM). Verify that all circuit pins are correctly set in the holder. Restart the machine.

Error message returns

No error message

Poor contact or program memory incorrectly set.

Fig. 24

2. Replace the program memory (EPROM). Verify that the programme version of the new memory is correct. Restart the machine.

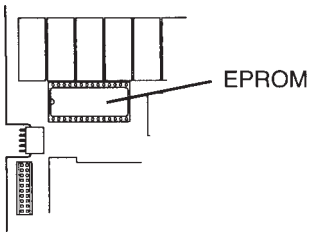
Error message returns

No error message

Incorrect programme memory (EPROM).

The programme unit is probably defective. (The old programme memory is probably correct and can be used again.)

24



5566 B

13E

The programme unit cannot communicate with the motor controller.

Try to restart the machine with a quick press on the START-button. If the fault returns, do the following:

- Check that the motor controller gets voltage. The green LED on the motor controller shall be lightened.
- Check the wire harness between motor controller and timer.

14E

The water level system has not been calibrated (hardware calibration).

This error code is only displayed for a brief while at the programme start. Upon this, the machine starts.

The error code implies that calibration of the programme unit level system has not been verified at the factory.

The machine can be used but, replacement of the programme unit is recommended.

17E

The signal from the “Door locked ” switch is present although there is no signal from the “Door closed” switch.

This error code can only be generated prior to programme start.

If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly.
If the error returns, troubleshoot as follows:

Fig. 25 Fig. 26

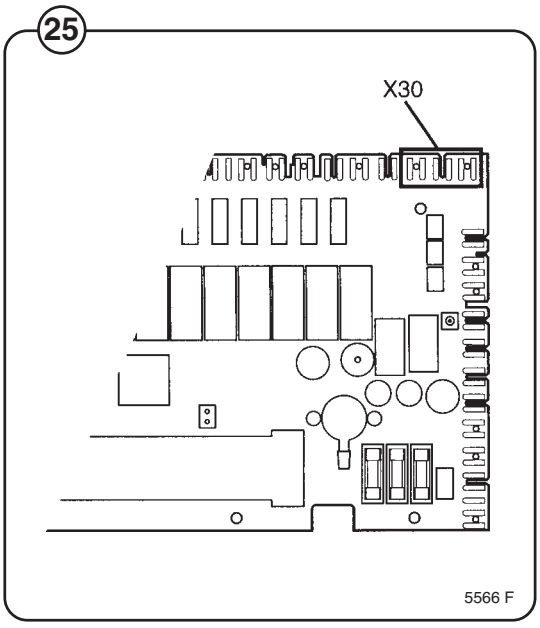
1. Undo the card contactor X30 on the programme unit card A1

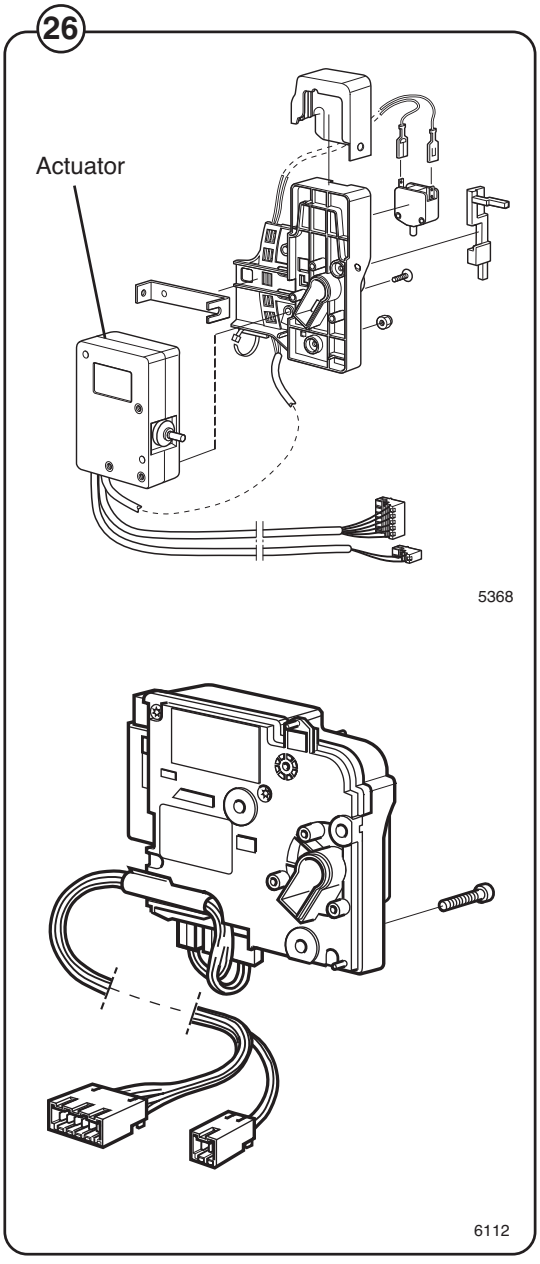
Error message returns

The programme unit card A1 is probably defective.

No error message

Troubleshoot the door lock and the cabling for electric or mechanical short-circuit.





18E

CALCAD 4400 doesn't allow start of selected program.

Try to restart the machine by a quick press on the START-button.

19E

Communication between CALCAD 4400 and the programme unit card A1 has been interrupted.

If the power is on, be very careful when working on the machine.

Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly.
If the error returns, troubleshoot as follows:

1. Is the machine connected to CALCAD 4400?

Yes

No

2. Enter the service programme (code 96). Short-circuit card switches X70:3 - 4 on the communication card A21 and read the displayed value.

0 is displayed

Replace the programme unit card A1.

1 is displayed

Press the On/Off button while the short-circuit above is maintained so that 0 is displayed. Exit the service programme and remove the short-circuit. Start the machine.

3. Verify that CALCAD operates and that the network cabling has been correctly connected to the communication card.

OK

Not OK

Troubleshoot CALCAD according to the instructions in the CALCAD manual.

4. Inspect the RS232 interface cabling between the programme unit card and the CALCAD equipment. Measure the resistance (Ω) of the four coloured leads and verify that the connection is OK. Also measure the connections to be sure there is no short-circuit between any two leads.

Cabling OK

Troubleshoot CALCAD according to the instructions in the CALCAD manual.

Cabling defective

Inspect the cabling and replace if necessary.

27

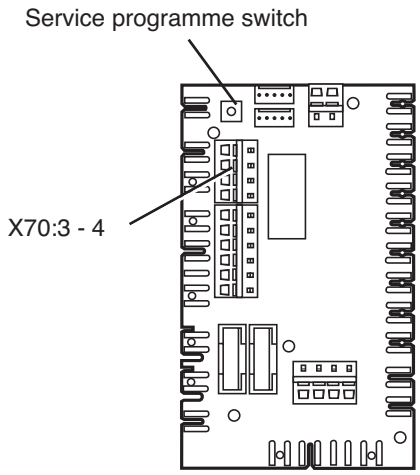


Fig. 27

21E

Microprocessor error (Configuration register).

Try to restart the machine (i.e. reset the error code) by pressing the Start button quickly.
If the error reappears, the configuration register in the microprocessor is faulty and the timer has to be changed.

22E

The level system indicates such a wrong value at program start that the automatic level calibration cannot correct the fault.

Fig. 28

This error code can only be generated at programme start. It implies that the machine detects the water level to be above the calibration level.

First verify that:

- the drain is not blocked by fluff or foam
- the same error appears again following resetting of the error code
- the level hose and air box are not blocked (blow into the level hose)
- for machines with a drain pump, verify correct operation.

Pay attention to temperature extremes in the surrounding which may affect the level system, generating this error code.

1. Verify whether there is any water in the drum.

Water in drum

No water in drum

Fig. 29

2. Enter the service programme and enter code 24 (level control). Record the value. Disconnect the level hose from the programme unit card A1.

Level value does not change

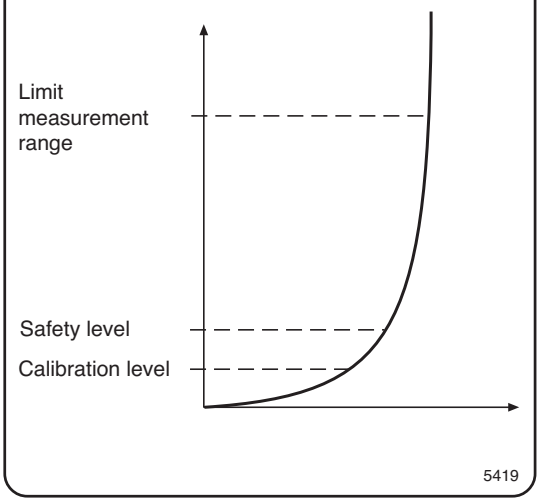
Level value falls

The level hose is probably blocked by fluff or installed incorrectly. Verify and clean, or replace the hose.

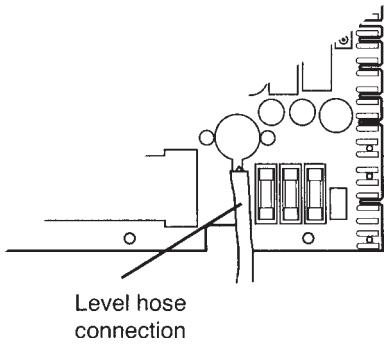
The level detector on programme unit card A1 is defective. (By pressing START, it is possible to use the washing programming without an optimally adjusted water level until a new programme unit card is installed.)

Verify the operation of the drain valve using the service programme (code 22). Remedy or replace the defective drain valve if necessary.

28



29



SU620 –520/19486 and –520/19549-22806,
SU630 – 595/9040, SU655 –725/7908,
SU675 –795/3769

32E

The motor controller indicates the thermal protector of the motor has triggered.

If the power is on, be very careful when working on the machine.

First verify that:

- the machine is not overloaded
- the ventilation openings of the machine are not blocked
- the external temperature is not very high
- the motor is not abnormally warm.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

1. Switch off the machine and verify that the drum and motor operate smoothly.

Drum/motor OK

Heavy operation of the drum/motor

Defective bearings in drum or motor, or there is an object between the outer and inner drum. Inspect and remedy.

2. Wait for at least 10 minutes to allow the motor to cool down. Then switch on the machine again. Enter the service programme and run the motor clockwise at low washing revolutions (code 25). Verify whether the error indication immediately returns.

No error indication

Immediate error indication

3. Switch off the machine. Undo the contactor at X3 on the motor. Use an ohm meter to measure the resistance between the contactor and the motor at X3:7 - 9.

Contact

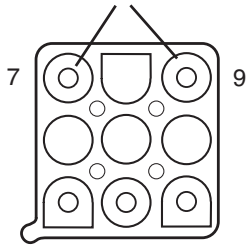
Interruption

Thermal protector of motor interrupted. Replace the motor.

Fig. 30

30

Measure the resistance between pins 7 and 9



Contactor X3, female towards motor

5420

Continued on next page

Continued from previous page

Fig. 31

4. Replace X3. Remove the contactor X312 and measure the resistance of the contactor with the motor cabling between X312:4 - 5.

Contact

Internal error in the thermal sensor of the motor controller detector.

Interruption

Defective cabling between motor controller and motor. Inspect the cabling and replace if necessary.

Fig. 32

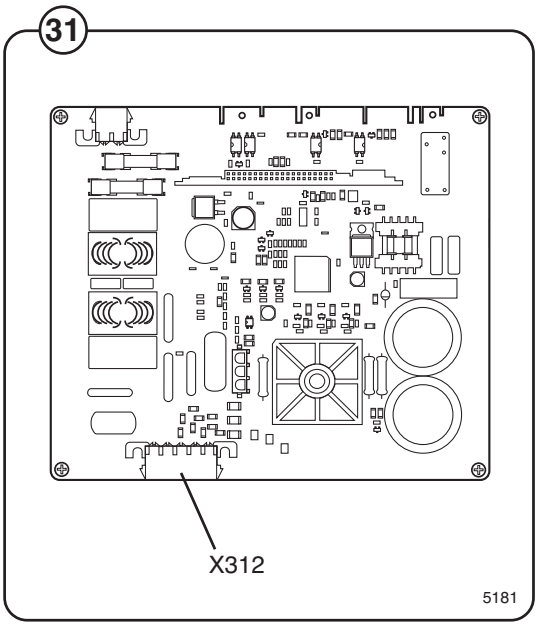
5. Switch of the wall-mounted power switch. Undo the contactor at X3 on the motor. Use an ohm meter to measure the resistance towards the motor. Measure between 1-2, 1-3 and 2-3. Correct resistance should be 2 - 5 Ω (depending on the motor rating).

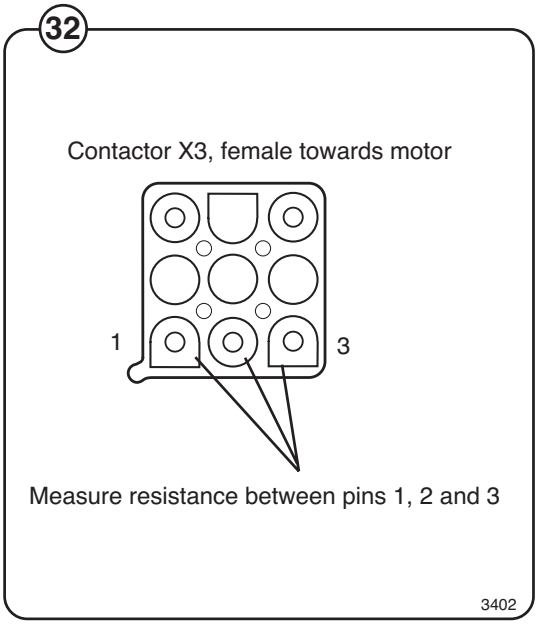
Correct resistance

Troubleshoot the cabling between the motor and motor controller.

One of the resistance values is incorrect

The motor is probably defective.





SU620 520/19487– 19548 and 520/22807–
SU630 595/9041–, SU655 725/7909–,
SU675 795/3770–

32E

The motor controller indicates the thermal protector of the motor has triggered.


If the power is on, be very careful when working on the machine.

First verify that:

- the machine is not overloaded
- the ventilation openings of the machine are not blocked
- the external temperature is not very high
- the motor is not abnormally warm.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

1. Switch off the machine and verify that the drum and motor operate smoothly.

Drum/motor OK

Heavy operation of the drum/motor

Defective bearings in drum or motor, or there is an object between the outer and inner drum. Inspect and remedy.

2. Wait for at least 10 minutes to allow the motor to cool down. Then switch on the machine again. Enter the service programme and run the motor clockwise at low washing revolutions (code 25). Verify whether the error indication immediately returns.

No error indication

Continued on next page

Continued from previous page

Fig. 33

4. Replace X3. Remove the contactor X312 and measure the resistance of the contactor with the motor cabling between X312:4 - 5.

Contact

Internal error in the thermal sensor of the motor controller detector.

Interruption

Defective cabling between motor controller and motor. Inspect the cabling and replace if necessary.

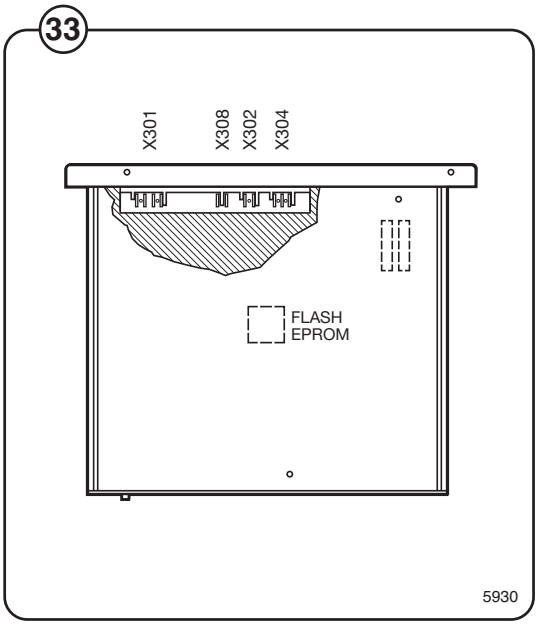
5. Switch of the wall-mounted power switch. Undo the contactor at X3 on the motor. Use an ohm meter to measure the resistance towards the motor. Measure between 1-2, 1-3 and 2-3. Correct resistance should be 2 - 5 Ω (depending on the motor rating).

Correct resistance

Troubleshoot the cabling between the motor and motor controller.

One of the resistance values is incorrect

The motor is probably defective.



33E

The motor controller received the start command from the programme unit, but did not receive an interlock ACK (“Door locked” signal).

If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

Fig. 34

1. Measure the interlock signal on the motor controller U1:X302.

No signal

Signal OK

Troubleshoot the motor controller.

Fig. 35

2. Measure the signal on interlock bus A1:X37 of the programme unit.

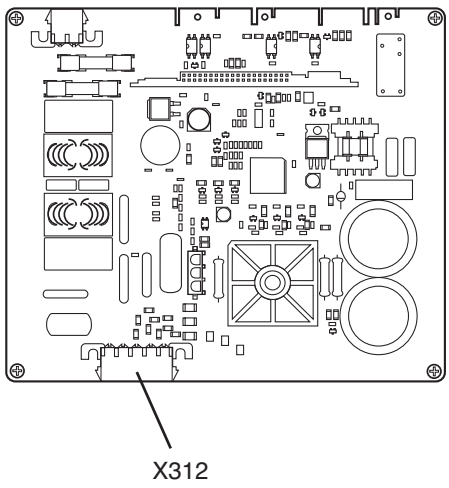
No signal

Signal OK

Troubleshoot the cabling between the motor controller and programme unit. Inspect the cabling and replace if necessary.

Troubleshoot the interlock circuits.

34



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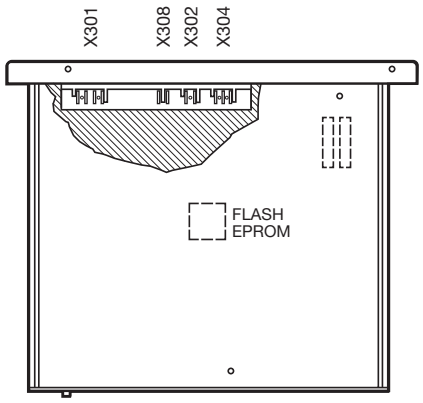
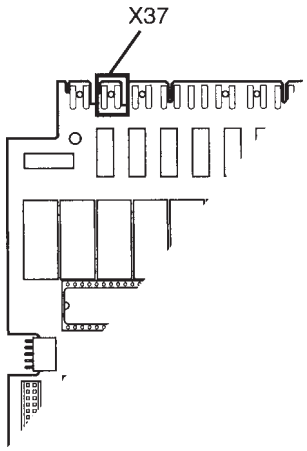


5930

35



5566 G

SU620 –520/19486 and –520/19549-22806,
SU630 – 595/9040, SU655 –725/7908,
SU675 –795/3769

35E

The motor controller indicates a short-circuit in the motor windings, cabling or internally in the motor controller.

If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

Fig. 36

1. Switch off the machine. Undo the contactor at X3 on the motor. Use an ohm meter to measure the resistance towards the motor. Measure between 1-2, 1-3, and 2-3. Correct resistance should be 2 - 5 Ω (depending on the machine size).

Correct resistance

One of the resistance values is incorrect

The motor is probably defective.

Fig. 37

2. Inspect the cabling from X312 on the motor controller to X3 on the motor. Use an ohm meter and measure the five leads as follows:

X312:	**1**	**2**	**3**	**4**	**5**	
X3:	**1**	**2**	**3**	**7**	**9**	**(X3:4 - 6, 8 not used)**

Also measure the five leads to be sure there is no short-circuit between any two leads.

Cabling OK

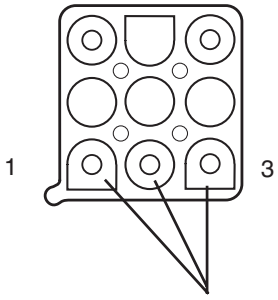
Incorrect cabling

Inspect the cabling and replace if necessary.

The motor controller output is defective.

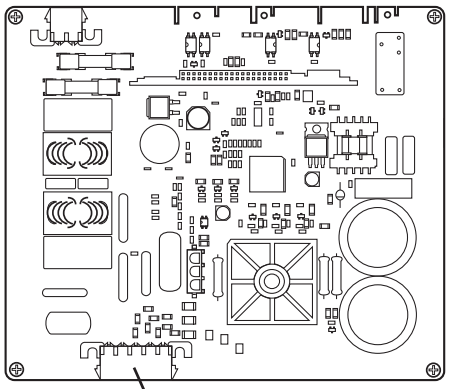
36

Contactor X3, female towards motor



Measure resistance between pins 1, 2 and 3

37



X312

5181

SU620 520/19487– 19548 and 520/22807–
SU630 595/9041–, SU655 725/7909–,
SU675 795/3770–

35E

The motor controller indicates a short-circuit in the motor windings, cabling or internally in the motor controller.

If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

Fig. 38

1. Switch off the machine. Undo the contactor at X3 on the motor. Use an ohm meter to measure the resistance towards the motor. Measure between 1-2, 1-3, and 2-3. Correct resistance should be 2 - 5 Ω (depending on the machine size).

Correct resistance

One of the resistance values is incorrect

The motor is probably defective.

Fig. 39

2. Inspect the cabling from X312 on the motor controller to X3 on the motor. Use an ohm meter and measure the five leads as follows:

X312: 1 2 3

X3: 1 2 3 (X3:4 - 6, 8 not used)

Also measure the five leads to be sure there is no short-circuit between any two leads.

Cabling OK

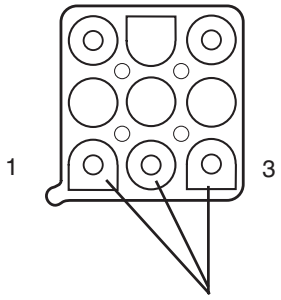
Incorrect cabling

Inspect the cabling and replace if necessary.

The motor controller output is defective.

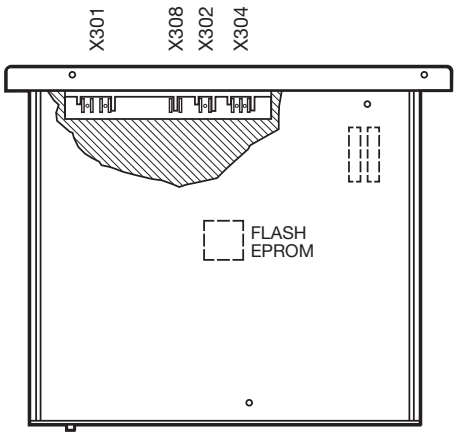
38

Contactor X3, female towards motor



Measure resistance between pins 1, 2 and 3

39



5930

36E

The motor controller indicates an error in the interlock receiving circuit.


If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, the motor controller is probably defective.

37E

The motor controller indicates the DC level is too low.

If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

Fig. 40

1. Verify the voltage supply (230 V) to the motor controller at the contactor X311.

Voltage too low

Voltage OK

The motor controller is probably defective.

Fig. 41

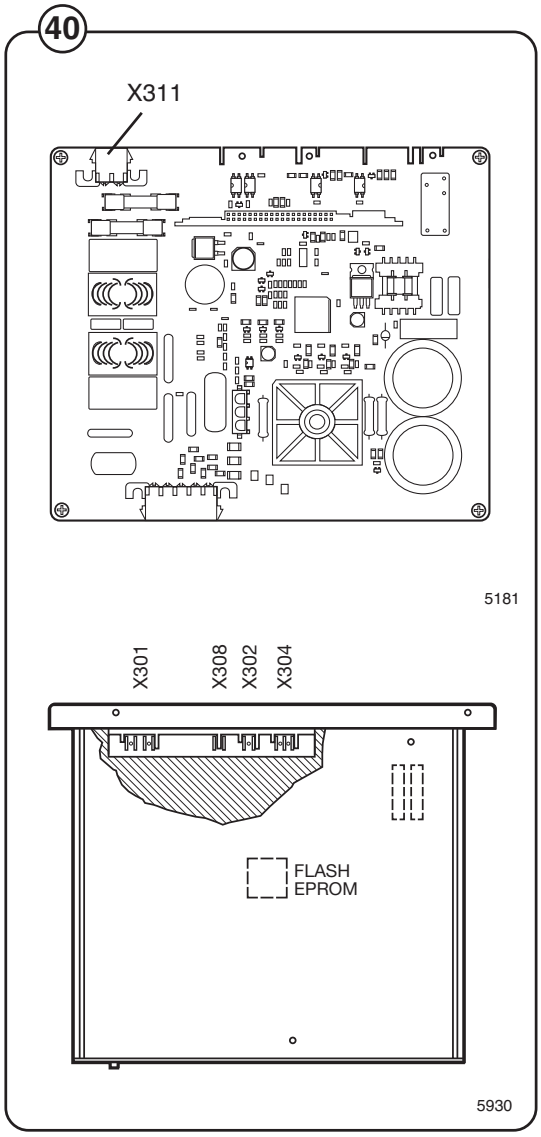
2. Inspect the power supply (230 V) at the main power switch Q1 on the machine.

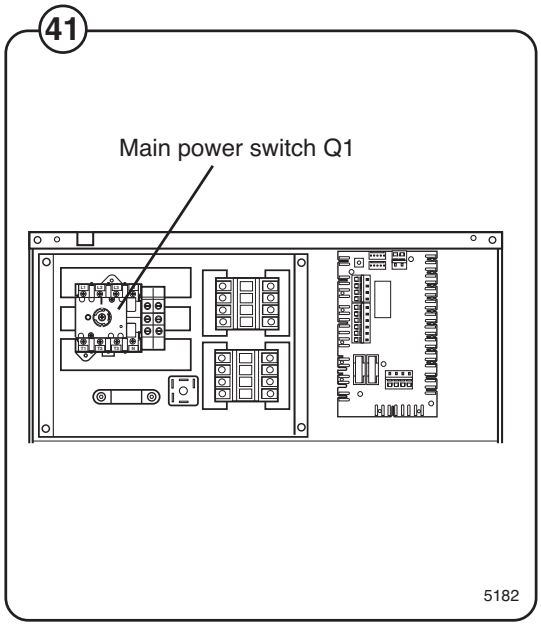
Voltage too low

Voltage OK

Defective cabling.

Troubleshoot the mains.





38E

The motor controller indicates the DC level is too high.

If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, troubleshoot as follows:

Fig. 42

1. Verify the voltage supply (230 V) to the motor controller at the contactor X311.

Voltage too low

Voltage OK

The motor controller is probably defective.

Fig. 43

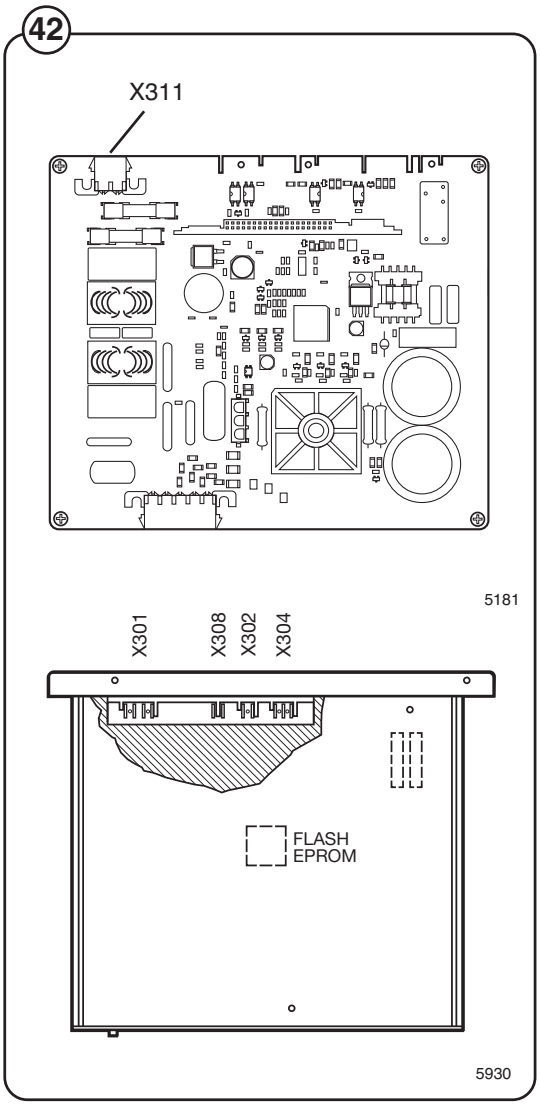
2. Inspect the power supply (230 V) at the main power switch Q1 on the machine.

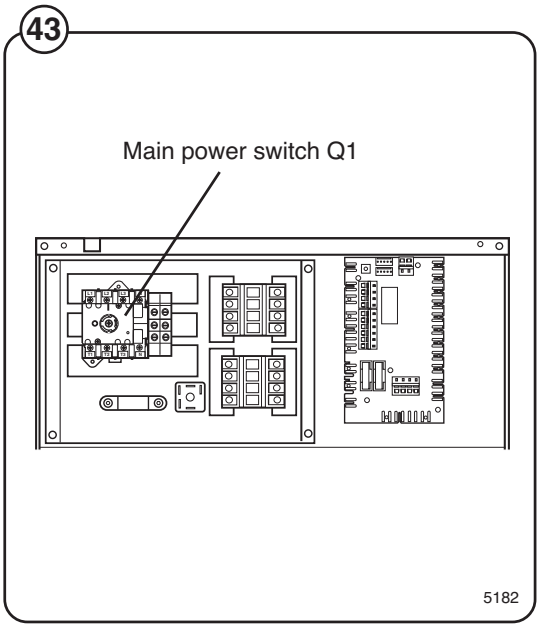
Voltage too low

Voltage OK

Defective cabling.

Troubleshoot the mains.





SU620 –520/19486 and –520/19549-22806,
SU630 – 595/9040, SU655 –725/7908, SU675 –795/3769

41E

The motor controller indicates an error in the thermal protection circuits of the motor.


If the power is on, be very careful when working on the machine.

Switch off the machine and wait for about 30 seconds. Then switch on the machine again and start a programme.
If the error returns, the motor controller is probably defective.

45E

The RDC card indicates tacho pulses missing at requested revolutions.


If the power is on, be very careful when working on the machine.

Switch off the machine for at least 30 seconds to ensure the motor controller has been completely reset. Then try to start the machine again. If the error returns, first verify:

- that the tacho generator generates pulses
- the cabling between the tacho generator and the RDC card

If the error remains, the RDC card is probably defective.

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Contents

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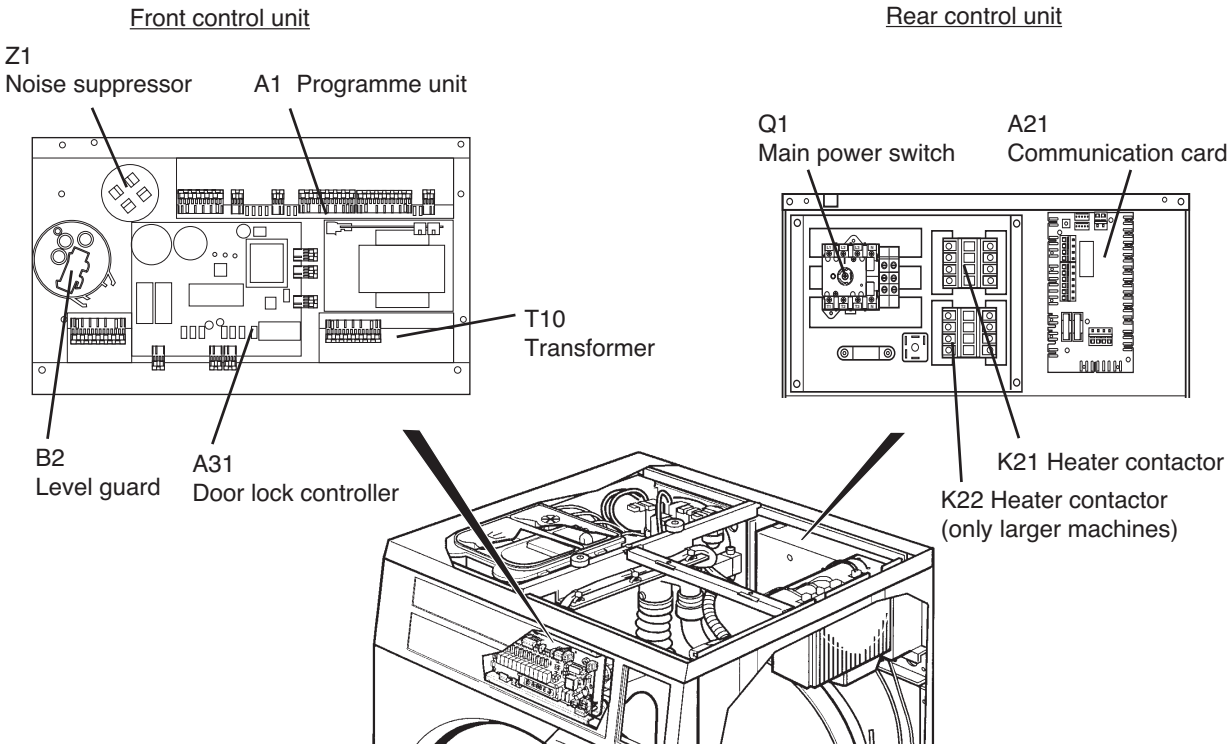
Description

Fig. 1

The control unit of the machine consists of the following parts:

- **Front control unit**
  This unit contains a microcomputer-controlled electronic programme unit A1, a safety control card for the door lock (door lock control A31), a noise suppressor Z1 and a low-voltage transformer T10 that supplies power to the programmer unit and the door lock control.
- **Rear control unit**
  This module contains the main power switch Q1 with a connection for received voltage, the heat contactor K21 and the communication card A21 with outputs for e.g. external detergent supply.

1



5183, 5182, 5467

Function

Front control unit

Programme unit A1

Fig. (2) The programme unit is electronically controlled and has seven fixed programmes and four optional functions. To simplify maintenance and troubleshooting, the programme unit features special service and self-diagnostic functions.

The programme unit is described in detail in section **23. Programme unit**.

Level guard B2

Fig. (2) Control of the water level and turning of the drum are controlled with a backup guard, to ensure that the door will not open with water in the drum or when the drum rotates.

