OPERATING & MAINTENANCE MANUAL

S 28/12 - S 28/22

From machine No. 91/6411- S28/12, 91/5875- S28/22

471 1562-64/02
97.43

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.

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 coin-operated models, insert the proper coins to start the machine.

   For manually operated models, place the ON-OFF switch in the ON position and press the Start switch.

   For FL and EX models, insert a program card, turn the starter knob to the Start position and place the ON-OFF switch in the ON position.

   For HI-TEK microprocessor models, turn the key switch to the RUN position, choose a program and press the START button.

   For SELECTA 28 models, select a wash program and press the Start button.

   THE MACHINE(S) SHOULD 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 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 Teletech Service Telephone - 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!

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 SHOULD 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

1. **When 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.**
2. **This washing machine MUST be securely bolted to an uncovered concrete floor according to the installation instructions to reduce the risk of fire and to prevent serious injury, or damage to the machine.**
3. **This machine MUST be serviced and operated in compliance with manufacturer's instructions. CHECK DOOR LOCKS EVERY DAY FOR PROPER OPERATION TO PREVENT INJURY OR DAMAGE.**
4. **Disconnect power prior to servicing of machine.**
5. **This washing machine MUST be connected to a dedicated electrical circuit to which no other lighting unit or general purpose receptacle is connected.**
6. **TO REMOVE TOP PANEL FOR SERVICE, remove two screws under soap supply box cover, holding panel to the supply box, before unlocking. Be certain to reinstall screws when remounting the top panel to prevent leaks from the supply box.**

MANUFACTURED BY ELECTROLUX-WASCATOR, LJUNGBY, SWEDEN
DISTRIBUTED BY WASCOMAT OF AMERICA, INWOOD, NEW YORK, USA
SOLD AND SERVICED BY INDEPENDENT WASCOMAT DEALERS

471 7446-01

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.

WARNING !

DO NOT ATTEMPT TO OPEN DOOR
UNTIL PROGRAM HAS FINISHED AND
DRUM HAS STOPPED ROTATING.

471 7651-17

Contents

The manufacturer reserves the right to make changes to design and material specifications.

Safety instructions

- **The machine is designed for water washing only.**
- **The machine must not be used by children.**
- **All installation operations are to be carried out by qualified personnel. Licensed personnel are necessary for all electric power wiring.**
- **The interlock of the door must be checked daily for proper operation and must not be bypassed.**
- **All seepage in the system, due to faulty gaskets etc., must be repaired immediately.**
- **All service personnel must be fully familiar with the operating manual before attempting any repair or maintenance of the machine.**
- **The machine must not be sprayed with water, otherwise short circuiting may occur.**
- **Fabric softeners with volatile or inflammable fluids are not to be used in the machine.**

Introduction

Fig. 1 The Selecta models washer/extractor has been developed to cover the heavy duty requirements of hotels, motels, nursing homes, hospitals, professional laundries, restaurants, airlines, steamships, schools, colleges and all on-premises laundries where flexibility and quick formula variation, coupled with high quality automatic washing, are required.

The machines are free-swinging, i.e., the drum is moveable and spring suspended in relation to the frame. This minimizes vibrations transferred to the frame thus simplifying installation, as no concrete base is required.

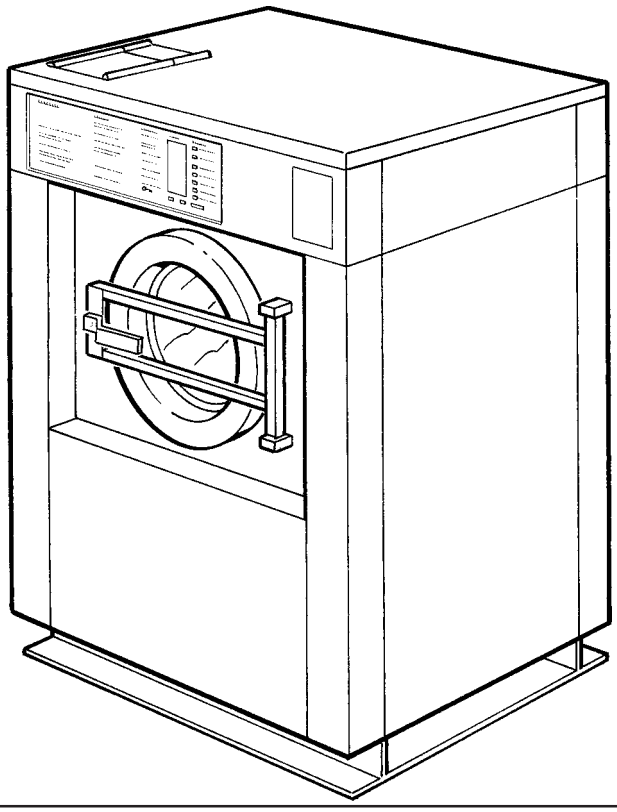
The high speed spin gives a G factor of approximately 300, providing very efficient water removal during the spin.

All parts of the machine which come into contact with the items being washed are made of heavy gauge surgical stainless steel, ensuring long life and lasting beauty, as well as full protection for no-iron fabrics. All electrical components are made accessible for servicing by simply removing the top panel.

This manual contains a technical description of the machine and instructions for its installation, operation and maintenance. Together with the wiring diagram which accompanies each individual machine it should be kept in a safe place for easy reference.

When ordering spare parts or contacting Wascomat for any purpose always give the machine serial number, model, voltage and other electrical characteristics appearing on the nameplate at the rear of the machine.

1



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Technical data

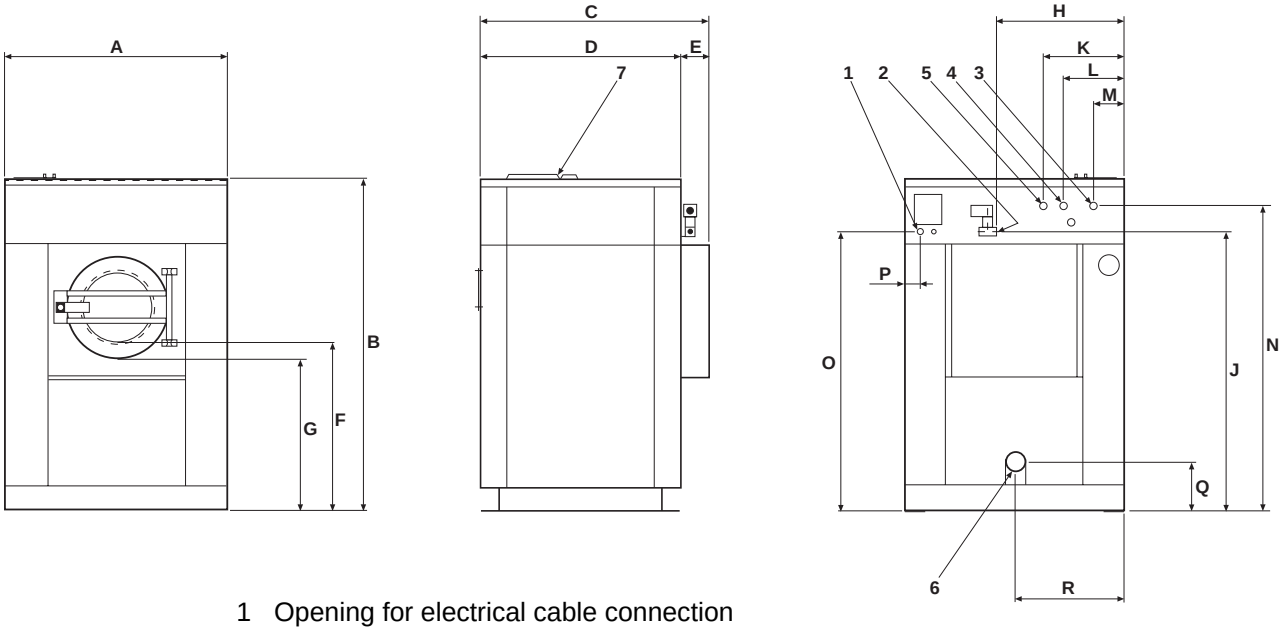
SELECTA EX 12

Dry load capacity	up to	13,5 kg	30 lbs
Overall dimensions	Width	870 mm	34 1/4''
	Depth	900 mm	35 15/16''
	Height	1302 mm	51 1/4''
	Net weight	290 kg	639 lbs
	Dyn.weight		120 lbs./sqft
Crated dimensions	Volume	1.25 m^3	44 cu.ft
	Weight	315 kg	695 lbs
Inner drum	Diameter	620 mm	24 7/16''
	Depth	412 mm	16 5/16''
	Volume	120 litre	4.4 cu.ft
Speed of rotation	Wash		48 r.p.m.
	Distribution		75 r.p.m
	Low extract		475 r.p.m.
	High extract		950 r.p.m.
G-factor	During wash		0.8
	During high extract		310
Motor speed	During wash		360 r.p.m.
	During high extract		3200 r.p.m.
Voltage requirements	Choice: 208-240 V 3-Phase 60 Hz 440 V 3-Phase 60 Hz		
Rated power	Motor, wash		250 W 0.35 HP
	Motor, extraction		1800 W 2.5 HP
Overcurrent protection	Three.-phase		15 A
Water connections			
Water pressure, max	10 kp/cm^2		142 psi
Recommended water pressure	2-6 kp/cm^2		25-85 psi
Hose connection, water	20 mm		3/4''
Hose connection, drain	75 mm		3''

SELECTA EX 22

Dry load capacity	up to	22.5 kg	50 lbs
Overall dimensions	Width	1000 mm	39 3/8''
	Depth	1102 mm	43 3/8''
	Height	1412 mm	55 9/16''
	Net weight	553 kg	1218 lbs
	Dyn.weight		157 lbs./sqft
Crated Dimensions	Volume	2.05 m^3	72.3 cu.ft
	Weight	588 kg	1295 lbs
Inner drum	Diameter	750 mm	29 1/2''
	Depth	500 mm	19 11/16''
	Volume	220 litre	7.8 cu.ft
Speed of rotation	Wash		45 r.p.m.
	Distribution		67 r.p.m.
	Low Extract		425 r.p.m.
	High Extract		850 r.p.m.
G-factor	During wash		0.8
	During High Extract		300
Motor speed	During wash		540 r.p.m.
	During High Extract		3200 r.p.m.
Voltage requirements	Choice: 208-240 V 3-Phase 60 Hz 440 V 3-Phase 60 Hz		
Rated power	Motor, wash		410 W 0.55 HP
	Motor, extraction		2600 W 3.5 HP
Overcurrent protection	Three-phase		20 A
Water connections			
Water pressure, max	10 kp/cm^2		142 psi
Recommended water pressure	2-6 kp/cm^2		25-85 psi
Hose connection, water	20 mm		3/4''
Hose connection, drain	75 mm		3''

Outline and dimensions



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1 Opening for electrical cable connection
2 Steam connection (optional)
3 Cold water
4 Hot water
5 Hot water (only Selecta EX22)
6 Drain outlet
7 Soap box

	Selecta EX12		Selecta EX 22	
	mm	inches	mm	inches
A	870	34 1/4	1000	39 3/8
B	1302	51 1/4	1412	55 9/16
C	913	36	1102	43 3/8
D	792	31 3/16	906	35 3/32
E	121	4 3/4	196	7 3/4
F	625	24 5/8	630	24 13/16
G	570	22 1/2	560	22
H	480	18 15/16	610	24
J	1100	43 5/16	1210	47 5/8
K	–	–	320	12 5/8
L	240	9 1/2	240	9 1/2
M	120	4 3/4	120	4 3/4
N	1200	47 1/4	1310	51 9/16
O	1110	43 11/16	1220	48
P	85	3 11/32	85	3 11/32
Q	203	8	203	8
R	433	17	498	19 5/8

Installation

The machine is delivered with expansion bolts and other items packed inside the drum.

Shipping securities

The machine is shipped with four large metal brackets bolted to the four suspension legs as well as a support between the pulley and the back plate.

Fig. 2

Prior to installation, follow these steps:

- Unpack the machine.
- Remove the lower front panel and the two rear panels.

Fig. 3

- Remove the support from the pulley at the back of the machine.
- Remove both front brackets.
- Remove both rear brackets.

Placement

The machine should be installed close to a floor drain or open drain to make installation, use and service easier.

The following clearances are recommended for ease of installation and service:

Fig. 4

- At least 20 inches between the machine and the wall behind it.
- At least 2 inches on each side.

The floor must be able to support a static load of 790 lbs for the EX-12 and 1440 lbs for the EX-22.

The maximum impact load at extraction is 260 lbs force for the EX-12 and 480 lbs for the EX-22.

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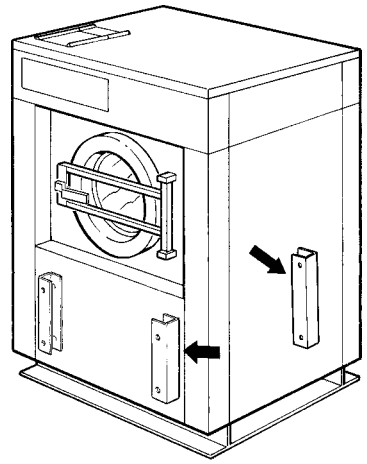

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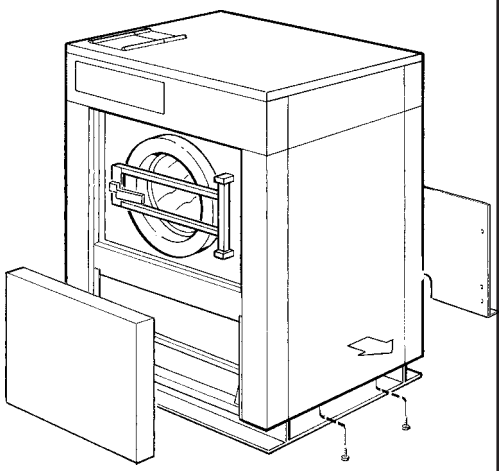

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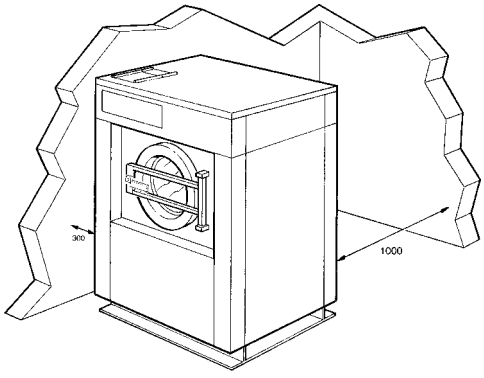

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Mechanical installation

Fig. 5
- Mark and drill two holes 3/8" in (8 mm) in diameter and approximately 3 1/2" in (90 mm) deep according to the dimensions in figure 5.
- Place the machine in position. Never lift the machine by the door or handle.

