OPERATING & MAINTENANCE MANUAL
WASCOMAT W 245 a

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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.

NOTICE À L'ATTENTION DES PROPRIÉTAIRES, UTILISATEURS ET REVENDEURS DE MACHINES WASCOMAT

UNE INSTALLATION INCORRECTE ET UN ENTRETIEN INADÉQUAT, DE MÊME QUE LA NÉGLIGENCE OU LA NEUTRALISATION DÉLIBÉRÉES DES DISPOSITIFS DE SÉCURITÉ, PEUVENT ÊTRE CAUSES DE BLESSURES OU D'ACCIDENTS SÉRIEUX. POUR ASSURER LA SÉCURITÉ DES CLIENTS ET/OU DES UTILISATEURS DE VOTRE MACHINE, IL EST INDISPENSABLE DE PROCÉDER CHAQUE JOUR AUX CONTRÔLES DE ROUTINE CI-APRÈS.

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.

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 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!

   AVERTISSEMENT: NE PAS FAIRE FONCTIONNER LA (LES) MACHINE(S) AVEC UN DISPOSITIF DE SÉCURITÉ NEUTRALISÉ, RECÂBLÉ OU NON OPÉRATIONNEL! NE PAS OUVRIR LA MACHINE TANT QUE LE TAMBOUR NE S'EST PAS IMMOBILISÉ!

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.

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.

MACHINE SHOULD NOT BE USED BY CHILDREN

LAS MÁQUINAS NO DEBEN SER USADAS POR NIÑOS

LOCATED AT THE REAR OF THE MACHINE:

INSTALLATION AND MAINTENANCE WARNINGS

1. **This machine MUST be securely bolted according to the installation instruction 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 LOCKS 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 originally shipped in the drum package. Be certain to relock after remounting the top panel.**

MANUFACTURED BY WASCATOR
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.

WARNING !

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

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Contents

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

Safetyinstructions

- **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 bypased.**
- **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.**
- **Fabrics softener with volatile or inflammable fluids are not to be used in the machine.**

Consignes de sécurité

- **La machine est conçue pour le lavage à l'eau exclusivement.**
- **La machine ne peut être utilisée par des enfants.**
- **Tous les travaux d'installation doivent être effectués par une personne qualifiée. Tous les câblages électriques doivent être réalisés par un électricien diplômé.**
- **Le verrouillage du hublot doit être vérifié chaque jour et ne peut être neutralisé.**
- **Toute fuite du système, due à des joints défectueux etc., doit être réparée sans délai.**
- **Tous les membres du personnel d'entretien doivent être parfaitement familiarisés avec le manuel d'entretien avant d'entreprendre une réparation ou un entretien de la machine.**
- **Ne jamais asperger d'eau la machine sous peine de risquer un court-circuit.**
- **Ne pas utiliser dans la machine des adoucissants textiles contenant des liquides volatils ou inflammables.**

Introduction

Fig. 1 The Wascomat Super Giant washer extractor has been developed to cover the heavy duty and various size requirements of coin laundries, apartment houses, hotels, motels, nursing homes, hospitals, professional laundries, restaurants, schools, colleges and all on-premises laundries where high quality automatic washing and quick formula variation are required.

The W model offer four pre-set wash programs Hot, Warm, Cold and Permanent Press which can be selected by turning the rotary program selector on the front panel. These programs are designed to suit a variety of fabrics and offer different water temperature programs. The machine is designed for connection to hot and cold water supplies.

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 Wascomat W 245 model machine and instruction 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 always give the machine serial number, model, voltage and other electrical characteristics appearing on the nameplate at the rear of the machine.

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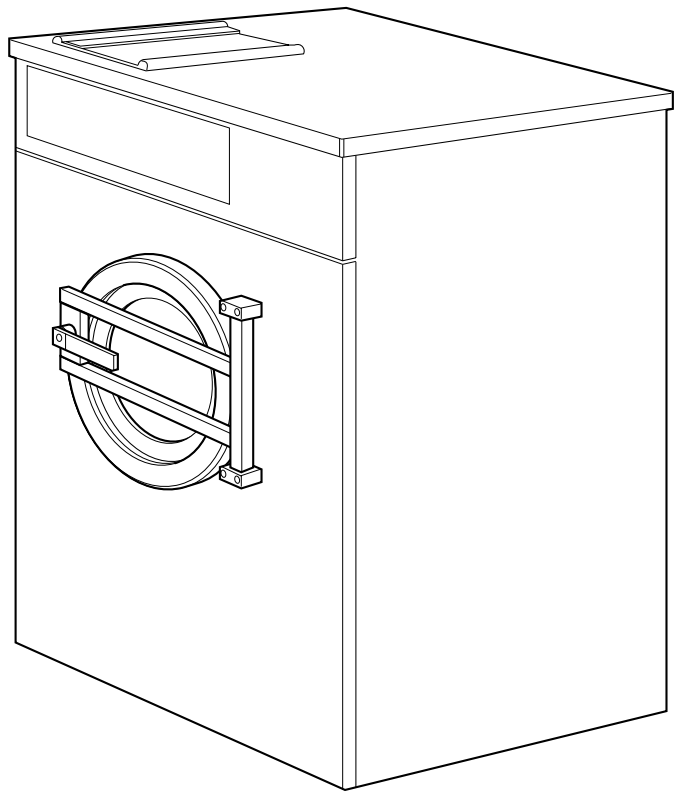