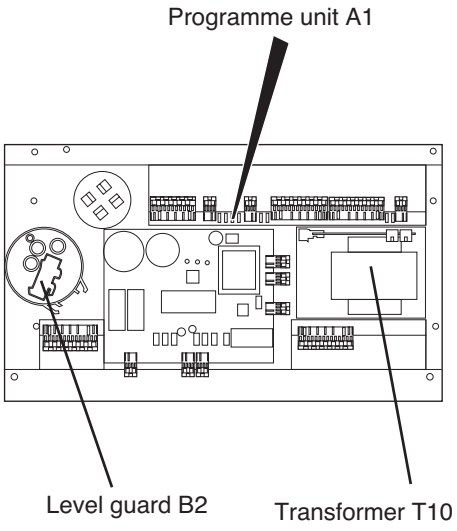
Apart from a level guard on the programme unit card, there is a level guard B2, connected to the door lock control A31. This card controls door locking action as well as the level and drum rpm speed.

Transformer T10

Fig. (2) Low-voltage transformer that supplies power to the programme unit.

Fig. (3) Using the shorting pins on the PCB, the transformer is switchable among four different voltages.

2



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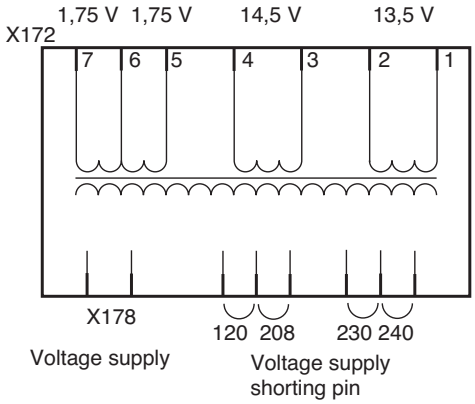


5199

Noise suppressor Z1

The noise suppressor is connected between the voltage supply and transformer T10.

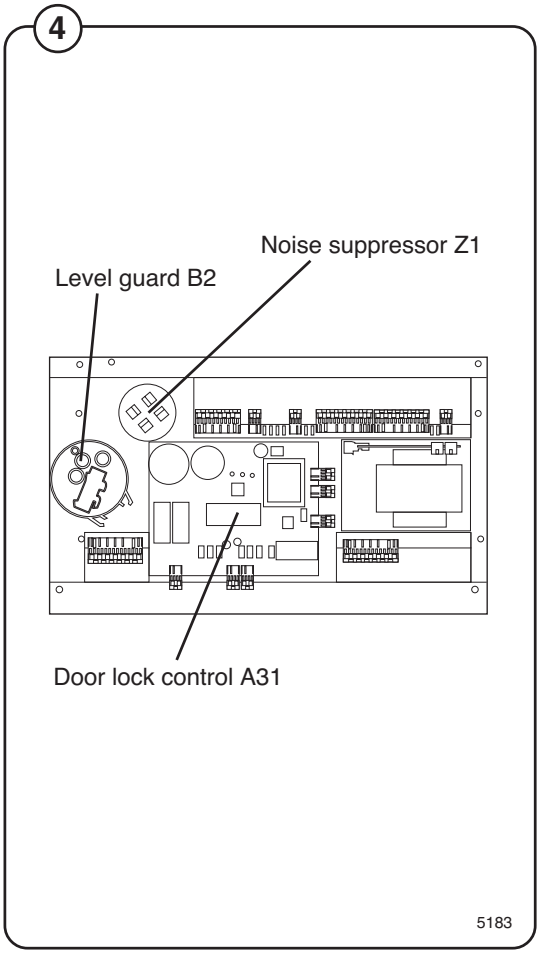
Door lock control A31

Fig. (4) This card serves to perform a safety check of the door lock function.

The card checks the water level using level guard B2 and drum rpm speed by way of a rotation sensor B3.

The door lock control controls the door lock coil, and the door lock does not open or close until the card itself and the programme unit have verified that the drum is not turning and that there is no water remaining in the drum.

The door lock control is described in detail in section **29. Door and door lock**.



Rear control unit

Main power switch Q1

Fig. 5 The main power switch interrupts all received power phases and is placed on the outside of the connection box cover.

The cover cannot be removed unless the main power switch is turned to the 0 position.

The received voltage supply is connected to the lower screw post of the main power switch, alt. the terminal connection.

Heating contactor K21

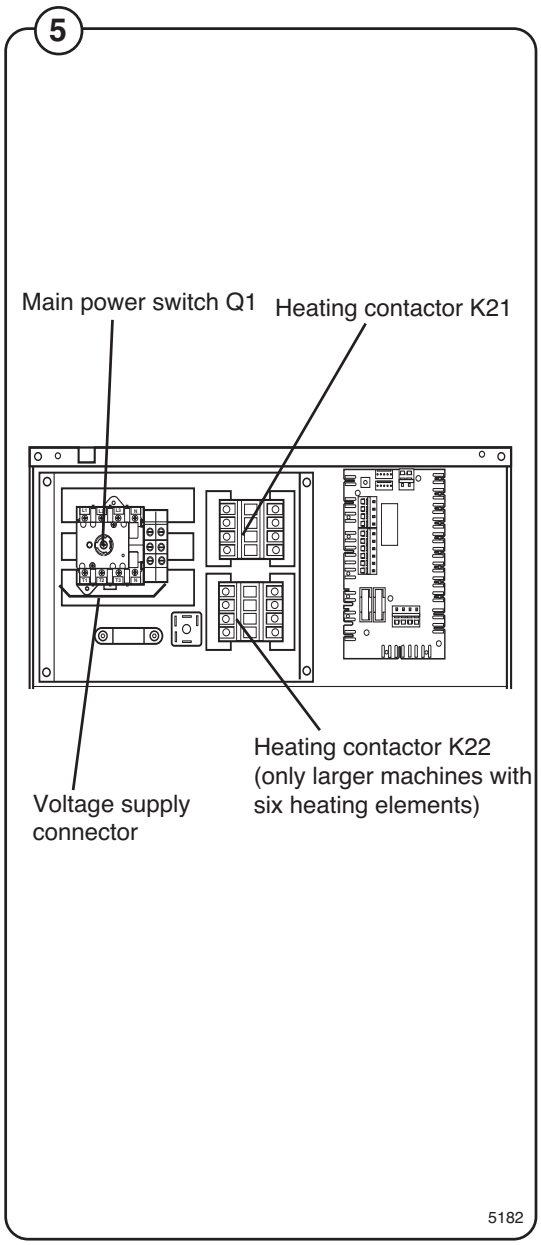
Fig. 5 This contactor is only featured on machines with electric heating.

It activates the three heating elements at the front, lower part of the outer drum. It is controlled by output X33:1 in the programme unit A1.

Heating contactor K22

Fig. 5 This contactor is only featured on larger machines.

It activates the three heating elements, with a total of four circuits, situated at the front, lower part of the outer drum. It is controlled by output X33:1 of the programme unit A1.



Communication card A21

Fig. 6

Fig. 7

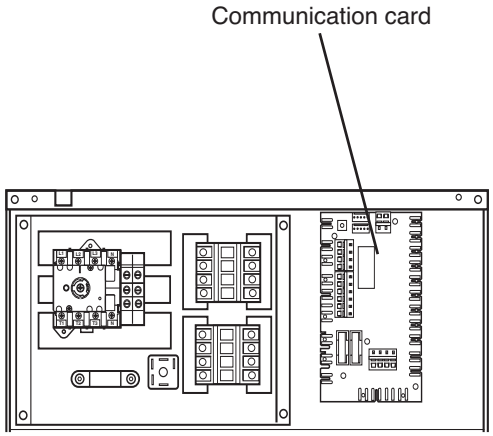
This communication card contains:

- **Fuses F11 and F12 (1.25 A)**
  These protect the received voltage supply for the programme unit and door lock controller.
- **Service button S40**
  Used to engage the service mode of the programme unit.
- **Output connection blocks**
  Control signals for connection to external system such as detergent supply.

Card No.	Function
Outputs (AC 200-240 V)	
X70	see Payment system
X72:1	0 V Door locked
X72:2	L1 Door locked
X72:3	Liquid supply 1 (Prewash)
X72:4	Liquid supply 2 (Main wash)
X72:5	Liquid supply 3 (Softener)
X72:6	Liquid supply 4 (Mop chemicals)*
X72:7	Liquid supply 5 (Bleach)

* Only for program 2M11 and 2M12.

6



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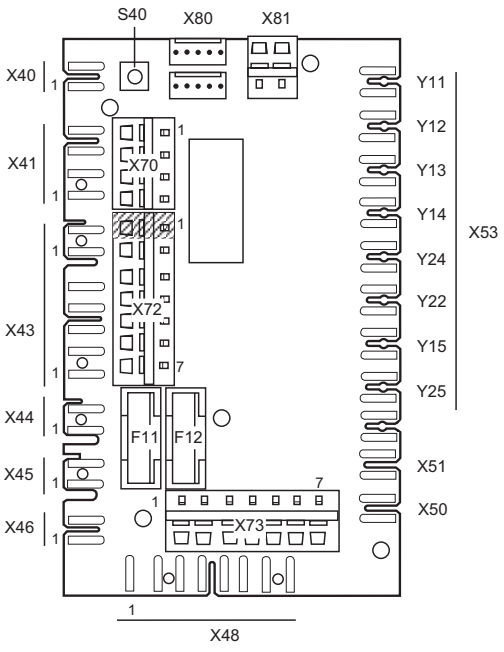
7

Card A



5233 A

Fig. 8

Payment system

FlexSystem

X70:1 Earth

X70:2 Price programming

X70:1 and X70:2 connection for price programming switch

X70:3 0 V

X70:4 24V

X70:3 and X70:4 to be connected to FlexSystem

Fig. 8

PCB (COGES)

X70:1 N

Fig. 9

X72:2 Available

X72:3 Booked

X72:4 Booked

Fig. 8

PCB (Aptus, In-Time, Camping)

X70:3 Booked

Fig. 10

X70:4 Booked

Electrolux Booking System

Fig. 8

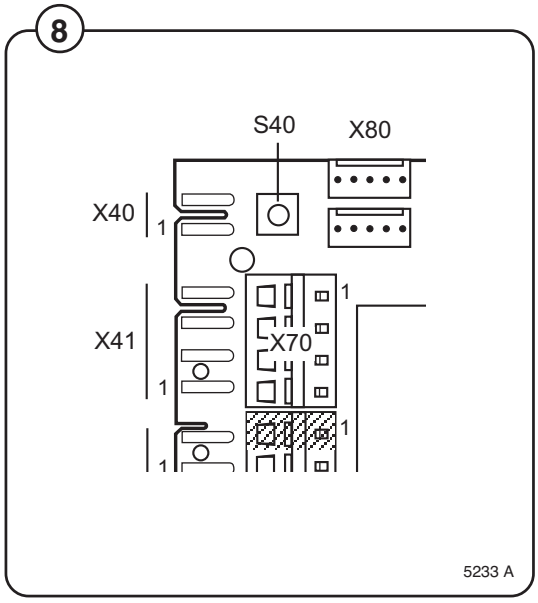
X70:1 L (230V), output

X70:2 N, output

X70:3 Opto-input

X70:4 Opto-input

8



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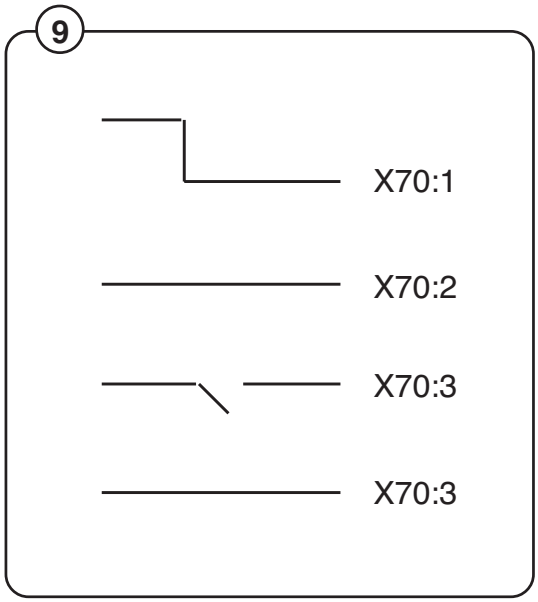

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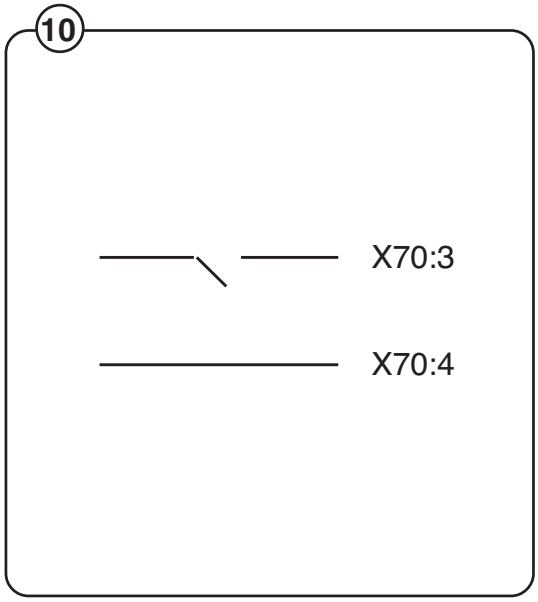


Central Payment (France)/External start

Fig. 8

X70:1	L (230V), output
X70:2	N, output

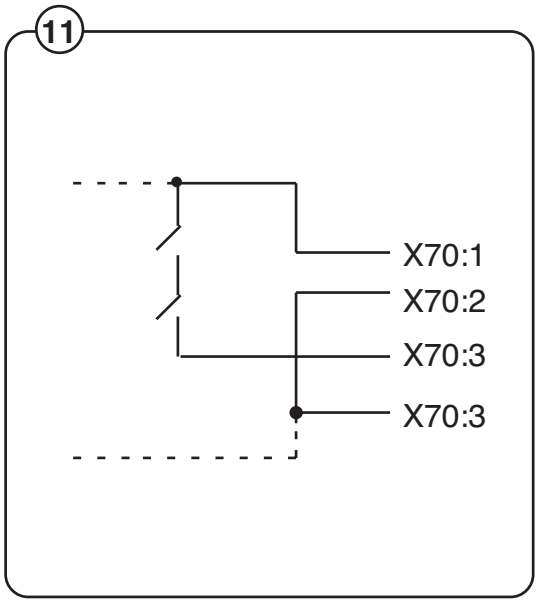
Fig. 11

X70:3	Start, opto- input (120-230V)
X70:4	Start, opto- input

Price reduction

Fig. 8

X70:1	Timer, opto- input (120-230V)
X70:2	Timer, opto- input



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Contents

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Description

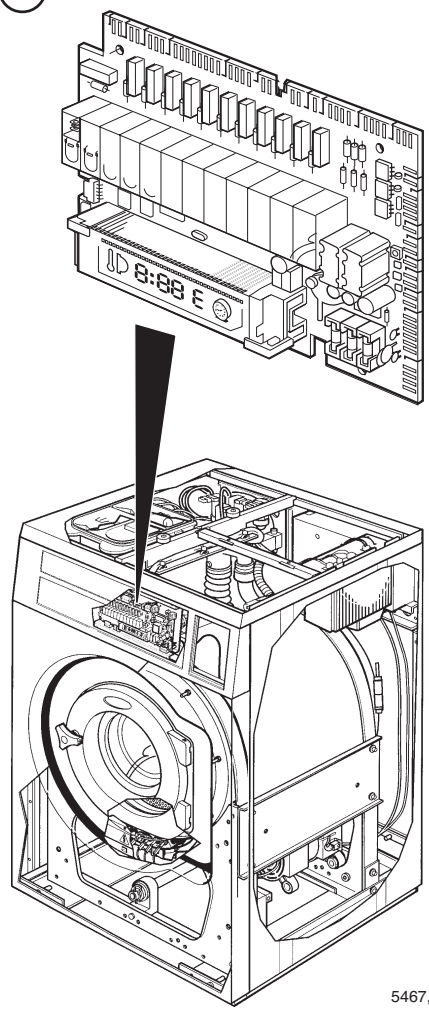
General

Fig. 1 The programme unit is electronically controlled and occupies half of one of the PCBs. One half of the card holds a microprocessor, the programme memory, voltage supply circuits, etc. The other half holds relays and noise suppressing components.

Fig. 2 The programme unit receives information from the temperature sensors, the door lock and the level guard on the card. There is also a serial interface for the motor controller.

The programme unit controls the water and drain valves as well as heating via the communication card, door locking/unlocking via the door lock controller and the motor via the motor control.

1



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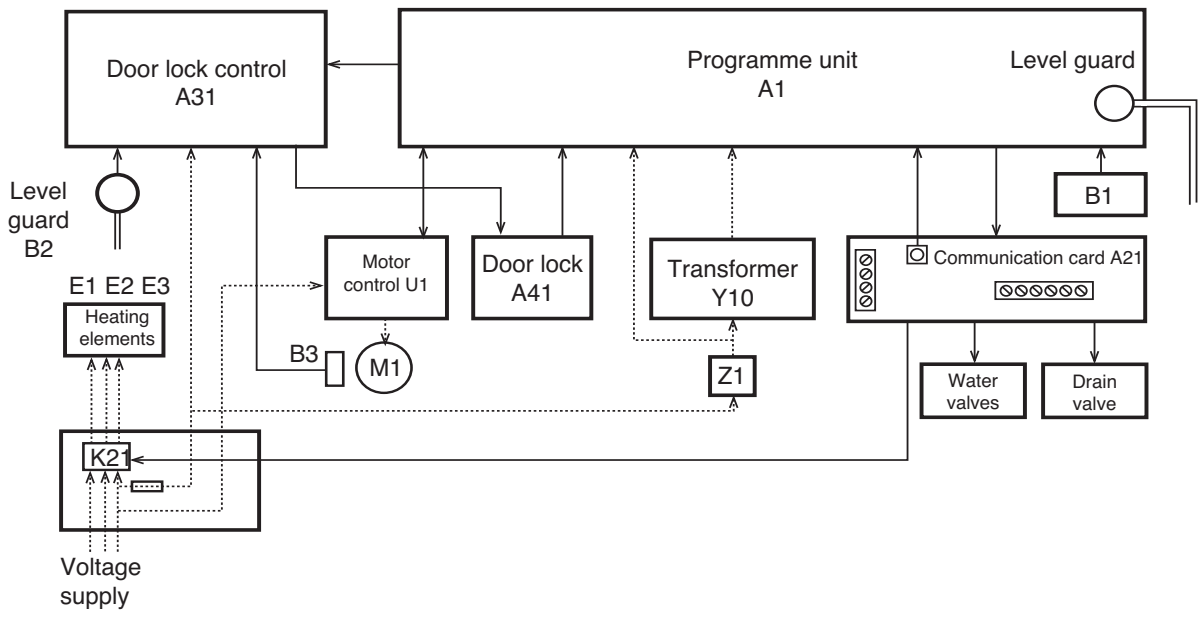

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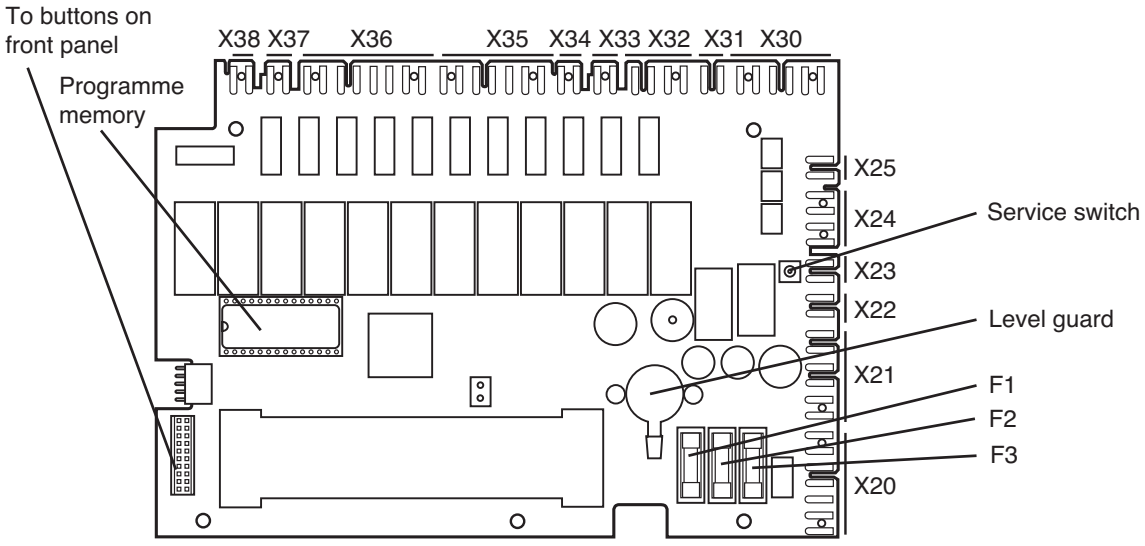
Inputs and outputs

Fig. (3) The programme unit has the following inputs and outputs:

Card terminal	Function
X20	Received voltage from the T10 transformer
X22	Output to service button in rear electric box
X23	Input from temperature sensor
X24	Serial communication with motor control
X25	Free wash (key switch)
X21	Inputs from coin detector
X37	Interlock signal to motor control
X38	Signal “Door locked”
X36	Outputs to water and drain valves
X35	Outputs to water valves and detergent supply
X34	Output to voltage supply
X33	Input from voltage supply
X32: 1, 2	Inputs for price reduction/start conditions/start after pause
X32: 3, 4	Output “Machine closed but not started”
X31	Outputs for door locking to the door lock control
X30	Input from the door lock micro switch

(3)



Function

Voltage supply

Fig. 4

Machines with electric heating receive three-phase voltage, while those without electric heating receive single-phase power supply. The voltage to the heating elements, used to heat the water, is controlled by the programme unit via the K21 terminal.

Single-phase voltage is fed to the motor controller U1. Single-phase voltage, protected by a 1.25 A fuse, is fed to the door lock controller A21 and the programme unit A1. The voltage to the programme unit is noise protected by the LC filter Z1.

The transformer T10 supplies low voltage to the programme unit.

Motor control

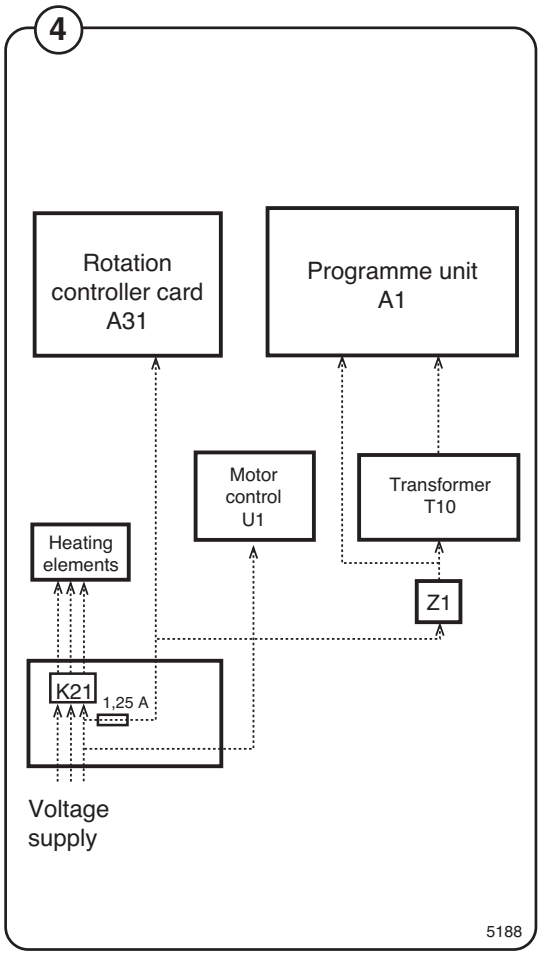
Fig. 5

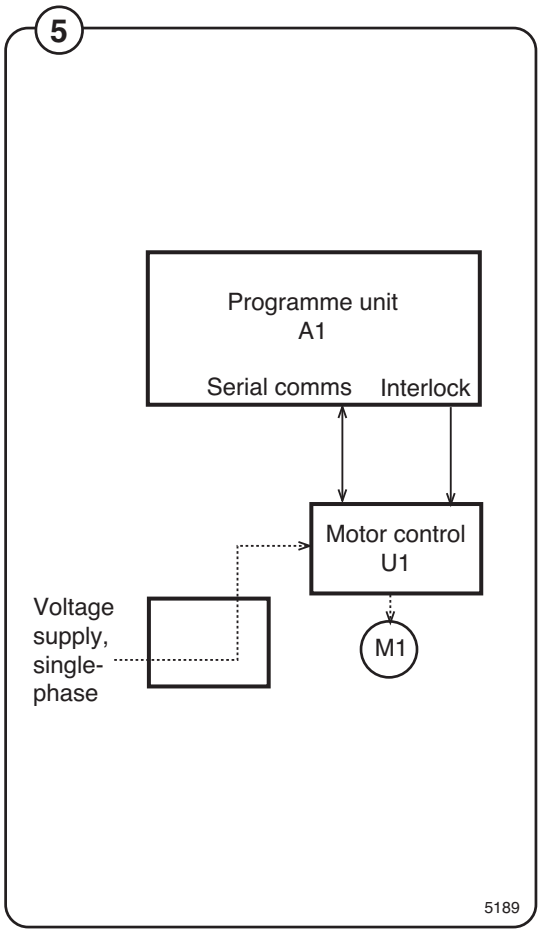
The programme unit controls the motor rpm, acceleration and retardation with a high degree of precisions via a serial interface that communicates with the motor controller.

The motor control also receives and interlock signal that informs when the door is closed and locked. If the programme unit tries to start the motor without the necessary interlock signal present, the motor remains stopped and an error message is sent from the motor control to the programme unit.

The motor control also sends information to the programme unit, such as instantaneous values, rpm and error conditions.

The motor control is described in detail in section **30. Motor and motor control.**



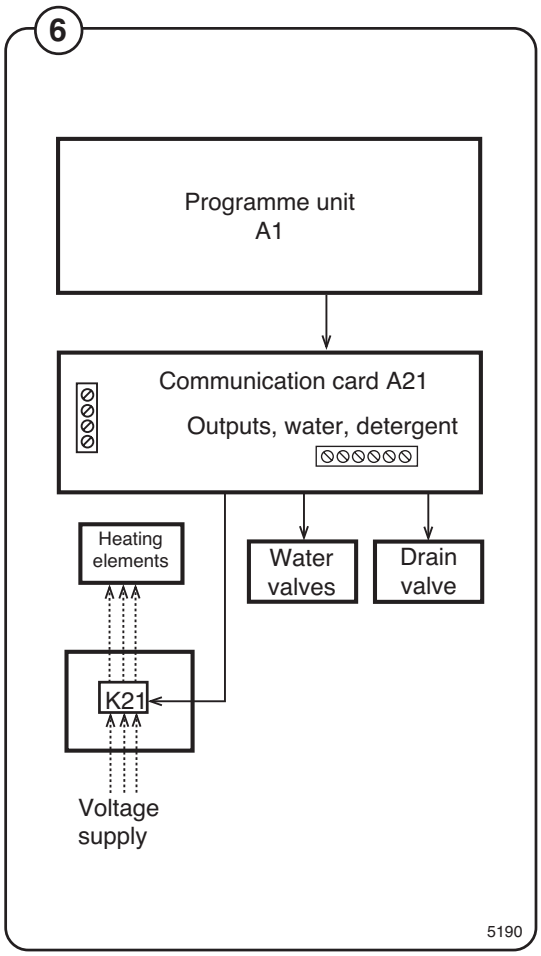


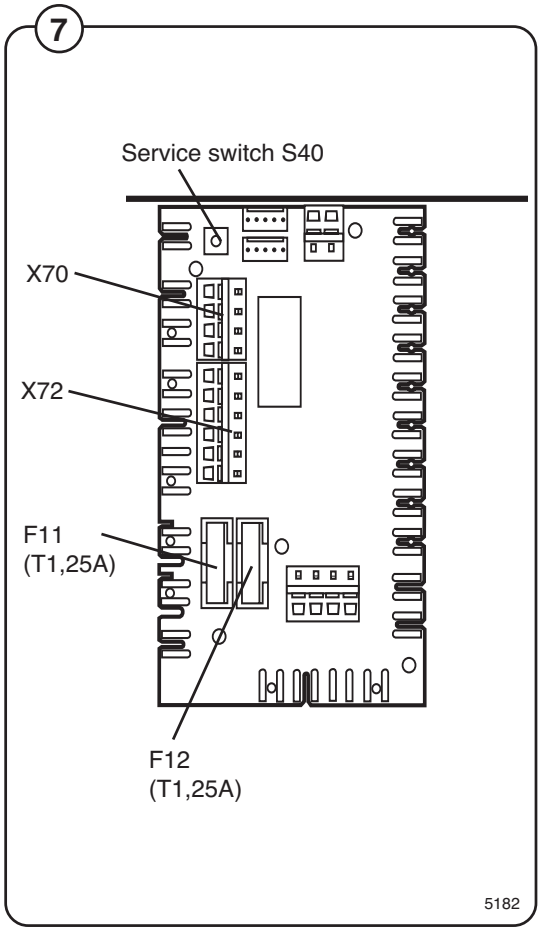
Outputs

Fig. 6 The programme unit has 11 relays that control the various functions of the machine, water valves the drain valve and heating of the water. All control signals are fed to the communication card before these are sent to the destination component.

Fig. 7 Some signals are also present for external control of detergent supply according to the table below.

Block No.		Function
Outputs (200 - 240 V AC)		
X72	:1	O V
	:2	"Door locked" signal
	:3	Pre-wash detergent
	:4	Main wash detergent
	:5	Rinsing agent (compartment 3)
	:6	Additional detergent (compartment 4)
	:7	Bleaching agent/starch
X70:	3,4	"Door locked, machine not started" signal
Input		
X70	1,2	Function 1, 2 or 3 below is preset in the service programme. 1. Price reduction in combination with coin box 2. Start condition 3. Start after pause



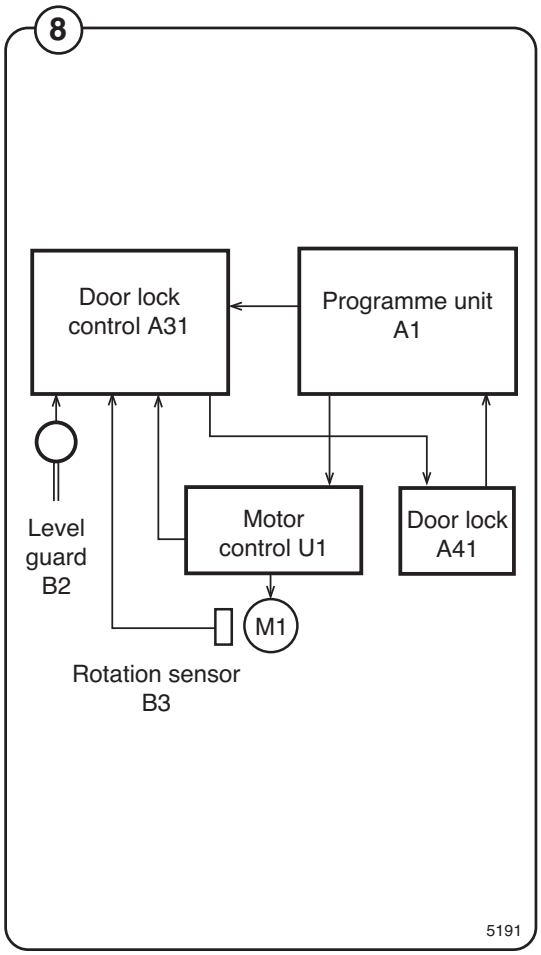


Door lock

Fig. 8

When the door is closed, the programme unit receives a signal from the door lock. When the programme starts operating, the programme unit sends a request for door locking to the door lock control A31. This card, with built-in sensors for motor revolution and the water level in the drum, verifies that the drum is empty and is stopped. When this is confirmed, the card locks the door.

When the door is locked, two micro switches close in the door lock and supply voltage to the relays on the programme unit card controlling the heating, water valves and the drain as well as to the interlock input on the motor controller.



Operation time, accumulated coin value, programme memory

The total operating time and the accumulated coin value on machines with a coin box can be verified when the machine is running a washing programme or when it is in the service mode. The programme memory part number can only be checked in the service mode.

Entering the service mode

- Switch off the main power switch. Unscrew the rear control unit cover.

Fig. 9

- Turn the main power switch again. Depress the service switch on the communication card. “SE” is displayed to indicate the service mode has been engaged.

Fig. 10

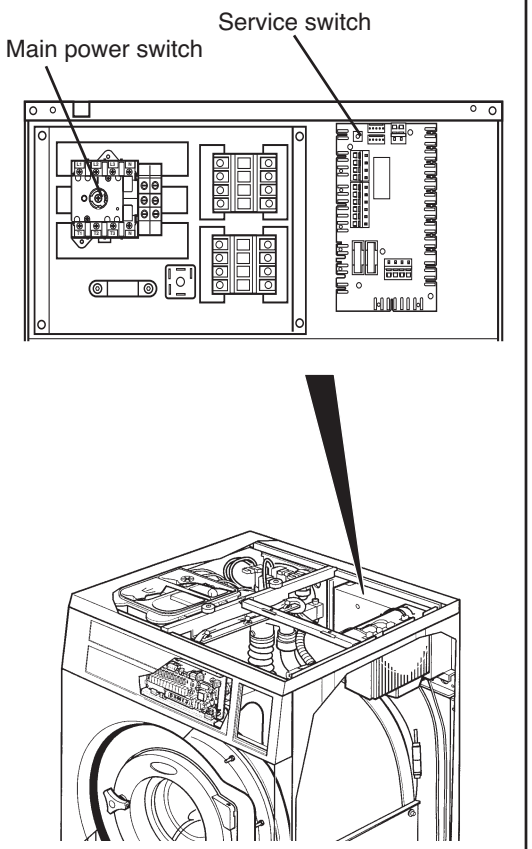
It is now possible to enter various service codes using the number buttons shown below. Using the start/door open button, it is possible to start and stop the current function being tested (see the section “Service codes”). This button, however, is not used to read the operation times and coin value. R = reset the set service code.

To leave the service mode

Press the service switch once more or interrupt power to the machine.

In order to be able to replace the cover on the rear electric box, the power switch must be set to 0.