Fig. 6
- Check that the machine is level and steady. Use stainless or galvanized washers between the machine and the floor.

Fig. 7
- Insert into the holes the expansion bolts supplied with the machine. Fit the washers and nuts.

It is of utmost importance that the machine is level, from side-to-side as well as front-to-rear. If the machine is not properly levelled, it may result in out-of-balance cutout without a real out-of-balance in the durm.

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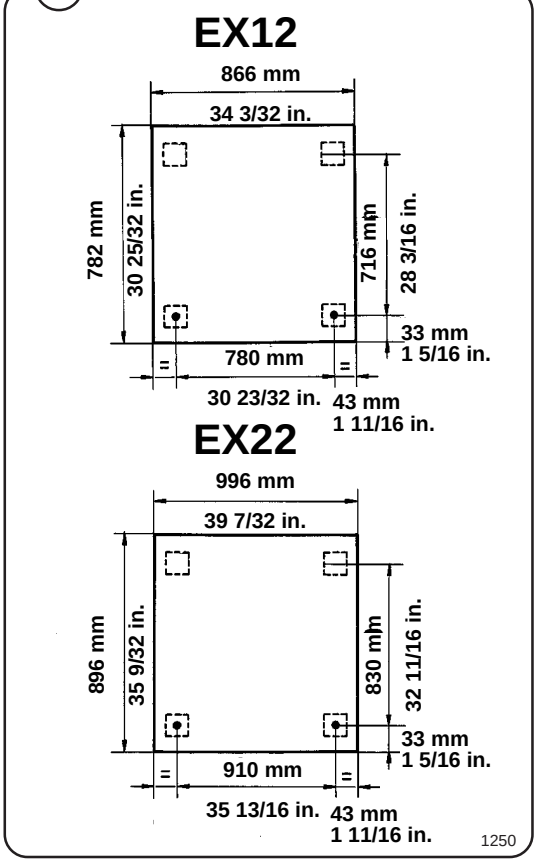

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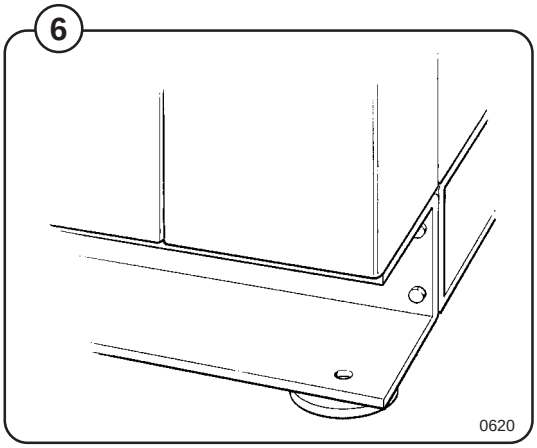

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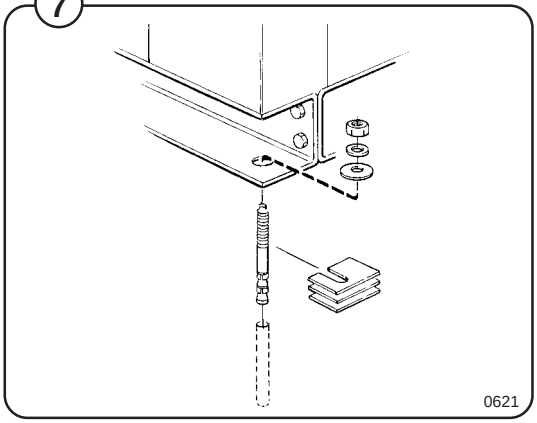

Electrical installation

Fig. 8 Although the machines are fitted with thermal overloads in the motor windings and separate fuses for the control circuit, a separate three-phase circuit breaker must be installed for all three-phase machines.

For proper overcurrent protection, check the data plate at the rear of the machine. Also consult local electrical code for special requirements.

Fig. 9 The machine is equipped with a control circuit transformer, mounted on the control unit and connected for 220 volt operation. If your incoming voltage is below 210 volts move the wire connection to the 208 volt tab on the transformer. If it is above 230 volts move the wire to the 240 volt tab on the transformer.

Check the incoming power for a high voltage leg. If present, connect that line to L2 on the terminal block. Make certain it is not connected to the control circuit transformer.

Fig. 8 Connect L1, L2, L3 and ground wires according to the markings of the terminal block. The cable is to hang in a large loose loop, supported by the clip of the terminal block.

To ensure proper operation the drum must rotate counter-clockwise (seen from the front) during extraction. If the drum rotates in the wrong direction interchange line L1 and L3 at the power connection terminal.

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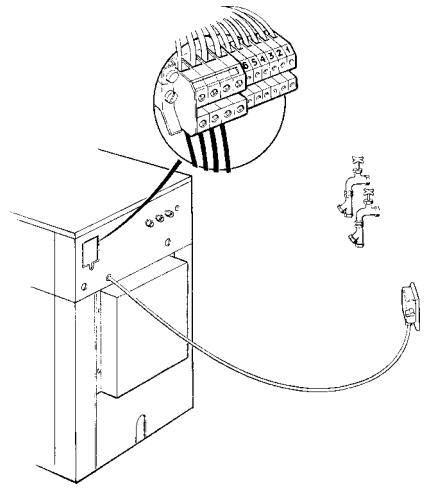

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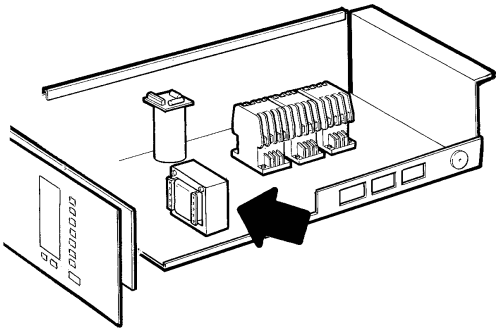

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Connection of external liquid supply

Remove cover and cover support over the soap box.

Fig. 10 Bend all the way back the metal plate in compartment 3.

Fig. 11 Pull the knobs up and forward.

Fig. 12

1. Loosen both knobs so that one side of the metal fingers underneath can slide under the top lid of the machine, within the supply box.
2. Fit the supply injector into the supply box so that both sides are held securely in places by the metal fingers.

Note:

If the supply injector does not fit turn it around. You have it in backwards.

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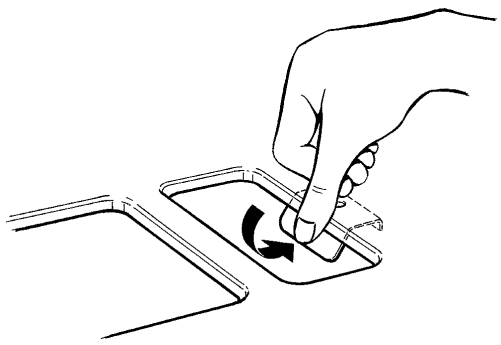

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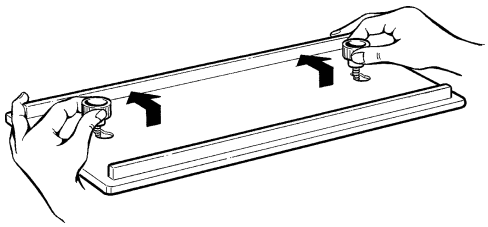

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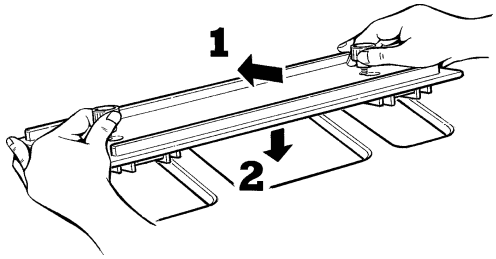

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Fig. 13

1. Drop the knob into the larger opening in the supply injector lid.
2. Tighten securely. Do not overtighten! Do not use pliers or other tools to tighten the knobs!

Fig. 14

1. Stretch the multi-rubber ring B and select the correct size ring which will fit snuggly on the chemical tube you are using. Ring A is used for tubes with Ø 1/3" (8 mm).
2. Use scissors or a razor to carefully cut out the proper size rubber ring. Wrap the rubber ring around each tube after threading each tube trough the plastic nipple. Run the tube trough the compression nut to the bottom of the compartment. Cut the end of the tube at an angle. Hand tighten the plastic nipple on to the compression nut.

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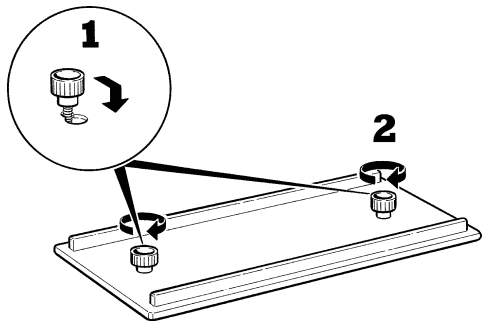

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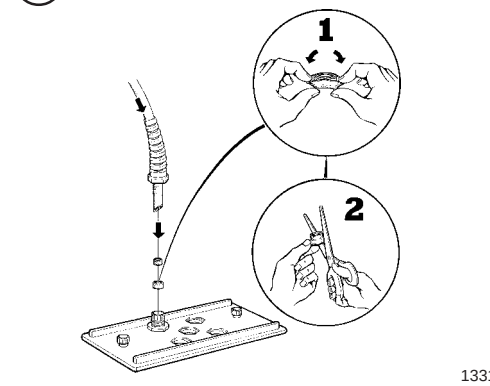

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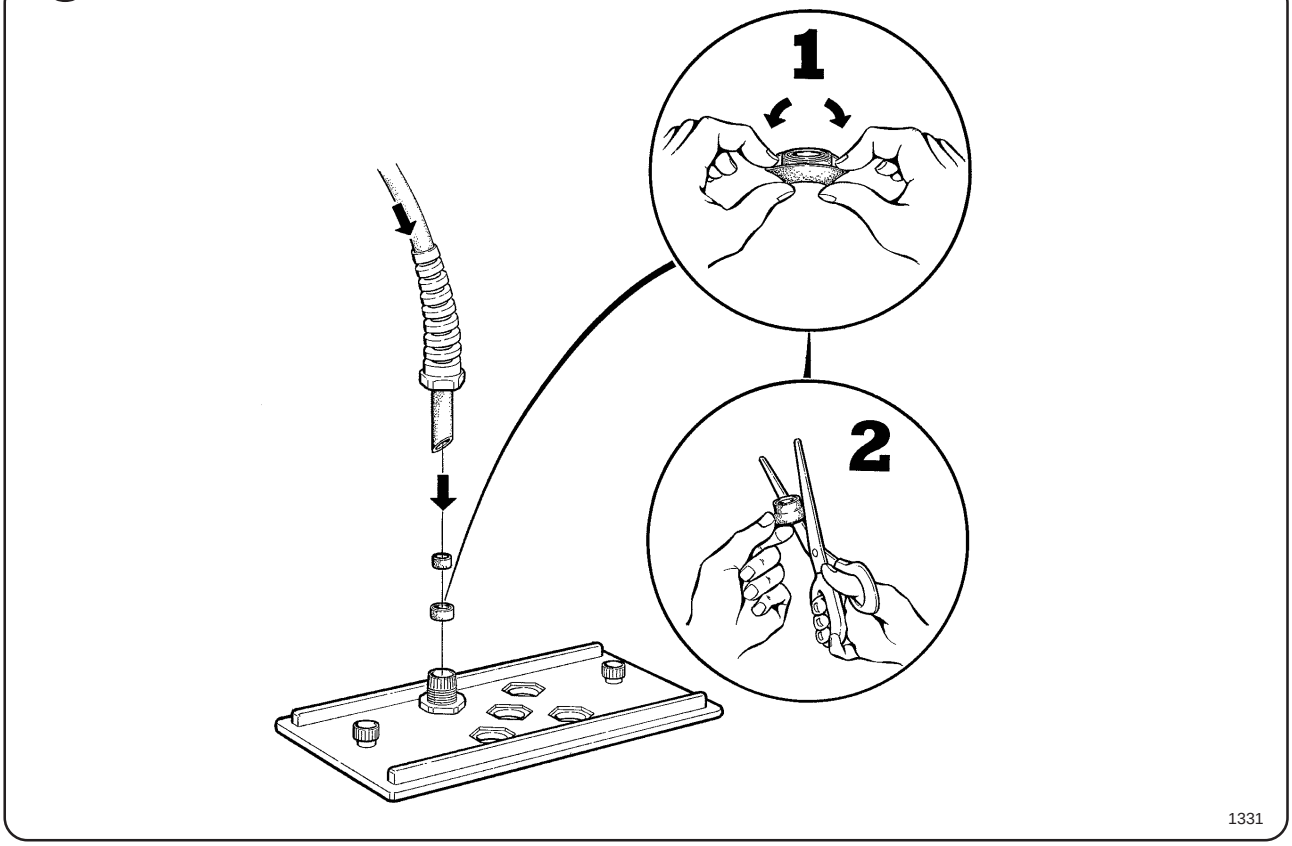

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Pump connection

Fig. 15 To the right of the incoming power terminal connection block is the connection for pumps. Depending on the number of pumps to be connected, they shall be connected from 1-5 and C (common) on resp. connection. The pumps obtain signals from the electronic timer.

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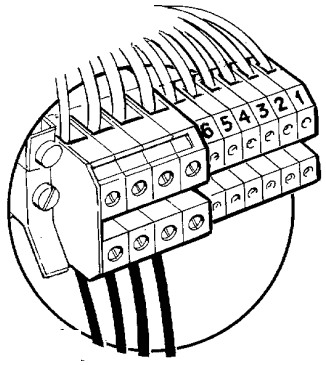

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Water connection

> **NOTE**
>
> **All plumbing must conform to national and local plumbing codes.**

Fig. 16

Incoming water lines do not require non-return valves, as the machine is already fitted with a siphon breaker. However, all incoming lines must be fitted with shut-off valves and strainers.