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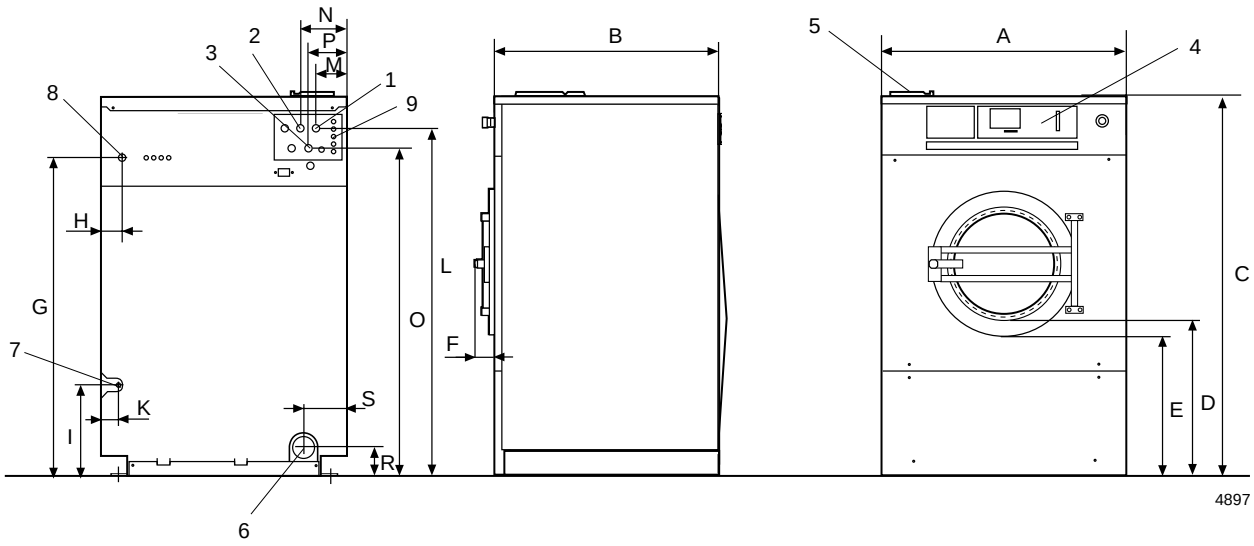
Technical data Wascomat W 245 a

Dry load capacity	up to		75 lbs
Dimensions	Width	933 mm	36 7/8 in
	Depth (at the base)	985 mm	38 9/16 in
	Height	1430 mm	55 in
	Net weight	380 kg	837 lbs
Crated dimensions	Volume	1.74 m^3	61.5 cu.ft
	Weight	395 kg	870 lbs
Inner drum dimensions	Diameter	830 mm	32 11/16 in
	Depth	590 mm	23 1/4 in
	Volume	325 litre	11.3 cu.ft
Speed of rotation	Wash	41 r.p.m.	
	Distribution	60 r.p.m.	
	Extraction	410 r.p.m.	
G-factor	During wash	0.8	
	During extraction	79	
Floor loading	Dyn force	4.25 ± 5.5 kN	1020 ± 1320 lbs
Motor speed	During wash	540 r.p.m.	
	During extraction	860 r.p.m.	
	During extraction	1740 r.p.m.	
Voltage requirements		208-240 V 3-Phase 60 Hz	
Rated output power	Motor, wash,	650 W 0.9 HP	
	Motor, extract.	1100 W 1.5 HP	
Overcurrent protection	Three-phase	15 A	

Water connections

Recommended water pressure	2 - 6 kp/cm^2	25 - 85 psi
Hose connection, water	DN 20	3/4"
Hose connection, drain	75 mm	3"

Outline and dimensions



	mm
A	935
B	985
C	1430
D	595
E	525
F	110
G	1210
H	75
I	335
K	55
L	1315
M	115
N	175
O	1240
P	175
R	105
S	135

W 245 a

1. Cold water inlet
2. Hot water inlet
3. Hot water inlet
4. Control panel
5. Soap box
6. Drain outlet
7. Steam connection (optical)
8. Electrical connection
9. Liquid supply connection

Installation

Machine foundation

The machines are designed to be bolted in position to a concrete floor or specially prepared concrete foundation. A template showing the size of the foundation and positioning of the foundation bolts is delivered with each machine.

For installation on an existing concrete floor, the floor must be at least 8" thick and of good quality. If the floor does not meet these requirements, then a 6-8" high concrete foundation should be made. A prefabricated steel base is available for mounting of machines without an additional foundation.

Follow the instructions below when making a concrete foundation:

Fig. 2

1. Decide where to place the machine and consider maintenance requirements, i.e. determine a suitable distance from the rear of the foundation to the wall, and the distance from the foundation to the nearest side wall. The distance should be at least 16 and 12 inches, respectively.

Fig. 3

2. Break up the floor to a depth of 3 inches, making sure that the sides of the hole slope inwards - the bottom of the hole should be 5 inches longer than the upper length.
3. Wet the hole well. Brush the bottom and sides with cement grout.
4. Prepare a casing and fill with concrete to form foundation. Make sure the foundation is level.

Fig. 4

5. Use the template to position the foundation bolts correctly - bolts are to extend 1 1/2" above concrete.

   NOTE: A prefabricated steel frame, designed to be placed in the concrete instead of the individual mounting bolts, is available.

	W 245 a	
	mm	inches
A	575	22 5/8
B	975	38 3/8
C	1040	40 15/16
D	135	5 5/16
E	800	31 1/2
G	985	38 25/32
H	985	38 25/32
I	1180	46 15/32
K	293	11 17/32

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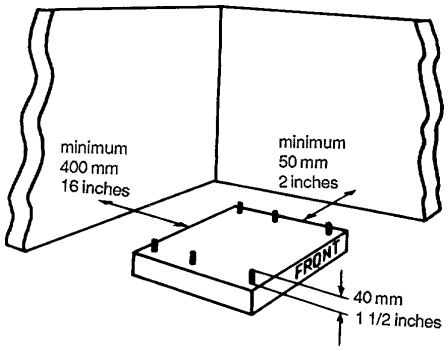