9



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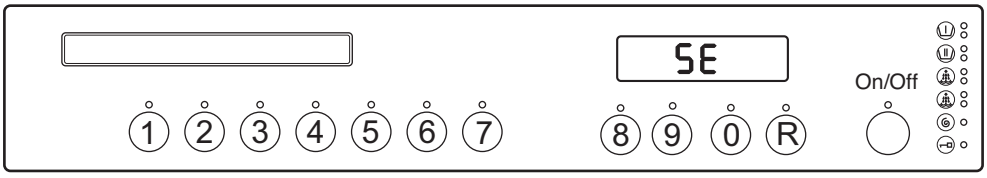

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Total operating time

Reading during normal operation

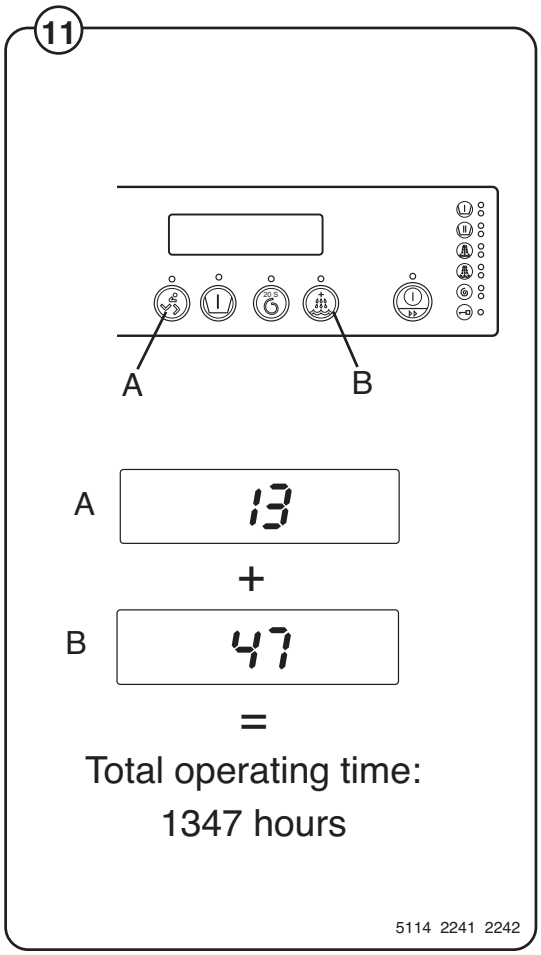
Fig. (11)

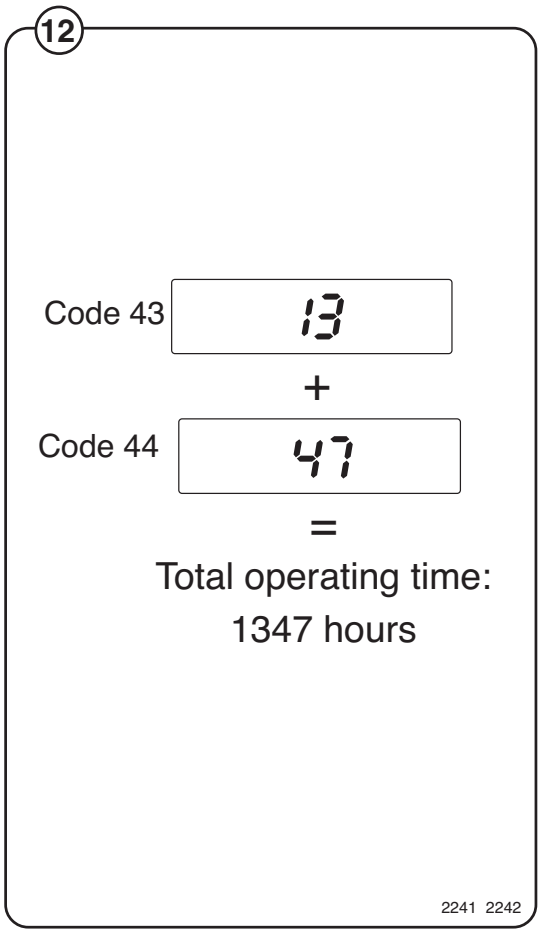
- The machine must be running a washing programme.
- The buttons A and B may be unmarked, i.e. they do not have any symbols or text. This verification procedure, however, is still possible.
- Depress button A. The thousands and hundreds of the operating hours are shown, e.g. “13”.
- Depress button B. The tens and single units are shown, e.g. “47”.
- This means that the total operating time is 1347 hours.

Reading in the service mode

Fig. (12)

- Depress the service button on the communication card.
- Enter code 43. The thousands and hundreds of the operating hours are shown, e.g. “13”.
- Enter code 44. The tens and single units are shown, e.g. “47”.
- This means that the total operating time is 1347 hours.





Accumulated coin value

Reading during normal operation

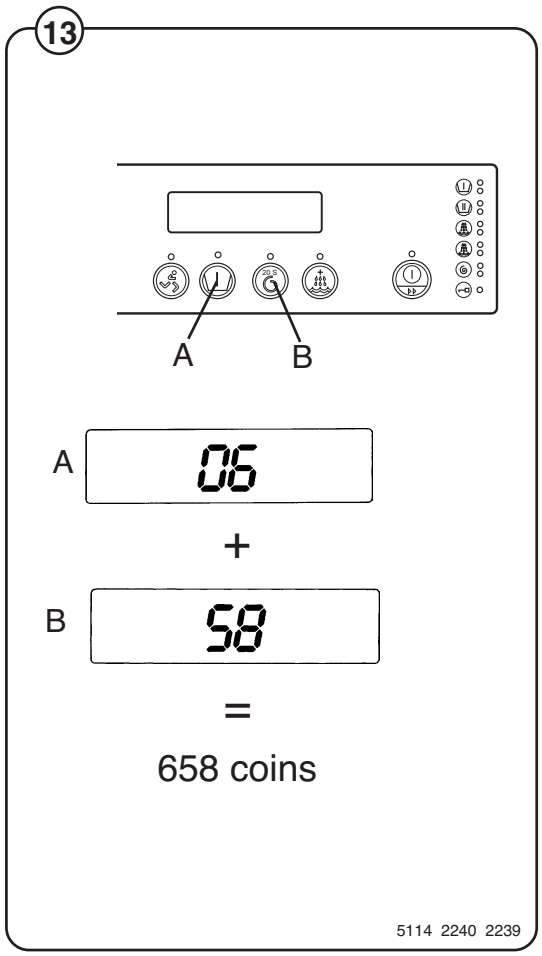
Fig. 13

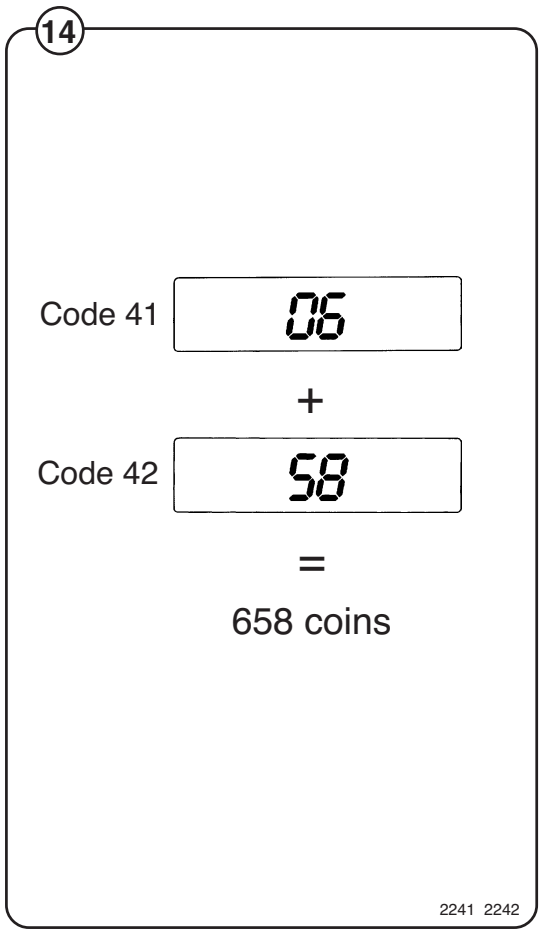
- The machine must be running a washing programme.
- Depress button A. The thousands and hundreds of the accumulated coin value are shown, e.g. “06”.
- Depress button B. The tens and single units are shown, e.g. “58”.
- This means that the accumulated coin value is 658 coins.

Reading in the service mode

Fig. 14

- Depress the service button on the communication card.
- Enter code 41. The thousands and hundreds of the accumulated coin value are shown, e.g. “06”.
- Enter code 42. The tens and single units are shown, e.g. “58”.
- This means that the accumulated coin value is 658 coins.

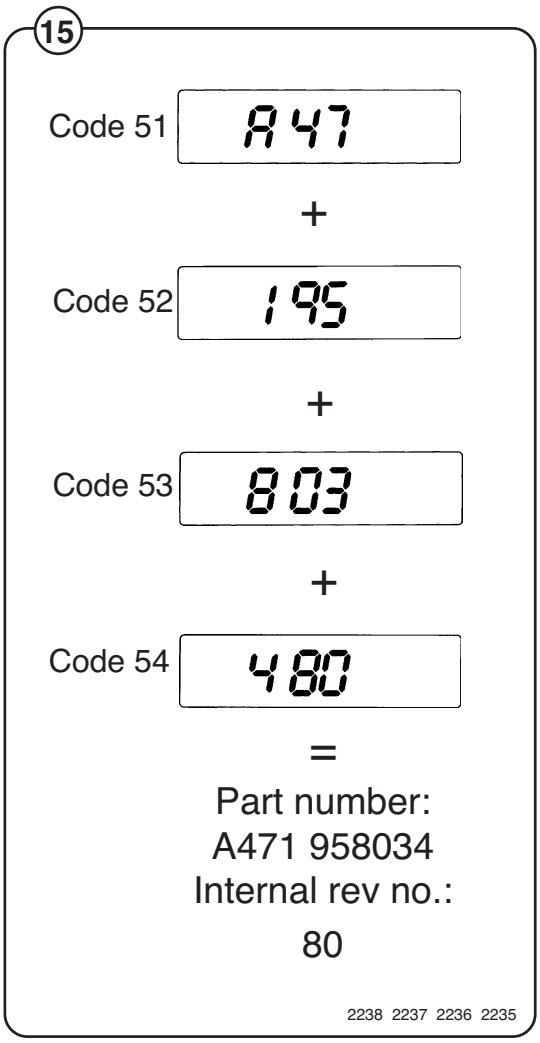




Programme memory part number (service mode only)

Fig. 15

- Depress the service button on the communication card.
- Enter code 51 (A47), code 52 (195), code 53 (803) and code 54 (480).
- The programme memory part number in this example is A471 958034. The number ’80’ is an internal revision number.



Service codes

Use the service switch to enter and exit the service mode.

Fig. (17) Using the front panel buttons, the various functions can be simulated by entering a service code. The functions can then be switched on and off using the **ON/OFF** button.

It is also possible to verify the input signals to the programme unit by watching the LEDs.

Entering the service mode

- Switch off the main power switch. Unscrew the rear electric box cover.
- Fig. (16) Turn the main power switch again. Depress the service switch on the communication card. “SE” is displayed to indicate the service mode has been engaged.

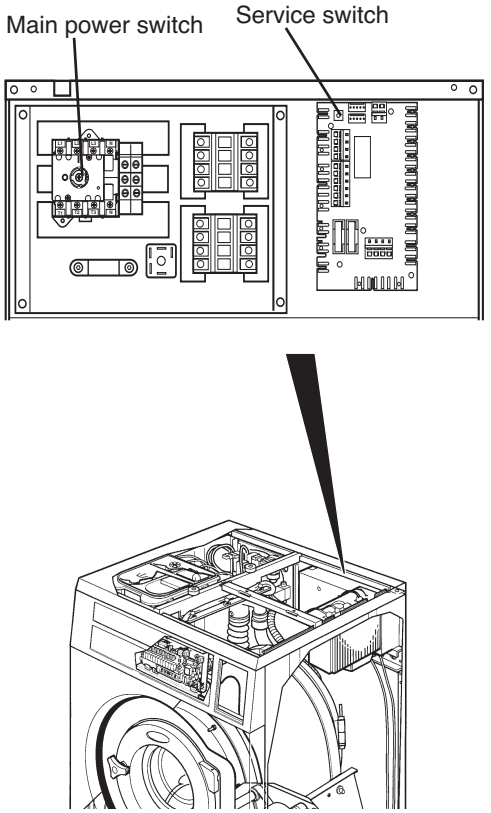
  When the door is closed it automatically locks. The door becomes unlocked when the service mode is switched off again.

Exiting the service mode

Depress the service switch once more or switch off the power to the machine.

To replace the cover on the rear electric box, the main power switch must be in the 0 position.

16



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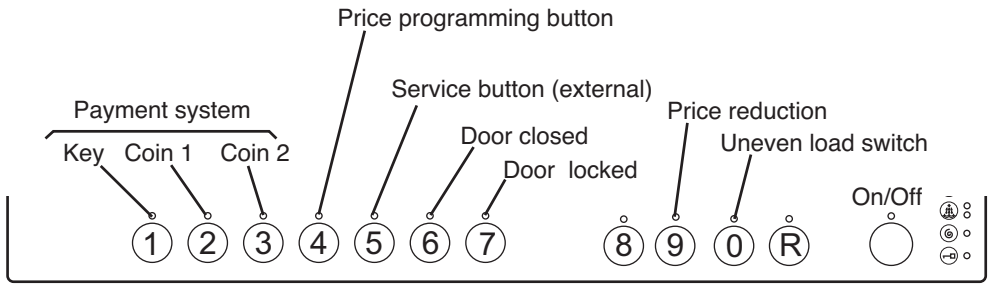

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Code table

Code	Function		
11	TM1/Re 2	X72:3	X53 (Y11)
12	TM2/Re 8	X73:2	X53 (Y12)
13	TM3/Re 4	X72:5	X53 (Y13)
14	TM4/Re 10	X73:4	X53 (Y22)
15	TM5/Re 5	X72:6	X53 (Y14/Y24)
16	TM6/Re 3	X72:4	
17	Hot/Re 11	X73:4	X53 (Y25)
18	Cold/Re 9	X73:3	X53 (Y15)
19	CHd, TM7/Re 6	X72:7	X52 (Y35)
21	Heat/Re 7	X73:1	X46:1
22	Pump/Re 12 NC Drain/Re 12 NO	X73:6 X73:7	X51:1 X50:1
23	Prog off/Re 1 NC Prog on/Re 1 NO (Door lock)	X32:3 X31:2	
24	Level control. The level is displayed and not code 24. Pressing START, cold water is sprayed into detergent compartment 1.		
25	Motor, low drum revolution, clockwise		
26	Motor, low drum revolution, counter-clockwise		
27	Motor, low drum revolution, clockwise		
28	Motor, low drum revolution, counter-clockwise		
29	Motor, medium drum revolution, clockwise		
31	Motor, medium drum revolution, counter-clockwise		
32	Motor, high drum revolution, clockwise		
33	Motor, high drum revolution, counter-clockwise		
34	Distribution rotation, counter-clockwise		
35	Spinning at low speed, clockwise		
36	Spinning at medium speed, counter-clockwise		
37	Spinning at high speed, counter-clockwise		
38	Turbo spinning, counter-clockwise		

Code	Function
41-42	Coin counter.
43-44	Hour meter for total operating time (see section 23. Programme unit).
45	Latest detected error code.
51-54	Programme memory part number (see section 23. Programme unit).
61	Weight calibration (zero weight calibration).
71	Display window, segment test, LED test and buzzer.
72	Buzzer test.
73	LED test.
81-82	Price reduction input configuration, input X36: 1, 2 on programme unit card (switch between 1 and 0 using the Start/Stop button). 81 = 0, 82 = 0 : Price reduction 81 = 1, 82 = 0 : Start condition 81 = 0, 82 = 1 : Remote start (parallel start button without quick advance).
83*	AWS (Automatic Weight System) off = 0, on = 1.
84*	Temperature stop off = 0, on = 1.
85*	Error code for too slow heating. Active = 1, No error code = 0.
86*	Reduce number of rinses (1 = Yes, 0 = No).
87*	Limited extraction speed (1 = Yes, 0 = No).
88*	Blocked START-button. (1 = Yes, 0 = No).
91	Coin value, coin entry 1. Programmed using the price-programming button.
92	Coin value, coin entry 2. Programmed using the price-programming button.
93	Option to pause a coin operated machine. 1 = Yes, 0 = No. Programmed using the price-programming button. Only active if coin value 1 not equal to zero.
94	Option to rapid advance a coin operated machine. 1 = Yes, 0 = No. Programmed using the price-programming button. Only active if coin value 1 not equal to zero.
95	Show reservation on display when CALCAD.
96	Reset of the CALCAD 4400 setting. 1 = Yes, 0 = No. Programmed using the price-programming button. This parameter configured to 1 when the CALCAD 4400 unit is installed.
97	Programming of price reduction on the coin box unit using the price programming button. The price reduction is entered as a percentage from 0 to 99 with rounding to the next higher coin value. A 99% price reduction implies a free wash.

Code	Function
111*	Add pre-rinse to all wash programs without option button pressed.
121*	Changes value for wash time in pre-wash for all programs without option button pressed.
122*	Changes value for water level in pre-wash for all programs without option button pressed.
123*	Changes value for wash temperature in pre-wash for all programs without option button pressed.
131-137*	Changes value for wash time in main wash in a certain wash program, no option button pressed.
138*	Changes value for water level in main wash for all programs, no option button pressed.
141-147*	Changes value for temperature in main wash in a certain wash program, no option button pressed.
151*	Add rinses to all wash programs without option button pressed.
152*	Changes value for water level in rinses without option button pressed.

* If one is lost in the different possible settings, one can get back to the original settings.

- Press the service button, go back to the service program.
- Press again and keep it pressed until the display shows the letters "EP". It will take about 10 seconds.

Changing wash program parameters

It is possible to change parameters in the wash programs and add or remove program sequences.

Fig. 18

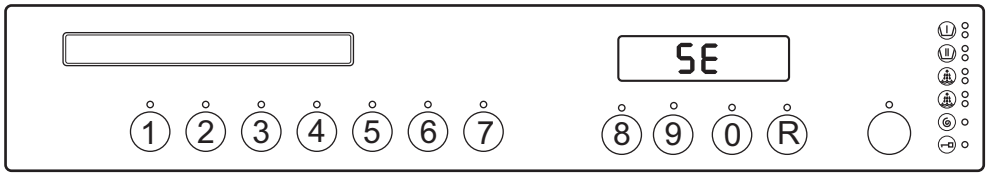
When service button has been pressed, the push button alter to a numerical fuction. The START-button will work as ON/OFF. The R is a reset button for resetting a sercive pogram number. When reset button is pressed the display will show 00 until a service number is given.

Adding or deleting a function, a Yes or No question has to be answered. For example to delete one rinse, which is service code 86, the display will show 0:86. To delete one rinse, press ON/OFF button and the display will show 1:86
(0 = No and 1 = Yes). The selected changes will be stored when a new service code is entered or when service button is pressed.

Changing a value e.g. wash time, temp, etc.
Press ON/OFF button twice. The display will change from showing service code to show the actual configuration value.
Decrease the value by pressing button 9 and increase with button 0. Press ON/OFF button and the value will be stored and the display will return to show the service code.

If the service button is pressed to leave the service program, when the ON/OFF button has been pressed twice (value selection mode entered), the old configuration value will be kept and the present value on the display will be scrapped.
The ON/OFF button **must** be pressed once to store the new value before leaving the service program.

18



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When programming time, the clock symbol is lit and temperature the thermometer is lit.

There is possible to decide from the factory for each wash module (prerinse, prewash, main wash and rinse), if the time in the wash module shall remain unchanged or not, despite of a time change done.

Reset all changes

It is possible to reset all changes made.

- Press service button to enter the service mode.
- Press service button again and keep it pressed for at least 10 seconds.
  The display will now show EP which means that the reset is completed.

Programmable functions

Service code 83
AWS (Automatic Weight System) can be turned off by changing from 1:83 TO 0:83.

Service vode 84
Heated to non-heated. Thermostop can be turned off be changing from 1:84 to 0:84.

Service code 85
Fault indication for "No heating" can be deactivated by changing from 1:85 to 0:85.

Pre-rinse

Service code 111
It is possible to add up to five pre-rinses before the pre-wash/main wash.
Pre-rinse(-s) will be added to all programs without option button pressed.

Pre-wash

Service code 121, 122 and 123.
Changes can be made in the pre-wash such as time, level and temperature. Code 121 changes value for time and can be changed ±20 min. Code 122 changes value for water level ±20 scale units. The display does not show present level, but 0.
Code 123 changes value for temperature ±20°C.
Changes value for all wash programs without option button pressed.

W385M/SU620 - Conversion table, water level

Scale units	Quantity of water (litres)	Water level * (mm)	
12	4.2	9	
20	8	35	
30	12.5	66	
36	16	85	
43	20	104	
47	22.6	116	
54	27.4	138	
61	31.8	159	
70	38	186	
94	55	260	
110	66	306	overfilling level

* Distance above bottom of inner drum.

W3105M - Conversion table, water level

Scale units	Quantity of water (litres)	Water level * (mm)	
16	5	15	
26	10	52	
32	13.5	73	
34	14.5	79	
41	19	101	
46	22	117	
50	24.5	129	
54	27	141	
59	30	156	
60	30.5	159	
66	35	178	
72	39	195	
88	50	245	
105	61.8	296	
118	71	336	overfilling level

* Distance above bottom of inner drum.

W3130M/SU630 - Conversion table, water level

Scale units	Quantity of water (litres)	Water level * (mm)	
24	10	39	
33	15	64	
41	21.4	91	
46	25	105	
52	30	124	
56	33.3	136	
60	36.6	148	
72	46.6	184	
87	60	231	
109	80.2	298	
118	89	325	overfilling level

* Distance above bottom of inner drum.

W3180M/SU640 - Conversion table, water level

Scale units	Quantity of water (litres)	Water level * (mm)	
16	8	17	
40	26.7	95	
50	36	125	
56	42	143	
66	52	173	
78	65	210	
85	72	231	
92	80	254	
154	146	433	overfilling level

* Distance above bottom of inner drum.

W3250M/SU655 - Conversion table, water level

Scale units	Quantity of water (litres)	Water level * (mm)	
20	13.5	32	
48	40	117	
56	50	142	
66	62.5	172	
78	77.5	208	
87	89.5	235	
97	103	265	
172	206.6	483	overfilling level

* Distance above bottom of inner drum.

W3330M/SU675 - Conversion table, water level

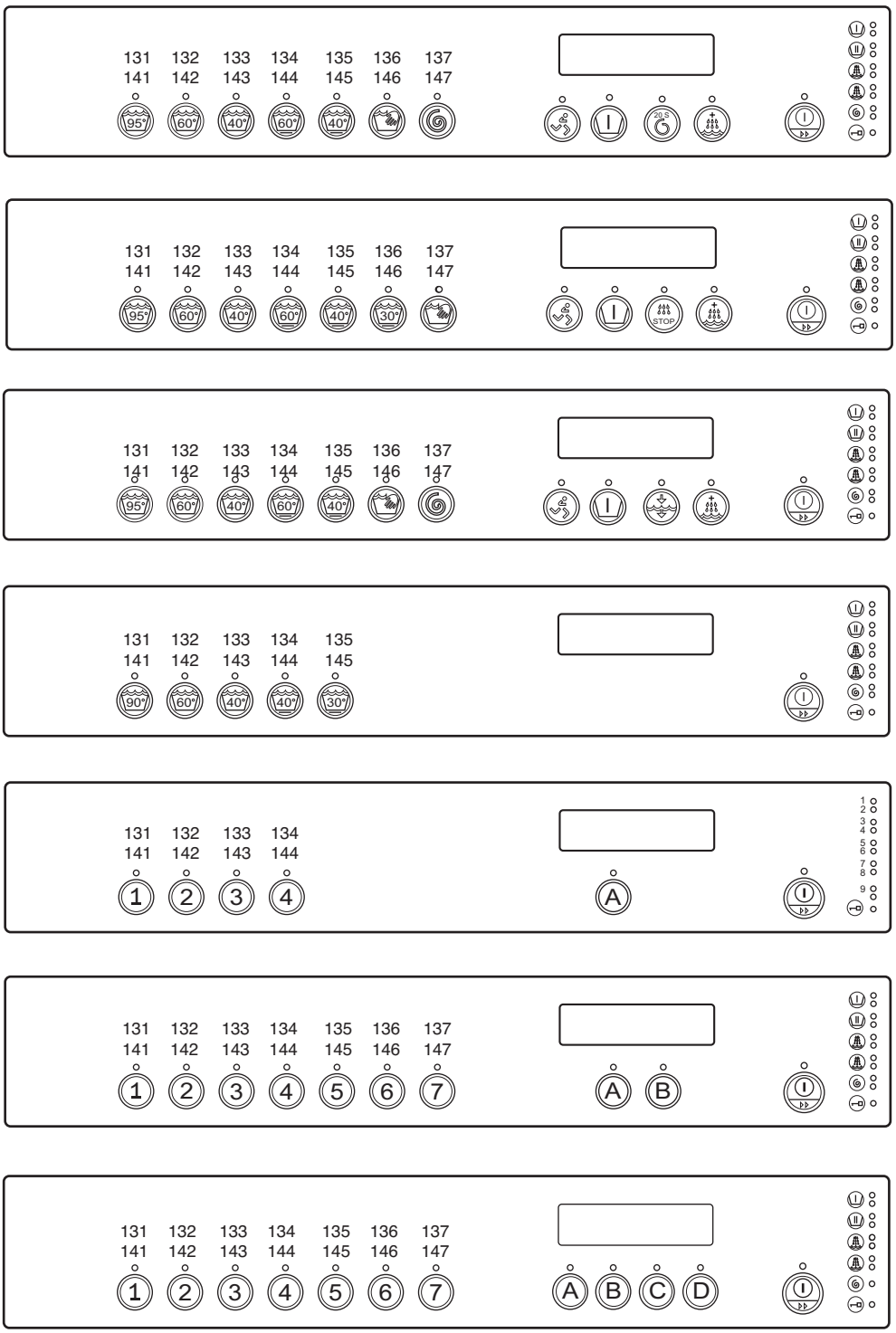
Scale units	Quantity of water (litres)	Water level * (mm)	
20	13.5	22	
36	30	73	
57	60	141	
73	86	193	
81	100	220	
87	110	238	
98	128	272	
105	140	294	
117	160	329	
138	199	397	
181	275	530	overfilling level

* Distance above bottom of inner drum.

Main wash

Service codes 131-137, 141-147 and 138. Changes can be made in the main wash such as time, level and temperature. Time and temperature can be made for each individual program. When changing the level, it will be the same level in all main washes without option button pressed.

19



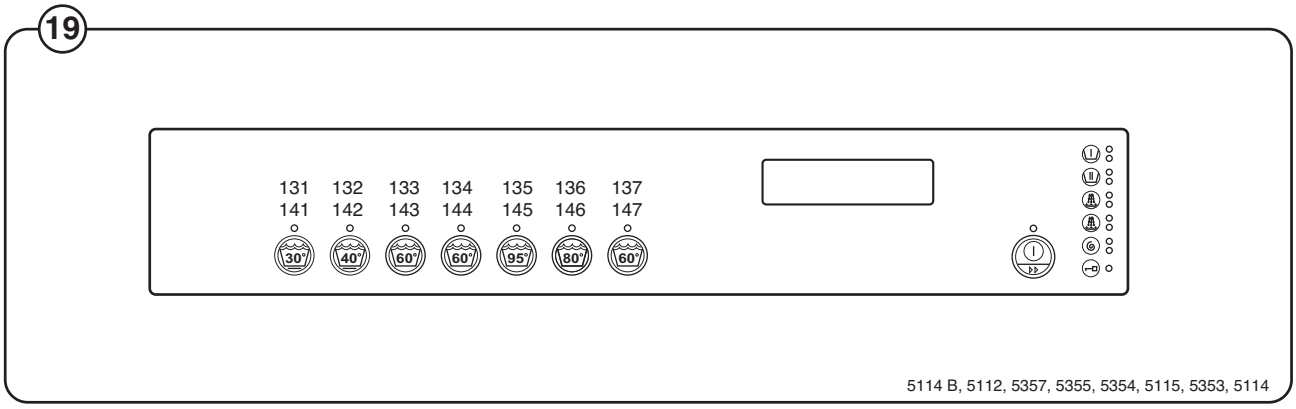


Fig. 19 Service codes 131-137 and 141-147 shall be used for the different wash programs. Starting from left to right.

Codes 131-137 changes the value for time and can be changed ±20 min.

Codes 141-147 changes the value for temperature and can be changes ±38°C.

Code 138 changes the value for water level and can be changed ±20 scale units.
Note: When using code 138 the level will change in all main washes in all wash programs without option button pressed. Re. scale units, se "Pre-wash"

Rinses

Service code 86
Second last rinse can be deleted by changing from 0:86 to 1:86. Valid for all wash programs without option button pressed.

Service code 87
A limit giving a maximun allowable extraction speed can be activated by changing from 0:87 to 1:87.

Service code 88
Start possibility by pressing the START-button can be blocked by changing from 0:88 to 1:88.

Service code 151
It is possible to add up to five rinses. The extra rinses will be added to all programs without option button pressed.

Service code 152
Change the value for washer level in all rinses and programs without option button pressed. Level can be changed ±20 scale units.

Zero calibration

Weight measuring function can be calibrated by entering the service program.

- Enter the service program and press service button.

1. Enter service code 61 and press START.
2. The machine will now do a standard start extraction and weight measuring sequence. Weight measuring sequence will be made three times.
3. If the weight measuring sequences don't differ more than ±0.3 kg an average value is established. The average value is saved and is used as tara in wash programs.
4. Service code 61 is flushing on the display as a receipt that the measuring is OK.
5. Leave the service program.

If the result is not within ±0.3 kg the measuring will be shown on the display with service code 61 plus an E.

- The calibration has to done again as above.
- If no result can be obtained, disconnect the function in the service program.

Imbalance detection

Imbalance can be split into three different types: extreme imbalance measurement, mechanical imbalance interruption and super imbalance measurement.

Extreme imbalance measurement

In a drain sequence, when the drum starts its acceleration from washing rpm to extraction rpm, the extreme imbalance measurement starts when 90% of the distribution rpm has been achieved. After this, for the remainder of the super imbalance measurement, the distribution time and throughout any subsequent extraction time, the programme detects whether extreme imbalance occurs or not.

In the event of extreme imbalance, which can occur if e.g. a spring strut is damaged or if washing is being performed in sacks, the acceleration is interrupted and it is necessary to wait for the drum to stop. If extreme imbalance occurs during:

a. distribution or during super imbalance measurement, the drain sequence starts again from the beginning. The number of attempted restarts can be set in the system data, but is usually set to 5 attempts. This value can also be altered via configuration 2.

b. extraction, the extraction is interrupted and the programme skips to the next washing sequence after extraction.

Mechanical imbalance interruption (detection via mechanical imbalance switch)

The same as extreme imbalance, except that if the imbalance switch is activated during a part of the washing programme that is run at washing rpm, the drum stops for a few seconds and then automatically starts up again.

Super imbalance measurement

Super imbalance measurement is the normal imbalance measurement. Its task is to ensure that the machine is not overloaded during extraction, as well as to ensure that the number of missed extractions is as small as possible.

Super imbalance measurement starts a few seconds after the drum has reached distribution rpm. The delay is there to allow the motor rpm to Ôsettle down' so that it is as stable as possible.

The magnitude of the imbalance is measured and compared first with a fairly low imbalance limit value 1. If the imbalance exceeds this limit value, the drum is slowed down to a lower rpm in order to achieve redistribution of the clothes. It then accelerates again without stopping at the distribution rpm again, after which a new imbalance measurement is carried out. The number of attempts at limit value 1 may be set in the system data and can also be altered in configuration 2. The value is normally set at 3.

If the imbalance is below the limit value, extraction starts at the extraction speed specified in the programme after the distribution time has elapsed.

If the imbalance still does not drop below limit value 1 after three attempts, the imbalance is instead compared with a slightly higher permitted imbalance value, limit value 2. If the imbalance exceeds this limit value, the drum is slowed down to a lower rpm in order to achieve redistribution of the clothes. It then accelerates again without stopping at the distribution rpm again, after which a new imbalance measurement is carried out. The number of attempts at limit value 2 may be set in the system data and can also be altered in configuration 2. The value is normally set at 2.

If the imbalance is suddenly lower than one of the two limit values, the extraction starts with the extraction speed programmed in the programme. The reason for the use of two limit values, both of which produce the same extraction rpm, is that in order to look after the machine's mechanism, it is desirable in the first instance to extract with as low an imbalance as possible.

In the same way as above, the imbalance is compared with a further two limit values, limit value 3 and limit value 4. However, each of these gives a reduced extraction rpm if the imbalance is below the limit value. The number of attempts at limit values 3 and 4 may be set in the system data and can also be altered in configuration 2. The value for each is normally set at 2.

It should be noted that even if imbalances have occurred continually that are so large that the comparison is made with limit value 4, and the imbalance suddenly drops below limit value 1, full extraction speed will be executed.

The distribution time programmed into the drain module does not count down during the time imbalance measurement is in progress. The countdown only starts when an approved imbalance value has been achieved.

In the event that an approved imbalance value is never achieved, the drain sequence is interrupted, any subsequent extraction is skipped and the next washing sequence in the washing programme will be executed.

Note that the imbalance measurement is always carried out if the distribution rpm has been programmed in a drain module. In other words, irrespective of whether the drain module is followed by extraction or not. If a drain module is not followed by an extraction, it is necessary to avoid programming the drain module with distribution rpm as the imbalance measurement will then be carried out. This takes time, approximately 40 seconds in the best case scenario, although in the worst case scenario, if limit value 4 has to be used, it can take several minutes.