Fig. 17

- Water inlets are labelled for hot and cold water connection.
- Flush the water system thoroughly and check that the strainer at the machine inlet is fitted correctly.

Fig. 18

- Connect the machine to the water mains with 3/4'' reinforced rubber hosing not to exceed 6 ft in length. Hang the hosing in a large loop. Do not use rigid piping.

Drain connection

Fig. 19

Connect a 3'' (75 mm) flexible hose to the drain outlet of the machine.

The drain house must not have any sharp bends and must slope from the machine to assure proper drainage. The outlet must open freely to the main drains.

Do not reduce the size of the drain connection from the machine to the waste line.

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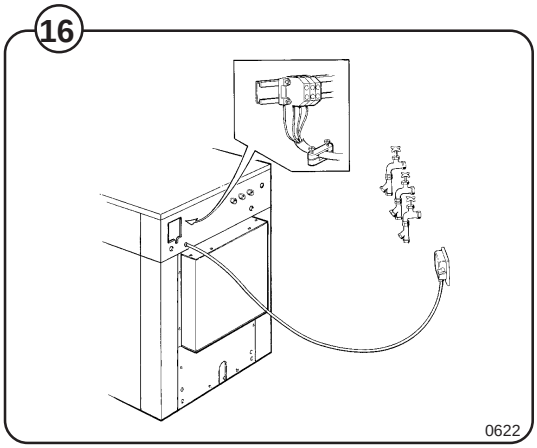

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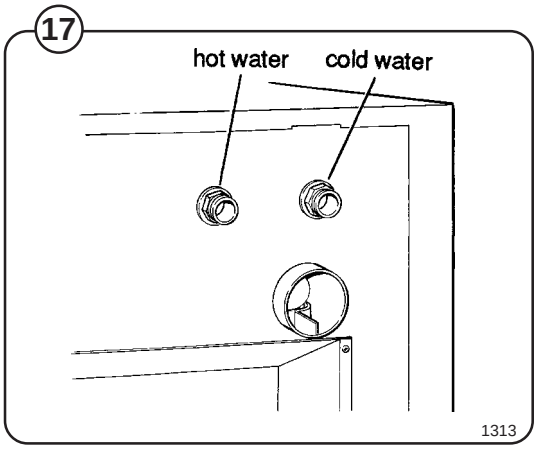

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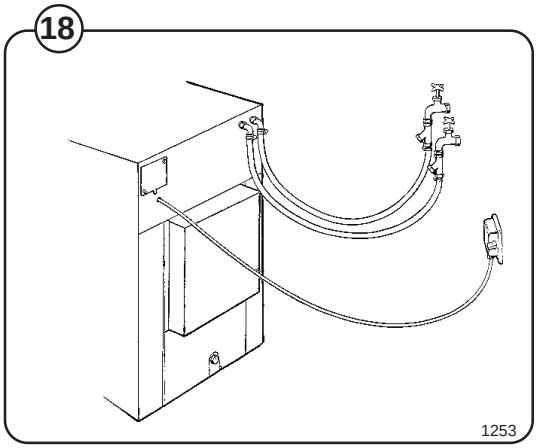

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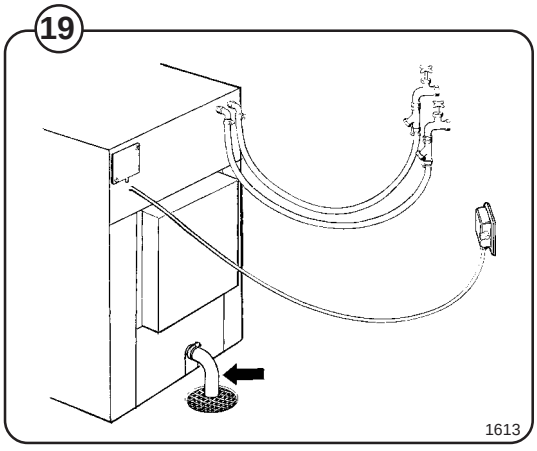

Instruction for setting timing on electro-lube oil dispensing

Fig. 20 Pry off the switch panel cap with a screwdriver.

- Under the cap are the switches for time setting.
- Fig. 21 Set the "Light" and "12M" dip switches to the "On" position. Make certain all other switches are in "Off" position.
- Fig. 22 The light will start flashing after a few minutes and will continue to flash every 15th to 20th seconds as long as the dispencer is in operation.
- Fig. 23 The decal shown below should be affixed at the front of the machine and updated as required.

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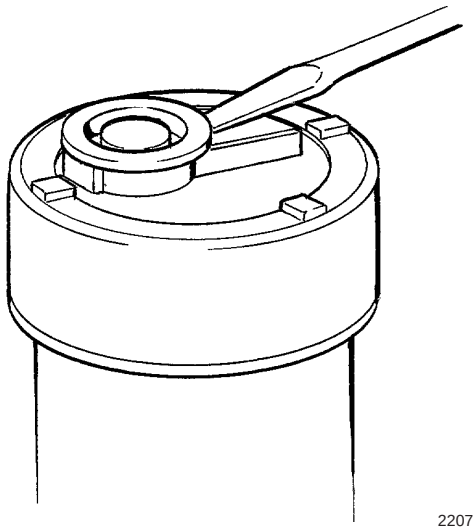

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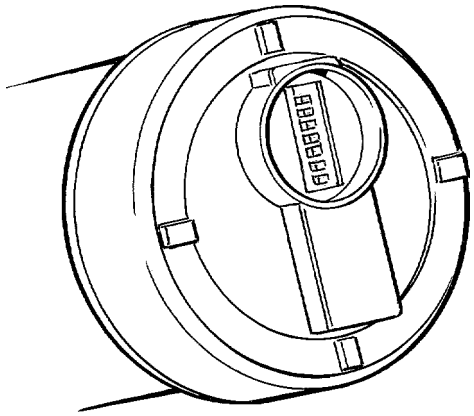

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23

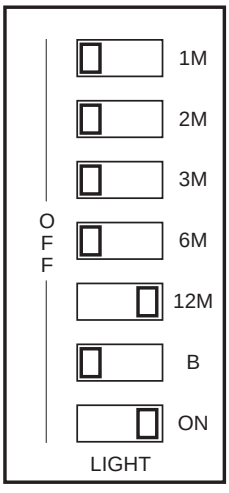
IMPORTANT

NOTICE

This machine is equipped with an automatic oiler, located at the right rear of the machine, which keeps it lubricated for long bearing and seal life.
The amount of oil in the container is sufficient for approximately one year's lubrication. It is of utmost importance that the oiler does not become empty. Therefore we recommend that the rear panel to be removed and a visual inspection to be made on a bimonthly basis. When the oil reaches a low level, the cannister must be replaced with a new one available from Wascomat as Part No. 827601.

Date Last Replaced	Date Last Replaced

22



2733

Start-up and safety checklist

Before initial start-up of a Wascomat washer-extractor, the following safety checks must be performed:

Fig. 24

- Make sure that all electrical and plumbing connections have been made in accordance with applicable local codes.
- Use only flexible water fill and drain hoses of the proper length to avoid sags and kinks.
- Make sure the machine is properly grounded electrically.

Before the machine is operated, the door safety interlock must be checked for proper operation as follows:

Fig. 25

- When washer loading door is open, the machine must not start. Verify this by attempting to start washer with door open.

Fig. 26

- When washer is in operation, the loading door is locked and cannot be opened. Verify this by attempting to open the loading door when the machine is operating. If necessary, consult this manual for proper operation of the door lock and door safety interlock or call a qualified serviceman.

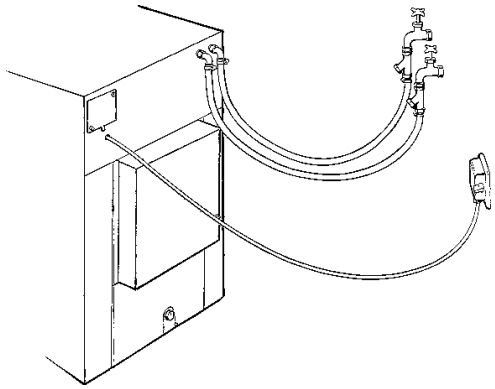
IMPORTANT:

Door safety interlock must be checked daily in accordance with above procedure.

WARNING:

Before servicing Wascomat equipment, disconnect electrical power.

24



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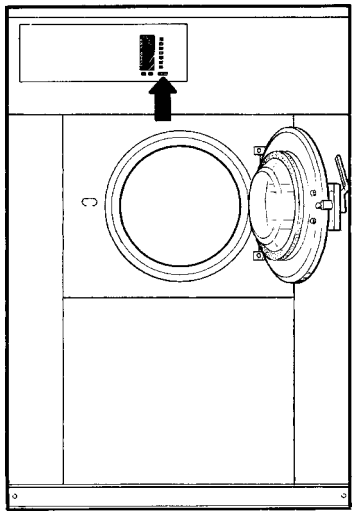

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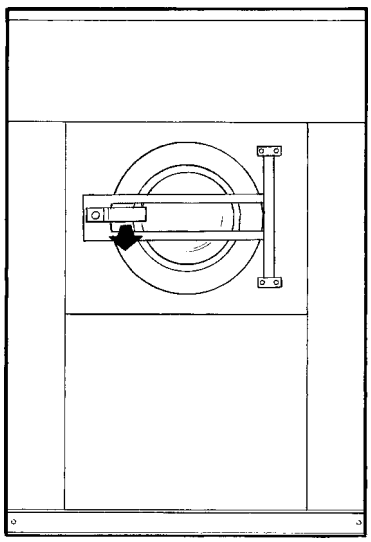


1615

Function control check-out list

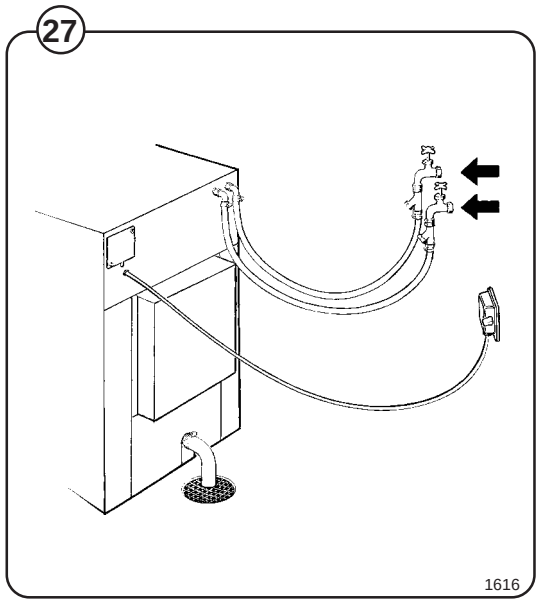
In the machine cylinder, you will find the warranty registration card, a copy of the warranty policy and other pertinent material.

The warranty card should be completed and sent to Wascomat. All other items should be placed in a safe place for future reference.

The machine should be cleaned when the installation is completed, and checked out as detailed below without loading the machine with fabrics:

1. Check the incoming power for proper voltage, phase and cycles.
2. Open manual shut-off valves to the machine.
3. Turn on electric power.
4. Check the door safety interlock as detailed on page 9 of this manual.
5. Run through a complete cycle, checking for water temperature, drain operation and the extract function. For operating instructions, see the section marked ''Procedure''.

Fig. (27)



NOTE

All machines are factory tested prior to shipment. Occasionally, some residual water may be found when the machine is installed.

Safety rules

- **This machine is designed for water washing only.**
- **Machines must not be used by children.**
- **All installation operations are to be carried out by qualified personnel. Licensed personnel are necessary for all electric power wiring.**
- **The interlock of the door must be checked daily for proper operation and must not be bypassed.**
- **All seepage in the system, due to faulty gaskets etc., must be repaired immediately.**
- **All service personnel must be fully familiar with the operating manual before attempting any repair or maintenance of the machine.**
- **This machine must not be sprayed with water, otherwise short circuiting may occur.**
- **Fabric softeners with volatile or inflammable fluids are not to be used in this machine.**

General

Fig. 28

The machine is a free-swinging model i.e. the outer drum and motor bridge are suspended in the machine chassis via a spring suspension with a strong spring in each corner of the machine. Each spring has a shock absorber which dampens the movement of the machine.

The wash drum or inner drum is driven by two motors via a V-belt: one motor for washing and distribution speed and one for spin speed. The inner drum is mounted in the outer drum with two heavy duty bearings at the back plate and is sealed with two V-rings.

The motors are suspended underneath on a motor support with a belt tensioning device. The motors are mechanically coupled to each other with V-belts. During wash and distribution speed the spin motor transmits power to the drum.

The water inlet and rain are both situated under the outer drum. This improves the flow during filling and prevents water vapour from entering the detergent compartment.

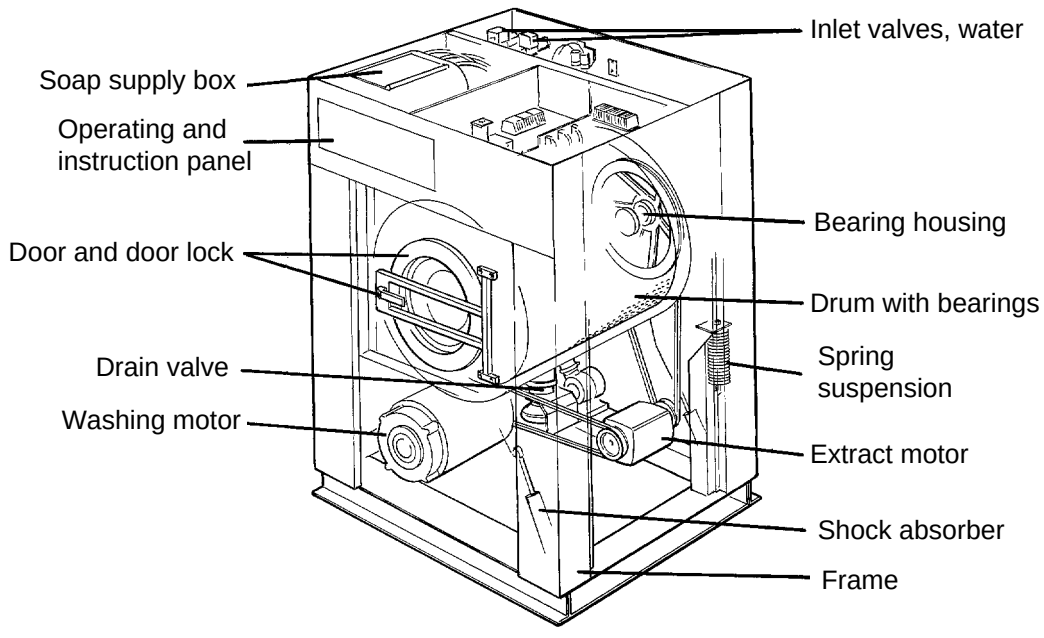
The robust square door is locked with a handle which is interlocked by a safety device when the machine is running.