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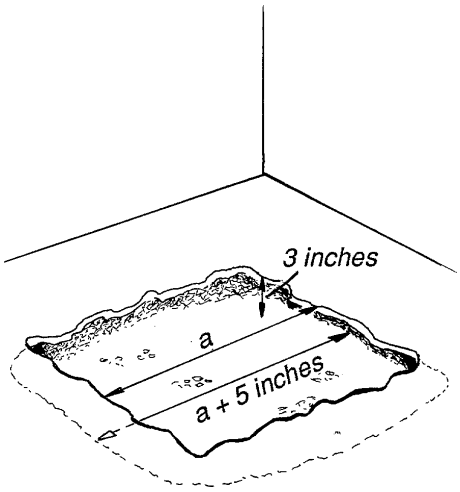

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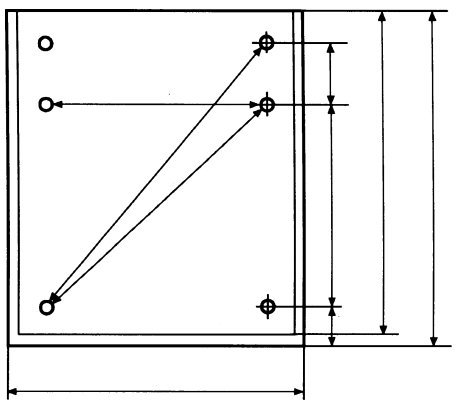

B = machine outline to edge of front panel
C, G = minimum foundation for one machine

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Mechanical installation

Fig. 5

- Place wide steel shims on the concrete foundation over the bolts.
- Lift the machine and lower it in position. Never use the door or the door handle to lift or lower the machine.

Fig. 6

- Check that the machine is level front-to-rear and side-to-side and standing firmly on the supporting points. Spacing washers must be mounted if one or more of these points is not resting against the floor/foundation.

Fig. 7

- Place flat washers over the foundation bolts and secure the machine in position by tightening the self-locking nuts. See illustration below.
- Check and tighten the nuts every week for the first month.

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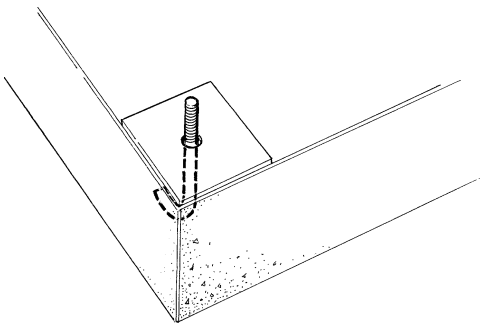

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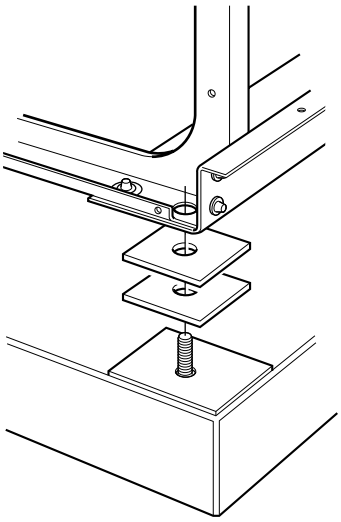

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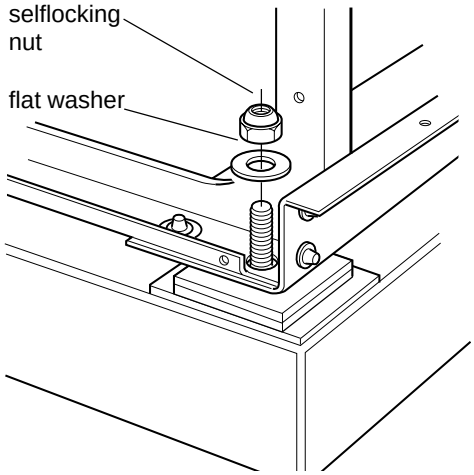

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Electrical Installation

All electrical installations are to be carried out by licensed personal.

Fig. 8 Although the machines are fitted with a thermal overload in the motor windings, a separate three-phase common-trip circuit breaker must be installed for all three-phase machines.

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

Fig. 9 Connect L1, L2, L3 and ground wires according to the markings of the terminal block. The cable is to hang in a loose loop, supported by the clip of the terminal block.

Make sure the machine is properly grounded electrically.

After installation do the following for 3-phase machines.

Check the incoming power for a high voltage leg. If present, connect that line to L2 on the terminal block.

Fig. 10 Start the machine and check that the drum rotates in the proper direction during extraction, i.e. counter-clockwise when seen from the front. If the drum rotates in the wrong direction intercharge line L1 and L3 at the power connection terminal.

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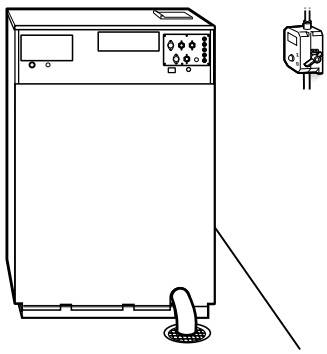

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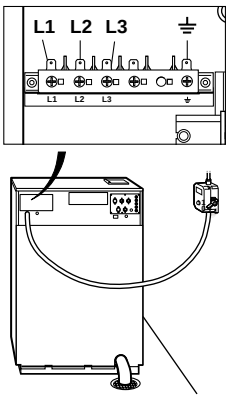

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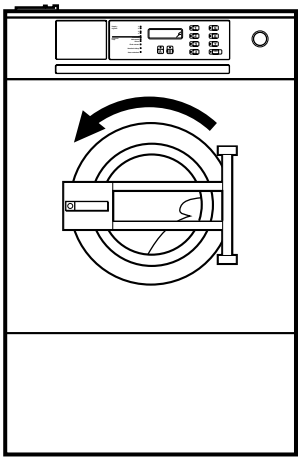

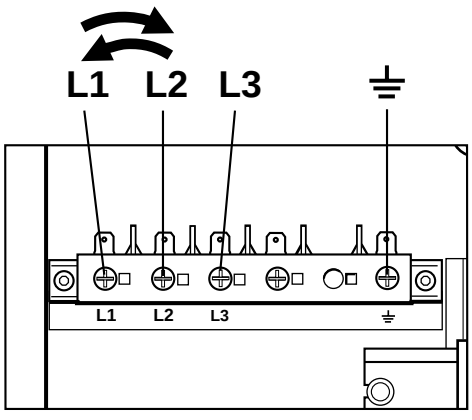

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The machine is equipped with a control circuit transformer, mounted on the control unit and connected for 220 volt operation. If your incoming voltage is below 210 volts move the wire connection to the 208 volt tab on the transformer. If it is above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

Water Connections

All plumbing must conform to national and local plumbing codes.