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Contents

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Description

SU620
Up to machine No. –520/19486
and 520/19549-22806

SU630
Up to machine No. –595/9040
SU640 Up to machine No. –650/14354
SU655 Up to machine No. –725/9708
SU675 Up to machine No. –795/3769

General

The door locks consists of the following:

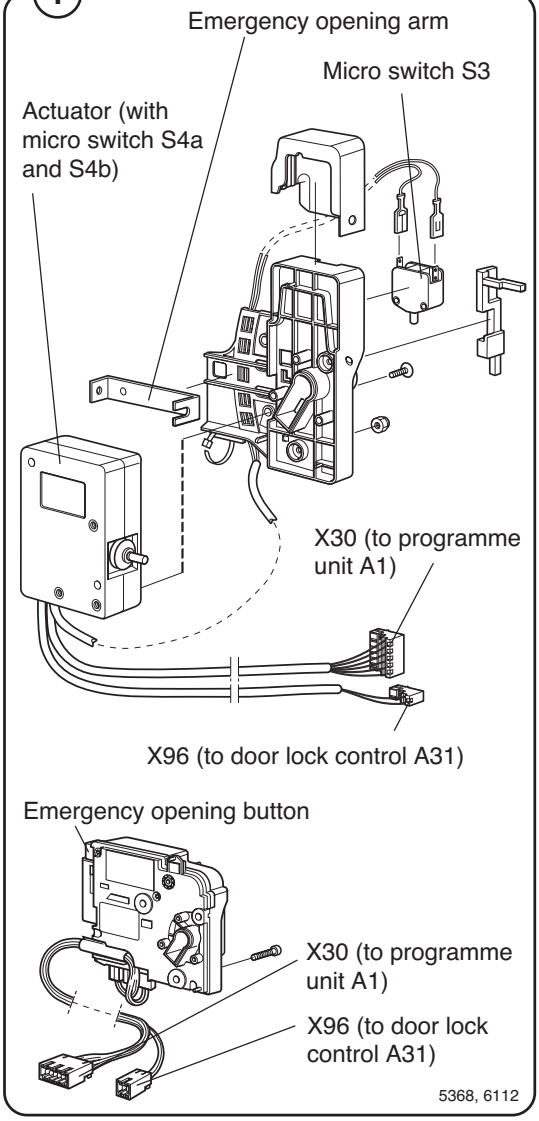
Fig. 1

- **Door lock A41**, which contains
  - An **actuator** that locks the door lock and also has two built-in micro switches, S4a and S4b. The actuator is bi-stable, i.e., it has two stable positions: locked door and unlocked door. The actuator must receive a pulse to lock and unlock the door lock. S4a and S4b are both closed when the door is locked.
  - A **micro switch S3** that is closed when the door is closed.
  - An **emergency opening arm/emergency opening button** that can be used to open the door lock in an emergency.

Fig. 2

- **Door lock controller A31** situated in the front control unit of the machine. This card controls the door lock function and whether the drum is empty and not turning. It locks and unlocks the door lock when the programme unit requests door locking or unlocking.

1



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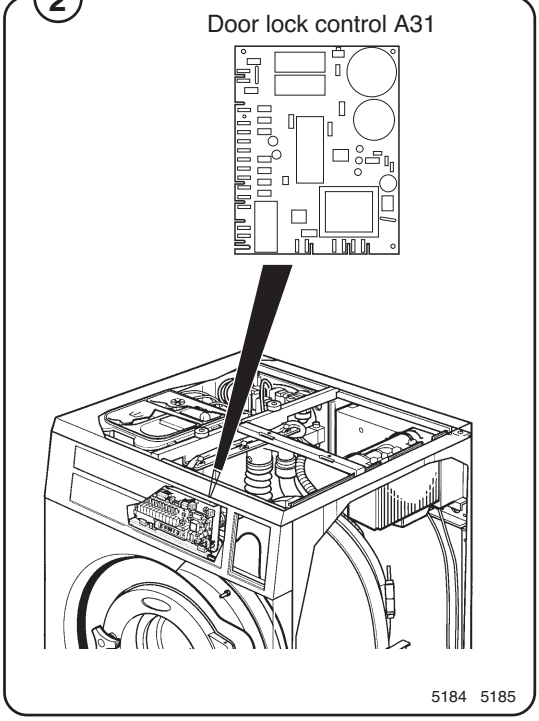
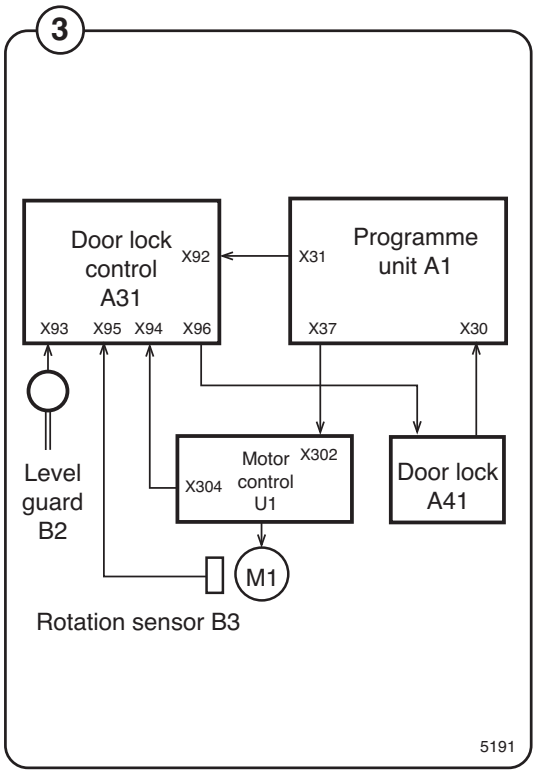


Function

The door lock locks the door

Fig. 3



When the door is closed (closed door lock switch S3), the programme unit may request door locking by applying a voltage of 200-240 V on the door lock controller A31 input X92.

The following check is made by the A31 card prior to locking of the door:

- **No water in drum** - input X93 from level guard B2 is closed = 0 V
- **Motor not engaged** - input X94 from motor control U1 open = 5 V
- **Drum not turning** - pulse frequency on input X95 from rotation sensor B3 less than 0.4 Hz.

When the above conditions are met, the card A31 outputs a closing pulse on output X96 to the door lock actuator/coil, which then locks the door. The micro switches S4a and S4b in the actuator/door lock are closed when the door is locked. These micro switches feed voltage to:

- **The output relays** on the programme unit card. The relays control the machine's drain and water valves as well as heater switch-on.
- **Interlock signal** for motor control (input X302) that releases the motor start prevention state.

Programme operation is now possible.

The door lock unlocks the door

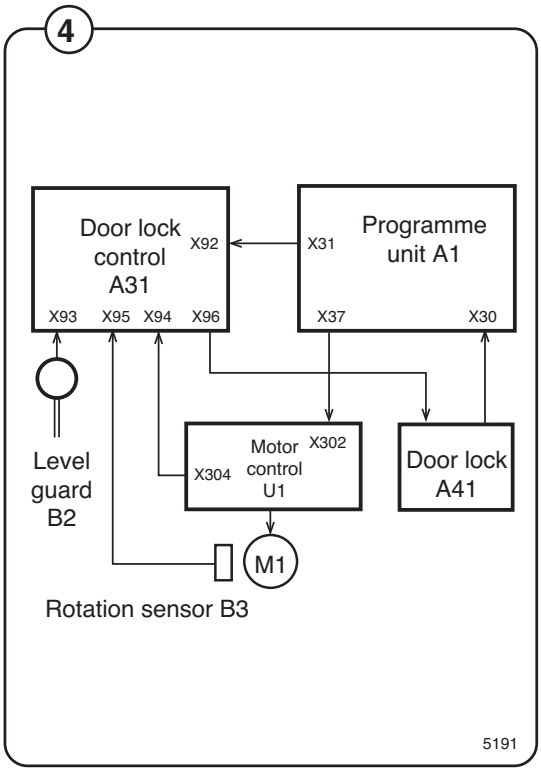
Fig. 4

The programme unit requests door unlocking by applying 0 V on input X92 of the door lock controller.

The following check is made prior to unlocking of the door:

- **No water in drum** - input X93 from level guard B2 is closed = 0 V
- **Motor not engaged** - input X94 from motor controller U1 open = 5 V
- **Drum not turning** - pulse frequency on input X95 from rotation sensor B3 is less than 0.4 Hz.

When the above conditions are met, the door lock controller outputs an opening pulse on output 96 to the door lock actuator/coil, which then unlocks the door. Micro switches S4a and S4b now interrupt the actuator/door lock and the I/O card 1 relays lose all voltage to prevent the motor from starting (interlock signal on motor controller input X302). The drain and water valves of the machine are now disabled and the heater and motor cannot be switched on.



Error codes

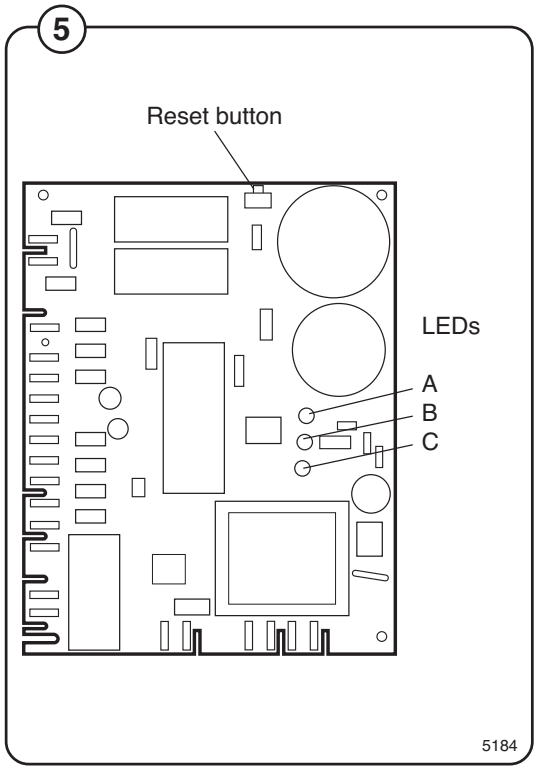
Fig. 5

The door lock control has three LEDs that show whether the door lock operates normally or whether an error has been detected. During normal operation, the LEDs blink when the drum is not turning and are off when the drum rotates. In case of an error, the three LEDs will show the error condition according to the table below. If an error disappears, the error code condition disappears. If the error is still present at the programme end, the error is automatically cleared after 5 minutes and the door is unlocked.

LEDs A	LEDs B	LEDs C	Normal operation
●	●	●	No error. The drum is not turning (no water in drum) (– – –)
●	●	●	Level switch B2 indicates water in drum when drum is stand-still (– – – – – –)
❍	❍	❍	No error. The drum is rotating

LEDs A	LEDs B	LEDs C	Error state
●	●	❍	Level guard B2 indicates water in drum when the door lock is open (input X93 open).
❍	●	●	Motor control indicates that motor is operating when door lock is open (input X94 closed).
●	❍	❍	No signal from rotation sensor B3 (frequency input X95 < 0.4 Hz) in spite of the motor control indicating motor operation (input X94 open).
❍	●	❍	No signal from motor control (input X94 not open) in spite of rotation sensor B3 indicating motor operation (frequency input X95 > 0.4 Hz).
●	❍	●	Error in drive circuits for door lock (output X96) or error in door lock/cable harness for the door lock.
❍	❍	●	Internal error in the door lock control.

❍ = no lit, ● = lit



Reset button

Fig. 5 The door lock control features a reset button used to reset the programme routines stored in the computer. When pressed, any error codes are erased.

Door lock control inputs/outputs

Fig. 6 **X90: AC 200-240 V feed**

X91: Transfer of voltage supply

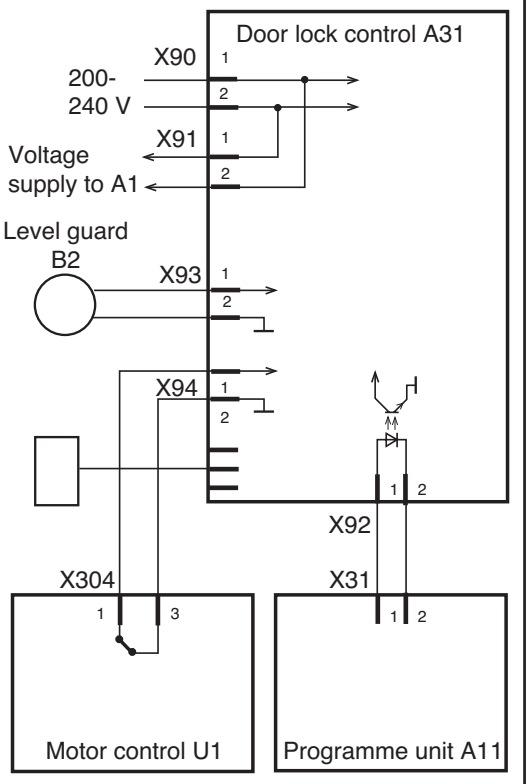
Fig. 7 Feeds the voltage to programme unit A1.

X92: Input from programme unit (via I/O card 1): Lock door

Prior to the door lock control locking the door (output X96), a check is made for any water left in the drum (input X96 closed) and whether the drum is not rotating (input X94 open).

Input voltage	Function
200-240 V DC:	Programme unit requests door locking
0 V:	Programme unit requests door opening

6



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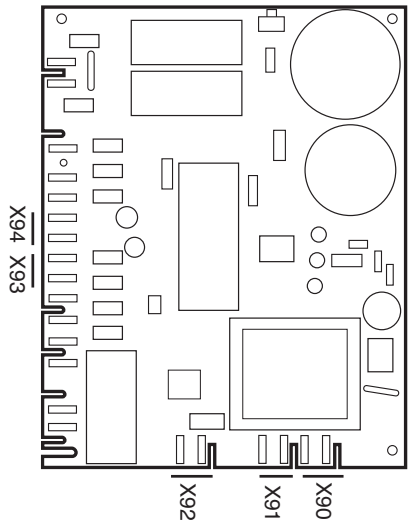


Fig. 8
Fig. 9

X93: Input from level guard

If the input indicates “Water in drum” when the door is not locked, the door cannot be locked. The LEDs then show the error code ● ● ❍.

Input voltage	Function
5 V DC:	Water in drum (level guard open)
0 V:	Drum empty (level guard closed)

X94: Input from motor control

If the input indicates “Motor operating”, the door cannot be locked. The LEDs then show the error code ❍ ● ●.

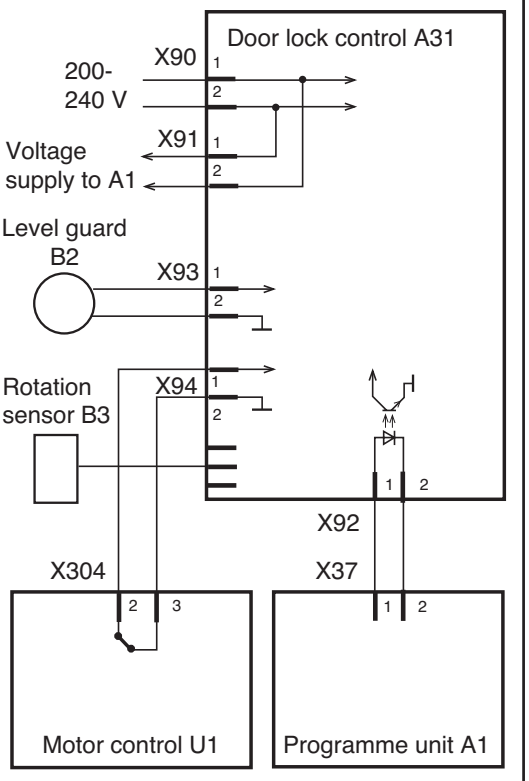
The input signal from X94 is compared with the signal from the rotation sensor B3 (input X95).

If the motor signal is operating, but the rotation sensor does not provide a signal, the error code ● ❍ ❍ is shown.

If the rotation sensor indicates motor operation when the motor is not operating, the error code ❍ ● ❍ is shown.

Input voltage	Function
5 V DC:	Motor not operating (input closed)
0 V:	Motor operating (input open)

8



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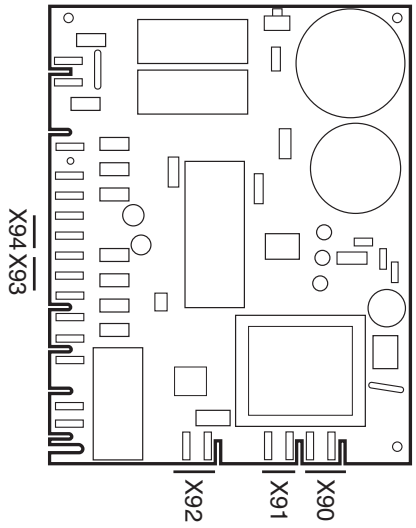


Fig. 10

X95: Input from rotation sensor on motor shaft

Fig. 11

When the motor is operating, a pulse train is applied on the input.

Input	Function
Pin 1:	DC 4-10 V feed
Pin 2:	0V
Pin 3:	DC 4-10 V pulse input Frequency > 0.4 Hz: drum is rotating Frequency < 0.4 Hz: drum is not rotating

X96: Output to door lock

Locks the door lock when the following conditions are met:

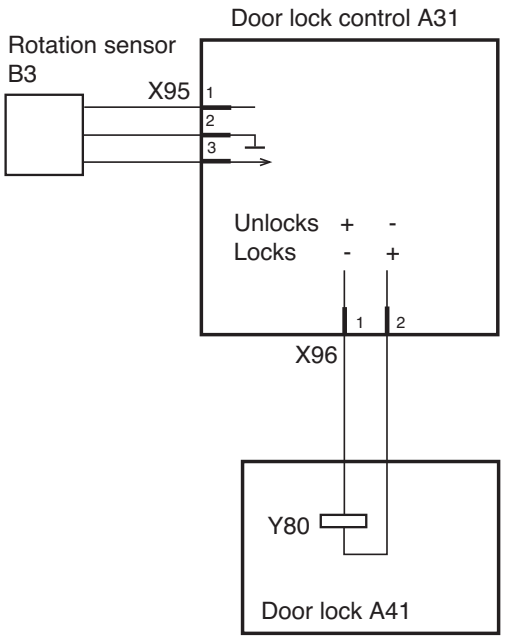
- DC 200-240 V on input X92 (programme unit requests door locking).
- DC 0 V on input X93 (no water in drum).
- DC +5 V on input X94 (motor not operating).
- <0.4 Hz on input X95 (drum not rotating).
- No error code present.

Unlocks the door lock when the following conditions are met:

- DC 0 V on input X92 (programme unit requests door unlocking).
- DC 0 V on input X93 (no water in drum).
- DC +5 V on input X94 (motor not activated).
- <0.4 Hz on input X95 (drum not rotating).
- No error code present.

Voltage	Function
17 - 31 V DC, + on pin 1, - on pin 2	Unlocks the door
17 - 31 V DC - on pin 1, + on pin 2	Locks the door

10



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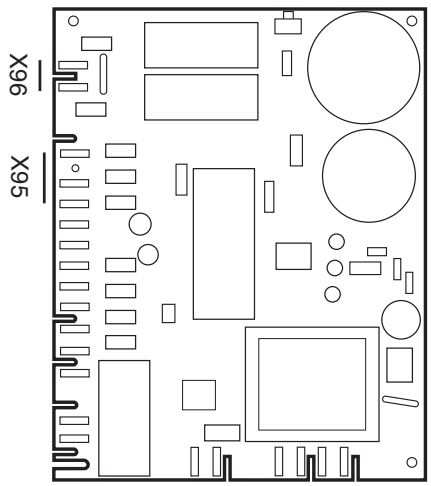

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Repairs

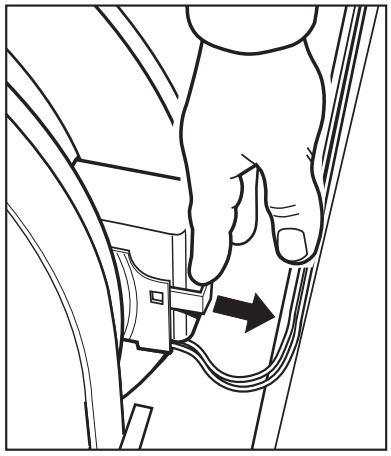
Repair work on the machine should only be done by specially trained personnel.

Emergency opening of door lock

Fig. 12

1. Take down power from the machine by turning the main power switch to the 0 position.
2. Remove the front cover or top cover. When replacing the door lock, it is recommended to remove the front cover.
3. Pull the emergency opening arm to the side. This retracts the spring-loaded locking pin and the door lock opens.
   Alt. Press down the emergency opening button.

12



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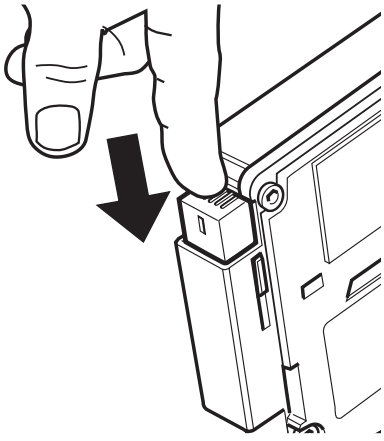

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Replacing the door lock

1. Take down power from the machine by turning the main power switch to the 0 position.
2. Remove the front cover alt. side pole.
3. Remove the door (two screws in each hinge).
4. Remove the front panel.
5. Remove the door lock (three holding screws).
6. Verify the strap positions on the cable for the lock. Cut the necessary straps to undo the cables leading to the lock.
7. Undo the connectors.
8. Replace the door lock.
9. Reconnect the new (door) lock.
10. Assemble in reverse order.
11. Strap the cables for the lock according to the notes made in step 6.

Description

SU620
from machine No. 520/22807–
and 520/19487-19548

SU630
from machine No. 595/9041–
SU640 from machine No. 650/14355–
SU655 from machine No. 725/7909–
SU675 from machine No. 795/3770–

General

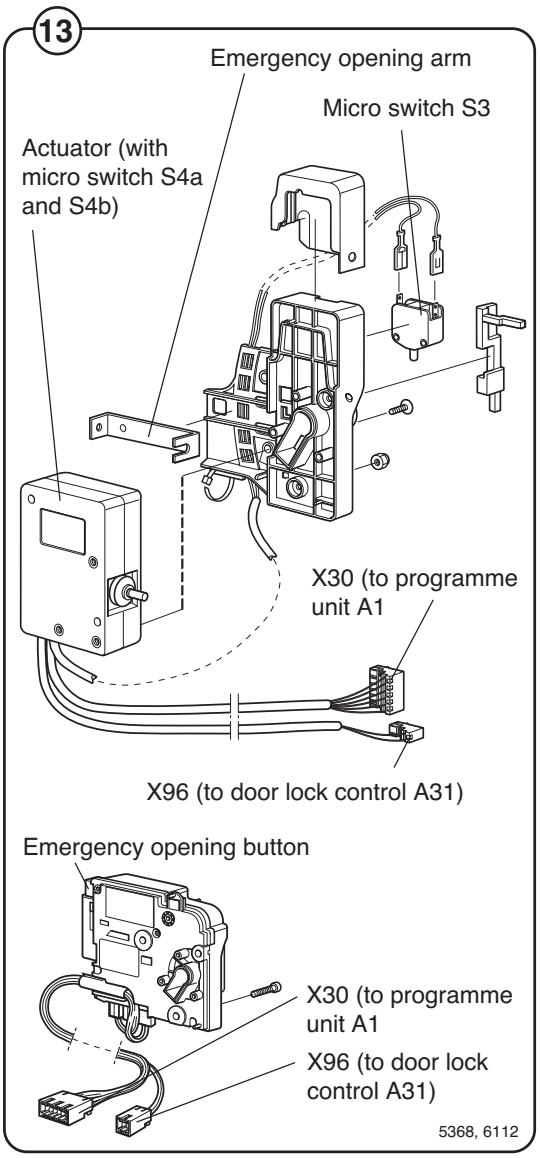
The door locks consists of the following:

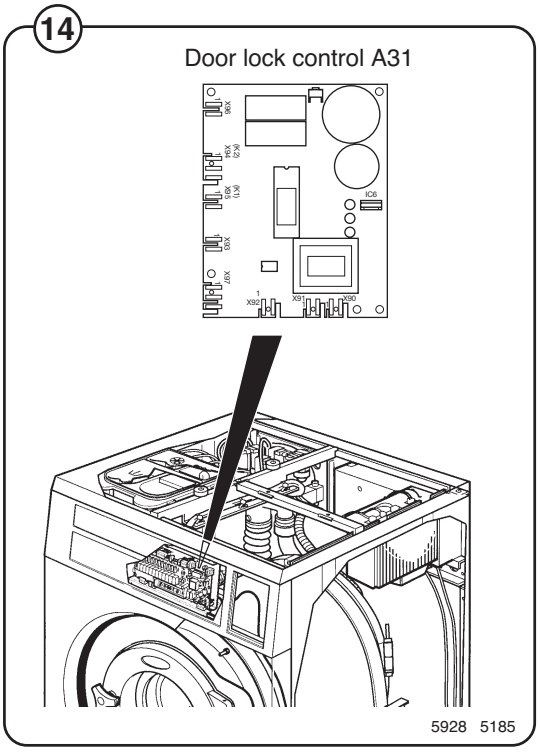
Fig. (13)

- **Door lock A41**, which contains
  - An **actuator** that locks the door lock and also has two built-in micro switches, S4a and S4b. The actuator is bi-stable, i.e., it has two stable positions: locked door and unlocked door. The actuator must receive a pulse to lock and unlock the door lock. S4a and S4b are both closed when the door is locked.
  - A **micro switch S3** that is closed when the door is closed.
  - An **emergency opening arm/emergency opening button** that can be used to open the door lock in an emergency.

Fig. (14)

- **Door lock controller A31** situated in the front control unit of the machine. This card controls the door lock function and whether the drum is empty and not turning. It locks and unlocks the door lock when the programme unit requests door locking or unlocking.

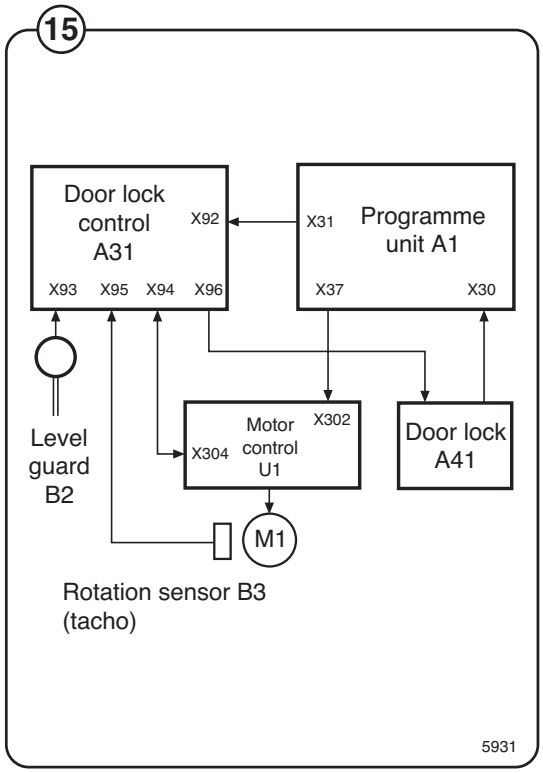




Function

The door lock locks the door

Fig. 15



When the door is closed (closed door lock switch S3), the programme unit may request door locking by applying a voltage of 200-240 V on the door lock controller A31 input X92.

The following check is made by the A31 card prior to locking of the door:

- **No water in drum** - input X93 from level guard B2 is closed = 0 V
- **Motor not engaged** - input X94 from motor control U1 open = 5 V
- **Drum not rotating** - pulse frequency on input X95 from rotation sensor B3 less than 3 Hz.

When the above conditions are met, the card A31 outputs a closing pulse on output X96 to the door lock actuator/coil, which then locks the door. The micro switches S4a and S4b in the actuator/door lock are closed when the door is locked. These micro switches feed voltage to:

- **The output relays** on the programme unit card. The relays control the machine's drain and water valves as well as heater switch-on.
- **Interlock signal** for motor control (input X302) that releases the motor start prevention state.

Programme operation is now possible.

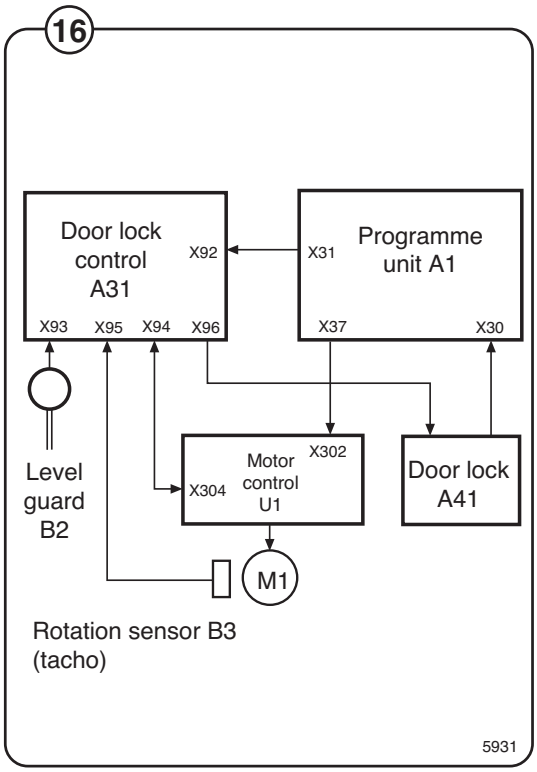
The door lock unlocks the door

Fig. 16 The programme unit requests door unlocking by applying 0 V on input X92 of the door lock controller.

The following check is made prior to unlocking of the door:

- **No water in drum** - input X93 from level guard B2 is closed = 0 V
- **Motor not engaged** - input X94 from motor controller U1 open = 5 V
- **Drum not turning** - pulse frequency on input X95 from rotation sensor B3 is less than 3 Hz.

When the above conditions are met, the door lock controller outputs an opening pulse on output 96 to the door lock actuator/coil, which then unlocks the door. Micro switches S4a and S4b now interrupt the actuator/door lock and the I/O card 1 relays lose all voltage to prevent the motor from starting (interlock signal on motor controller input X302). The drain and water valves of the machine are now disabled and the heater and motor cannot be switched on.



Error codes

Fig. 17

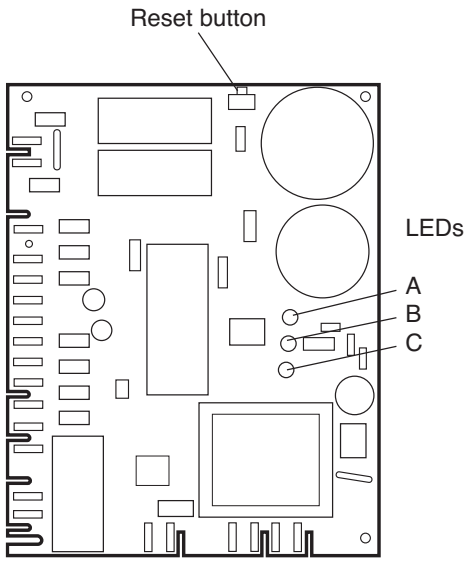
The door lock control has three LEDs that show whether the door lock operates normally or whether an error has been detected. During normal operation, the LEDs blink when the drum is not turning and are off when the drum rotates. In case of an error, the three LEDs will show the error condition according to the table below. If an error disappears, the error code condition disappears. If the error is still present at the programme end, the error is automatically cleared after 5 minutes and the door is unlocked.

LEDs A	LEDs B	LEDs C	Normal operation
●	●	●	No error. The drum is not turning (no water in drum) (– – –)
●	●	●	Level switch B2 indicates water in drum when drum is stand-still (– – – – – –)
❍	❍	❍	No error. The drum is rotating

LEDs A	LEDs B	LEDs C	Error state
●	●	❍	Level guard B2 indicates water in drum when the door lock is open (input X93 open).
❍	●	●	Motor control indicates that motor is operating when door lock is open (input X94 closed).
●	❍	❍	No signal from rotation sensor B3 (frequency input X95 < 3 Hz) in spite of the motor control indicating motor operation (input X94 open).
❍	●	❍	No signal from motor control (input X94 not open) in spite of rotation sensor B3 indicating motor operation (frequency input X95 > 3 Hz).
●	❍	●	Error in drive circuits for door lock (output X96) or error in door lock/cable harness for the door lock.
❍	❍	●	Internal error in the door lock control.

❍ = no lit, ● = lit

17



Reset button

The door lock control features a reset button used to reset the programme routines stored in the computer. When pressed, any error codes are erased.

Door lock control inputs/outputs

Fig. 18

X90: AC 200-240 V feed

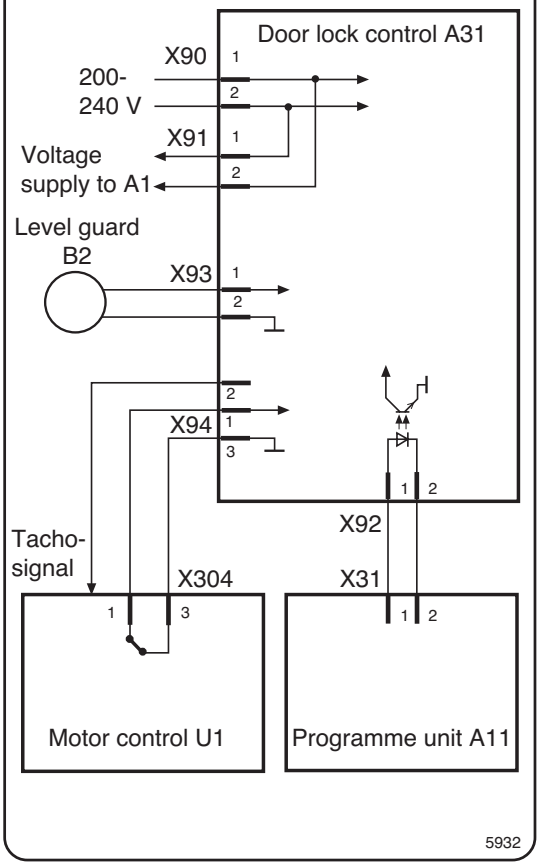
Fig. 19

X91: Transfer of voltage supply
Feeds the voltage to programme unit A1.

X92: Input from programme unit (via I/O card 1): Lock door
Prior to the door lock control locking the door (output X96), a check is made for any water left in the drum (input X96 closed) and whether the drum is not rotating (input X94 open).

Input voltage	Function
200-240 V DC:	Programme unit requests door locking
0 V:	Programme unit requests door opening

18



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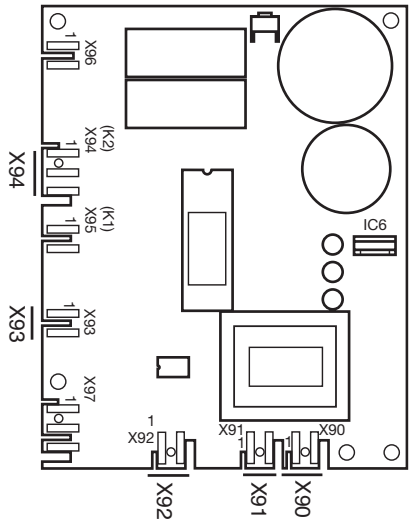


Fig. 20

Fig. 21

X93: Input from level guard

If the input indicates “Water in drum” when the door is not locked, the door cannot be locked. The LEDs then show the error code ● ● ❍.