The electronic timer with displays is fitted at the front of the machine.

All control and indicating components i.e. relays, delay unit, etc. are assembled under the top cover, easily accessible from the top of the machine for simplified servicing.

The machine housing consists of hot-dip galvanised, painted steel plates and stainless steel sheets, painted on the front and sides. It has a stainless door (and front, on request).

28



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Frame

Description

Fig. 29 The frame is constructed on the free-swinging principle, i.e. the washing drum is freely and resiliently suspended in the fixed frame.

The entire frame is constructed of U-shaped iron beams forming a stable and torsionally rigid structure.

The suspension device for the drum unit and motors consists of four posts, one in each corner, each with a robust spring in which the washing drum supports are attached. In order to prevent excessibely great vibrations which can be caused by imbalance in the drum, a shock absorber is fitted between the drum and frame by each spring. (The EX 12 model has twin shock absorbers at the front.)

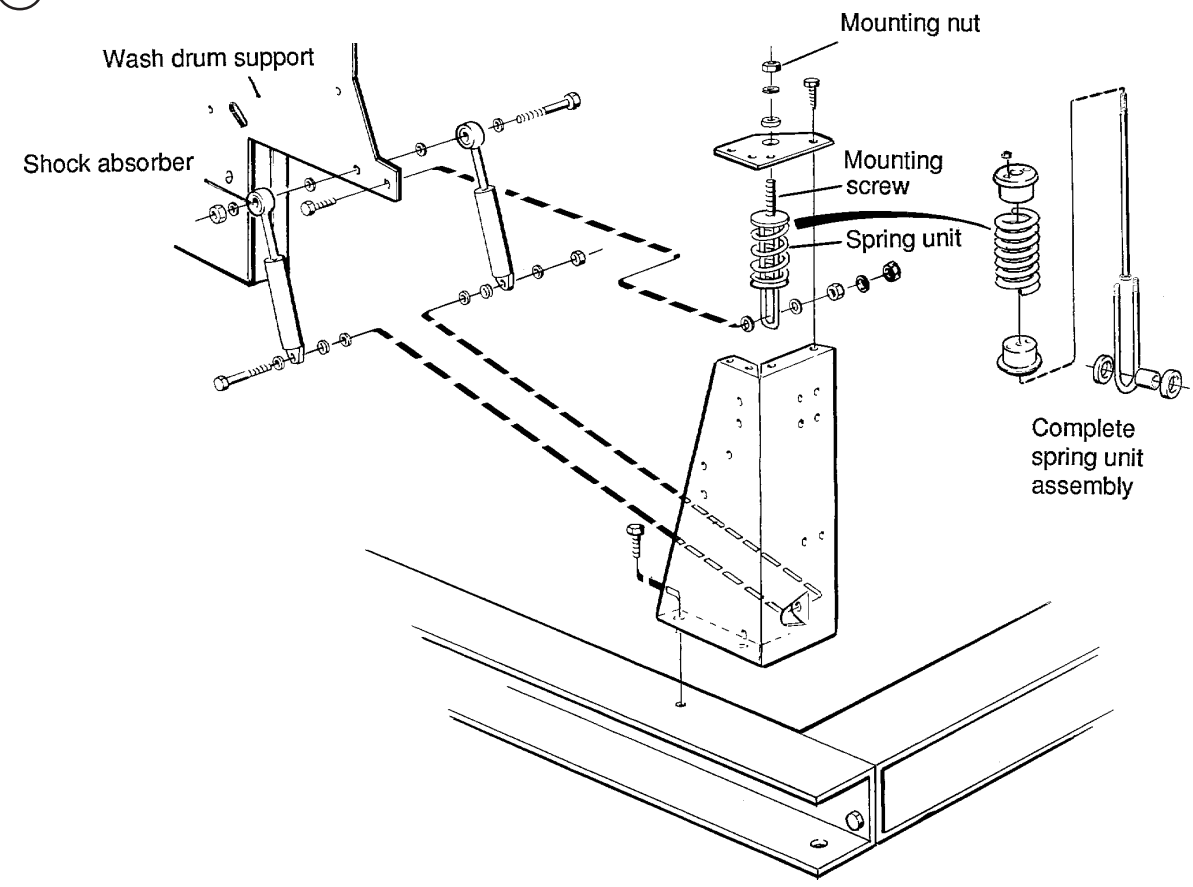
Repair instructions

If the out-of-balance cutout is repeatedly triggered

- Check the shock absorbers, replace them if required. Note that the shock absorbers should be fitted with the plunger rod upwards.
- Check the attachment of the springs:
  - the spring is attached by a bolt from above: Check that it has been properly tightened down.

The entire spring unit should be replaced in spring replacement.

29



Drum with bearings

Description

Fig. 30

The inner drum is journalled to the outer drum by two robust bearings in a bearing housing which is bolted to the rear plate. The bearing unit supports the drum without any support being needed at the front. Shaft seals of the V-type, as well as O-rings, seal against leakage.

The space between the bearings is packed with grease during assembly. No additional grease is required.

The inner drum shaft is continuous, and the V-belt pulley is attached to the protruding journal by an adapter sleeve.

The outer drum end plate consists of two parts, the inner and outer end plates which are bolted to the bearing housing with through bolts. NOTE: The inner and outer end plates must not be taken apart when the bearings are replaced.

The outer drum and rear plate are held together by 3 straps.

The outer drum is connected to its resilient suspension by four supports, bolted to the end plates. It is important that these supports are not loosened from the rear plate during repairs.

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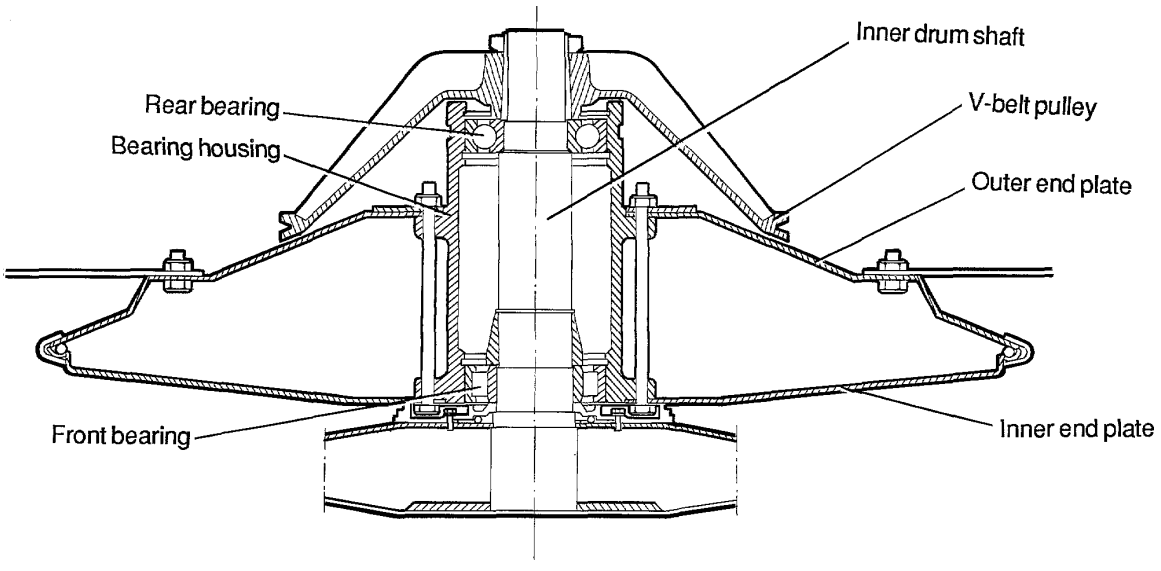


0635

Safety locking device

Description

Fig. (31) The machine safety locking device includes a safety interlock system which prevents personal injury through the following precautions:

- The machine cannot be started until the door is shut.
- The door is automatically locked when the machine starts.
- It is not possible to open the door until 2-3 minutes have elapsed after the washing program has ended. This ensures that the drum is motionless when the door is opened.

Repair instructions

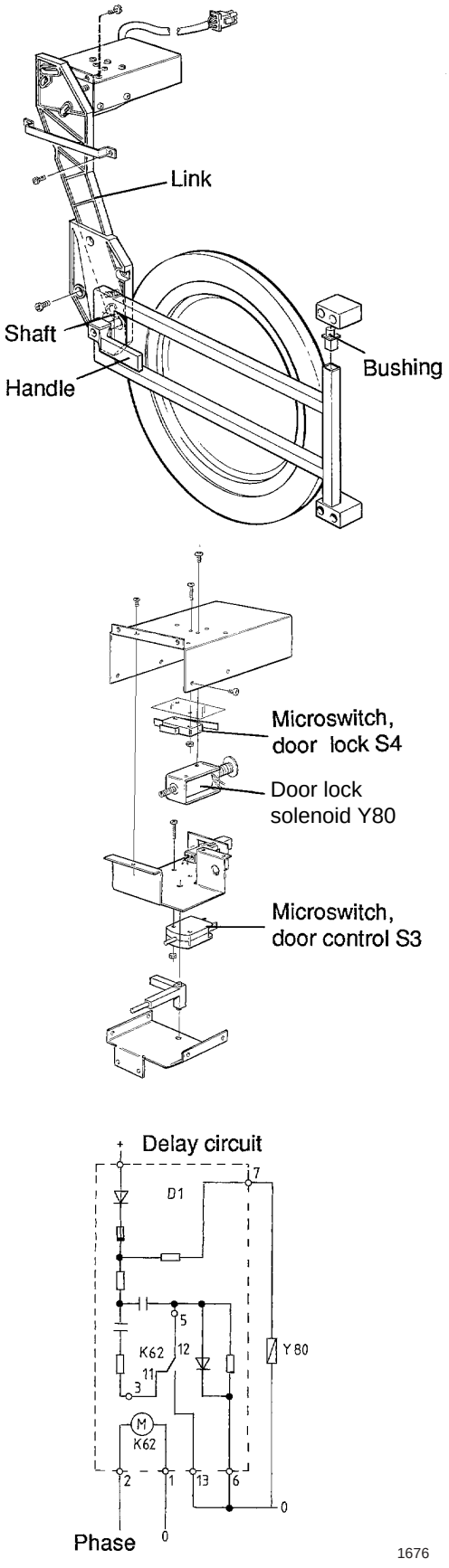
It the coil does not lock the door:

- Check that the coil is receiving 100-110 V DC. Measure the coil to determine if there is an interruption.
- Check that the armature of the coil is not stuck.
- If necessary replace the entire coil.

Other possible faults:

- Faulty microswitch.
- Faulty delay circuit.
- Moving parts jammed.
- Handle not in locking position.

31



Control unit

Fig. 32 The control panel (1), mounted at the front, includes all components necessary for operating the machine, such as display window, control switches and a key-operated switch.

The printed circuit board (2) with the microprocessor electronic timer is mounted just behind the control panel.

Relays (3) and delay unit (4) are located at the top of the machine, easily accessible for service.

Electrical connections to the machine are made by quick-disconnect plugs.

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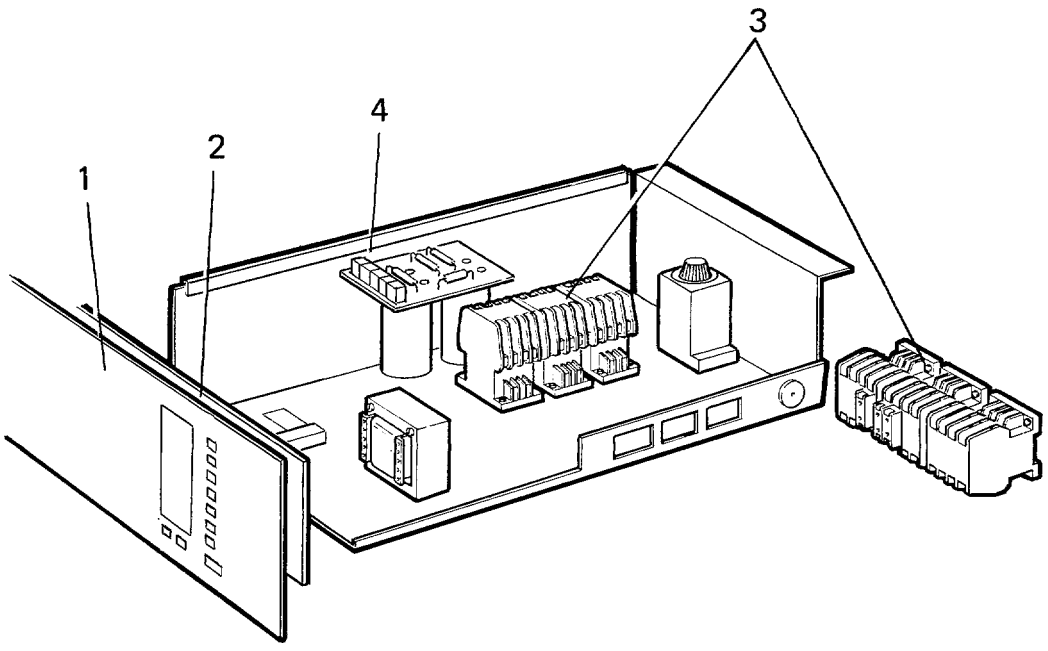


1625

Relays

The Selecta models employ six relays. The relays control:

- the reversing wash action of the wash motor (2 relays)
- the distribution action of the wash motor
- the extraction motor (3 relays)

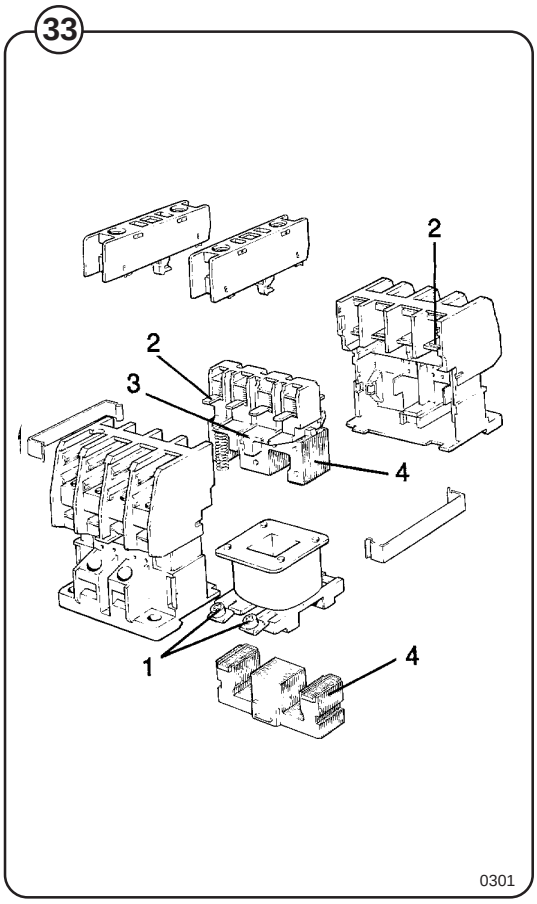
Construction

Fig. 33

The body of the relay holding the stationary contacts is made of current-resistant plastic. A solenoid and a contact bank hold the moving contacts. The contacts are spring-loaded to assure the correct contact pressure.