Fig. 11

Incoming water lines do not require non-return or back flow prevention valves, as the machine is already fitted with an approved siphon breaker. However, all incoming lines must be fitted with shut-off valves.

Fig. 12

- Water inlets are labelled for hot and cold water connection. The W245ES has two hot water and one cold water connections.
- Flush the water lines thoroughly before connecting hoses to the washers. Then check that all water valves are attached tightly and inlet screens not clogged. Use teflon pipe tape if necessary to ensure watertightness.
- Use 1/2" or 3/4" diameter reinforced rubber hosing not to exceed 6 feet in length. Let the hoses hang in a loop. Do not use rigid piping.

  Never force a hose onto the threads or you may cause cross-threading and leaks. If this occurs, place the threaded portion of the hose over the valve threads and push forward firmly, to catch the next thread. Then tighten.

  Depending how large your laundry is, your main incoming water line will generally be between 1-1/2" to 3" diameter to assure adequate water supply.

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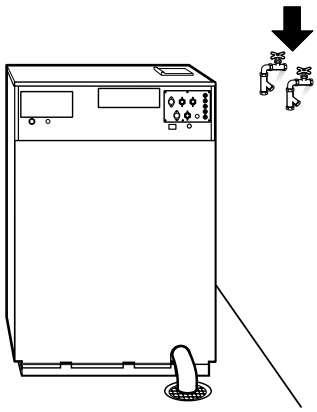

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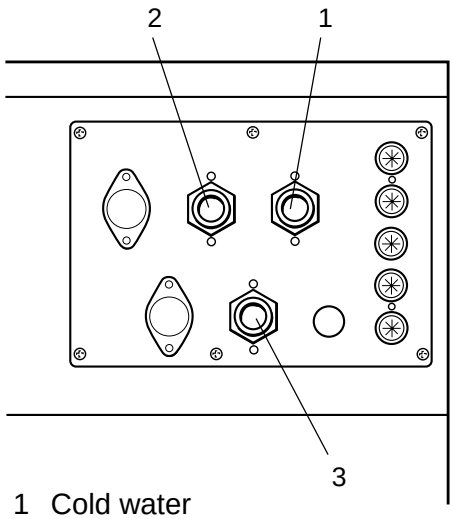

1 Cold water
2 Hot water
3 Hot or cold water

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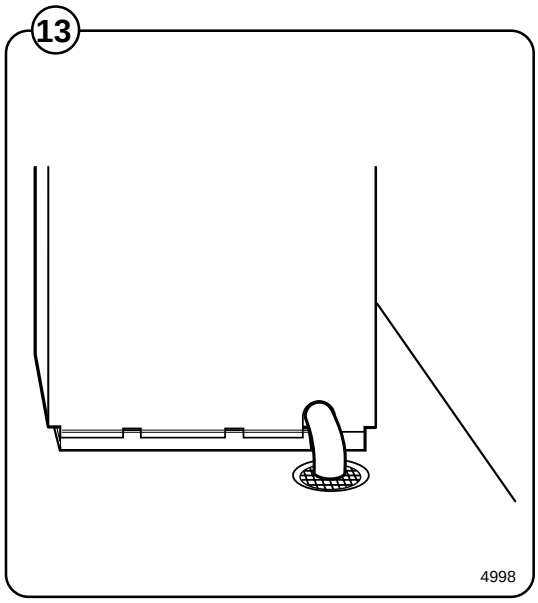
Drain connection

Fig. 13 Connect a 3" (75 mm) flexible hose to the drain outlet of the machine.

The drain hose 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.



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

Fig. 14

- When washer loading door is open, the machine must not start. Verify this by attempting to start washer with door open (see section ”Procedure”).

Fig. 15

- 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 <u>daily</u> in accordance with above procedure.

WARNING:

Before servicing Wascomat equipment, disconnect electrical power.

IMPORTANT:

Le verrouillage de sûreté de la porte doit être vérifié <u>tous les jours</u> selon la procédure ci-dessus.

AVERTISSEMENT:

Couper l’alimentation électrique avant tous travaux d’entretien sur un appareil Wascomat.

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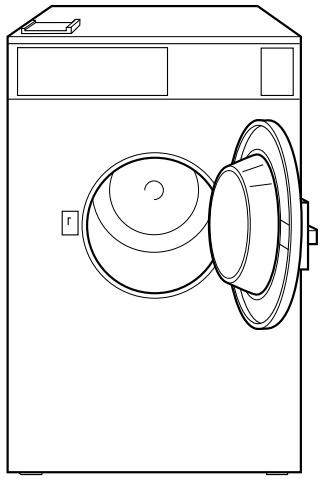

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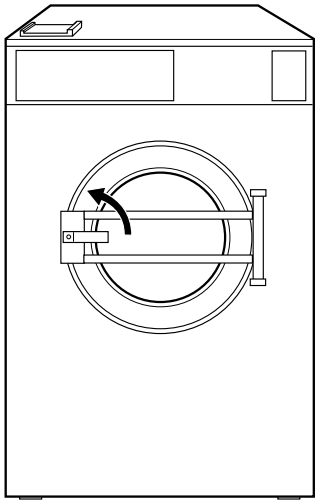

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Function control check-out list

In the machine cylinder, you will find the warranty registration card, a copy of the warranty policy, the bolt hole template and other pertinent materia. 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 function of the door safety interlock as detailed on page 10 of this manual.