Input voltage	Function
5 V DC:	Water in drum (level guard open)
0 V:	Drum empty (level guard closed)

X94: Input from motor control

If the input indicates “Motor operating”, the door cannot be locked. The LEDs then show the error code ❍ ● ●.

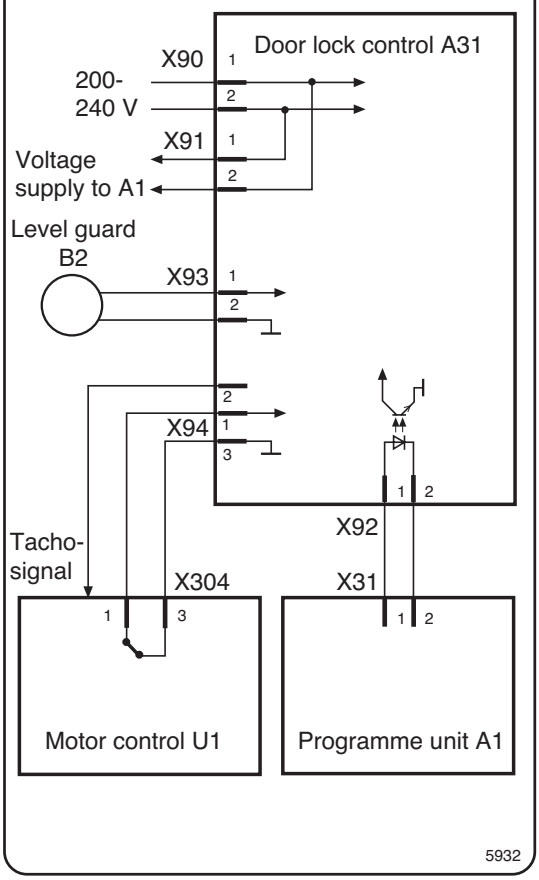
The input signal from X94 is compared with the signal from the rotation sensor B3 (input X95).

If the motor signal is operating, but the rotation sensor does not provide a signal, the error code ● ❍ ❍ is shown.

If the rotation sensor indicates motor operation when the motor is not operating, the error code ❍ ● ❍ is shown.

Input voltage	Function
5 V DC:	Motor not operating (input open)
0 V:	Motor operating (input closed)

20



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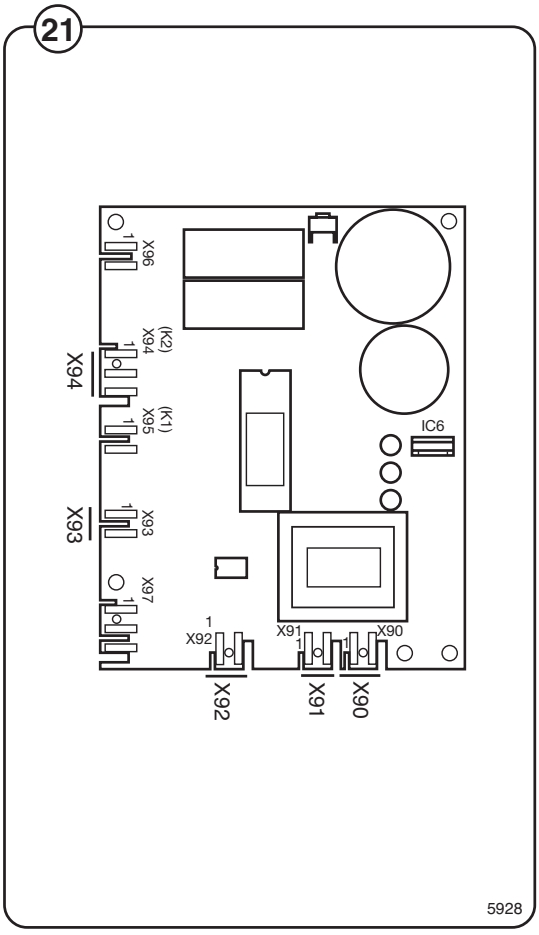


Fig. 22

X95: Input from rotation sensor on motor shaft

Fig. 23

When the motor is operating, a pulse train is applied on the input.

Input	Function
Pin 1:	0 V
Pin 2:	Tacho signal

X96: Output to door lock

Locks the door lock when the following conditions are met:

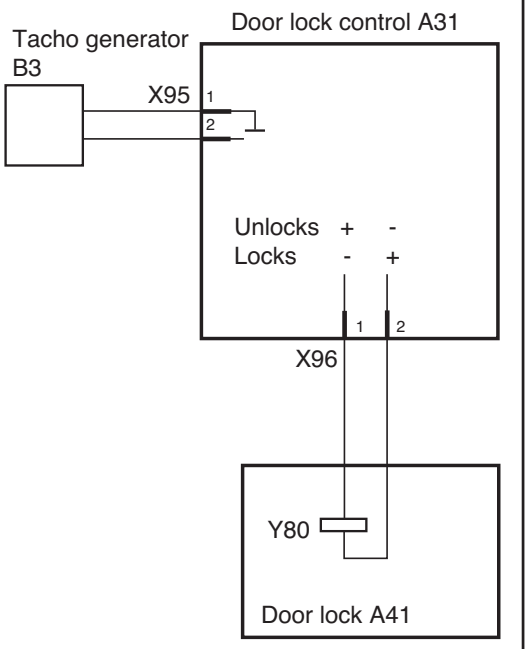
- DC 200-240 V on input X92 (programme unit requests door locking).
- DC 0 V on input X93 (no water in drum).
- DC +5 V on input X94 (motor not operating).
- <3 Hz on input X95 (drum not rotating).
- No error code present.

Unlocks the door lock when the following conditions are met:

- DC 0 V on input X92 (programme unit requests door unlocking).
- DC 0 V on input X93 (no water in drum).
- DC +5 V on input X94 (motor not activated).
- <3 Hz on input X95 (drum not rotating).
- No error code present.

Voltage	Function
17 - 31 V DC, + on pin 1, - on pin 2	Unlocks the door
17 - 31 V DC - on pin 1, + on pin 2	Locks the door

22



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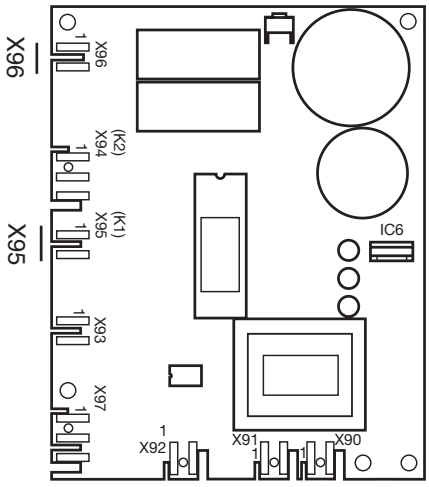

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Repairs

Repair work on the machine should only be done by specially trained personnel.

Emergency opening of door lock

Fig. 24

1. Take down power from the machine by turning the main power switch to the 0 position.
2. Remove the front cover or top cover. When replacing the door lock, it is recommended to remove the front cover.
3. Pull the emergency opening arm to the side. This retracts the spring-loaded locking pin and the door lock opens.
   Alt. Press down the emergency opening button.

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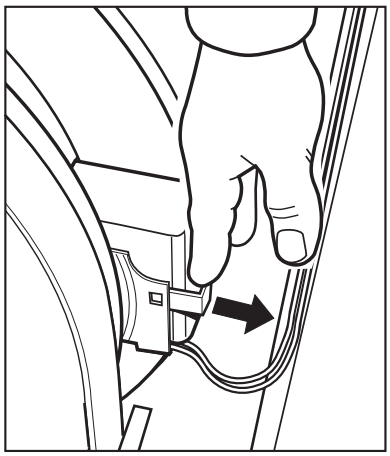

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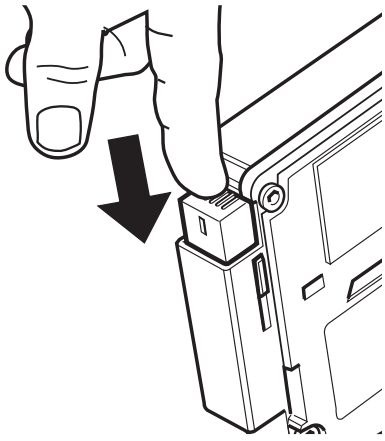

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Replacing the door lock

1. Take down power from the machine by turning the main power switch to the 0 position.
2. Remove the front cover alt. side pole.
3. Remove the door (two screws in each hinge).
4. Remove the front panel.
5. Remove the door lock (three holding screws).
6. Verify the strap positions on the cable for the lock. Cut the necessary straps to undo the cables leading to the lock.
7. Undo the connectors.
8. Replace the door lock.
9. Reconnect the new (door) lock.
10. Assemble in reverse order.
11. Strap the cables for the lock according to the notes made in step 6.

Contents

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Warnings

DANGER

Be careful when measuring the electric components in the motor control. All components have a potential difference of approx. 300 V in relation to protective earth and neutral.
When the green LED on the motor control card is lit, the components carry dangerous voltages.
The motor control lose all voltage about 10-30 seconds after the voltage has been disconnected and the motor has stopped.

Description

SU620
Up to machine No. –520/19486
and 520/19549-22806

SU630
Up to machine No. –595/9040
SU640 Up to machine No. –650/14354
SU655 Up to machine No. –725/9708
SU675 Up to machine No. –795/3769

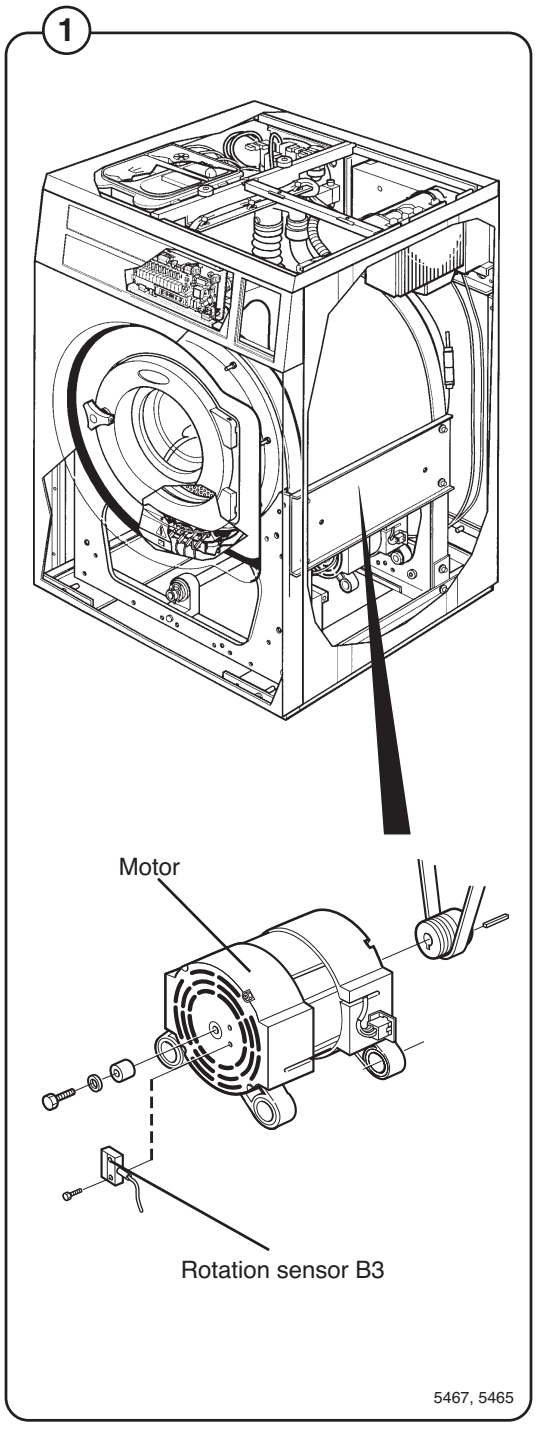
Motor

Fig. (1) The motor is fitted in a bridge carrier under the outer drum. It drives the washing drum using a drive belt.

The motor is frequency-regulated and is controlled by a microcomputer control. The various speeds for normal operation, distribution speeds and extraction as well as acceleration/ retardation can be controlled with a high degree of precision.

The motor winding is protected against overloads using a thermal overheating protector that is automatically reset.

The motor is connected directly to the motor controller via a cable with quick connectors.



Motor control

Fig. (2) The motor control unit is microcomputer controlled and is situated under the top cover of the machine, right above the outer drum.

The unit consists of a PCB (mother board) fitted on a heat sink that does double-duty as part of the housing. In the cover there is a choke coil together with the cable harness and contact.

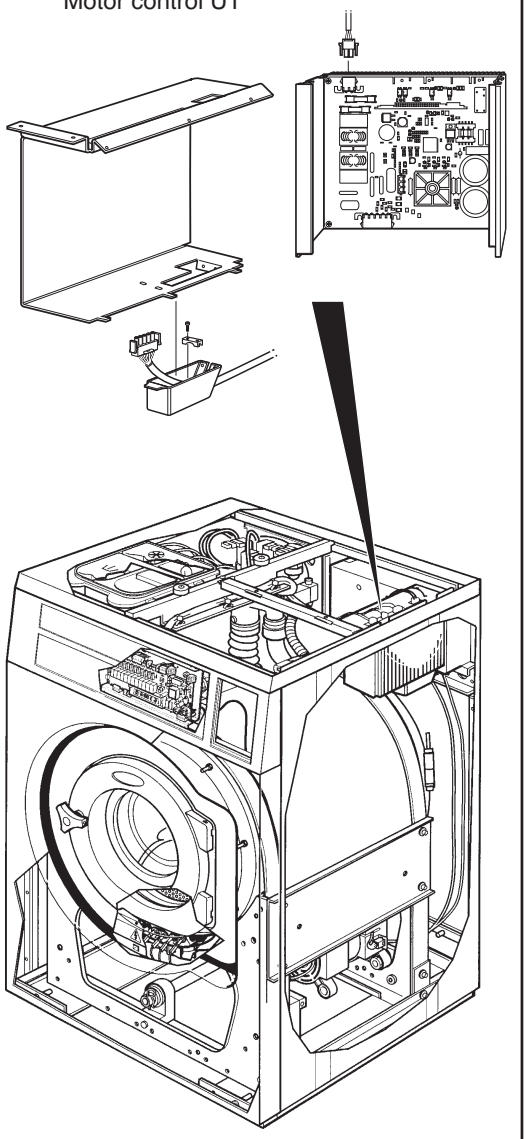
The cable harness is directly connected to the PCB, voltage supply input and the voltage supply to the motor using connectors; the other cables are connected with flat connectors to the PCB.

A detailed description of input and output cables is presented in the section “Function”.

Depending on the machine size, this unit comes in four different versions. The units have different sizes in order to be able to control motors of different sizes. Larger machines also have ventilation fans, however the function and connections are identical.

2

Motor control U1



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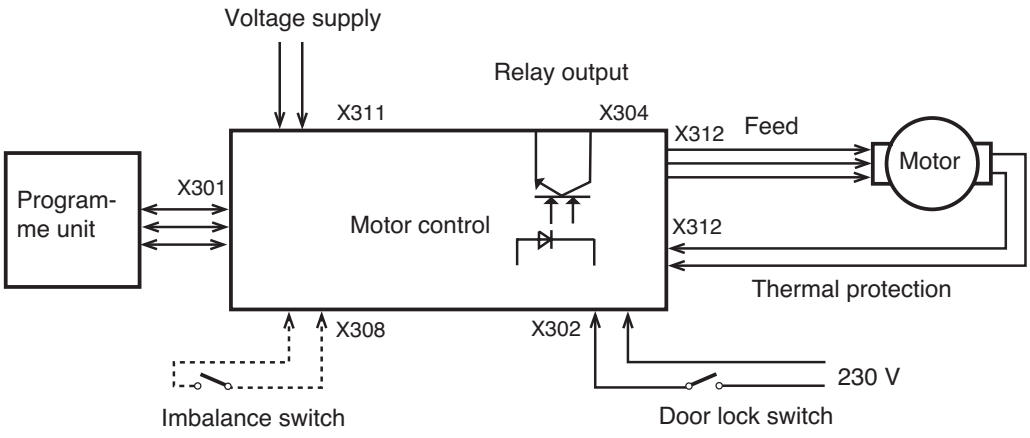
Function

DANGER

Be careful when measuring the electric components in the motor control. All components have a potential difference of approx. 300 V in relation to protective earth and neutral.
When the green LED on the motor control card is lit, the components carry dangerous voltages.
The motor control lose all voltage about 10-30 seconds after the voltage has been disconnected and the motor has stopped.

The motor control communicates with the programme unit via a serial two-way interface. With the help of the motor control, the programme unit can control not only the instantaneous motor rpm, but also with high precision the acceleration and retardation of the motor in order to reach the target rpm. The motor control continuously replies with information to the programme unit PCB regarding the current operating state and sends reports if an error occurs.

3



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The motor control is also able to deliver the various instantaneous and output values during constant speed, acceleration and retardation. These values are used to calculate the weight of the loaded laundry and to detect any load imbalances. A separate imbalance switch can also be connected to the motor control.

The safety system of the machine includes double detection of the door lock. Both the programme unit and motor control use different switches to detect proper door locking. The motor cannot start unless both switches verify the door is locked.

Inputs and outputs

Fig. 4

X301: Serial communication

Handles communication between the motor control and the programme unit. Using a special interface, it is possible to connect a PC for testing the motor control.

Card No.	Function
X 301:2	Gnd
X 301:3	Txd
X 301:4	Rxd

X302: Lock sequence input

Detects when the door is locked or unlocked. The motor cannot start until the door has been locked. If the indication disappears when the motor is operating, the motor stops and an error message is shown on the programme unit display.

Input voltage		
	min:	120 V-20 % 50/60 Hz
	max:	240 V+15 % 50/60 Hz
Current:	max:	0,01 A

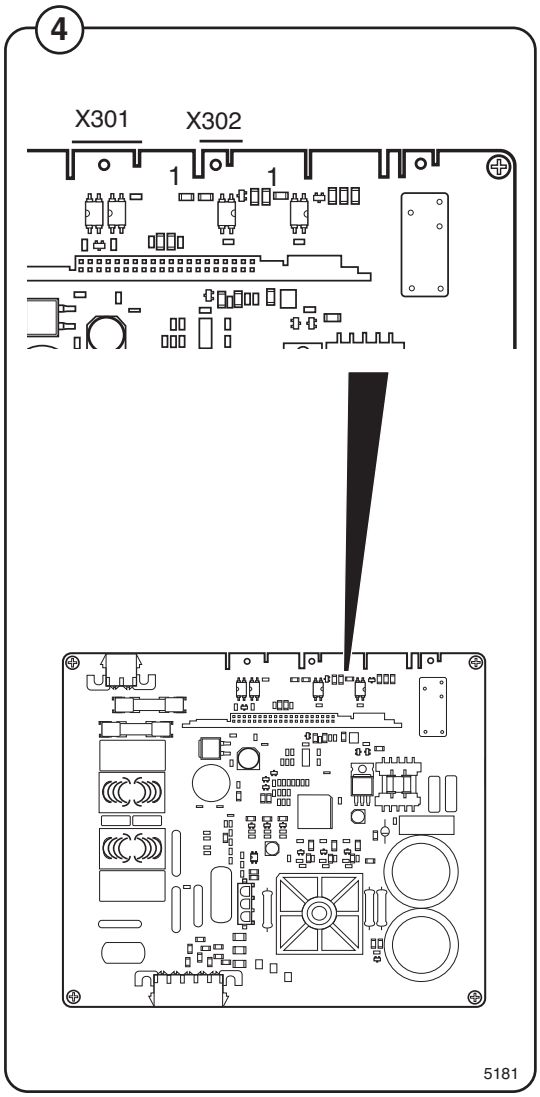


Fig. 5

X304: Opto output

The opto function is controlled from the programme unit (X301). The output does not switch on if there is no communication with the programme unit.

Card No.	Connection
X304:1	Emitter-opto
X304:2	not used
X304:3	Collector-opto

Voltage, max: 70V DC

Current, max: 10 mA

X308: Imbalance switch

Input from the imbalance switch (only fitted on some machines). The imbalance switch is usually open.

Input voltage		
	min:	120 V-20 % 50/60 Hz
	max:	240 V+15 % 50/60 Hz
Current:	max:	0,01 A

X311: Voltage supply

Input voltage, single phase or rectified three-phase

min:	200V-15%
max:	240V+10%

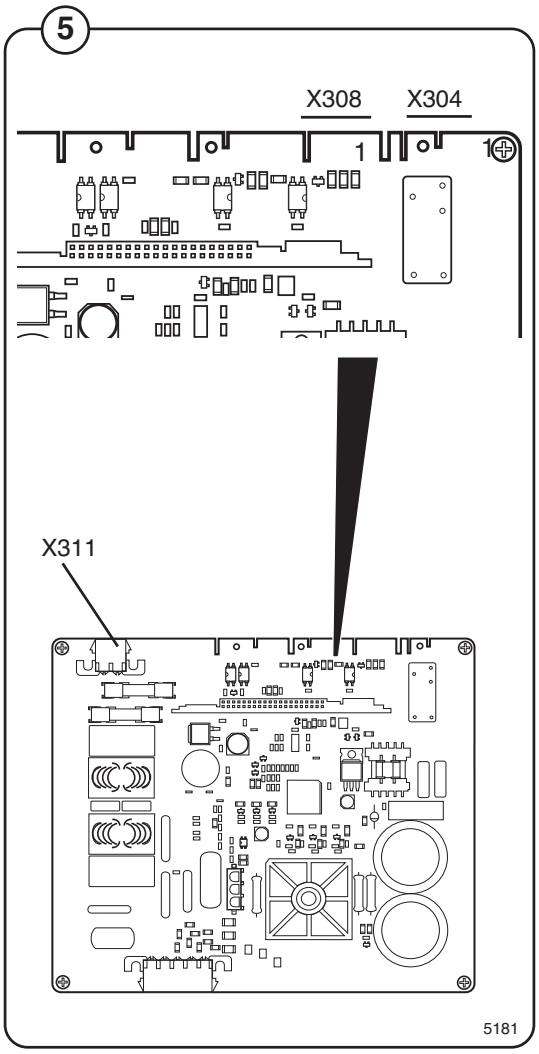


Fig. 6

X312: AC supply to motor and input from the motor thermal protector

The motor is fed with alternating current with varying frequency that is proportional to the motor speed.

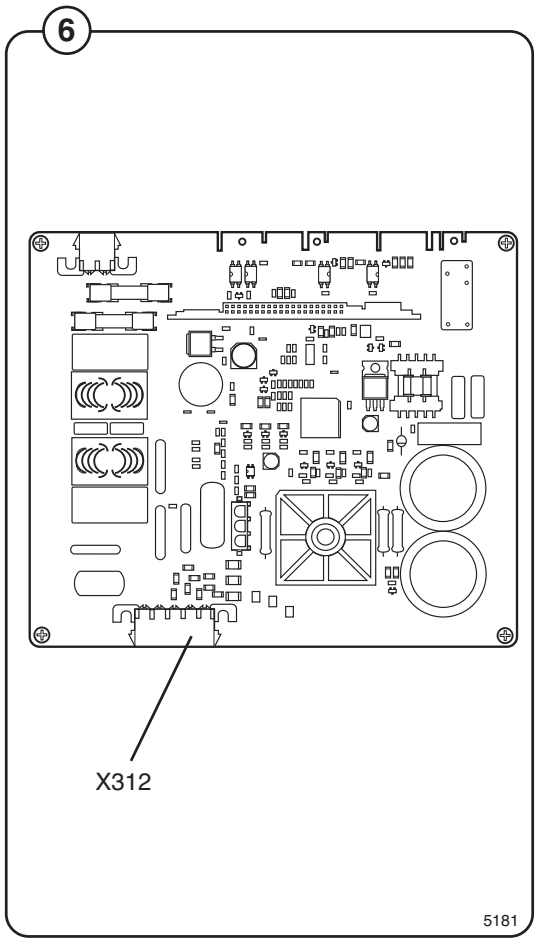
This connector also includes the input from the thermal protector of the motor.
The thermal protector switch is usually closed and triggers only in case of overheating.

SU620-640

Card No.	Function
X 312:1	AC supply to motor, phase 1
X 312:2	AC supply to motor, phase 2
X 312:3	AC supply to motor, phase 3
X 312:4	To thermal protector F1
X 312:5	To thermal protector F1

SU655-675

Card No.	Function
X 312:1,2	AC supply to motor, phase 1
X 312:3,4	AC supply to motor, phase 2
X 312:5,6	AC supply to motor, phase 3
X 312:7,8	To thernal protector F1

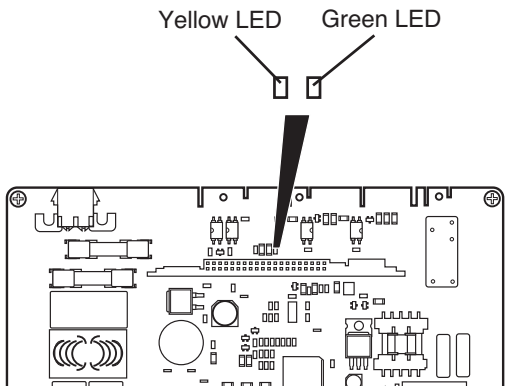


LED indications

Fig. 7 Two LEDs, one yellow and one green, indicate any errors on the motor controller and motor.

Fig. 8 The table below shows the blinking patterns of the various error codes.

7



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Green LED

LED blinking pattern	Cause
	OK blink (brief pause every 5 seconds).
	Connection with programme unit broken or programme unit microcomputer in reset mode.
approx. 5 seconds	Current limiter of motor control has switched on.

Yellow LED

LED blinking pattern	Error code on display EXACTA	CLARUS	Cause
	31E	HEAT SINK OVER TEMP	Overheated heat sink on motor control.
	32E	MOTOR HOT	Motor thermal protector has triggered.
	33E	NO INTERLOCK	Motor control receives start request, but receives no lock ACK (input 302).
	13E	NO MOTOR COMM	Communication error in motor control - programme unit.
	-	-	Short-circuit in motor winding, harness or internally in motor control. Motor control restarts automatically.
	35E	SHORTED MOTOR	Short-circuit in motor winding, harness or internally in motor control.
	36E	HARDW INTERLOCK	Error in lock ACK circuits in motor control.
	37E	LOW DC VOLTAGE	DC level in motor control too low.
	38E	HIGH DC VOLTAGE	DC level in motor control too high.
approx. 5 seconds	41E	KLIXON CIRCUIT	Error in motor control circuits used to detect motor thermal protector.

Repairs

Repair work on the machine should only be done by specially trained personnel.

Motor replacement

Disassembly

Fig. 9

1. Take down power from the machine by turning the main power switch to the 0 position.
2. Remove the rear cover.
3. Undo the bracket for the drain hose connector from the lower rear piece, then remove the rear cover.

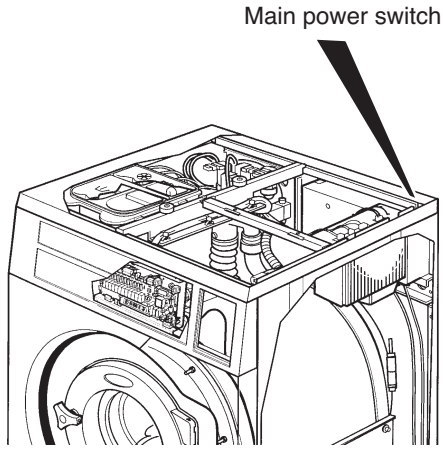
Fig. 10

4. Undo the ground connection from the motor.
5. Remove the drive belt by pulling the belt towards you while rotating the drum by hand.
6. Undo the motor cable from motor.
7. Lock the motor in place to avoid it from falling when lifting it out.
8. Undo and remove the two motor mounting bolts.
9. Lift out the motor.

Assembly

1. Fit the new motor **without** locking the mounting bolts.
2. Fit the drive belt and adjust the belt tension with the tensioner on one side of the motor. Se section Adjustments - Drive belt tension for details.

9



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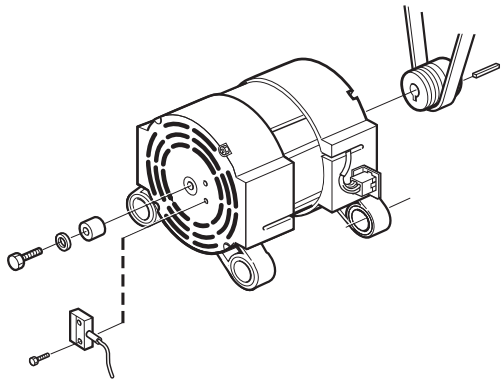

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3. Connect the new motor to the cable and use straps to secure the cable.
4. Connect the motor cable to the motor.
5. Fit the lower rear piece and secure the drain hose connection with screws.
6. Fit the upper rear piece.
7. Connect the voltage supply and verify that the motor operates normally.

Adjustments

Drive belt tension

The drive belt is pre-tensioned upon delivery from the factory.

Fig. (11) The drive belt tension should be as follows:

Model	Force A (N)	Post tensioning B (mm)	New belt C (mm)
SU620	35	9	8
SU630	50	9	8
SU640	75	12	9
SU655	83	12	9
SU675	105	11	9

Fig. (12) To adjust drive belt tension, first undo the motor retaining screw a couple of turns, then press down on the motor to achieve proper tensioning. Lock the locking nut when the tension is correct. Then lock the retaining screw.

Inspection of the drive belt tension is an important part of general maintenance.

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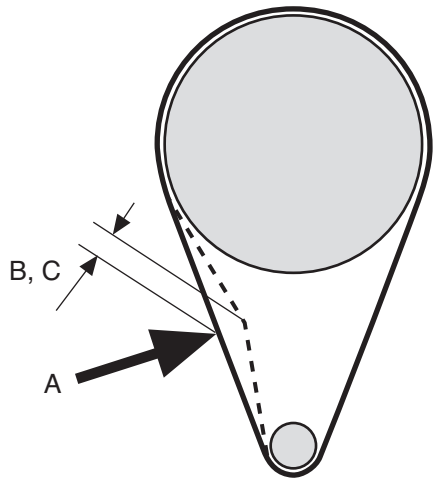

Adjust drive belt tension if values exceed those shown in the table.

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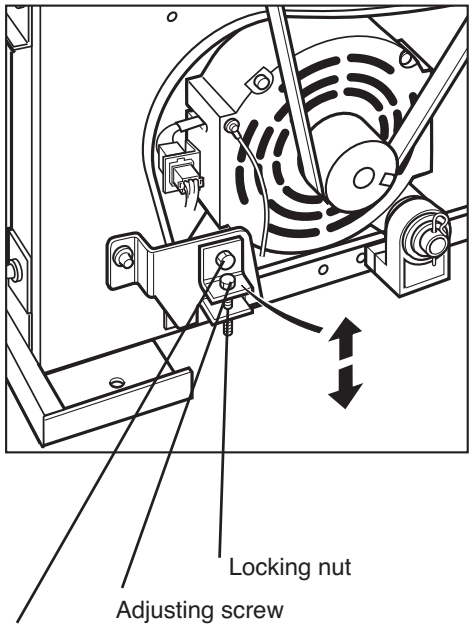

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Description

SU620
from machine No. 520/22807–
and 520/19487-19548

SU630
from machine No. 595/9041–
SU640 from machine No. 650/14355–
SU655 from machine No. 725/7909–
SU675 from machine No. 795/3770–

Motor

Fig. 13 The motor is fitted in a bridge carrier under the outer drum. It drives the washing drum using a drive belt.

The motor is frequency-regulated and is controlled by a microcomputer control. The various speeds for normal operation, distribution speeds and extraction as well as acceleration/ retardation can be controlled with a high degree of precision.

The motor winding is protected against overloads using a thermal overheating protector that is automatically reset.

The motor is connected directly to the motor controller via a cable with quick connectors.

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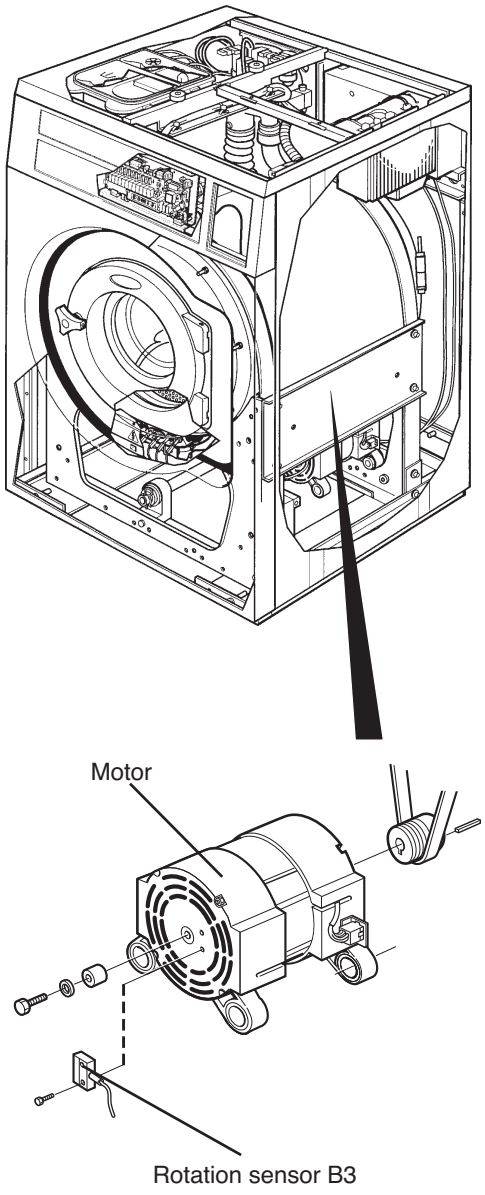

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Motor control

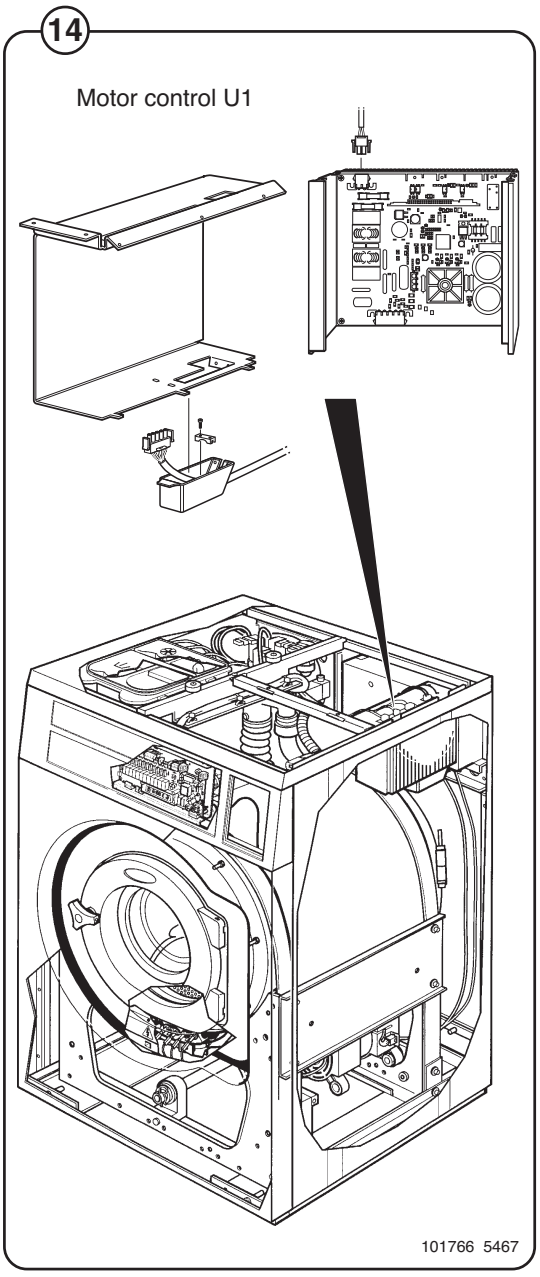
Fig. (14) The motor control unit is microcomputer controlled and is situated under the top cover of the machine, right above the outer drum.