The relay is constructed for continuous operation, whether mounted horizontally or vertically.

Screw-type terminals provide perfect connections even when one or two wires have different diameters.



Operation

When the solenoid is energized, the two halves of the magnet core are drawn together, pulling down the moving contacts, thus making or breaking the circuit. When the current cuts out, springs force the contact bank into its original position, thus closing or opening the circuits.

Trouble shooting

If the relay fails to operate despite power to the coil, turn off the power and check the solenoid by measuring the resistance across the terminals (1).

If the relay hums when power is applied, this indicates either a break in the insulator holding the moving contacts at the axle where it holds the top half of core (3) or a rusty core (4), which can be cleaned.

Make sure that the moving contact assembly (4) moves freely. Always replace burnt or pitted contacts (2)... do not reuse contacts.

Drive motors

Description

Fig. 34 Both motors, one for wash and distribution and one for extraction, are installed on the same motor bridge. The motors drive the drum and are mechanically connected to each other by V-belts. On the EX 22 there is also an electromechanical clutch. The motors rotate at each others' speed during the wash speed, distribution speed and low extraction speed.

During high extraction speed the speed control on the EX 22 gives a signal to the electromechanical clutch. This disconnects the motors from each other mechanically. The wash motor now rotates at distribution speed and the extract motor at high speed.

On the EX 12 the power supply to the wash motor is disconnected by the speed control.

On the motor bridge there are belt tensioning devices. The extract motor is screwed to a mobile plate which moves via oblong holes in the motor bridge. This is used to tension the belt drive between the motors. It is possible to tilt the entire motor bridge with the use of the oblong holes on the wash motor side. This is used to tension the V-belt up the wash drum.

Fig. 35 The motors are equipped with thermal protectors which are placed in the stator coil. In the case of overheating in the motors, i.e. if the temperature exceeds 130°, the protector contacts cut the power to the motor relays.

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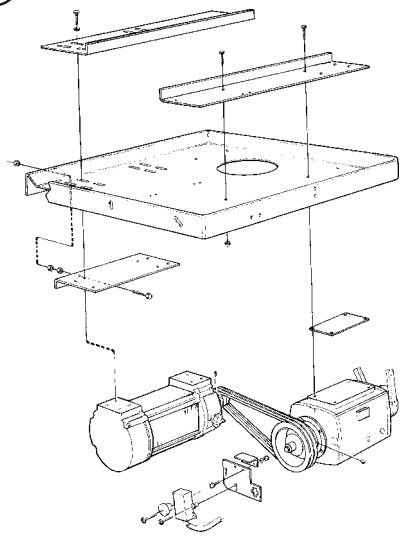

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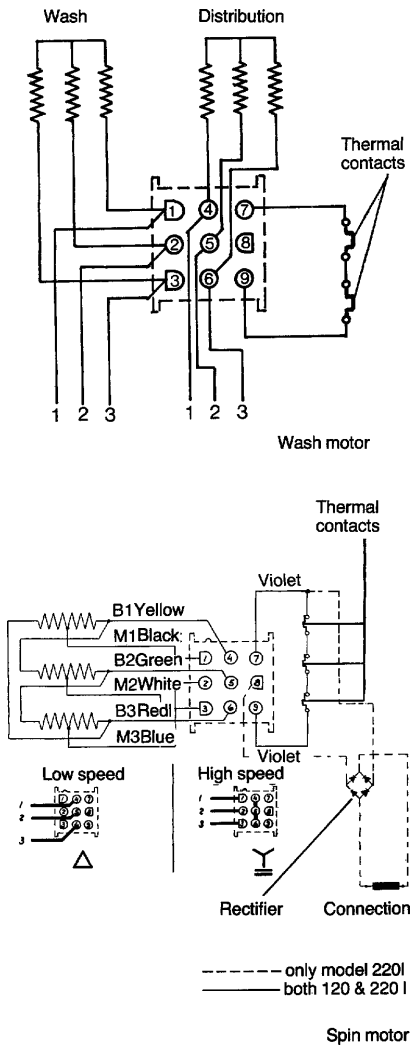

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Repair instructions

Overheated motor, motor not running

- Wait till motor has cooled down. Motor thermal protectors are automatically reset after appr. 30 minutes. Restart.
- Possible cause of motor protector releasing repeatedly. could be oversensitivity of thermal protector.

Very noisy motor

- Breakdown of bearings - replace bearings or motor.

Motor running slowly

- The motor is probably running on two phases - measure coils on terminal.

Wash motor only runs at one of the speeds

- Check that the quick connection is correctly connected.
- Measure coils at connector, as the fault can be caused by interruption in one of the coils.

Motor locks

- Breakdown of bearings - replace bearing or motor.

Motor does not turn

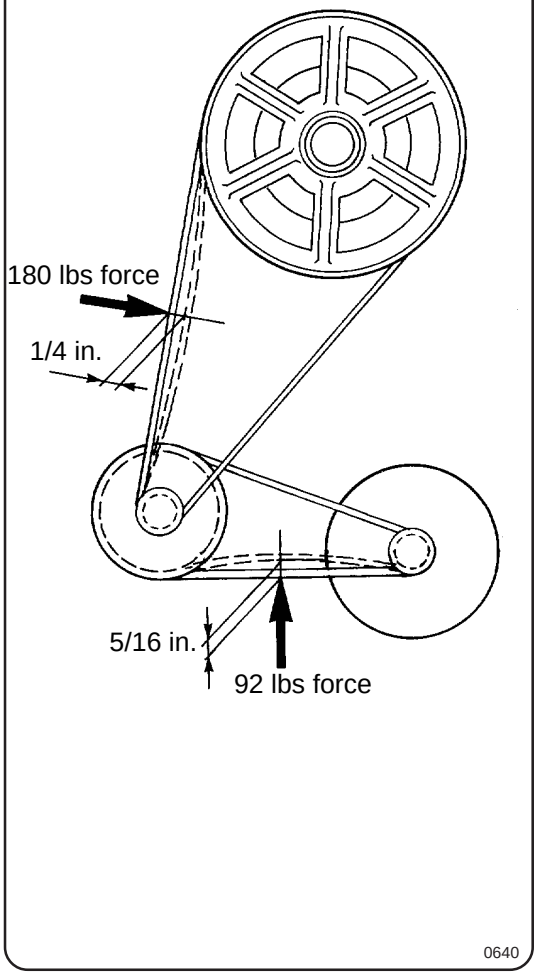
- Check belt tension.

Tensioning of the V-belt

Fig. 36

- Belt between the wash motor and extract motor
  - release and adjust backing plate to correct belt tension according to illustration. Fasten plate.
- Belt between extract motor and drum
  - remove screws for the attachment of motor bridge at extract motor side, lower motor bridge to correct belt tension according to illustration and fasten bridge.

36



Supply injection valve

Construction

Fig. (37) This valve has a single-inlet and one outlet.

The body is made of heat-resistant polyamid plastic and the solenoids encased in water-tight plastic. The electrical connector terminals are spade lugs.

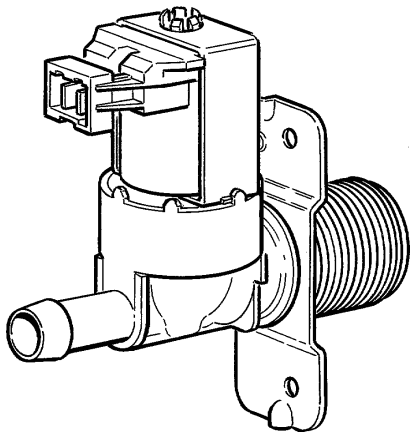
A filter screen on the inlet side prevents dirt from entering the valve. Flow restrictors can be placed at either the inlet or the outlet.

Operation

Fig. (38) When the solenoid is energized, the spring-loaded plunger is drawn up and the pilot valve in the center of the diaphragm open. Because of the difference in diameter between the pilot valve opening and the ventilating hole in the diaphragm, the pressure above the diaphragm drops to a point where the admission pressure below the diaphragm can lift the diaphragm, thus opening the valve.

When the current to the solenoid is cut off, the plunger spring will press the plunger against the pilot opening of the diaphragm. The pressure above the diaphragm then rises to correspond to the water inlet pressure and the pressure of the spring will close the valve.

37



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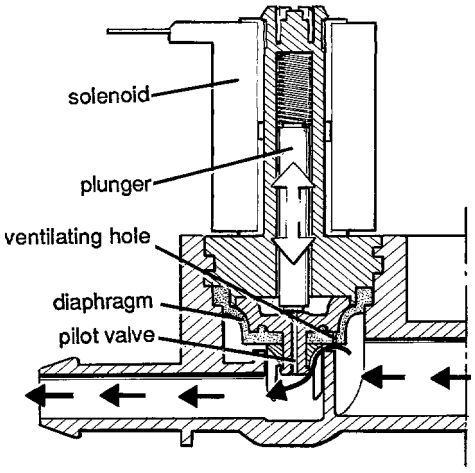

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Repair instructions

Limescale can block the hole in the valve diaphragm and interfere with the function of the valve.

Fig. (39) It is therefore advisable to dismantle and clean the valve at certain regular intervals. The frequency depends on operating conditions and the level of contamination in the water.

If the valve does not open

- Check that power is supplied to the coil.
- Check the coil with an instrument to determine whether there is a break or a short circuit.
- Dismantle the valve (see below) and check the openings in the valve diaphragm.
- Check the inlet strainer and clean as required.
- Undo the coil and clean the surfaces of the magnetic core.

If the valve does not close

- Check that the coil is not live. The valve is normally closed when the magnet is not energised.
- Check the return spring.
- Check the diaphragm (pilot pressure opening).

Dismantling the valve.

Fig. (40)

- Pull the coil stright upwards. Use a screwdriver if necessary to carefully undo the coil.

Fig. (41)

- Use the tool supplied (attached to one of the hoses when the machine is delivered) to open the valve housing. Slide the tool over the protruding plastic sleeve to that the pegs on the tool engage the corresponding sockets in the valve housing.
- Use a spanner or a pair of pliers and unscrew the upper part of the valve housing.

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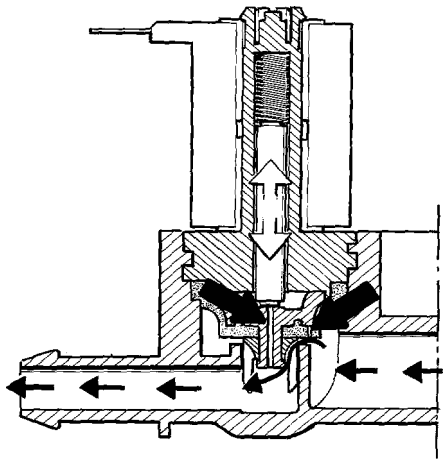

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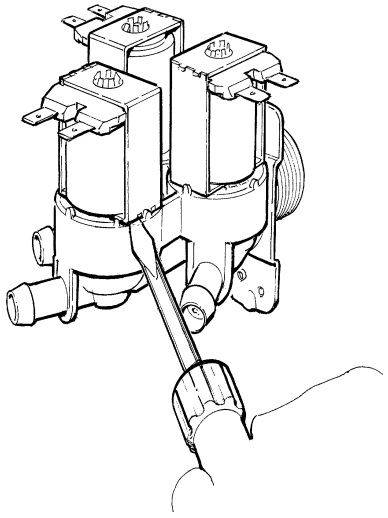

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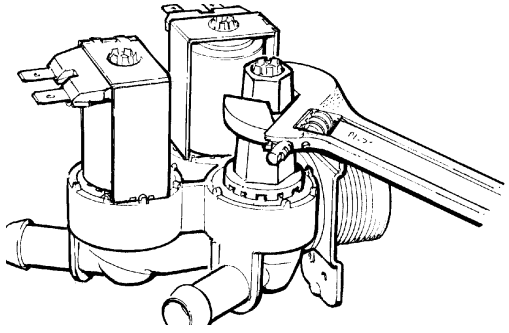

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Inlet valve for S 28/12-S 28/22

Fig. 42 The water inlets have brass bodies with larger cross section of the outlet in order to achieve a shorter filling time for the machine.

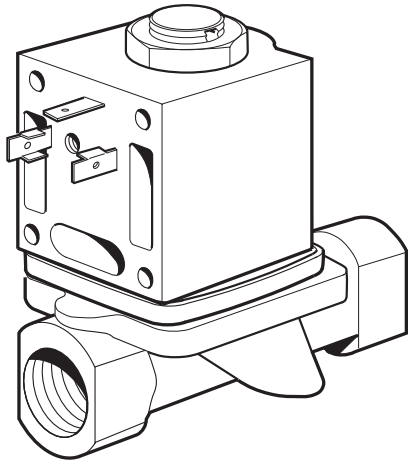
Construction

Fig. 43 The valve housing is made of pressed brass. The spring-loaded plunger is made of stainless steel and located at its lower end.

Operation

The valve is automatically operated by means of a rubber diaphragm and a pilot valve in exactly the same way as the supply injector valve.
NOTE: To strip, clean, re-assemble and troubleshoot the inlet valve, follow the instructions outlined for the supply injector valve.