Fig. (16)

5. Select the HOT program and start the machine.
6. Run through a complete cycle, checking for water temperature, drain operation and extract direction.
7. When the program is in the Soak cycle, hot and cold water should be entering the machine. In the Wash cycle only hot water should enter.
8. If cold water comes in, the hoses are improperly connected. Reverse hot and cold water hoses.

Fig. (17)

9. Machine must spin in a counter-clockwise direction, as seen from the front, during extraction. If it does not, reverse lines L1 and L3.

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

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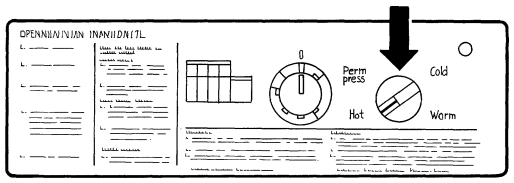

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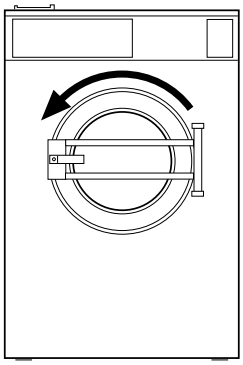

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Safety rules

- **This machine is designed for water washing only.**
- **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.**
- **This machine must not be used by children.**
- **Fabrics softener with volatile or inflammable fluids are not to be used in the machine.**

Consignes de sécurité

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- **Le verrouillage du hublot doit être vérifié chaque jour et ne peut être neutralisé.**
- **Toute fuite du système, due à des joints défectueux etc., doit être réparée sans délai.**
- **Tous les membres du personnel d'entretien doivent être parfaitement familiarisés avec le manuel d'entretien avant d'entreprendre une réparation ou un entretien de la machine.**
- **Ne jamais asperger d'eau la machine sous peine de risquer un court-circuit.**
- **La machine ne peut être utilisée par des enfants.**
- **Ne pas utiliser dans la machine des adoucissants textiles contenant des liquides volatils ou inflammables.**

General

The door, cycle indicator, coin meter or manual start switches, indicator light and program-selection knob are located at the front of the machine.

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

Main units

- Program-selector - rotary switch for choice of different wash programs.
- Door - with automatic locking device which remains locked until the cycle is completed and the drum has stopped rotating.
- Detergent supply box - three compartments for automatic injection of powdered detergents and fabric softener.
- Inner cylinder - of stainless steel supported at the rear by two ballraces.
- Outer drum - of stainless steel (18/8) securely attached to the frame.
- Wash motor - for reversing wash action and distribution speed and extract motor for high speed extraciton.
- Hot and cold water valves - program and level controlled solenoid valves for filling with water, and for flushdown of automatic detergent dispenser.
- Drain valve - timer controlled for draining the machine of water.
- Siphon breaker - to prevent water in the machine from re-entering the water supply system.
- Control unit - plug-in type for time and temperature control of the different wash cycles.
- Coin-meter or manual start switches.

Machine construction

Outer shell

Fig. 18 The outer shell is made of heavy gauge surgical steel and is attached to a heavy duty, rigid head casting (back gable).

The whole assembly is mounted on a heavy gauge fabricated steel base, galvanized for long life and corrosion resistance.

Panels

The machines are equipped with a top panel made of stainless steel. The front panel is available in different colors or in stainless steel. The colored panels are made of phosphatized steel plate. For servicing purposes, the panels can easily be removed.

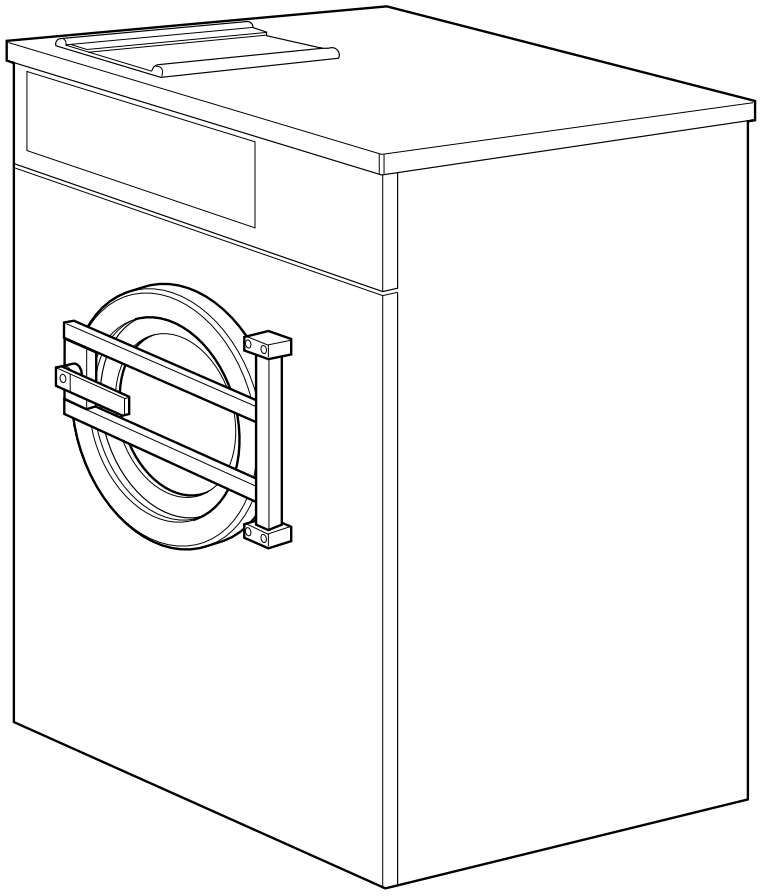
Inner cylinder

The inner cylinder is made of perforated surgical stainless steel. It is equipped with three lifting ribs and has highly-polished side sheets and back with maximum embossed perforated area to assure high flow of water and supplies through fabrics.