The unit consists of a PCB (mother board) fitted on a heat sink that does double-duty as part of the housing.

The cable harness is directly connected to the PCB, voltage supply input and the voltage supply to the motor using connectors; the other cables are connected with flat connectors to the PCB.

A detailed description of input and output cables is presented in the section “Function”.

Depending on the machine size, this unit comes in four different versions. The units have different sizes in order to be able to control motors of different sizes. Larger machines also have ventilation fans, however the function and connections are identical.



Function

DANGER

Be careful when measuring the electric components in the motor control. All components have a potential difference of approx. 300 V in relation to protective earth and neutral.
When the green LED on the motor control card is lit, the components carry dangerous voltages.
The motor control lose all voltage about 10-30 seconds after the voltage has been disconnected and the motor has stopped.

The motor control communicates with the programme unit via a serial two-way interface. With the help of the motor control, the programme unit can control not only the instantaneous motor rpm, but also with high precision the acceleration and retardation of the motor in order to reach the target rpm. The motor control continuously replies with information to the programme unit PCB regarding the current operating state and sends reports if an error occurs.

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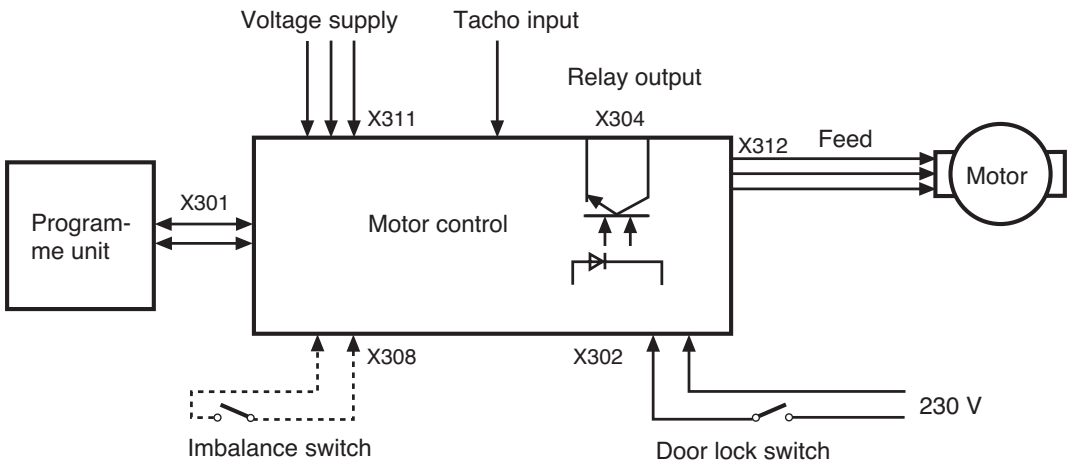
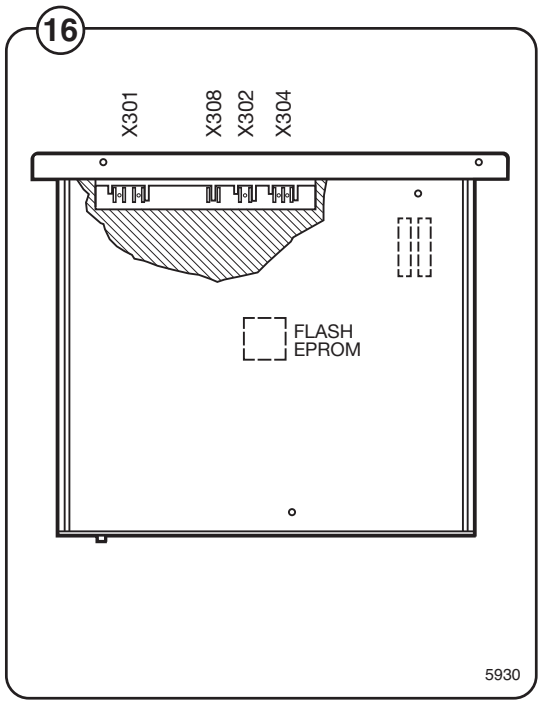


The motor control is also able to deliver the various instantaneous and output values during constant speed, acceleration and retardation. These values are used to calculate the weight of the loaded laundry and to detect any load imbalances. A separate imbalance switch can also be connected to the motor control.

The safety system of the machine includes double detection of the door lock. Both the programme unit and motor control use different switches to detect proper door locking. The motor cannot start unless both switches verify the door is locked.

Inputs and outputs

Fig. 16



X301: Serial communication

Handles communication between the motor control and the programme unit. Using a special interface, it is possible to connect a PC for testing the motor control.

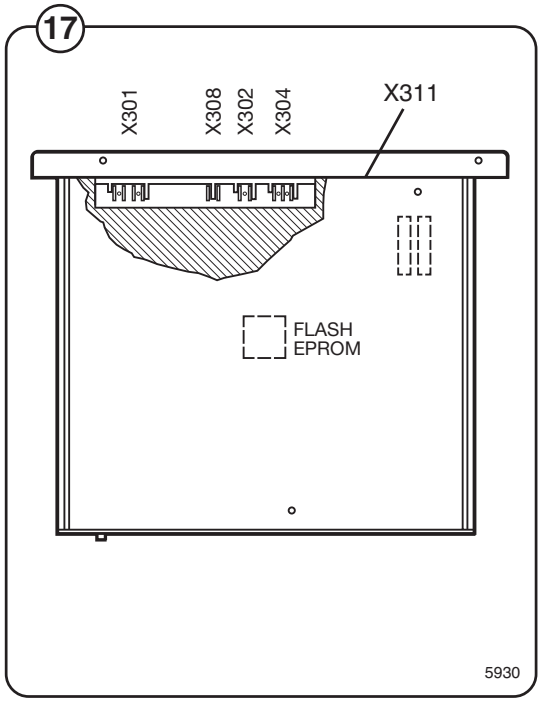
Card No.	Function
X 301:2	Gnd
X 301:3	Txd
X 301:4	Rxd

X302: Lock sequence input

Detects when the door is locked or unlocked. The motor cannot start until the door has been locked. If the indication disappears when the motor is operating, the motor stops and an error message is shown on the programme unit display.

Input voltage		
	min:	120 V-20 % 50/60 Hz
	max:	240 V+15 % 50/60 Hz
Current:	max:	0,01 A

Fig. 17



X304: Opto output

The opto function is controlled from the programme unit (X301). The output does not switch on if there is no communication with the programme unit. Tacho signal from the motor (via door lock control A31) is needed to control the motor.

Card No.	Connection
X304:1	Emitter-opto, 0V
X304:2	Tacho signal
X304:3	Collector-opto

Voltage, max: 30V DC

Current, max: 10 mA

X308: Imbalance switch

Input from the imbalance switch (only fitted on some machines). The imbalance switch is usually open.

Input voltage		
	min:	120 V-20 % 50/60 Hz
	max:	240 V+15 % 50/60 Hz
Current:	max:	0,01 A

X311: Voltage supply

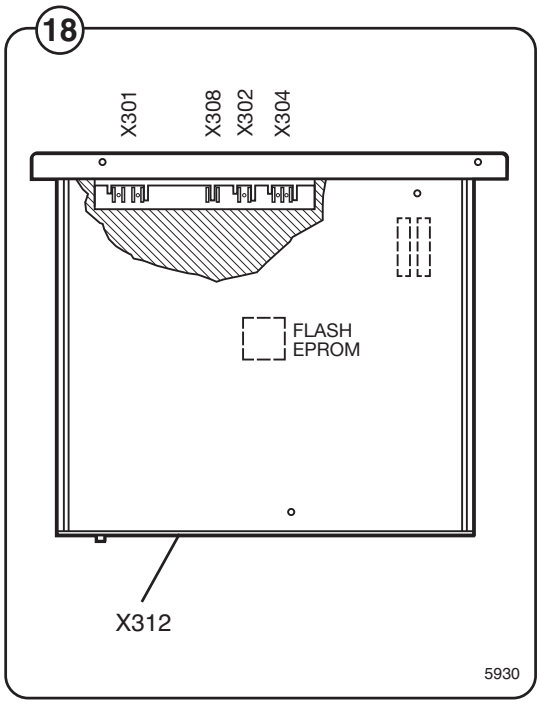
Input voltage, single phase or rectified three-phase		
	min:	200V-15%
	max:	240V+10%

Fig. 18 **X312: AC supply to motor and input from the motor thermal protector**

The motor is fed with alternating current with varying frequency that is proportional to the motor speed.

This connector also includes the input from the thermal protector of the motor.
The thermal protector switch is usually closed and triggers only in case of overheating.

Card No.	Function
X 312:1	AC supply to motor, phase 1
X 312:2	AC supply to motor, phase 2
X 312:3	AC supply to motor, phase 3



LED indications

Two LEDs, one yellow and one green, indicate any errors on the motor controller and motor.

Fig. 19 The table below shows the blinking patterns of the various error codes.

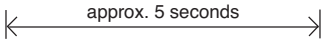
19

Green LED

LED blinking pattern	Cause
	OK blink (brief pause every 5 seconds).
	Connection with programme unit broken or programme unit microcomputer in reset mode.
	Current limiter of motor control has switched on.

Yellow LED

LED blinking pattern	Error code on display EXACTA	CLARUS	Cause
	31E	HEAT SINK OVER TEMP	Overheated heat sink on motor control.
	32E	MOTOR HOT	Motor thermal protector has triggered.
	33E	NO INTERLOCK	Motor control receives start request, but receives no lock ACK (input 302).
	13E	NO MOTOR COMM	Communication error in motor control - programme unit.
	-	-	Short-circuit in motor winding, harness or internally in motor control. Motor control restarts automatically.
	35E	SHORTED MOTOR	Short-circuit in motor winding, harness or internally in motor control.
	36E	HARDW INTERLOCK	Error in lock ACK circuits in motor control.
	37E	LOW DC VOLTAGE	DC level in motor control too low.
	38E	HIGH DC VOLTAGE	DC level in motor control too high.



Repairs

Repair work on the machine should only be done by specially trained personnel.

Motor replacement

Disassembly

Fig. 20

1. Take down power from the machine by turning the main power switch to the 0 position.
2. Remove the rear cover.
3. Undo the bracket for the drain hose connector from the lower rear piece, then remove the rear cover.

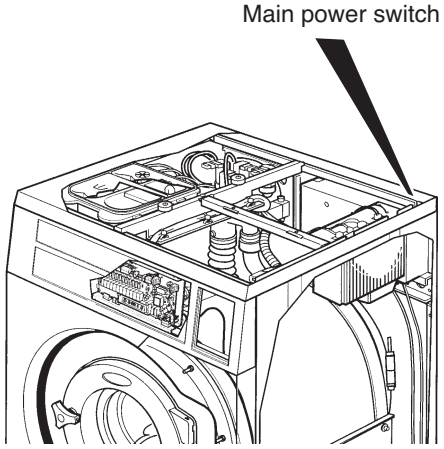
Fig. 21

4. Undo the ground connection from the motor.
5. Remove the drive belt by pulling the belt towards you while rotating the drum by hand.
6. Undo the motor cable from motor.
7. Lock the motor in place to avoid it from falling when lifting it out.
8. Undo and remove the two motor mounting bolts.
9. Lift out the motor.

Assembly

1. Fit the new motor **without** locking the mounting bolts.
2. Fit the drive belt and adjust the belt tension with the tensioner on one side of the motor. Se section Adjustments - Drive belt tension for details.

20



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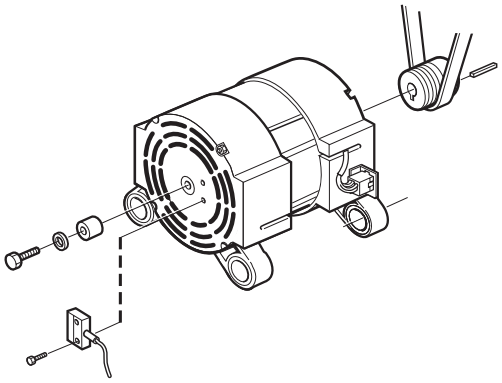


5465

3. Connect the new motor to the cable and use straps to secure the cable.
4. Connect the motor cable to the motor.
5. Fit the lower rear piece and secure the drain hose connection with screws.
6. Fit the upper rear piece.
7. Connect the voltage supply and verify that the motor operates normally.

Adjustments

Drive belt tension

The drive belt is pre-tensioned upon delivery from the factory.

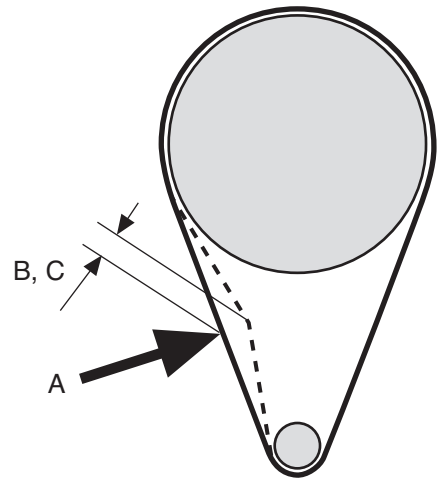
Fig. 22 The drive belt tension should be as follows:

Model	Force A (N)	Post tensioning B (mm)	New belt C (mm)
SU620	35	9	8
SU630	50	9	8
SU640	75	12	9
SU655	83	12	9
SU675	105	11	9

Fig. 23 To adjust drive belt tension, first undo the motor retaining screw a couple of turns, then press down on the motor to achieve proper tensioning. Lock the locking nut when the tension is correct. Then lock the retaining screw.

Inspection of the drive belt tension is an important part of general maintenance.

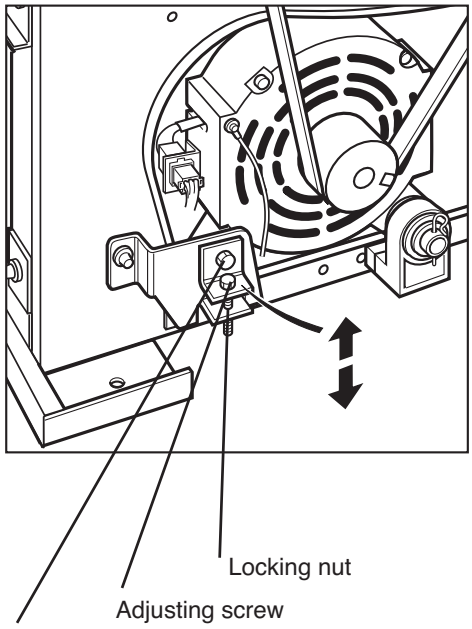
22



Adjust drive belt tension if values exceed those shown in the table.

4741

23



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Contents

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Description

Fig. 1

The drain valve is situated on a flange at the bottom of the outer drum and can be accessed from the front after removing the front cover. The drain valve consists of the following principal parts:

- Lower part with rubber diaphragm.
- Piston and cylinder.
- Pressure plate and recoil springs.
- Rubber diaphragm with drain connection.
- Upper part with connection for outer drum.

Function

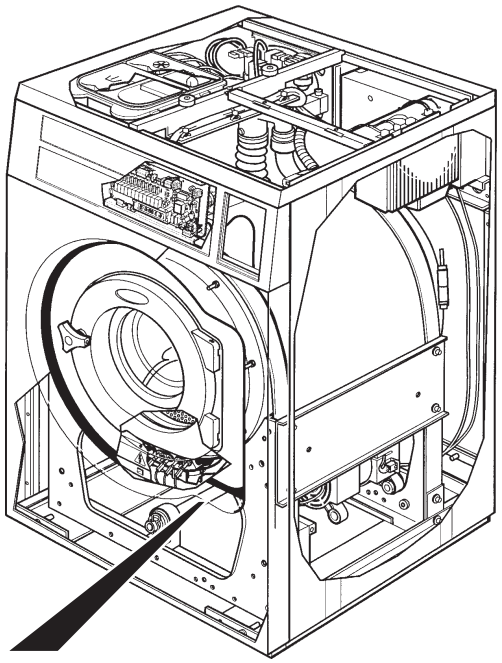
Fig. 2

The drain valve uses the water pressure in the cold-water inlet to close the valve. A feed hose is connected between the water inlet and the control valve.

When the control valve operates (drain valve should be closed), the control valve opens the water pressure onto the feed hose, which is connected to the lower part of the drain valve. When the lower part is filled with water, the lower part diaphragm pushes up the piston. The piston lifts the pressure plate against the drain valve rubber diaphragm, which in turn forms a seal against the outer drum, effectively closing the valve.

When the drain valve should be opened, the control valve changes position to allow the water pressure to the lower part of the drain valve to close, instead opening the return hose to the drain. The pressure plate recoil springs pull the pressure plate back, upon which the piston is pressed back into the cylinder. The water from the lower part is fed through the feed hose and the control valve to the drain.

1



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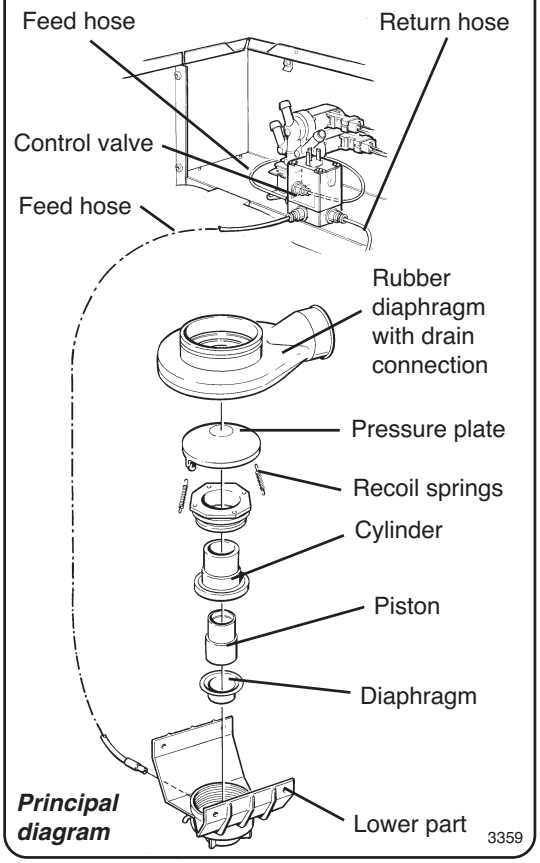


Principal diagram

3359

Repairs

Repair work on the machine should only be done by specially trained personnel.

Disassembly

For repair works on the drain valve, there is a risk that water still left in the machine may flood onto the floor. Be sure to dry up any spilled water since it may cause people to slip and hurt themselves.

Fig. 3

1. Take down power from the machine by turning the main power switch to the 0 position.
2. Remove the front cover.

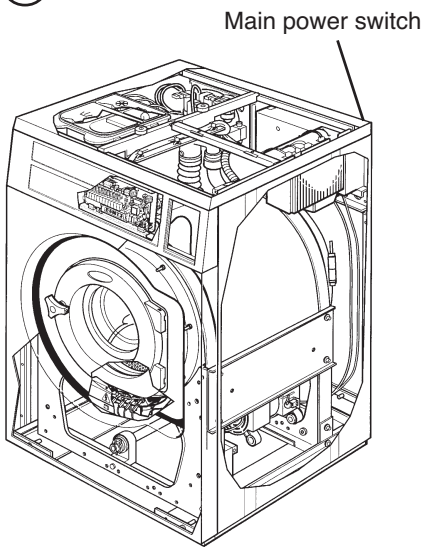
Fig. 4

3. Disconnect the drain hose from upper part of the valve.
4. Undo the hose clamp holding the valve rubber bellows against the sleeve coupling of the outer drum.

Fig. 5

5. Loosen and unscrew the 4 retaining nuts of the valve a couple of turns (use a socket, extender and ratchet wrench). Turn the valve and unhook it from the bolts.
6. Disconnect the pressure hose from the lower part of the valve.
7. Replace the valve with a new one or replace the defective part.

3



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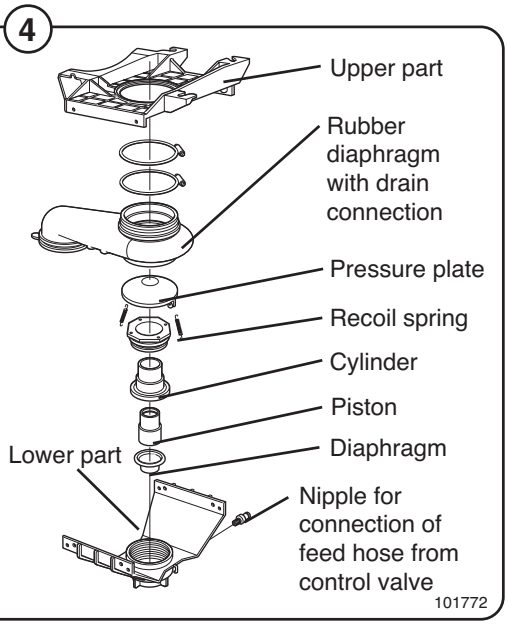

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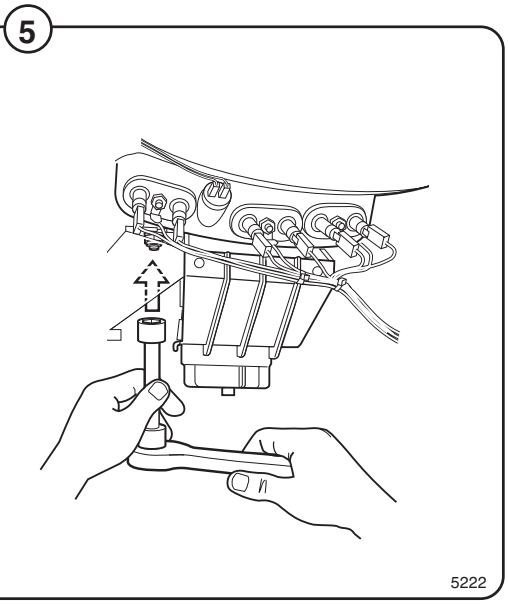

Assembling

Fig. 4
1. Connect the pressure hose to the lower part of the valve. Verify that the hose is not bent or pinched.
2. Fit the rubber bellows onto the sleeve coupling.

Fig. 5
3. Hook the valve onto the bolts and turn the valve into position. Secure the 4 retaining bolts of the valve.
4. Secure the hose clamp at the connection of the rubber bellows on the sleeve coupling.
5. Connect the drain hose to the upper part of the valve.

Fig. 3
6. Turn the main power switch to position 1 and verify correct valve operation and that it does not leak.
7. Reattach the front cover.

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Contents

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Description

Fig. 1

The detergent compartment of the machine is designed for use with powder and liquid detergent. The compartment is divided into four sub-compartments as follows:

Fig. 2

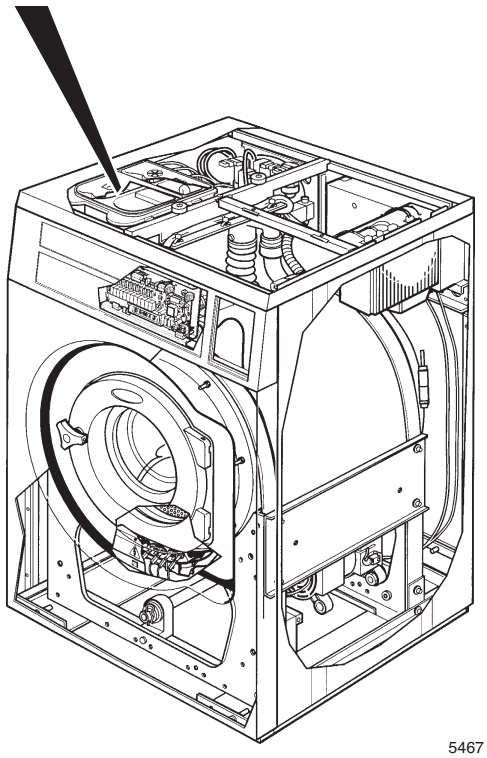
- Compartment 1 - For pre wash with powder or liquid detergent.
- Compartment 2 - For main wash with detergent powder.
- Compartment 3 - Rinse.
- Compartment 4 - Main wash with liquid detergent or, bleaching-agent.

The connections for incoming water are situated on the rear side of the compartment. Compartments 3 and 4 each have one connector, while compartments 1 and 2 each have two connectors, one for cold water, the other for warm water.

The detergent is routed from the bottom of the compartment to the outer drum through the combo module immediately behind the compartment.

To safeguard against overfilling, e.g., due to a blocked hose on its way to the drum, the combo module features an overflow drain directly connected to the drain of the machine.

1



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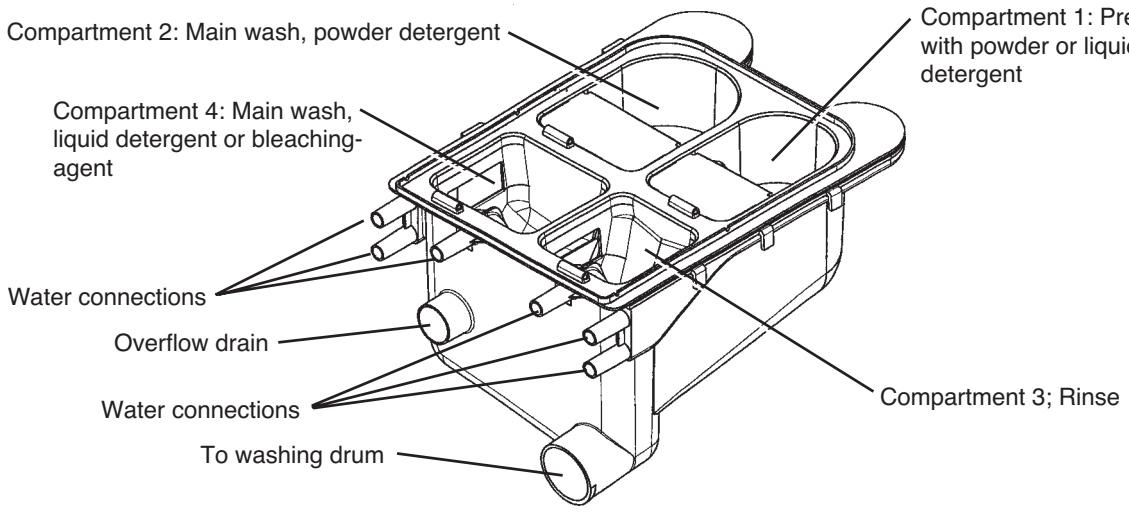

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Contents

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Description

Electric heating

Fig. 1

The heating system of the machine consists of:

- Three heating elements for heating the water in the drum.
- A temperature sensor to detect the water temperature in the drum.
- One or two heating contactors for switch-on/ switch-off of the heating elements.

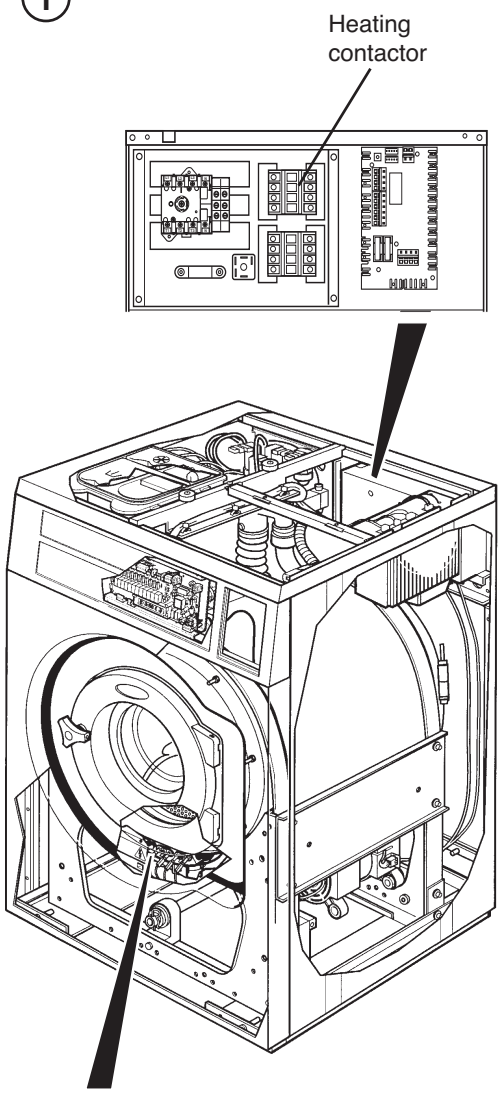
The heating elements and the temperature sensor are situated at the bottom of the outer drum close to the edge. They can be accessed front the front after the front plate is removed.

The contactor(s) is(are) placed in the rear control unit.

Depending on the size of the machine, the following heating elements are available:

Machine model	Heating element size (kW)
SU620	3 x 0.665, 3 x 1, 3 x 1.8, 3 x 2.5
SU630	3 x 3.3
SU640	3 x 4.33
SU655	3 x 6
SU675	3 X 7.66

1



Heating elements and temperature sensor

5182 5467

Function

Electric heating

Fig. 3

The three heating elements in the machine are connected to separate phases and are switched on and off using one or two heating contactors, K.21 and K22 (two contactors are used for higher heating power). The heating contactors are controlled by the programme unit A1 via output X8:1 on I/O card 1 A11. The control signal is fed via the communication card A21.

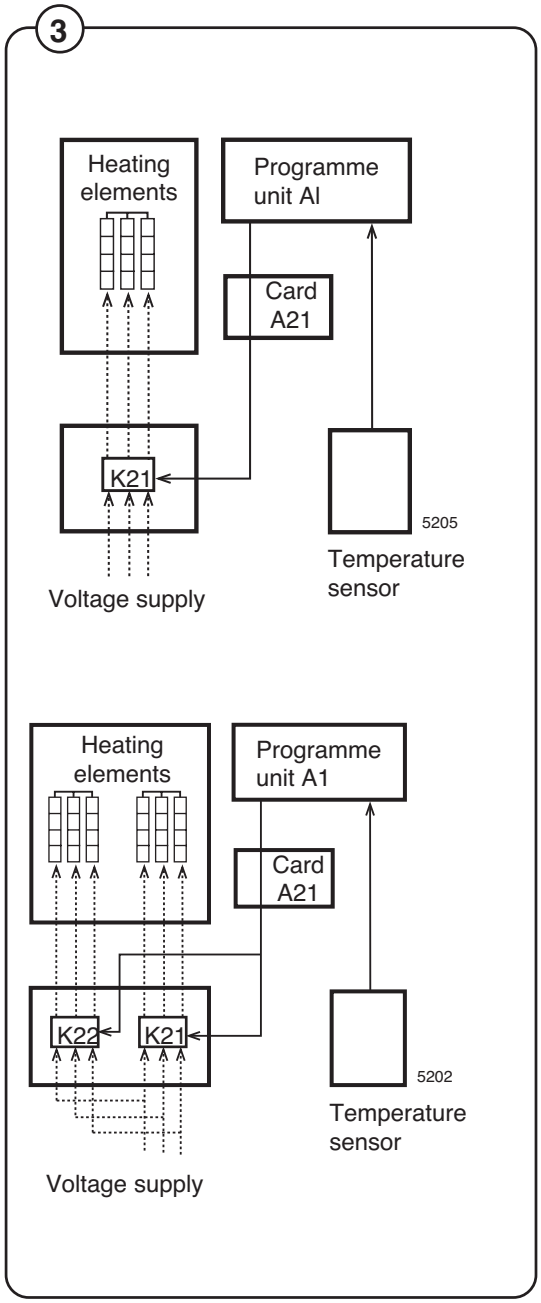
The programme unit receives information on the water temperature in the machine through an analogue signal from the temperature sensor situated in the outer drum. The programme unit controls the heating contactors to achieve the set water temperature for the current washing programme.

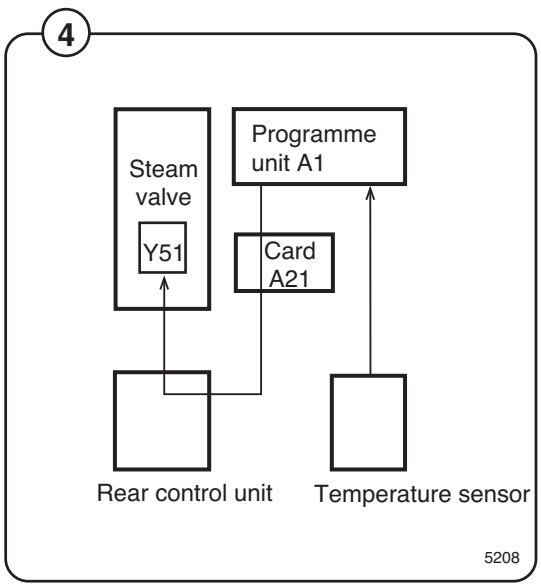
When there is no water in the drum, the programme unit prevents switch-on of the heating elements. If an error would nevertheless cause the elements to switch on, a slow-blow fuse triggers to switch them off again.Then the heating element has to be changed.

Steam heating

Fig. 4

The steam valve is controlled by the programme unit A1, output (X3 36:7). The control signal travels via the communication card A21.