42



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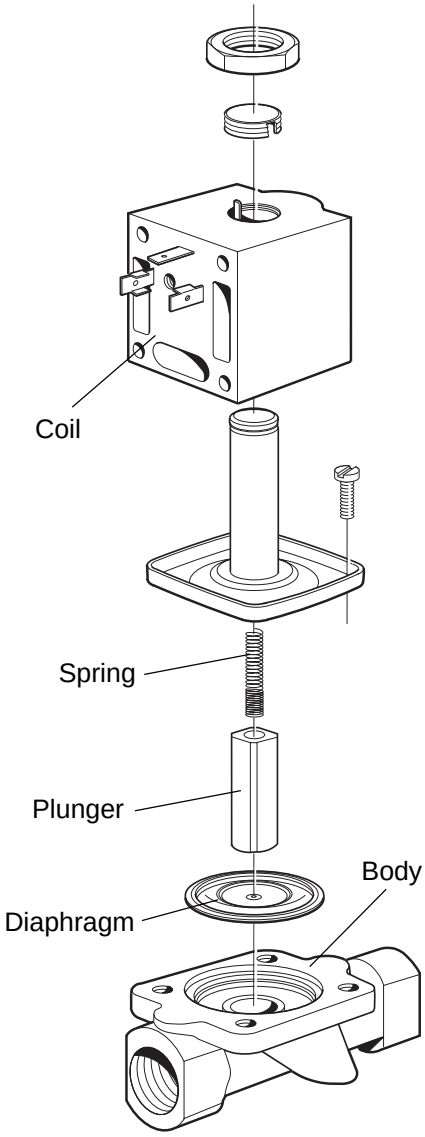


3961

Soap supply box

Fig. 44

The three-compartment soap supply box is located at the top of the machine. Viewed from the front, the compartments are marked with figures 1, 2 and 3.

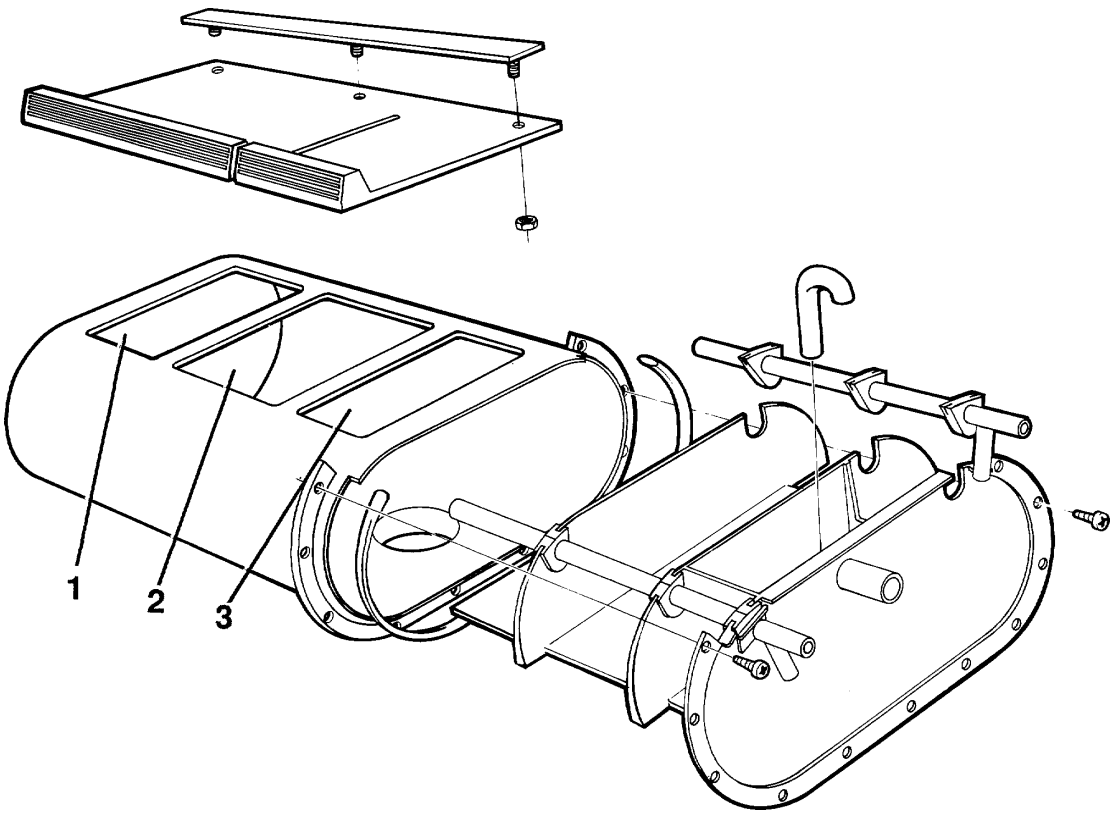
Powder supplies

Compartment 1 and 2 are used for adding detergent directly to the wash. Compartment 3 is used for adding fabric softener. All three compartments can be programmed individually.

Liquid supplies

Use wascomat top mount supply injector connections.
Compartment 2 only is flushed down.

44



Drain valve

Description

Fig. 45 The drain valve consists of a bracket (1), on which are mounted the motor and gear (2) and diaphragm (3). The rubber diaphragm is resistant to a water temperature up to 100°C (212•F). The installation of a lint trap is not necessary. The machine is equipped with an overflow, which bypasses the drain valve. The drain can be cleaned by removing the drain connection (4) outside of the machine or by removing the rubber diaphragm (3). The motor and gear assembly is covered by a plate and provided with quick-disconnect electrical connections. The stator coil is constructed for continuous operation.

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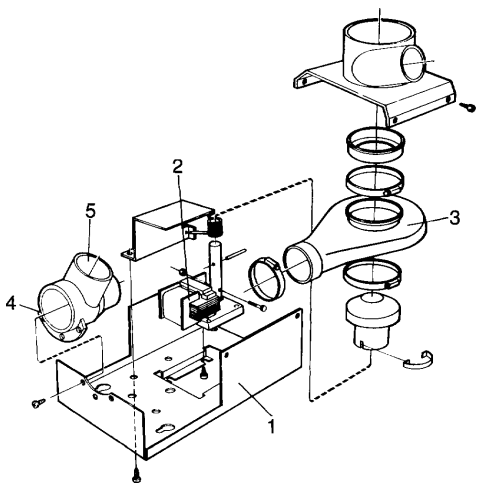

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Operation

The drain valve is normally open, i.e. the motor does not close the valve until it receives current. As soon as the current is cut, the shaft turns and opens the diaphragm of the valve. This also permits the machine to drain, in the event of power failure. The overflow hose (5) leads excess water or suds directly to the waste line, in the event of failure in the inlet valves or level control.

Trouble-shooting

If the valve does not open or close properly:

1. Check that the shaft is moving freely.
2. Check that the diaphragm is not obstructed.
3. Check the coil for continuity.

Clean out

Periodic cleaning of the valve is recommended, depending upon how often the machines are used, as well as the type of wash handled most frequently.

Fig. 46 The control panel consists of seven program buttons, two programs option buttons and a combined start, pause and rapid advance button. A display panel with illuminated symbols shows the chosen program, the functions that have already occured, those still to occur, and the remaining wash time.

If a fault occurs then indicators will refer the user to the fault list found under Service Information in this handbook.

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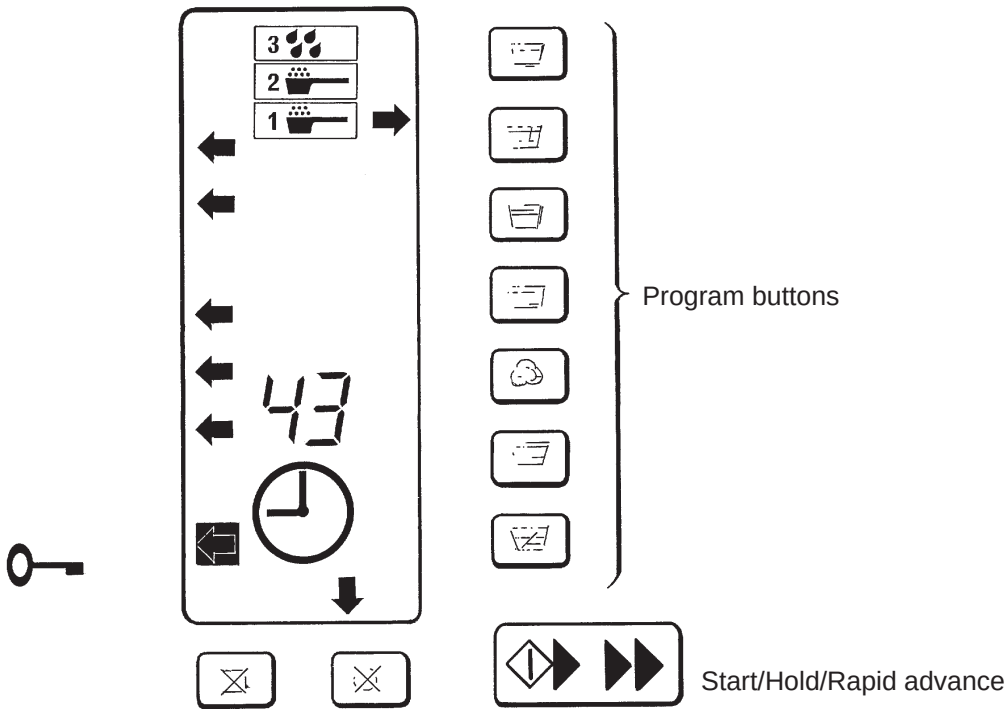


Preparations

Sort the wash according to the choices shown on the control panel. Check washing tips on garment labels.

Make sure all pockets are empty and zippers are closed.

Open drum door, load articels and close door.

Washing

Fig. 47

- Set the program selector to the desired program.

  An arrow to the right will light up to show selection. The five lowest arrows to the left will light to show the stages that will be passed during the program.

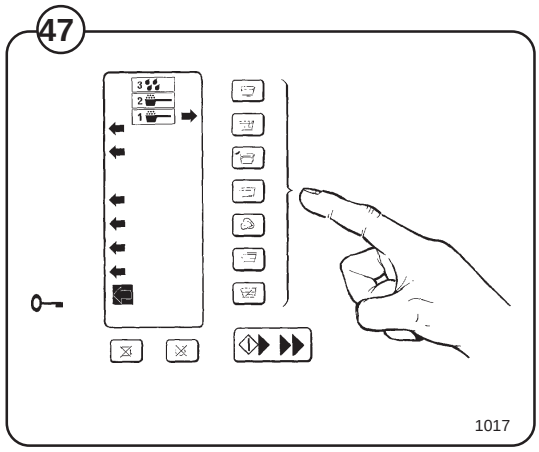
Fig. 48

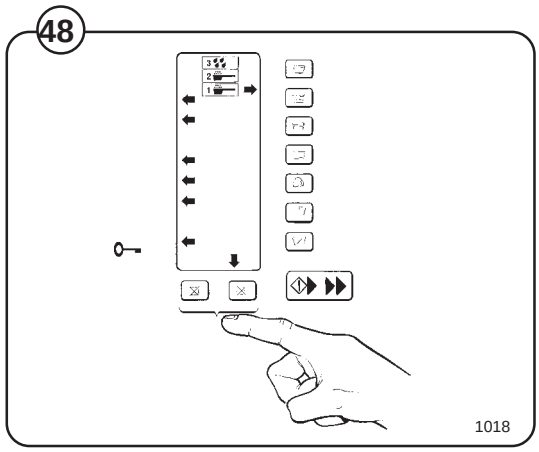
- Select other programs if desired by pushing program option buttons.

  Arrows will show selected programs.

Fig. 49

- The five top arrows to the left will indicate which supply signals will be provided during operation. One window in the display will also indicate which compartment will be flushed down during the wash program.





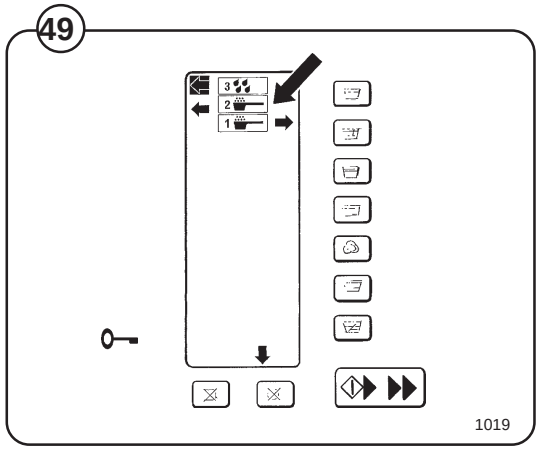


Fig. 50

- Press **START**.

  A clock dial will now appear in the display panel and two figures will show remaining wash time in minutes.

  A colon (two dots) will flash for five minutes. The machine can be restarted during this time with no loss of detergent. This allows you to rectify a possible mistake (eg: wrong program or wrongly sorted wash). (See **RESTARTING**).

  Boxes around arrows will light up as each successive wash stage or supply signal is passed or used.

Fig. 51

After the machine has started you can check the wash temperature by pushing the program button. A thermometer will now light up showing the temperature in ˚C, both in a scale and as two numbers.

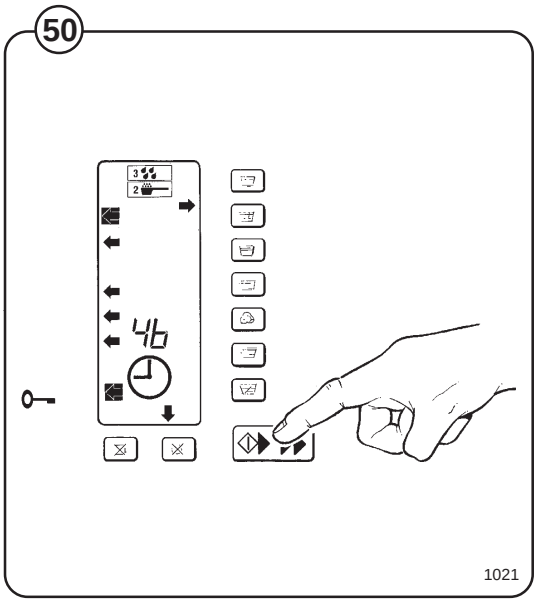
If the machine is not started and no buttons are pushed the program choice will disappear after five minutes and only the arrow next to the key symbol will remain lit (resting position).