Scientifically correct ratio of cylinder diameter and depth assures maximum washing action.

The shaft is electrically welded to the reinforced back of the cylinder. A specially designed chrome-plated sleeve bushing protects the seals from wear.

18



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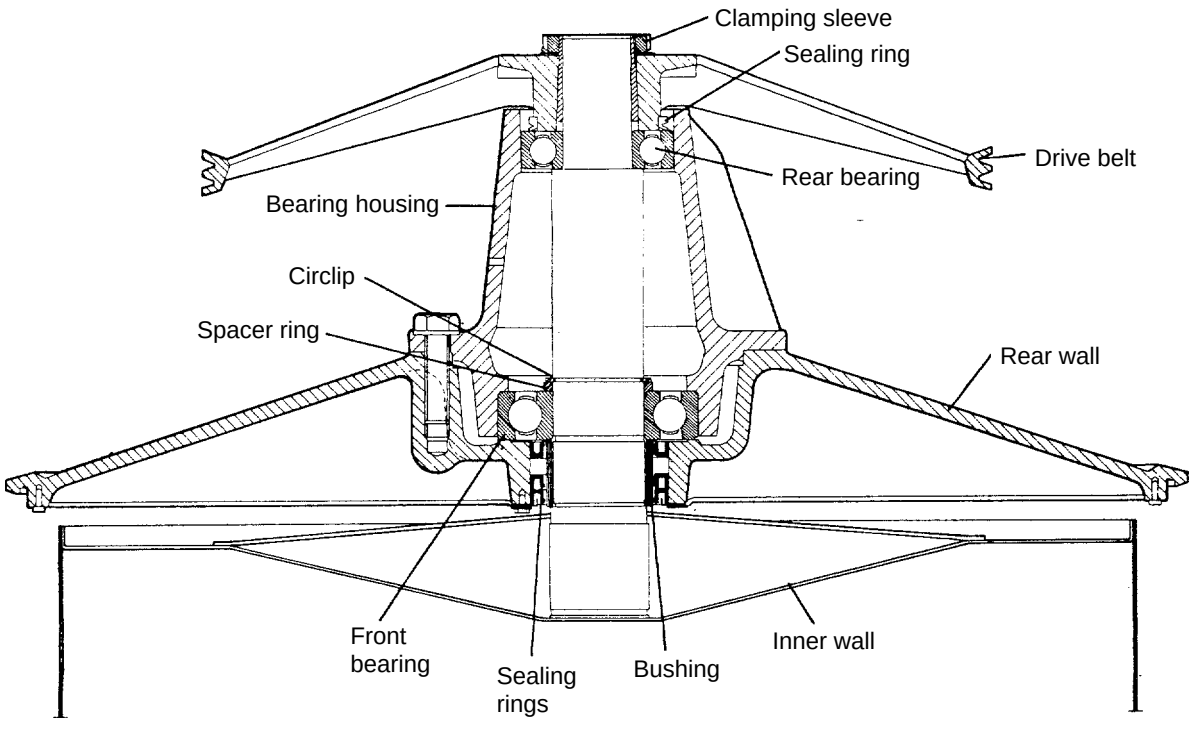
Back gable and bearing

Fig. 19 The back gable and the bearing trunnion housing are constructed of a webbed heavy casting for extra rigidity. The bearings are protected against infiltration of water by three neoprene seals. An intermediate safety outlet provides an escape for any possible condensation.

The seals are mounted on a chrome-plated, noncorrosive, specially hardened sleeve bushing that is mounted on the drive shaft to prevent wear of the seals and shaft. The main bearing is fitted machinetight into the bearing trunnion housing. A nut is tightened on the shaft to prevent the cylinder from moving in and out.

The extension of the bearing trunnion housing supports the rear bearing holding the shaft. A grease seal is mounted to prevent escape of grease. The bearings are permanently lubricated and need no maintenance. Wascomat's design transfers the weight of the loaded wash cylinder to the largest possible surface area away from the bearings, for longest machine life.

19



Control unit

Fig. 20 The cycle timer (K51), rotary program selector (S5), level controls (B1 and B2) and rotation guard (B31) are mounted just behind the control panel.

The relays (K1-4) are located at the top of the machine, easily accessible for service.

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

The timer scheme and basic circuit diagram are available at the end of this manual.

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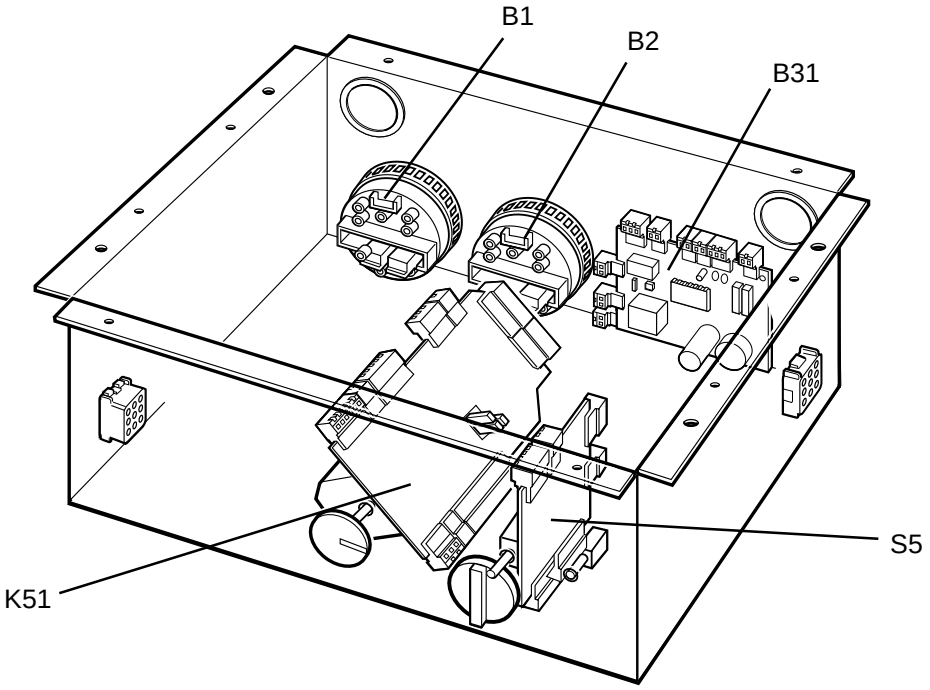