Repairs

Repair work on the machine should only be done by specially trained personnel.

Replacing the heating elements

Wen replacing the heating elements, there is a risk that water still left in the machine may flood onto the floor. Be sure to dry up any spilled water since it may cause people to slip and hurt themselves.

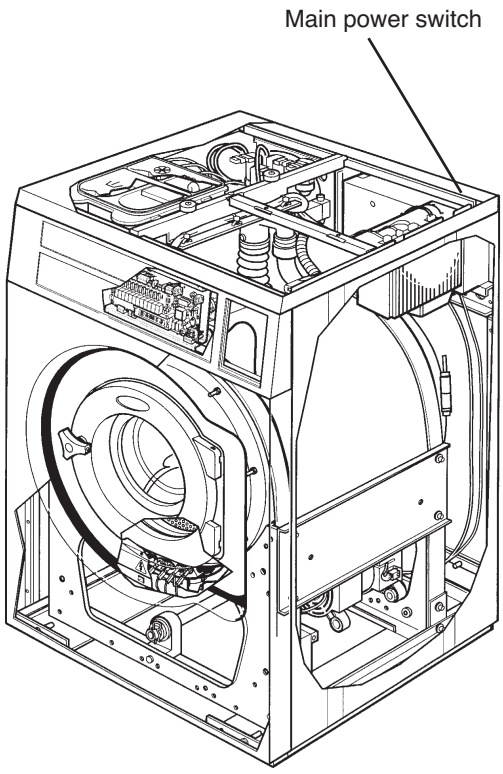
Fig. 5

1. Take down power from the machine by turning the main power switch to the 0 position.
2. Remove the front cover.

Fig. 6

3. Make a note of how the heating elements are connected.
4. Disconnect the connection to the heating element to be replaced.
5. Unscrew the nut between the connections approx. 1 cm.
6. Push on the nut and bolt to undo the expansion bracket from the outer drum.
7. Remove the old heating element and install the new one. Be sure that the rear edge is fitted into the element holder at the rear of the outer drum.
8. Assemble in reverse order.

5



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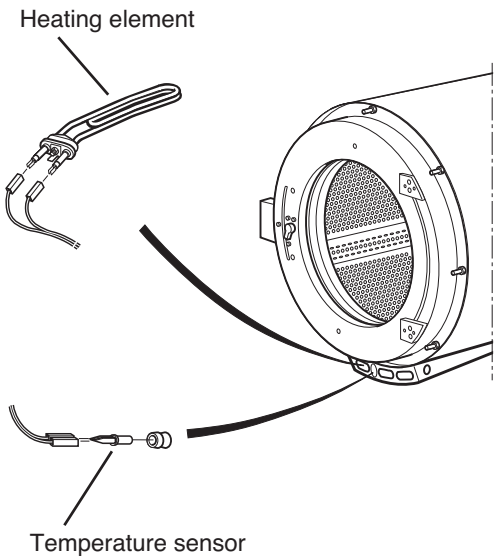

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Contents

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Coin-operated machines

In coin-operated machines the prices for the various programs have to be programmed in.

Values from the coin mechanism (the accumulated value) can be read out with the aid of the service program.

If a machine is fitted with a coin mechanism after its original installation the relevant electronic circuitry will have to be activated before the prices can be programmed in.

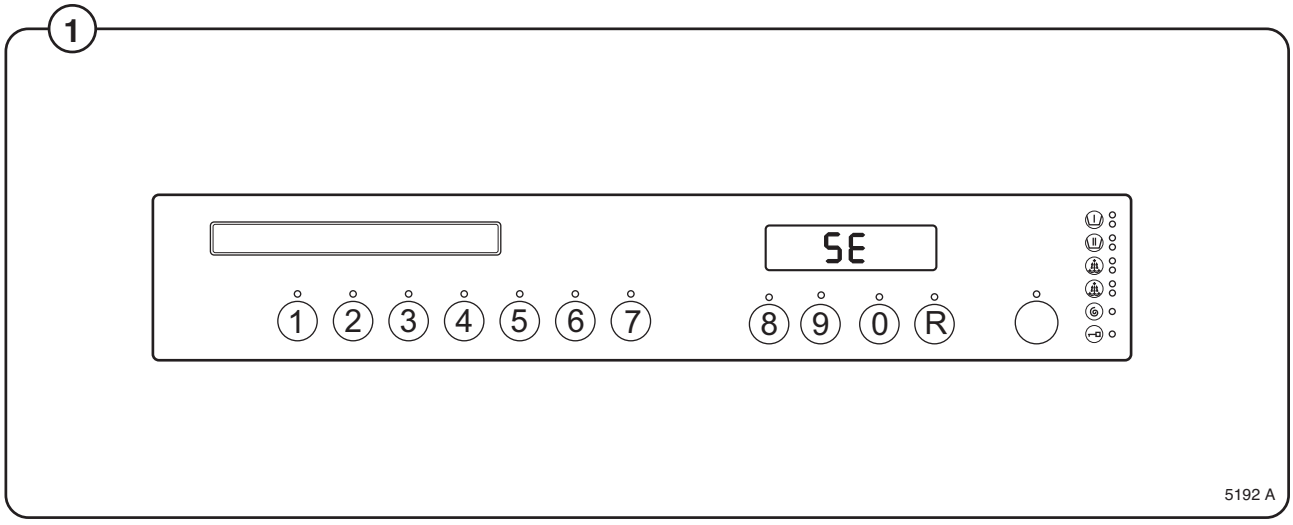
Only trained service personnel may use the service program and program in prices for coin operation.

Activation of electronic circuitry in machines fitted with coin operation after original installation.

- Press the service button.

  Now certain of the buttons switch to being number keys (0 to 9).

Fig. 1



Codes 91 and 92 are used to store the values for coin slots 1 and 2. For mechanisms with only one slot, only code 91 is used.

The values to be stored are the ratio of one coin to the other.

For example: if the coin slots are for a 1 crown coin and a 5 crown coin. The value 1 should be stored under code 91, and the value 5 should be stored under code 92.

Fig. 2

- Enter code 91 using the buttons which have become number keys 9 and 1.

  The display will now show 91.

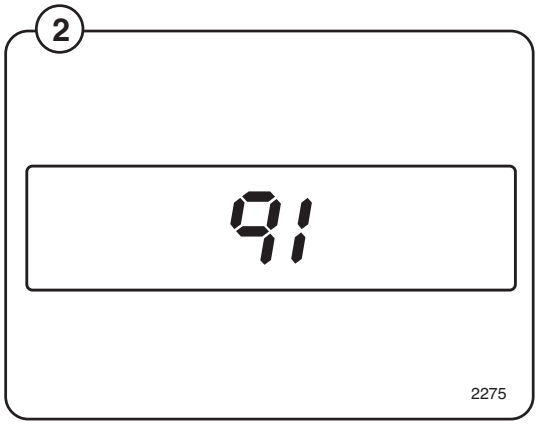


Fig. 3

- When entering the actual value: keep the price-programming button activated (the switch is located under the top cover at the right front edge). Enter the value 1 and then release the button.

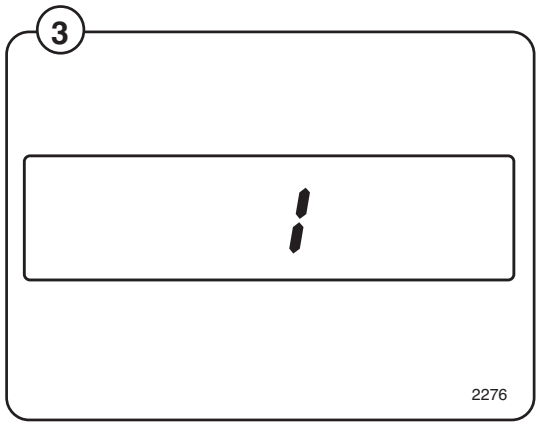


Fig. 4

- Enter code 92. The display will now show 92.

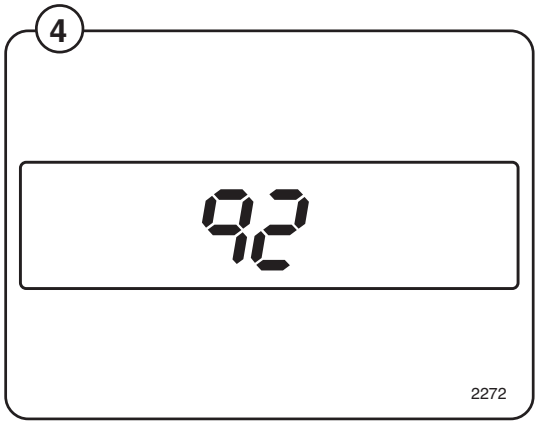
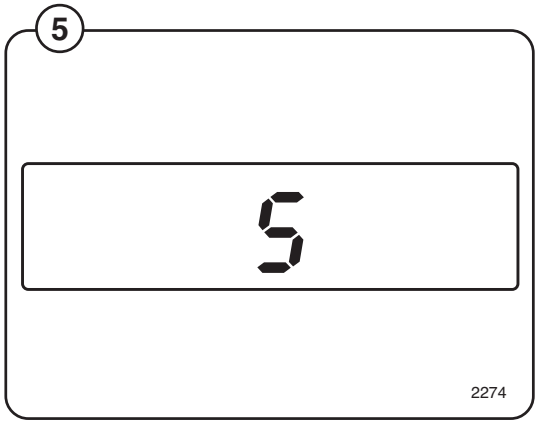


Fig. 5

- Enter the value 5.



- Exit the service program by pressing the service button again.

Price programming:

- Press the relevant program selector button.

When programming the price of a wash program plus option, press both the relevant program selector button and the option button.

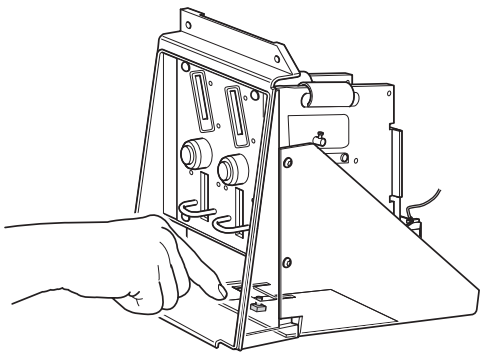
Fig. 6
- Keep the price-programming button activated.

Fig. 7
Now the display shows 00 plus the coin symbol.

Fig. 7
- Enter the price via the numerical key functions.
- Release the price-programming button.

This procedure should be repeated for all programs.

6



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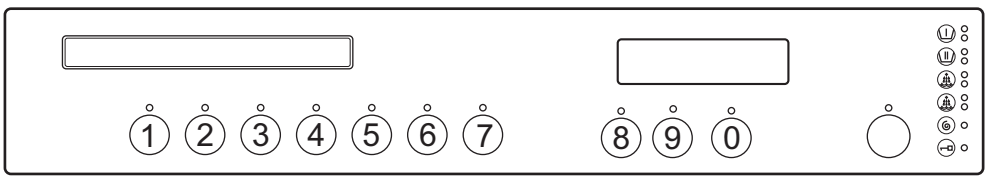

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Instruktion för remskiva

Instruction for pulley

W365H/N/M – W3330H/N/M
EX618-EX670, E/W/SU620-675

438 9041-53
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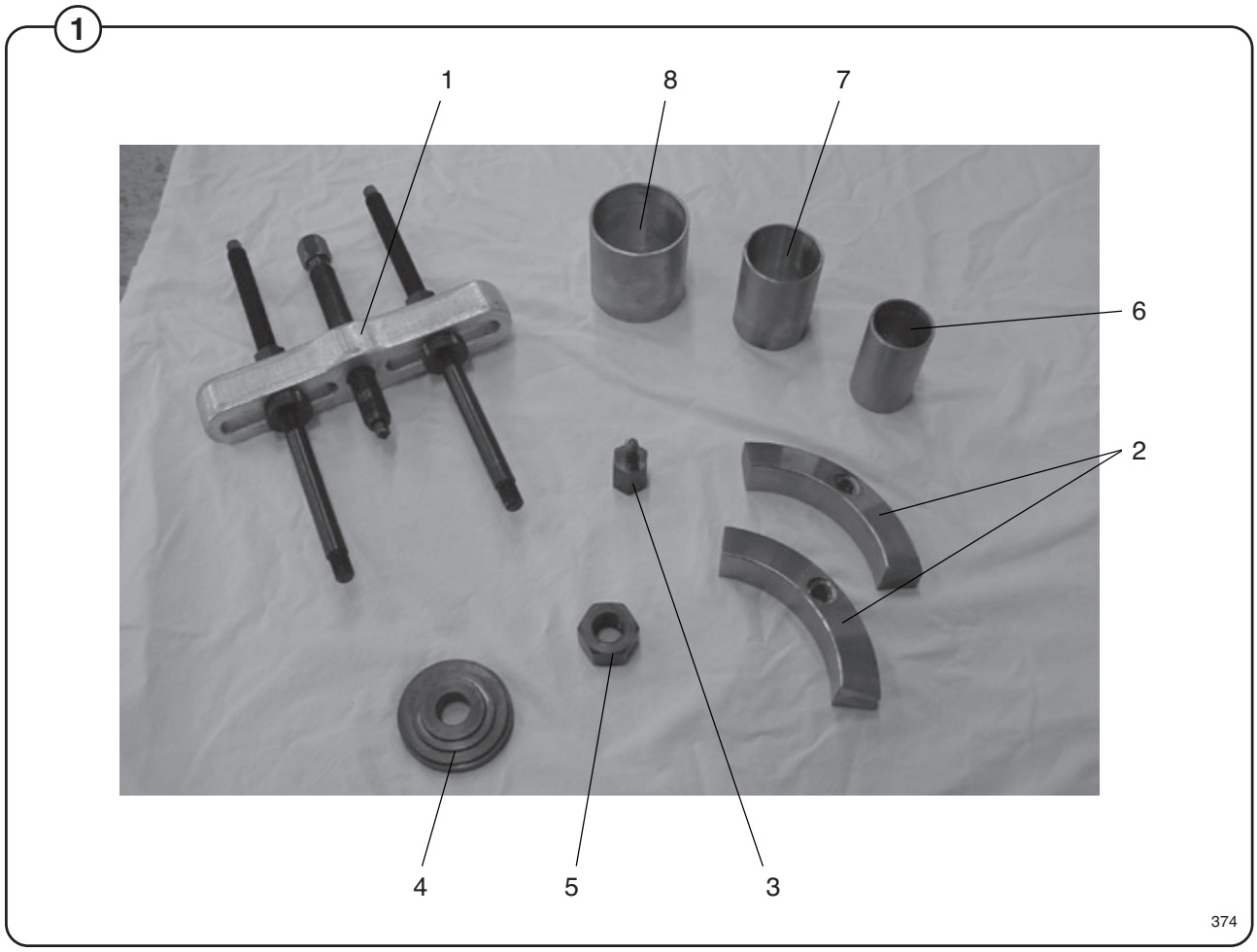
Instruktion/Instruction

Fig. Komplett verktygssats, art. nr: 472 9913-57
(1) Complete tool kit, part No: 472 9913-57



Pos.	Art. nr./Part No	Beskrivning/Description	Antal/Qty
1.	432 1725-01	Avdragare/Puller	1
2.	432 1728-01	Avdragare remskiva/Pulley drag	2
3.	432 1717-01	Adaptor/Adaptor G1/2"/M10	1
4.	432 1720-01	Bricka/Washer	1
5.	438 6031-02	Mutter/Nut G 1/2"	1
6.	432 1721-01*	Hylsa/Sleeve 48 x 42 L = 80	1
7.	432 1721-02**	Hylsa/Sleeve 60 x 54 L = 90	1
8.	432 1721-03***	Hylsa/Sleeve 75 x 69 L = 100	1
	438 8002-02	Gängtapp/Thread tap M12	1
	438 8001-02	Borr/Drill	1

* For W365-385H/N/M
** For W3105H/N, 3130H/N/M, 3180N/M
*** For W3180H, 3240H, 3250N/M, 3300H, 3330N/M

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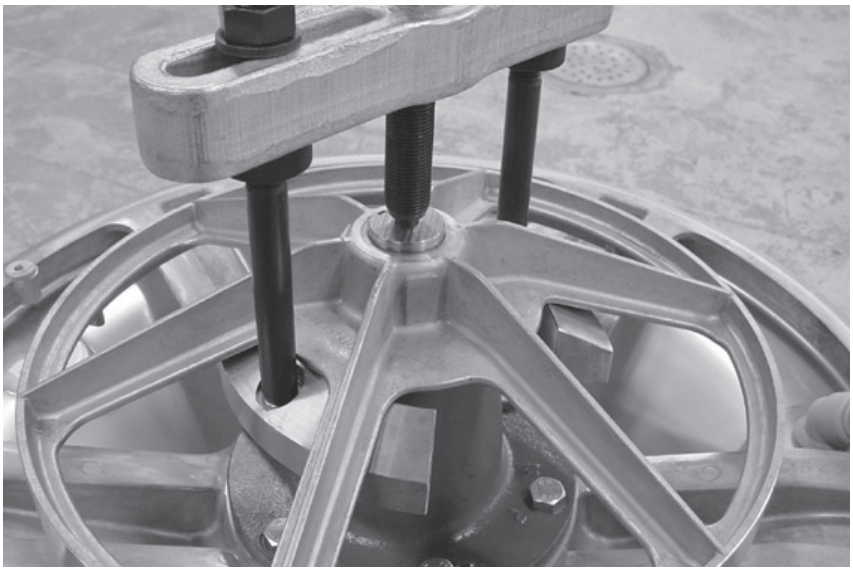

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- Tag bort segersäkringen från trumaxeln.
- Remove the C-clamp from the drum shaft.

Fig. 2

- Fixera avdragsklackarna och avdragarna på axeln och remskivan.
- Mount the puller with puller drags on shaft and pulley.

3

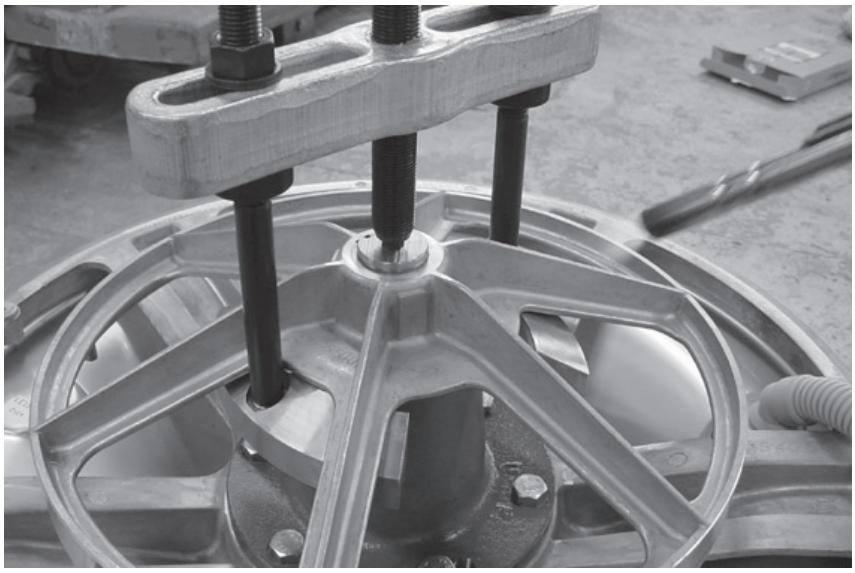

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Fig. 3

- Värm med värmepistol på remskivan vid axelinfästningen så att aluminiumet utvidgar sig något. Det går då lättare att dra av remskivan.
- Warm the pulley around the shaft so that the aluminium expands slightly. Then it is easier to pull off the pulley.

- Drag loss remskivan.
- Pull off the pulley.

Montering av remskiva/Mounting pulley

4

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Fig. 4
- Gänga axeländan M12 och 20 mm djupt.
- Thread the shaft end with M12 and 20 mm deep.

5

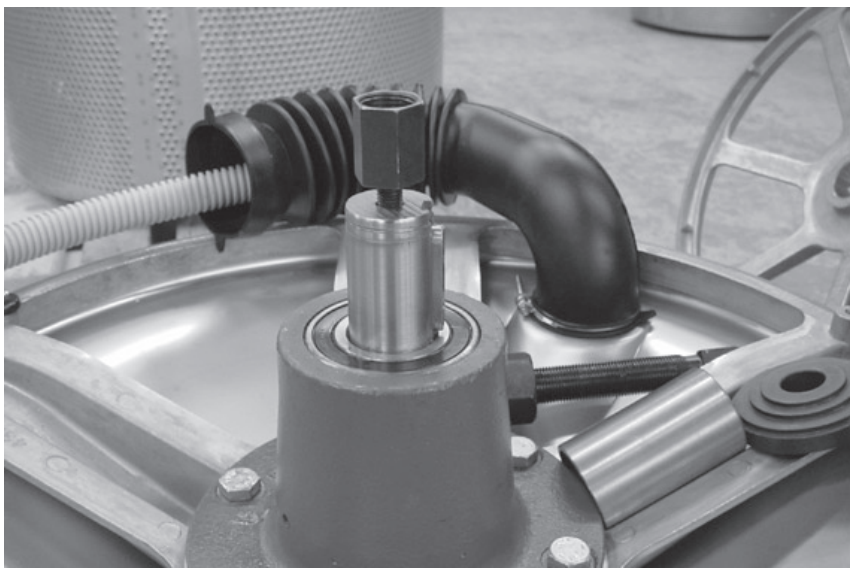

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Fig. 5
- Montera adapter G 1/2"/M12 i axeländan. Gänga ner den i botten.
- Mount adaptor G 1/2"/M12 in the shaft end. Thread it to the bottom.

6

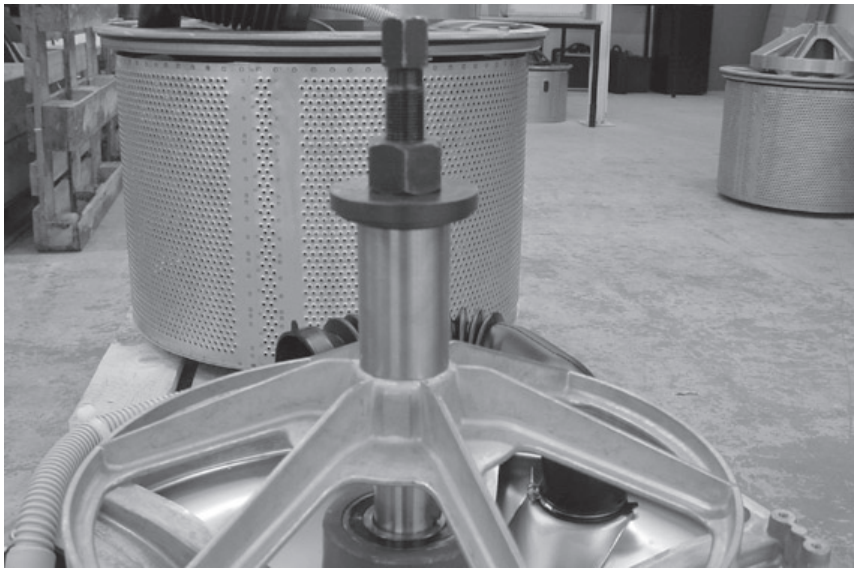

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Fig. 6

- Montera remskiva, hylsa och bricka över axeln. Skruva avdragarbult med mutter i adaptern på axeln.
- Mount pulley, sleeve and washer over the shaft. Mount the puller screw with nut in the adaptor on the shaft.
- Pressa ner remskivan på axeln. Det går lättare om remskivan värms med värmepistol.
- Press the pulley onto the shaft. It is easier if the pulley is slightly heated.
- Lås remskivan med segersäkringen.
- Lock the pulley with the C-clamp.
- Provkör maskinen.
- Test run the machine.

Instruktion för lagerbyte

Instruction for replacing bearings

W365H/N/M – W3330H/N/M
EX618-EX670, E/W620-675

438 9041-61/02
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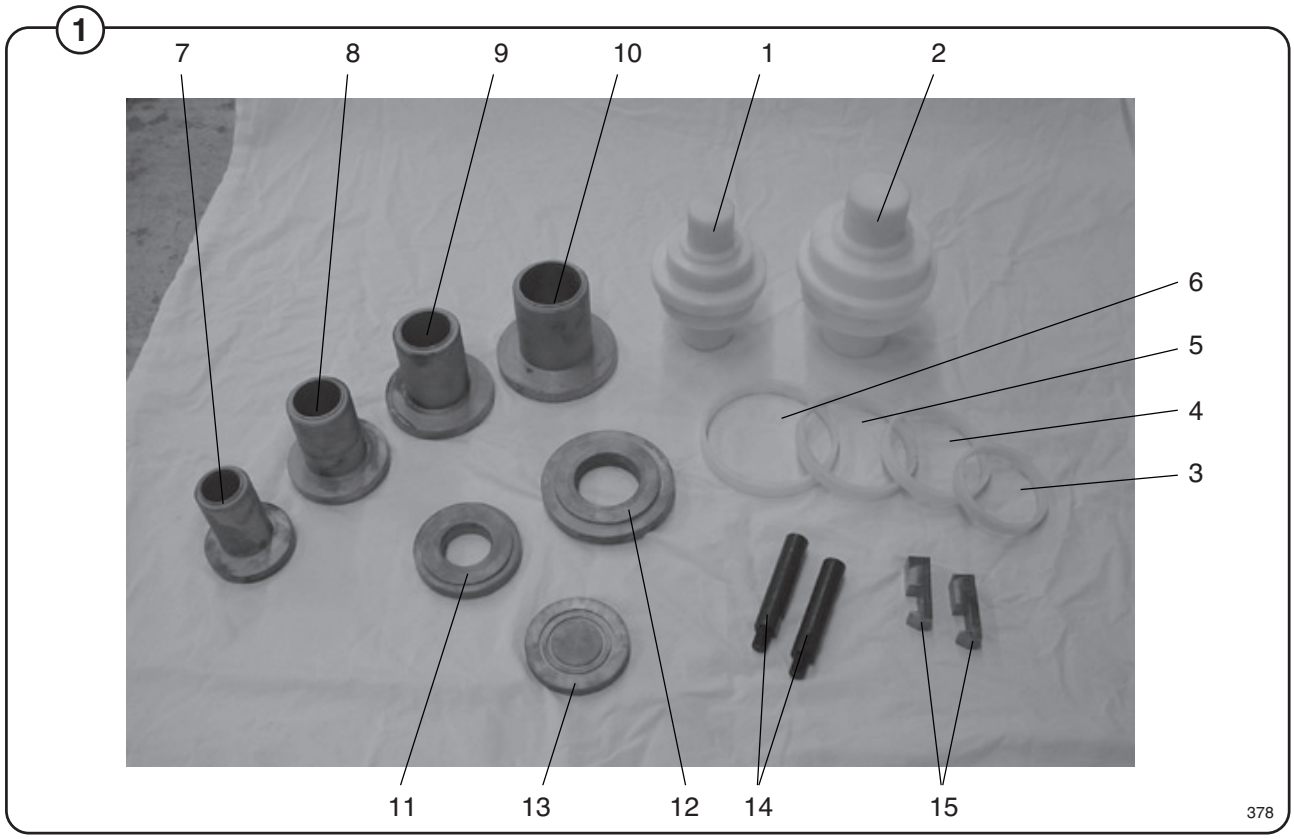
Instruktion/Instruction

Fig. Komplett verktygssats, art. nr: 472 9913-60
(1) Complete tool kit, part No: 472 9913-60



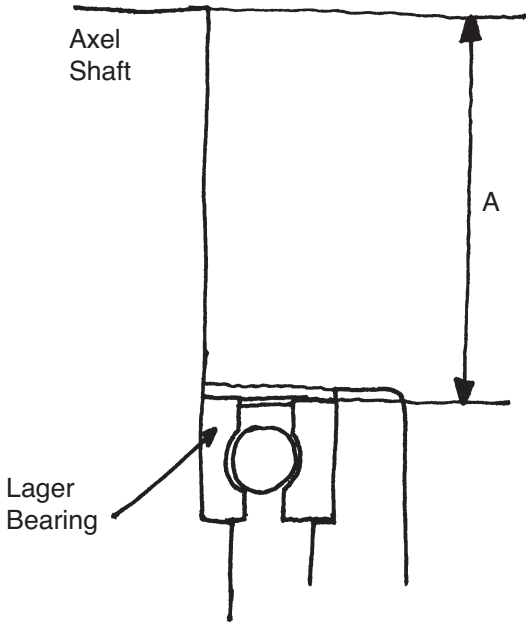
Pos.	Art. nr./Part No	Beskrivning/Description	Antal/Qty
1.	432 1723-01	Dorn för tätningar/Drift for gaskets (W365-3105H/N/M, W3130N/M, EX618, 625, E/W630)	1
2.	432 1723-02	Dorn för tätningar/Drift for gaskets (W3130-3300H, W3180-3330N/M, EX630-670, E/W640-675)	1
3.	432 1716-01	Distans/Spacer (W365-385H/N/M, EX618, E/W620)	1
4.	432 1716-02	Distans/Spacer (W3105H/N/M, W3130N/M, EX625, E/W630)	1
5.	432 1716-03	Distans/Spacer (W3130H, W3180N/M, EX630, E/W640)	1
6.	432 1716-04	Distans/Spacer (W3180-3300H, W3250-3330N/M, EX640-670, E/W655-675)	1
7.	432 1719-01	Dorn, stora lagret/Drift, large bearing (W365-385H/N/M, EX618, E/W620)	1
8.	432 1719-02	Dorn, stora lagret/Drift, large bearing (W3105H/N/M, W3130N/M, EX625, E/W630)	1
9.	432 1719-03	Dorn, stora lagret/Drift, large bearing (W3130H, W3180N/M, EX630, E/W640)	1
10.	432 1719-04	Dorn, stora lagret/Drift, large bearing (W3240-3300H, W3250-3330N/M, EX655-670, E/W655-675)	1
11.	432 1730-01	Pressdorn/Presser (W365-3105H/N/M, EX618-625, E/W620)	1
12.	432 1730-02	Pressdorn/Presser (W3130-3300H, W3180-3330N/M, EX630-670, E/W640-675)	1
13.	432 1722-01	Bricka/Washer	1
14.	432 1727-01	Förlängare/Extender	2
15.	432 1729-01	Avdragsklackar, stora lagret/Puller block, large bearing	2

- Avmontering av remskiva, se instruktion 438 9041-53.
- Removal of pulley, see instruction 438 9041-53.
- Tag bort kilen från axeln.
- Remove wedge from shaft.

Fig. 2

- Mät avståndet A mellan lager och axelända.
- Measure the distance A between bearing and end of shaft.

2



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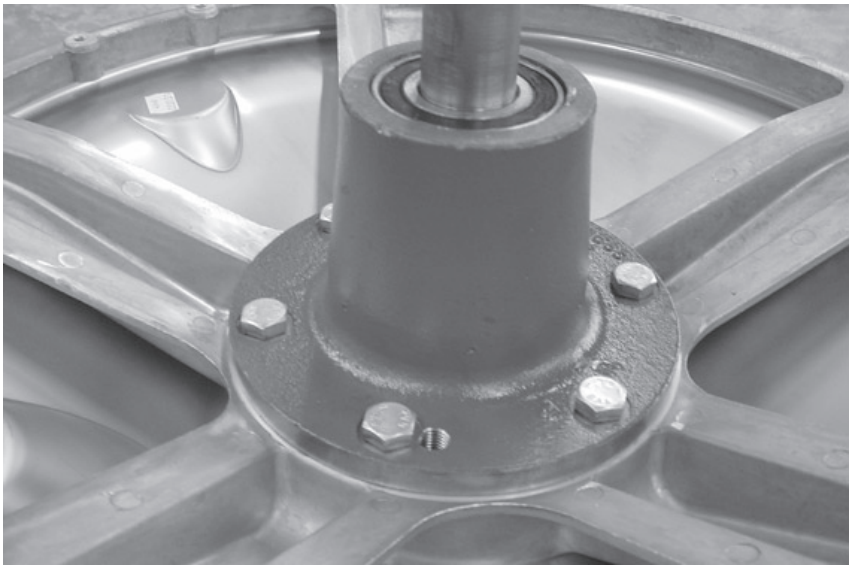
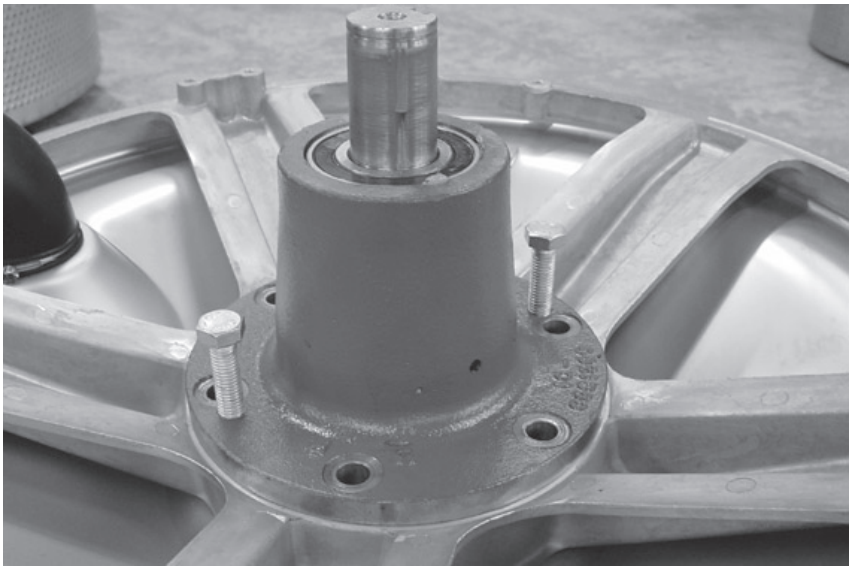


338

Fig. 3
- Skruva loss bultarna i lagerhuset.
- Loosen the bolts in the bearing house.