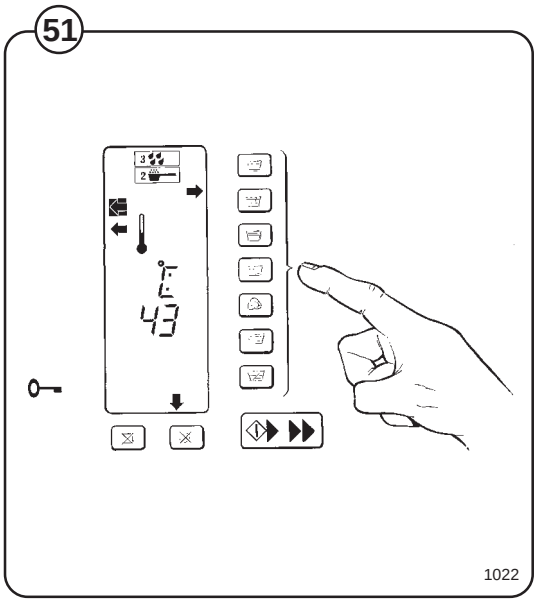
Pause

Fig. 50

If for any reason a pause is desired during the wash then the **START** button should be briefly pressed. The machine will now stop, the arrow showing the current programstep will start to flash and the water outlet will remain closed.

The program may be restarted by a brief push on the **START** button.





Rapid advance

Phases of the program can be bypassed by using Rapid advance.

Fig. 52

- Hold the **START** button depressed until the indicators have gone past the unwanted stages.

Restarting

If you discover, within five minutes of starting, that a wrong program has been selected, or that, for example a wrong garment has been put in with the wash, then the machine can be restarted wihtout the wash water emptying out.

A flashing colon (two dots) in the display panel will indicate that restarting may proceed.

Change of program

- Push **PAUSE**.
- Choose a new program.
- Push **START**.

Restarting of same program

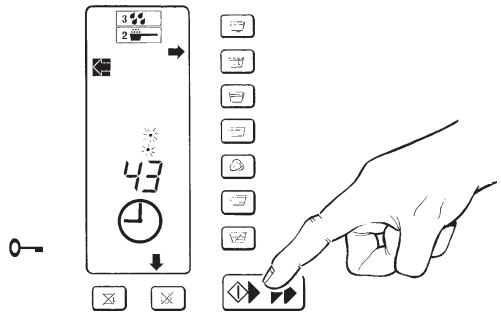
Fig. 53

- Push **RAPID ADVANCE** through the whole program until the key symbol is reached. Wait until the box around the arrow lights up (about 30 secs.)
- Open the door and remove the offending garment. Shut the door once more.
- Push **START**.

WARNING

Remaining wash time will not be shown after Rapid Advance has been used.

52



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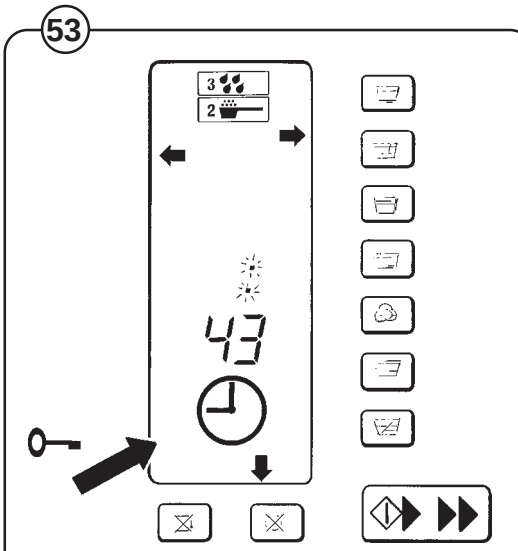

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Maintenance

Preventive maintenance has been reduced to a minimum by the careful design of reliable components and material.

However, the following, measures should be taken at regular intervals and in proportion to the hours of service.

IMPORTANT!
Make certain that all electrical power to the machine is shut off before removing top or rear panels.

Daily

- Check the door lock and interlock before starting operations.
- The soap supply box should be cleaned at the end of each working day as follows:
  - Use a spatula to scrape loose any detergent which may have stuck on the inside of the dispenser.
  - Flush the loosened detergent with warm water.
  - Wipe dry and leave lid open.

Fig. 54

- Check that the drain valve does not leak and that it opens properly.
- Check that the door does not leak. Clean residual detergent and foreign matter from the door gasket.
- Wipe the outside of the machine.
- When the machine is not in use, leave door slightly open to allow moisture to evaporate.

Weekly

- Remove hose from drain connection and clean inside drain valve.

Every three months

Fig. 55

- Remove the cover plates of the machine and check that the V-belt of the wash motor is undamaged and correctly tensioned.
- Check that all tubing, piping and connections are free from leaks.
- Wipe and clean the inside of the machine, making sure that the control components are protected from moisture and dirt during the cleaning operation.
- Check level of oil electro-lube oil dispenser.

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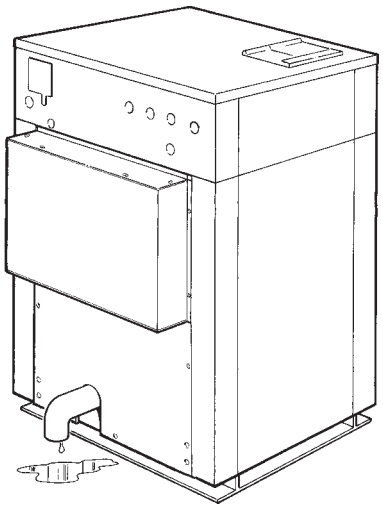

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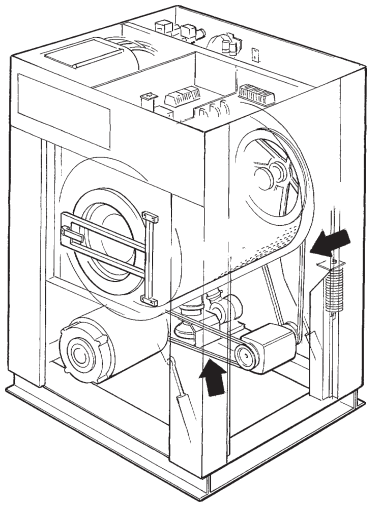

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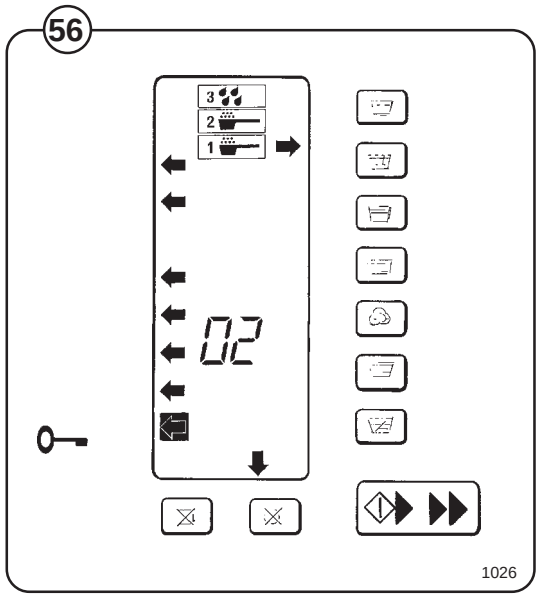
Conclusion

Service Information

Fig. 56



If there is an electric power failure the machines' memory will remember the selected program for about 8-10 minutes. The machines will restart automatically when power is restored.

Program error is indicated by a number code in the display panel.

For codes 01 and 02 a new start may be attempted directly after the fault has been rectified. In the case of other codes the mains switch must be turned off and on again before the machines can be started.

If codes 03-09 appear, contact authorised personnel.

Fault Code	Cause of fault
01	Water level low.
	Open shut off valve. Try again.
02	Door lock defective.
	Open and shut. Try again.
03	Short circuit in or to the temperature sensor.
04	Too high temperature, check temperature sensor and cable.
05	Drainage defective.
06	Program defect.
07	Heating defective.
08	Drainage defective.
09	Out of balance switch defective.

Built in service program

In order to facilitate function checks or possible fault finding, a service program has been built into the machine. This program should only be used by qualified service personnel.

Setting of service position

- Remove the machine's top cover.

> **Warning**
>
> **Remember that the machine is under power when price programming is made.**

Fig. 57

- Set the service switch to service mode. (The switch located on the circuit board behind the control panel display window).

Fig. 58

This transforms the various program selection buttons into a numerical pad. Numbers 1 7 are on the program choice buttons, 8 9 on the supplementary program buttons and the START button serves as an ON/OFF switch.

> **CAUTION**
>
> **When in service mode the number 0 does not exist. That's why only figures 11-19, 21-29 etc are used.**

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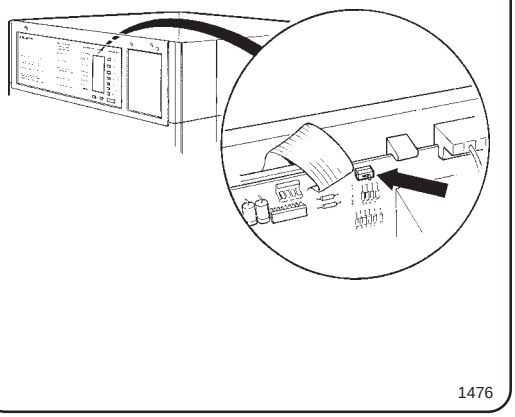

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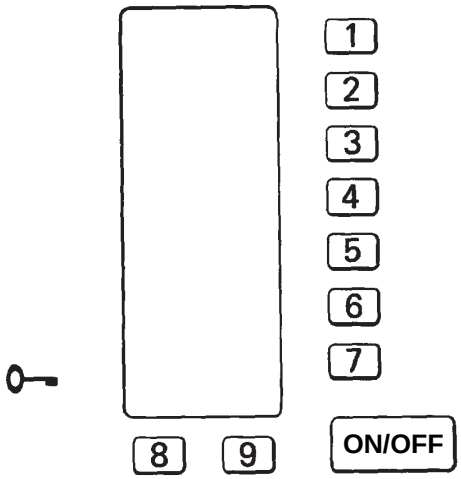

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Function checks

Fig. 59

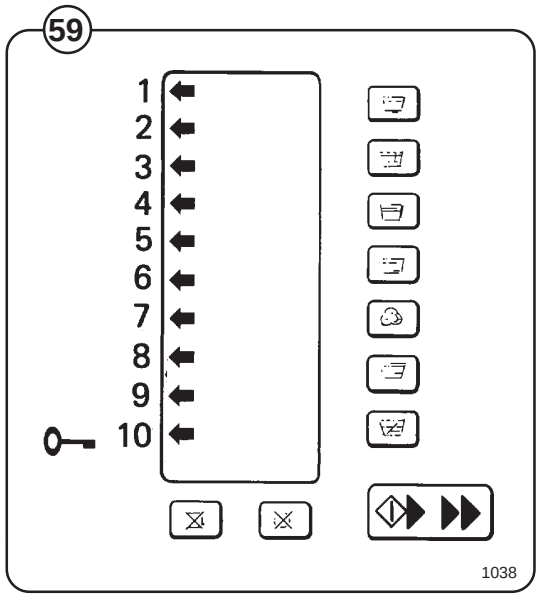
The program indicator on the display window indicates certain 31 inputs by lighting arrows. For example, arrow number 5 is lit when the door closes. This shows that the door's micro switch is operating correctly.

The table below shows the inputs displayed by the program indicator.

Indicator	Function
1	-
2	-
3	-
4	Balance sensor switch
5	Door lock
6	-
7	-
8	-
9	-
10	ON/OFF (function entered using the various buttons – see below).

It is also possible to simulate certain functions by using the various program selection buttons on the control panel. The chosen function can then be turned on and off using the START button. Number 10 on the program indicator shows if the function is on or off.

The table on the next page shows which functions can be simulated, along with the number for each.



Code	Function
11	Detergent supply signal 1
12	Detergent supply signal 2
13	Detergent supply signal 3
14	Detergent supply signal 4
15	Detergent supply signal 5
16	Inlet valve, hot water
17	Inlet valve, cold water
18	Inlet valve, hard water
19	Heating (The temperature itself is shown in the display window, not the 19 code).
21	Motor, wash (clock-wise)
22	Motor, wash (counterclock-wise)
23	Distribution (counterclock-wise)
24	Extraction (counterclock-wise)
25	Clutch
26	Drain valve
27	Door lock.
28	Not used

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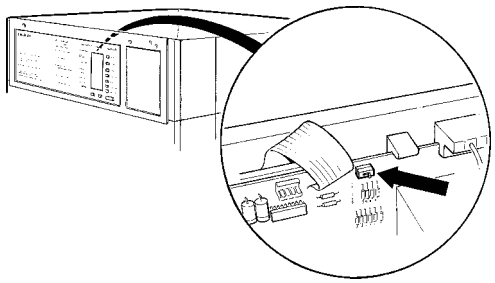

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CAUTION

The actual temperature reading is shown in the display window - NOT CODE 19.

Leaving service mode

Fig. 60

- Flip the service switch on the circuit board back to OFF.
- Replace the machine’s top cover.
- Select desired washing program.

Trouble-shooting

If machine does not start

Fig. 61

A Check circuit breaker in the power feed line to the machine.

B Check door safety switches.

C Check glass cartridge fuses.

D Check for fault indication on display (see under the heading "Service information").

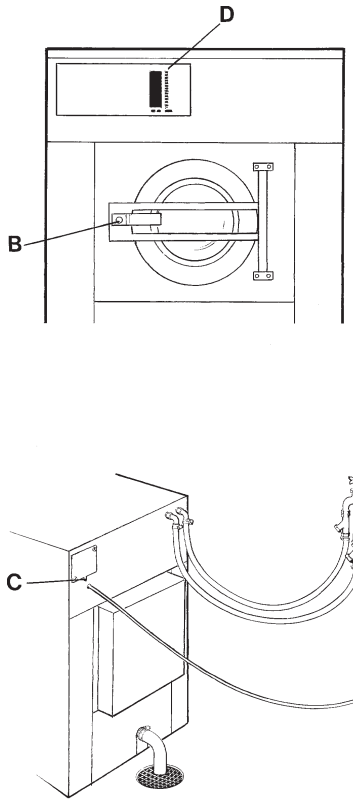
If water does not drain

Fig. 62

A Check for fault indication on display (see under the heading "Service information").