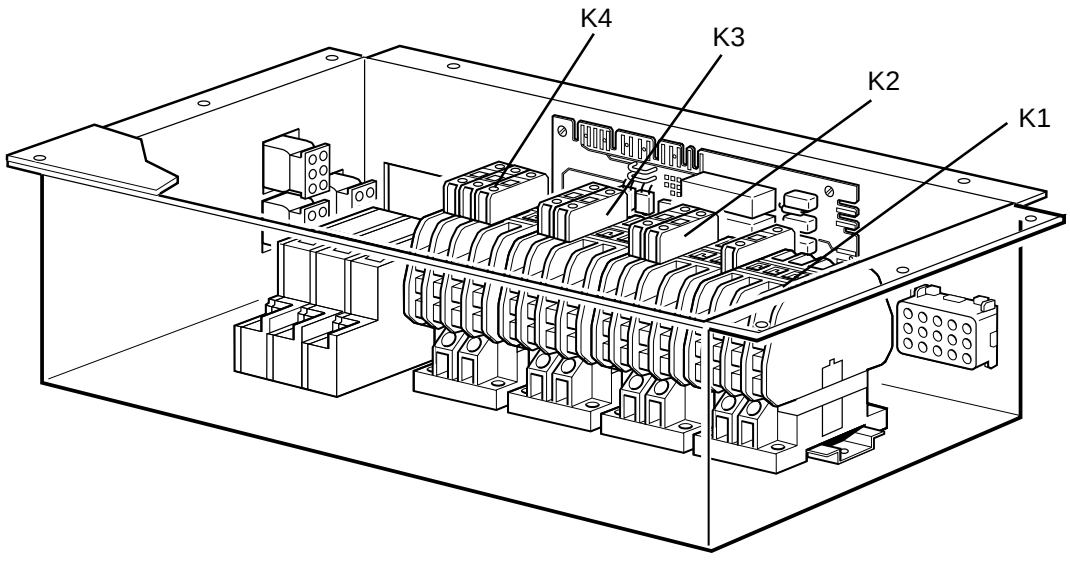

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Relays

Fig. (21) The W245 employs four relays to control the motor speeds:

- wash speed (K1 and K2)
- distribution speed (K3)
- extract speed (K4)

Construction

Fig. (22) 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 continous 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.

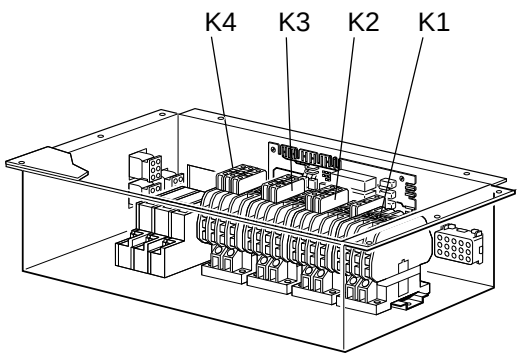
Trouble shooting

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 moves freely. Always replace burnt or pitted contacts (2) ... do not reuse contacts.

21



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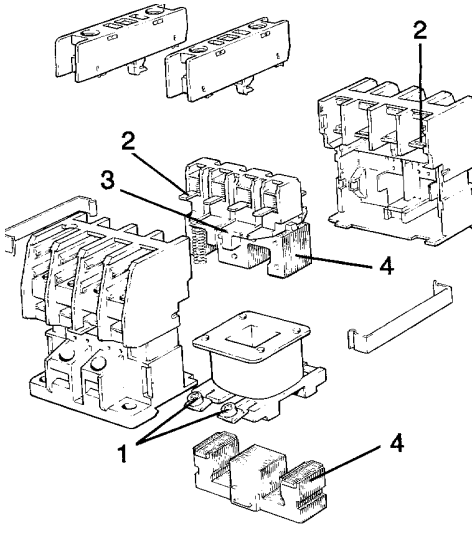

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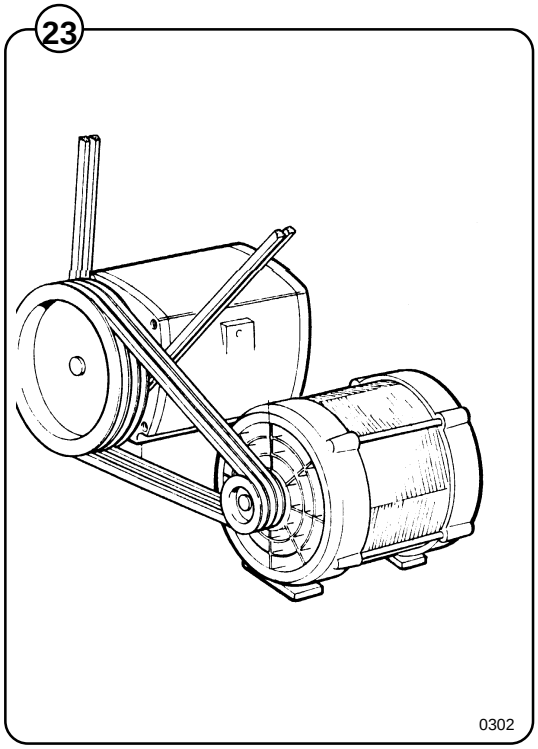
Drive motor description

Fig. (23) The three-speed operation of the wash cylinder is achieved by two motors. One 2-speed motor for wash speed (12-pole drive) and distribution speed (8-pole drive) and one single speed motor for extraction speed (4-pole drive). The motors are mounted on a motor bracket, the extract motor fixed the bracket, the wash and distribution motor in slots which allow adjusting the distance between the two motors for proper belt tension by adjusting screws. For silent operation the motor bracket is mounted to the base of the machine by rubber bushings. Correct tension to the main belt, between the cylinder and the extract motor, is obtained by the weight of the motors and the motor bracket and by the spring loaded set screws.