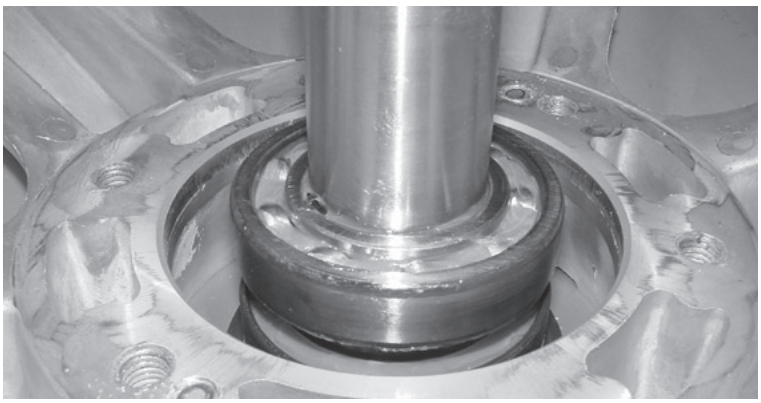
4

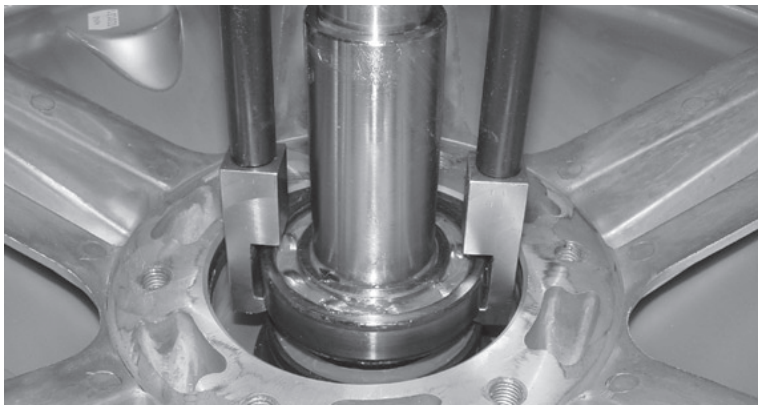


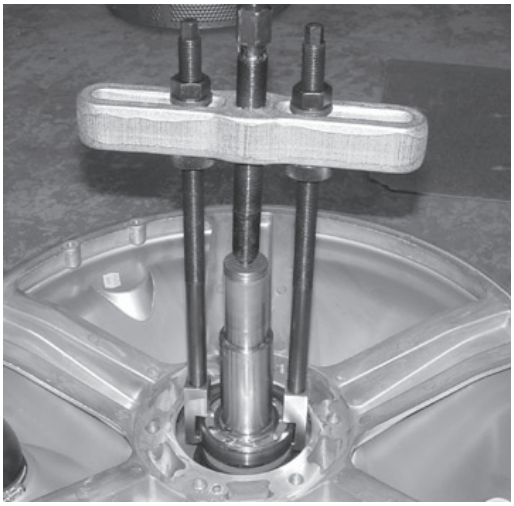
339

Fig. 4
- Montera två bultar i lagerhusets gängade hål och pressa loss lagerhuset.
- Mount two bolts in threaded holes and press until the bearing house is loose.

5





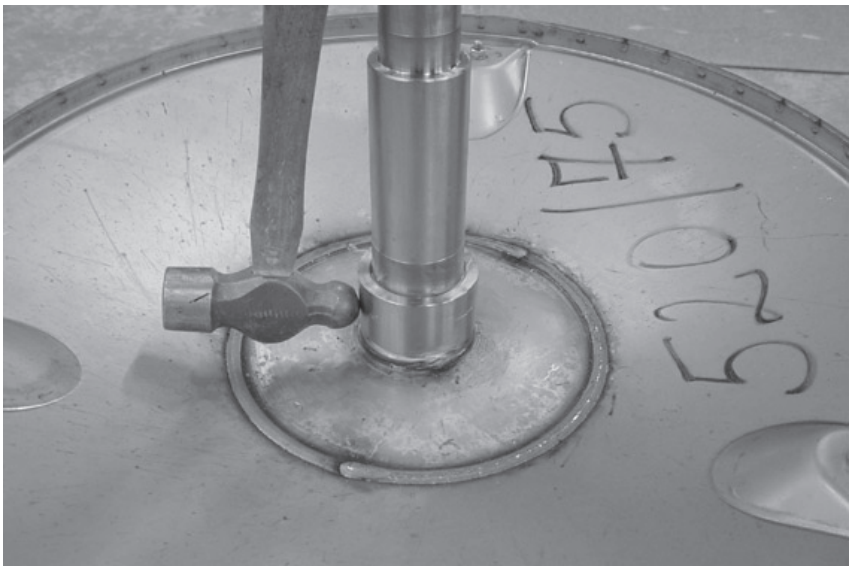


341, 342, 343

Fig. 5

- Om det främre lagret sitter kvar på axeln, drag av det med avdragaren och de två avdragarklackarna (på de större maskinerna använd också förlängarna). Försök ej dra av bakgaveln när det främre lagret sitter kvar, då förstörs klädselplåten.
- If the front bearing is still on the shaft, use the puller to remove it. In order to be able to put the puller blocks under the bearing, push the rear gable a little. Do not attempt to remove the rear gable when the bearing is still on the shaft. It will result in a damaged lining.
- Tag bort tätningarna och därefter bakgavel.
- Remove the sealings and then the rear gable.

6

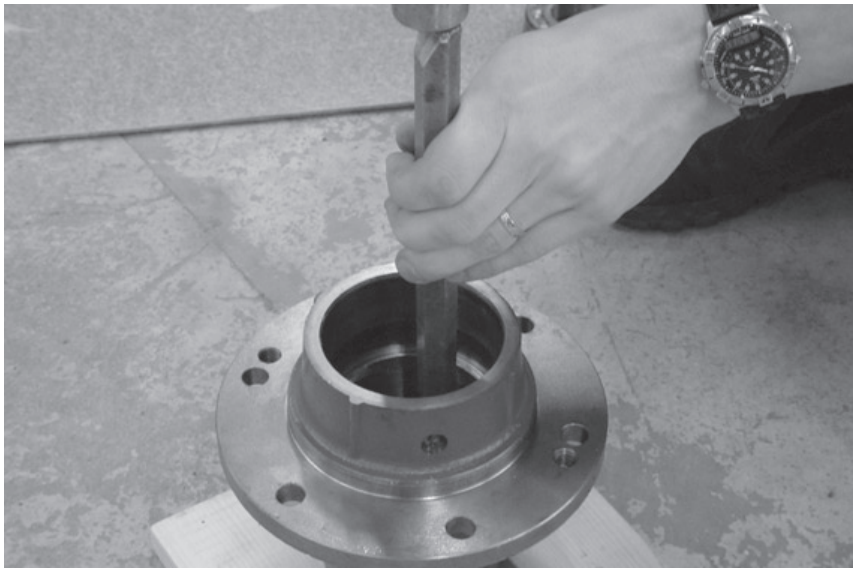


346

Fig. 6

- Alt. 1. Knacka på bussningen på tre ställen (ca 120° mellan).
  Ibland räcker det för att den skall släppa.
- Alt. 1. Tap the bushing in three places (with about 120° in between).
  Sometimes it is sufficient to loosen it from the shaft.
- Alt. 2. Mejsla eller slipa bort bussningen från axeln.
- Alt. 2. Chisel or grind the bushing off the shaft.

7



347

Fig. 7

- Knacka ur lagren ur lagerhuset.
- Tap the bearings from the bearing house.
- Rengör lagerhuset noggrant.
- Clean the bearing house thoroughly.

8

386

Fig. 8
- Lagersats
- Bearing kit.

W365H, W375H/N, W385N/M, EX618, E/W620	472 9913-12
W3105H/N/M, W3130N/M, EX625, E/W630	472 9913-13
W3250N/M, E/W655	472 9913-15
W3180N/M, E/W640	472 9913-14
W3330N, E/W675	472 9913-19
W3330N/M	472 9913-16

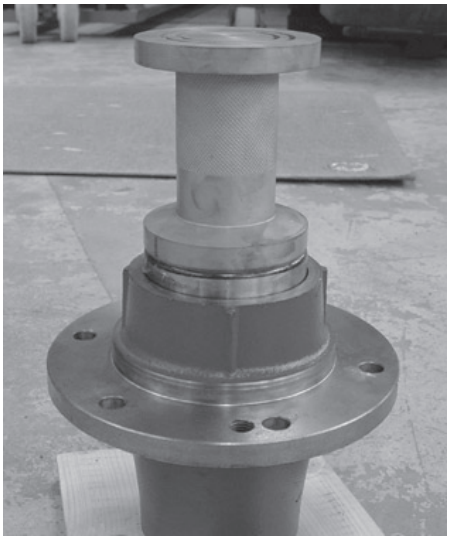
9

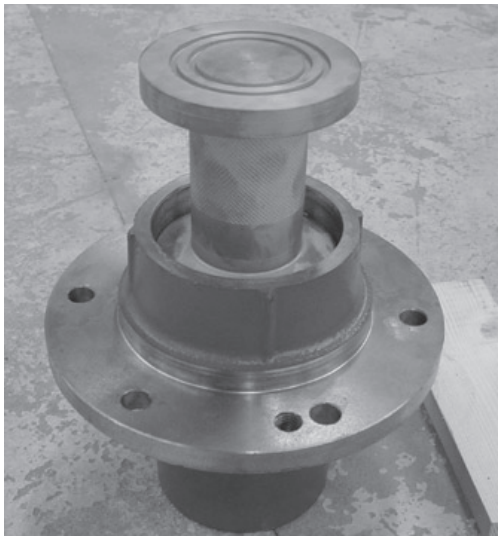
384

Fig. 9
- Lagersats
- Bearing kit.

W3130H, EX630	472 9913-17
W3180H, EX640	472 9913-18
W3240H, EX655	472 9913-19
W3300H, EX670	472 9913-64

10



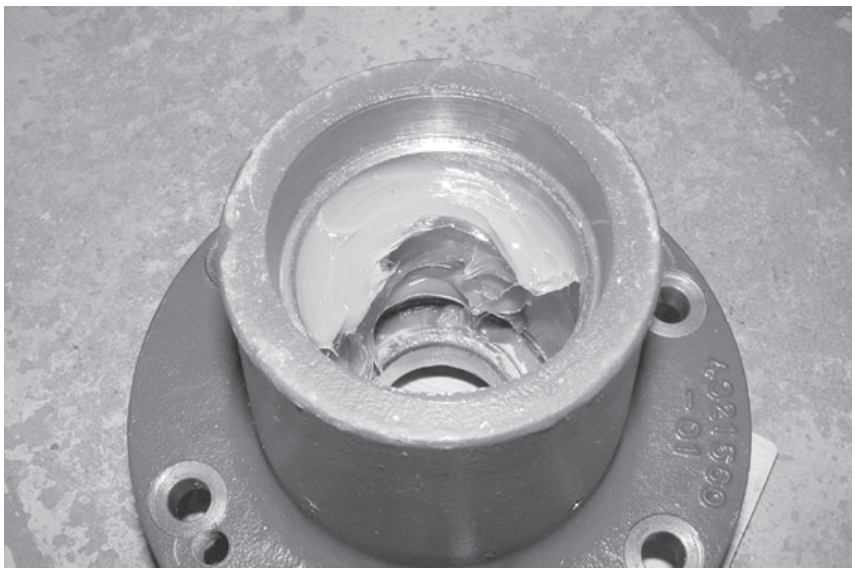


348, 349

Fig. 10

- Fyll främre lagret med fett och knacka försiktigt ner lagerhuset med hjälp av dorn och bricka.
- Fill the front bearing with grease and tap it gently into the housing with drift and washer.

11

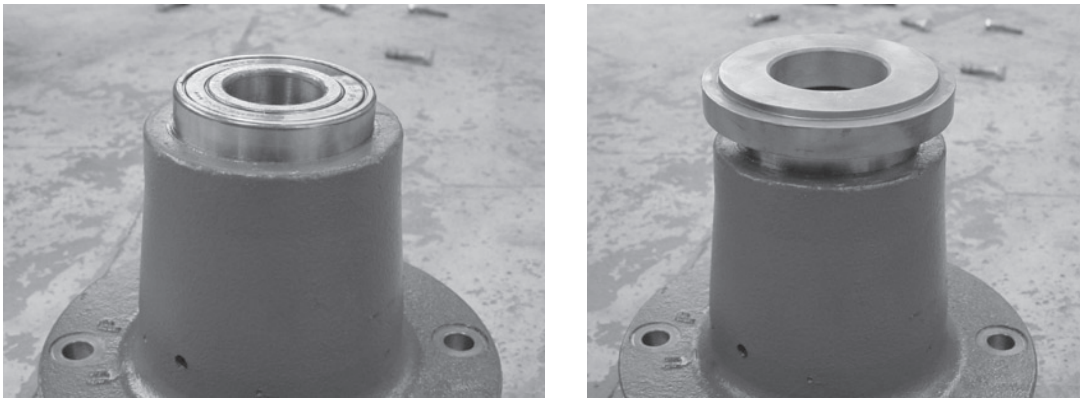


350

Fig. 11

- Fyll lite fett i lagerhuset
- Put some grease into the housing.

12



351, 352

Fig. 12
- Vänd på lagerhuset och knacka försiktigt ned det bakre lagret med hjälp av pressdornet.
- Turn the housing around and gently tap the rear bearing into the housing using the presser.

13

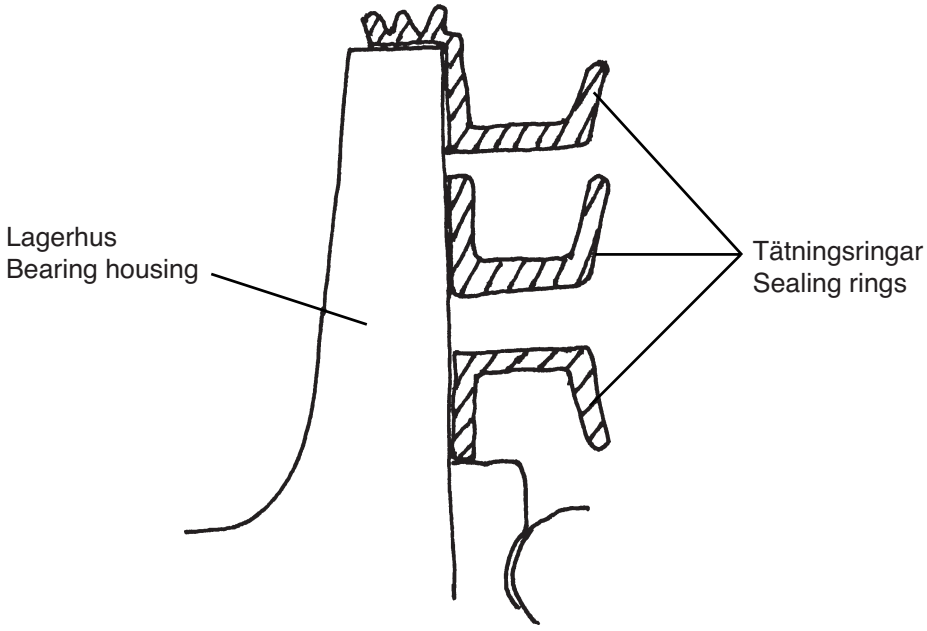
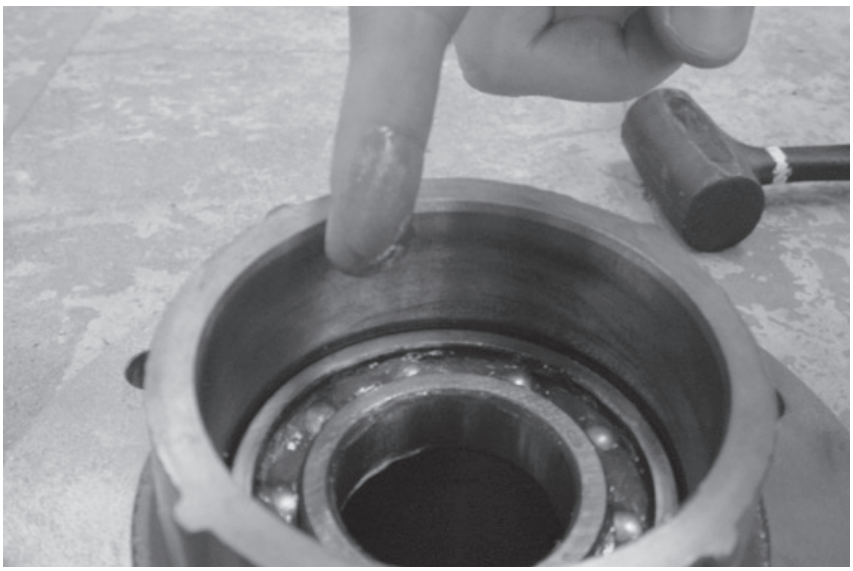


Fig. 13
- Montering av tätningsringar.
- Mounting of sealings.

14

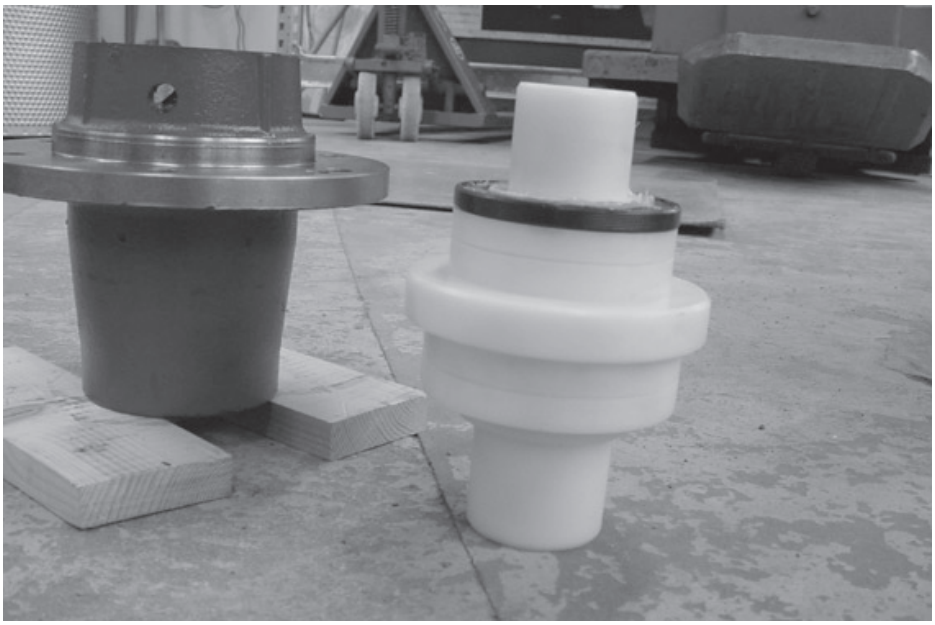


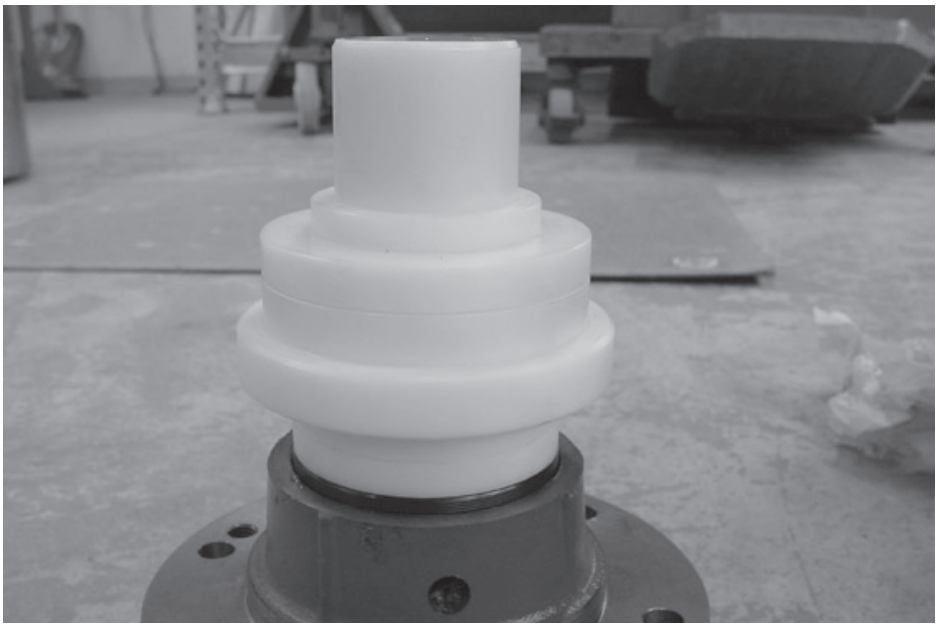
354

Fig. 14

- Smörj lagerhusets innersida med lite fett så går det lättare att montera tätningarna.
- Put some grease on the inside of the bearing housing. Then it is easier to mount the sealing rings.

15





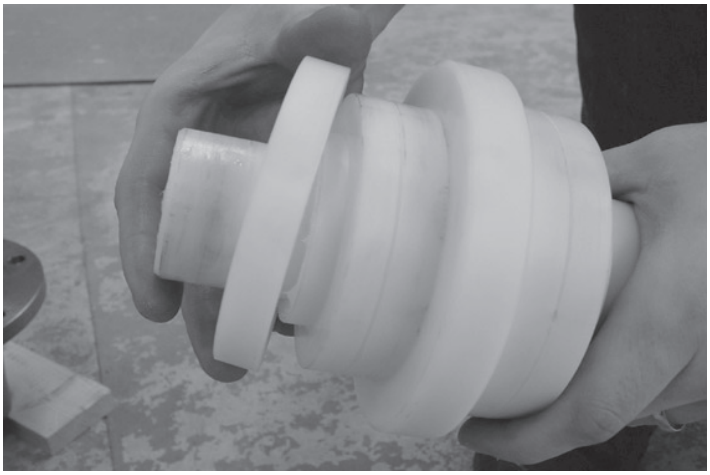
353, 355

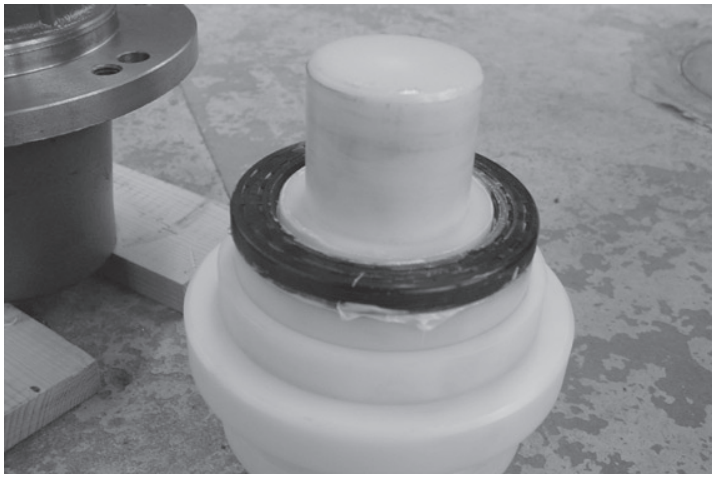
- Fyll den första tätningen med fett.
- Fill the first sealing with grease.

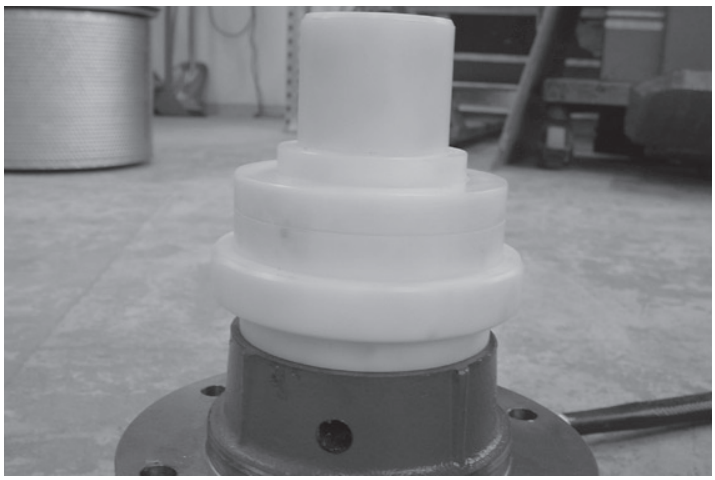
Fig. 15

- Placera tätningen på dornet med tätningens öppning uppåt. Knacka försiktigt ned den i lagerhuset. Tätningen skall ned tills det tar stopp.
- Place the sealing on the drift with the opening up. Tap carefully it down in the bearing housing. Push it down until it stops.

16





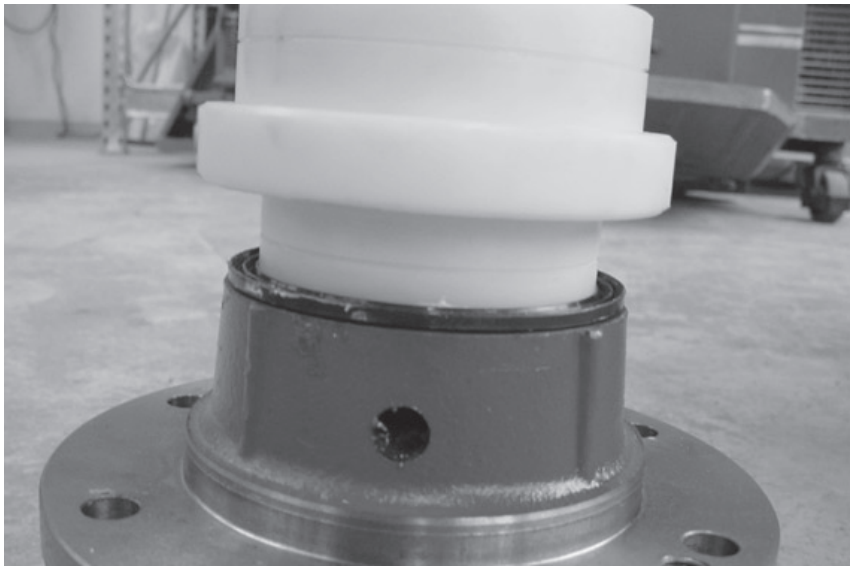


356, 357, 359

Fig. 16

- Fyll den andra tätningen med Amblygon fett. Placera distansring och tätning på dornet. Pressa ner dornet i botten på lagerhuset.
- Fill the second sealing with Amblygon grease. Place the spacer and sealing on the drift. Press down the drift to the bottom.

17



361

Fig. 17

- Montera den tredje tätningen. Läppen skall ligga an mot lagerhuset. Tryck ej för långt, tätningsläppen kan gå sönder.
- Mount the third sealing. The lip shall lay against the housing. Don't push too far as the lip can break.

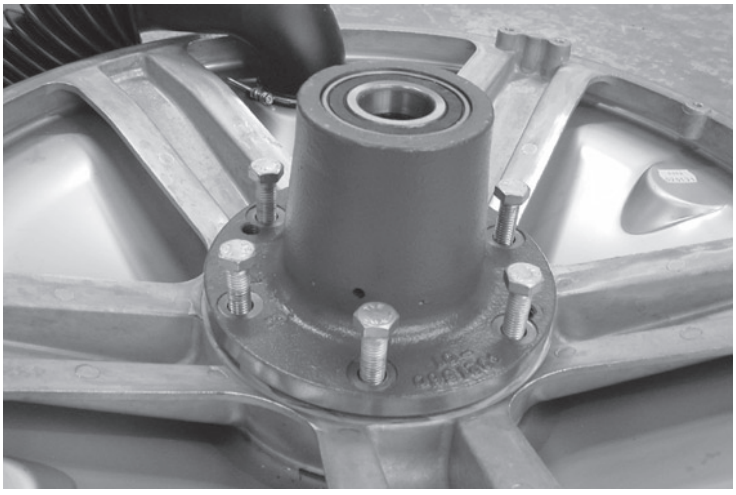
18

371

Fig. 18

- Om maskinen är försedd med oljesmörjning, kontrollera att slang och nippel är hela. Om inte, byt.
- If the machine is equipped with oil lubrication, check that the hose and nipple are OK. If not, replace.
- Gänga axeländan med M10 och min 20 mm djupt.
- Thread the shaft end with M10 and min 20 mm deep.

19

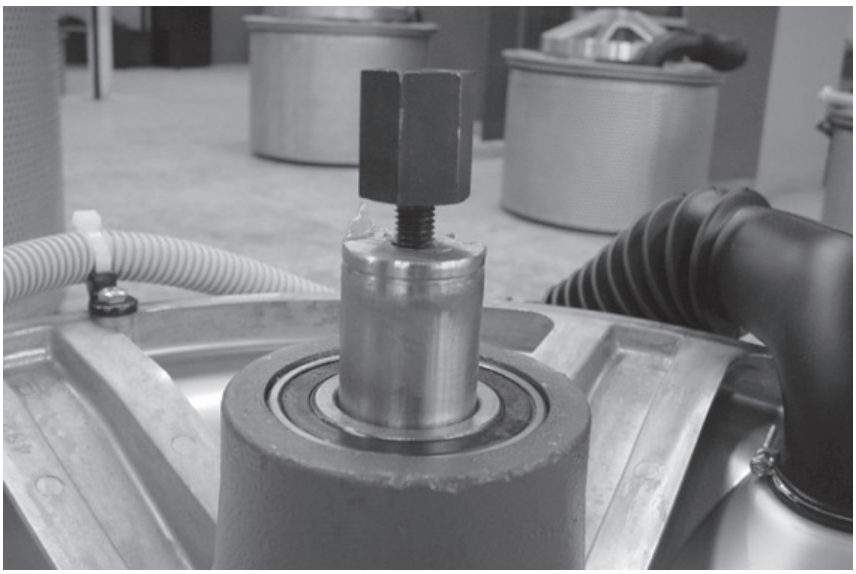


364

Fig. 19

- Montera lagerhuset på bakgaveln och korsdrag bultarna.
  OBS! Markering (Up) på lagerhuset skall peka upp när bakgavel är monterat på maskinen.
- Mount the bearing housing to the rear gable and tighten the bolt crosswise.
  NOTE! The marking (Up) shall be pointing up when rear gable are in place on the machine.

20



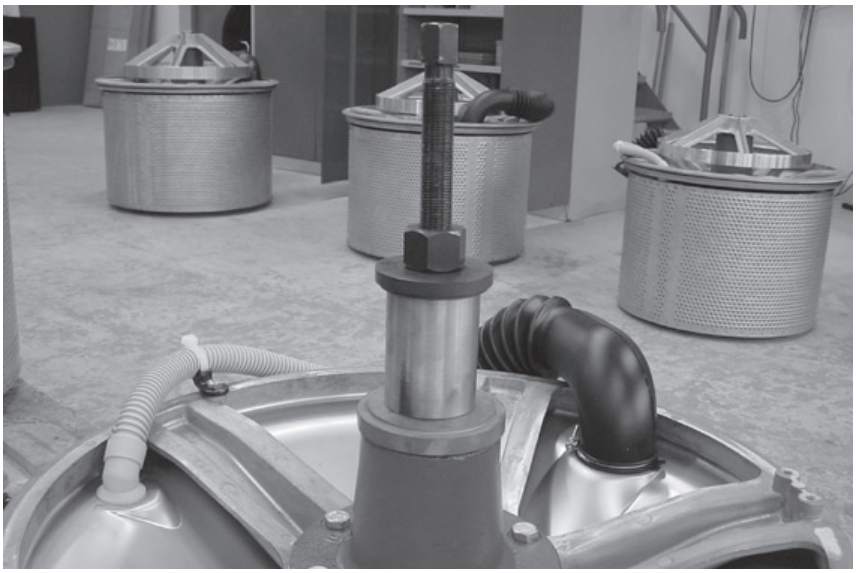
365

- Montera bakgavelpaketet över axeln. Var noga med att hålla gaveln horisontellt och var uppmärksam på att tätningarna inte skadas på axeln.
- Mount the rear gable over the drum shaft. Be sure to put it on horizontally so that the sealings don't get damaged on the shaft.

Fig. 20

- Montera adapter på axeländan och skruva ner den i botten.
- Mount the adaptor on the shaft end and thread it down to the bottom.

21

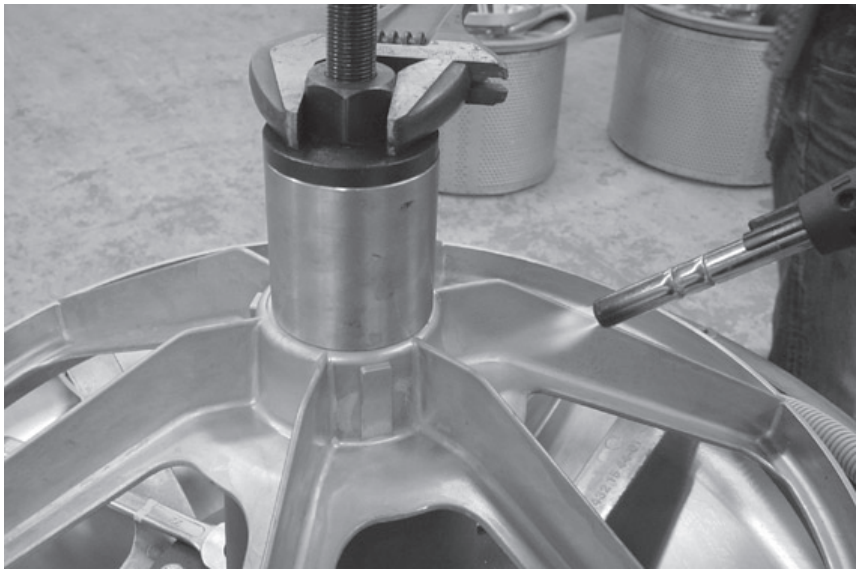


366

Fig. 21

- Montera pressdorn, bricka, mutter och avdragarbult. Pressa ner gaveln i botten. Kontrollera måttet mellan axelända och bakre lagerbana som uppmättes vid isärtagningen.
- Mount presser, washer, nut and puller bolt. Press down the rear gable until stop. Check the measure between the shaft end and bearing race. This measure was taken before removing the rear gable from the shaft.

22



373

- Montera kilen på axeln.
- Mount the wedge on the shaft.

Fig. 22

- Montera remskiva, hylsa, bricka, mutter och avdragarbult på axeln. Skruva avdragaren i adaptern på axeln. Pressa ned remskivan på axeln. Det går lättare om remskivan värms.
- Mount pulley, sleeve, washer, nut and puller bolt onto the shaft. Thread the bolt to the adaptor on the shaft. Press the pulley onto the shaft. It is easier if the pulley is heated.

23

369

Fig. 23

- Lås remskivan med segersäkringen.
- Lock the pulley with the C-clamp.
- Byt tätningen runt bakgavelns ytterkant.
- Replace the gasket around the circumference of the rear gable.

- Lyft in trumpaketet i yttertrumman.
  OBS! Texten"Up" på bakgaveln skall peka uppåt.
- Lift the drum package into the outer drum.
  NOTE! The text "Up" on the rear gable must be pointing upwards.
- Återmontera övriga detaljer.
- Remount other parts in their proper places.
- Provkör maskinen.
- Test run the machine.