B Disconnect drain hose connected to drain line. If full flow of water comes out, the problem is in the main waste line. If water flow is slow, the problem is accumulation of foreign materials between drain valve and shell outlet of machine. Clean valve body of any foreign objects found.

61



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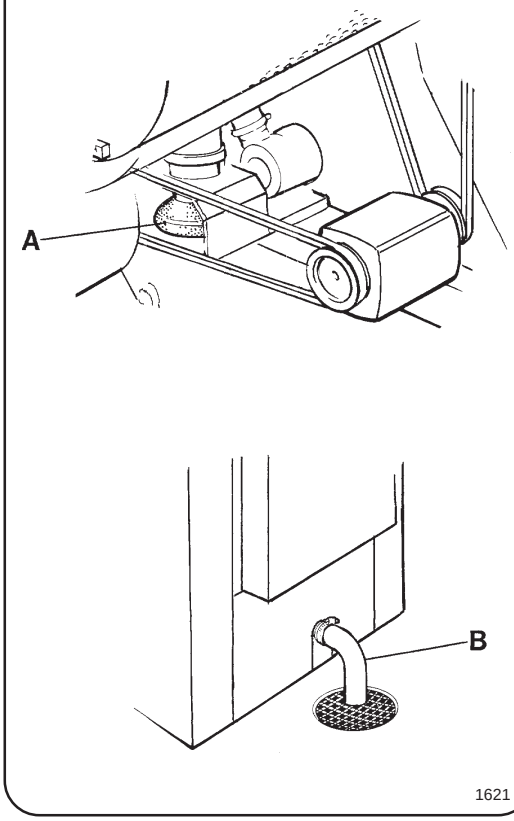


If machine does not extract

Fig. 63

A Check extract relays and relay coils for proper operation.

If motor does not operate at wash speed

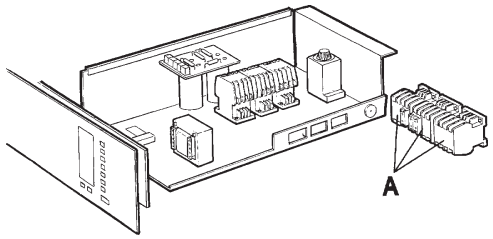
A Check wash relays.

B Check motors and V-belts.

Fig. 64

C Review procedures outlined under section "If machine does not start" above.

63



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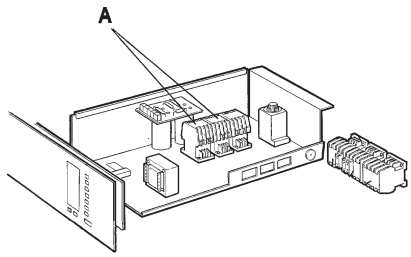

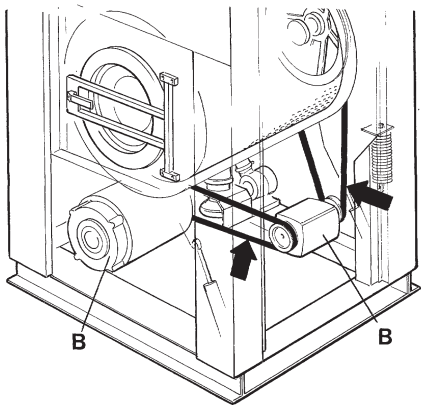

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If machine runs slowly on wash speed or there is a slapping or thumping noise

Fig. 65 A Replace V-belts

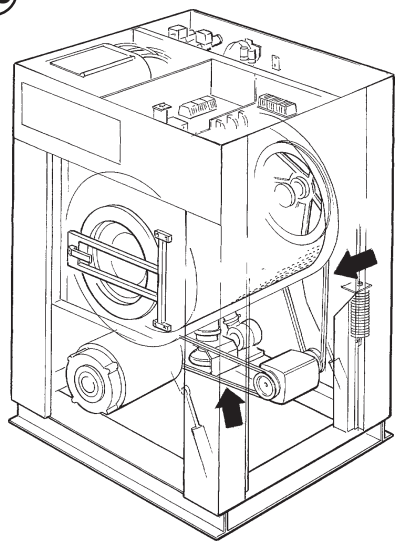
If a metallic noise can be heard at rear of machine

Fig. 66 A Tighten lock screw on pulley on motor shaft.

If the door is leaking

Fig. 67 A Check door gasket. If gasket is in good condition, check the tension between door gasket and door frame and adjust.

65



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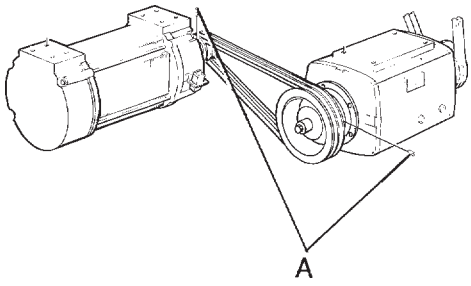

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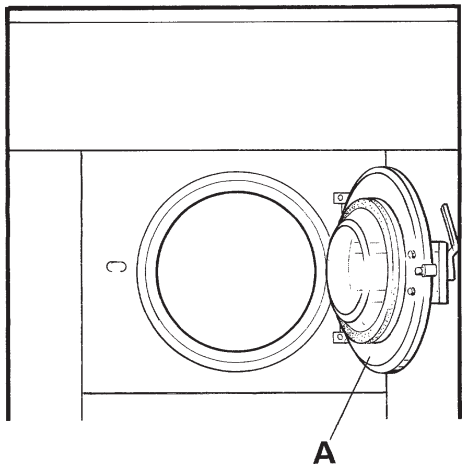

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If there is leaking around the glass

Fig. 68

A Re-cement glass in door gasket, if worn.
Replace door gasket if worn.

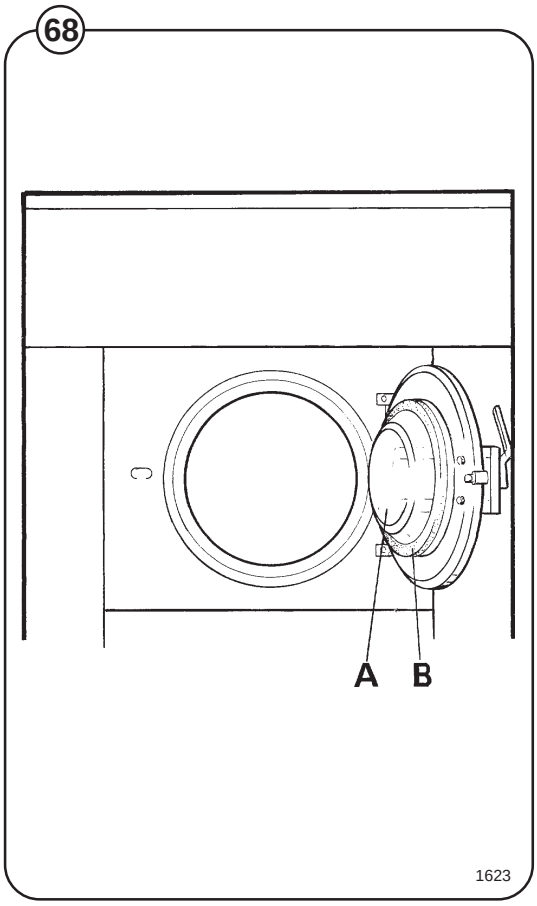
If water does not enter the machine

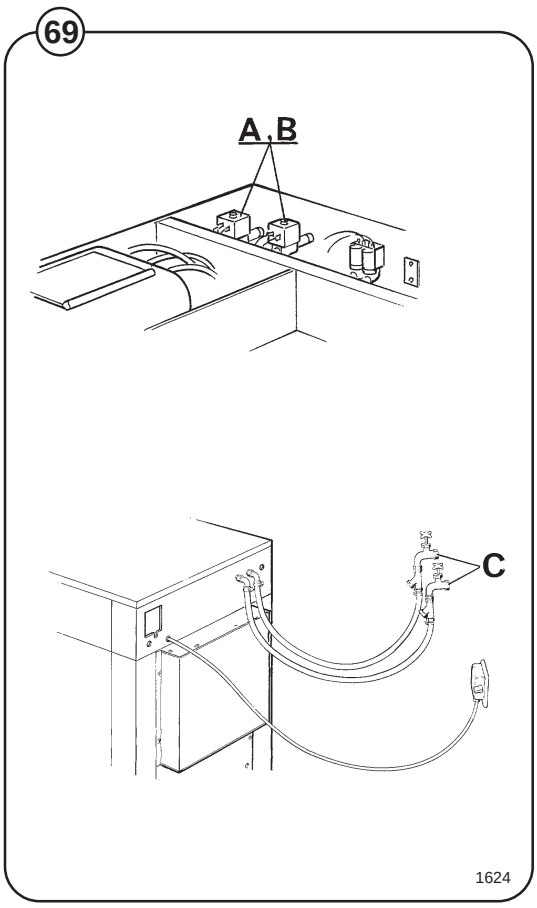
Fig. 69

A Check the coils on inlet valves.

B Check wires leading to electric coils.

C Be sure manual shut-off valves are in open position.





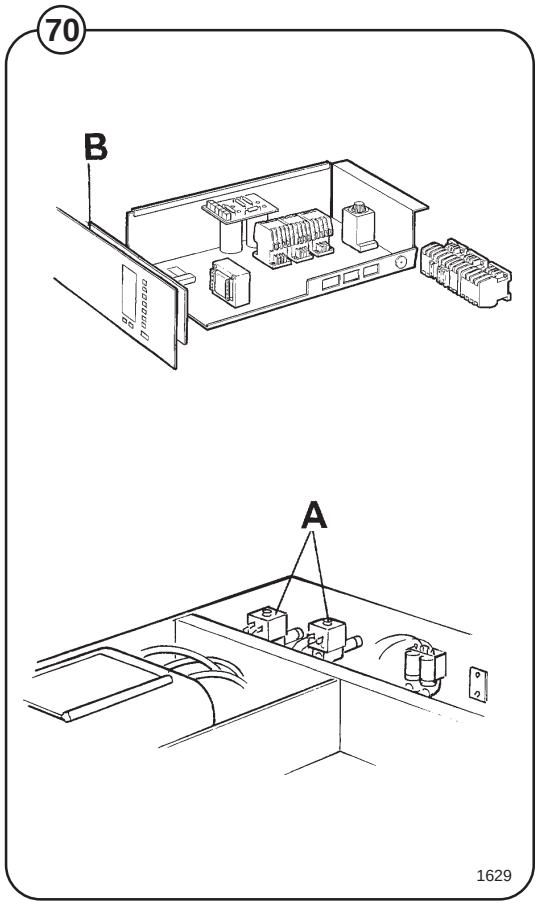
Trouble-shooting

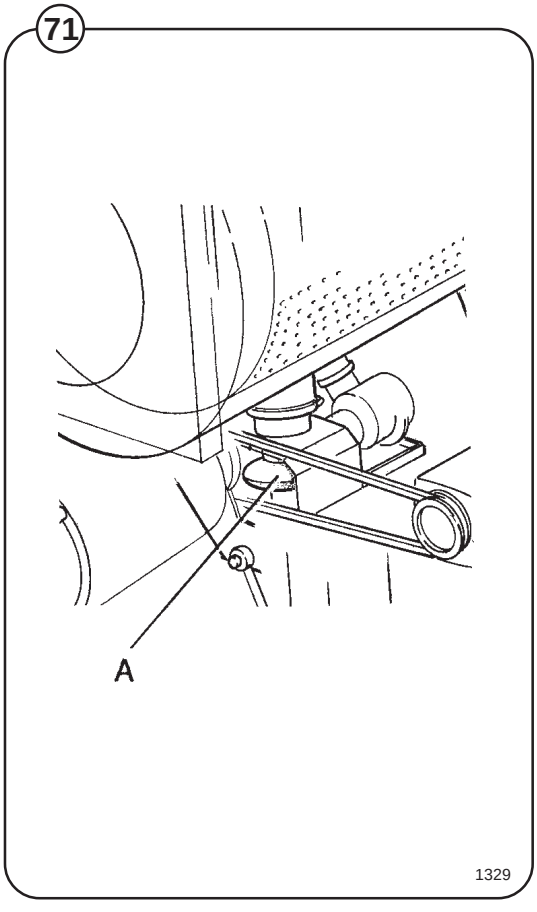
If water continues to fill without stopping

Fig. 70 A Check inlet valves for dirt underneath the valve diaphragm. To localize, shut off power. If water continues to flow, inlet valves have foreign material in them and should be thoroughly cleaned.

If water continues to flow without filling machine

Fig. 71 A Check seating of drain valve.





If machine vibrates excessively

Fig. 72

A Check the unbalance detector switch.

B Check the shock absorbers and the springs of the drum suspension.

If safety fuse blows at the beginning of the cycle

Fig. 73

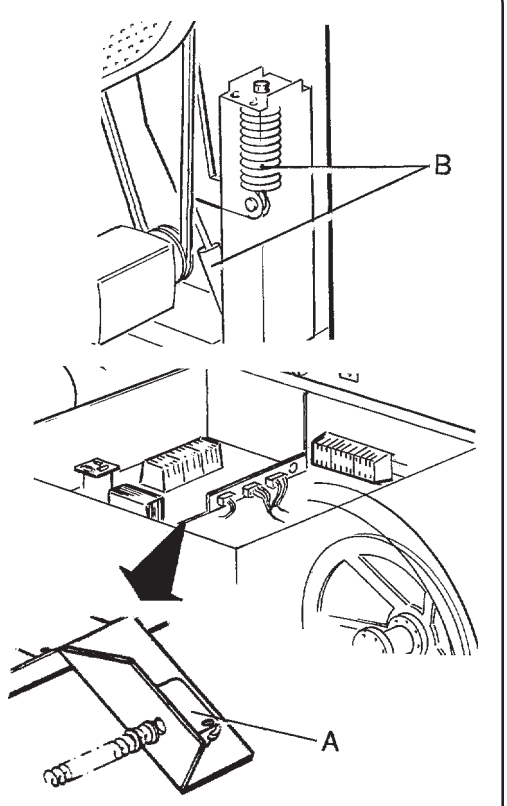
A Replace fuse.

B Disconnect wires leading to the delay circuit of the door lock. Replace fuse and start. If the machine now works, replace delay circuit.

NOTE

The electronic timer has a built in service program that can be useful when troubelshooting. Contact service personnel for further information.

72



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