Construction of motors

The motors consist of stator, rotor and end-shields with ball-bearings. The stator and the rotor consists of plates, insulated from each other and welded together. The stator is provided with slots in which the 2-pole and 18-pole windings are wound. The windings are impregnated with a temperature-resistant sound-insulating resin varnish according to class B. The end-shields are die-cast. The ball bearings are permanently lubricated.

Function of motors

When the stator winding is charged, a magnetic field will occur, which in turn will rotate the motor at a fixed RPM depending upon the number of poles in the winding. The 12-pole winding gives the wash speed and the 8-pole winding in the same motor gives the distribution speed. The separate 4-pole motor gives the extraction speed. When operating with load, the speed deviates slightly from the synchronous (no-load) speed. This difference is called the slip and usually expressed as a percentage of the synchronous speed. The motors will work satisfactory at nominal voltage +10%-15%.

Motor connections

Fig. (24) This diagram illustrates motor connections to the connector plug:

Wash/distribution motor:

1, 2 and 3: wash speed (12-pole winding).

4,5 and 5: distribution speed (8-pole winding).

7 and 9: motor overload protector.

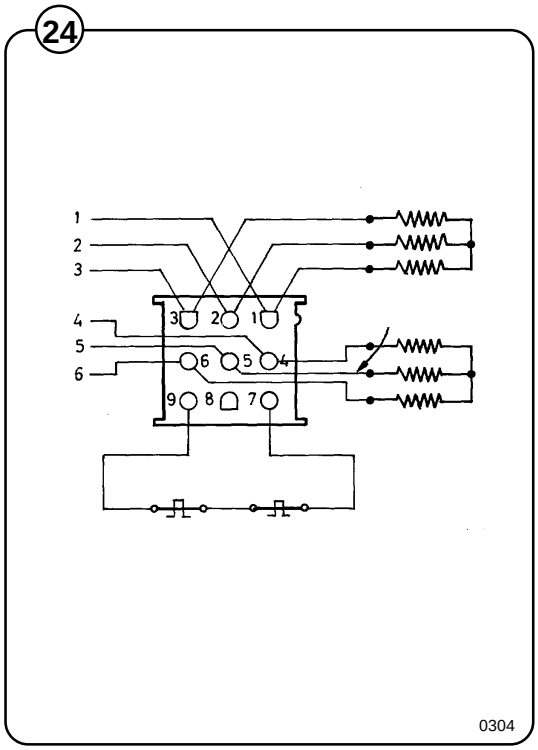
Extract motor:

1, 2 and 3: extract speed (4-pole winding).
7 and 9: motor overload protector.

Motor overload protector

The motor is equipped with two self-resetting, thermal overload protectors, situated one in the each winding of the stator. The protectors are connected in series and will trip at a temperature of 120°C (248°F) (3-phase) or 130°C (266°F) (single-phase). If the event the protectors fail but the motor remains otherwise undamaged, an overload protector may be mounted in the control unit of the machine. Before making such installation check to ascertain that the windings are not damaged. A burned out motor can be re-wound.

Before connecting a separate overload protector consult the local code.



How to remove motors

Fig. (25) Loosen the spring loads set screw. Lift the motor unit and detach the V-belts. Dismount the bracket holding the motor hinge shaft. Lift out the motor bracket with motors mounted. Loosen the mounting screws of the wash/distribution motor and the set screws. Lift off the V-belts. Now remove the mounting screws for each motor and the guide pins for the wash/distribution motor.

How to mount motors

Place the motors on the table or bench with the mounting holes upwards. Mount the guide pins on the wash/distribution motor. Then mount the mounting bracket to the extract motor. Position the other motor and fasting the mounting screws. Mount the V-belts. Tighten the belts. Mount the bracket with motors in the machine in the opposite way as outlined above in "How to remove motors".

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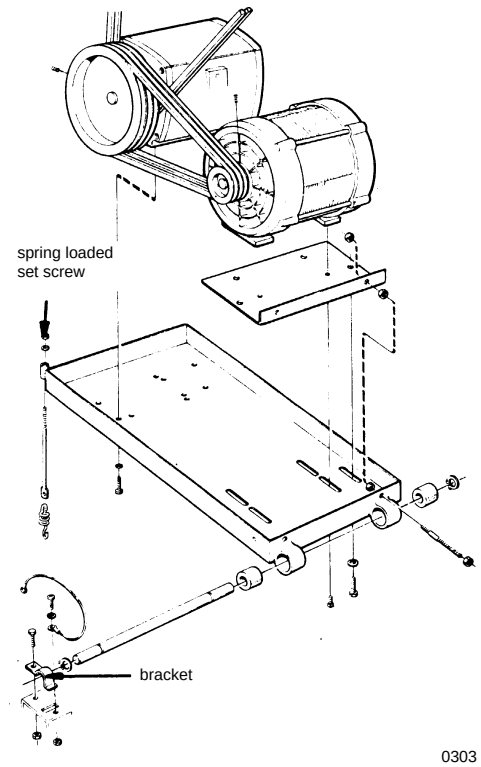

Description

Fig. 26 The machine door lock consists of the following:

- The locking unit, located behind the front panel below the detergent dispenser. The unit consists of a solenoid which locks the door, and two microswitches. Switch S4A indicates that the door is locked and switch S3 indicates that the door is closed.
- The door lock control unit, located in the automatic control unit. This unit consists of a circuit board for monitoring door lock functioning.
- The locking arm, located between the door lock handle and the locking unit. This arm provides the mechanical link between door lock handle and locking unit.

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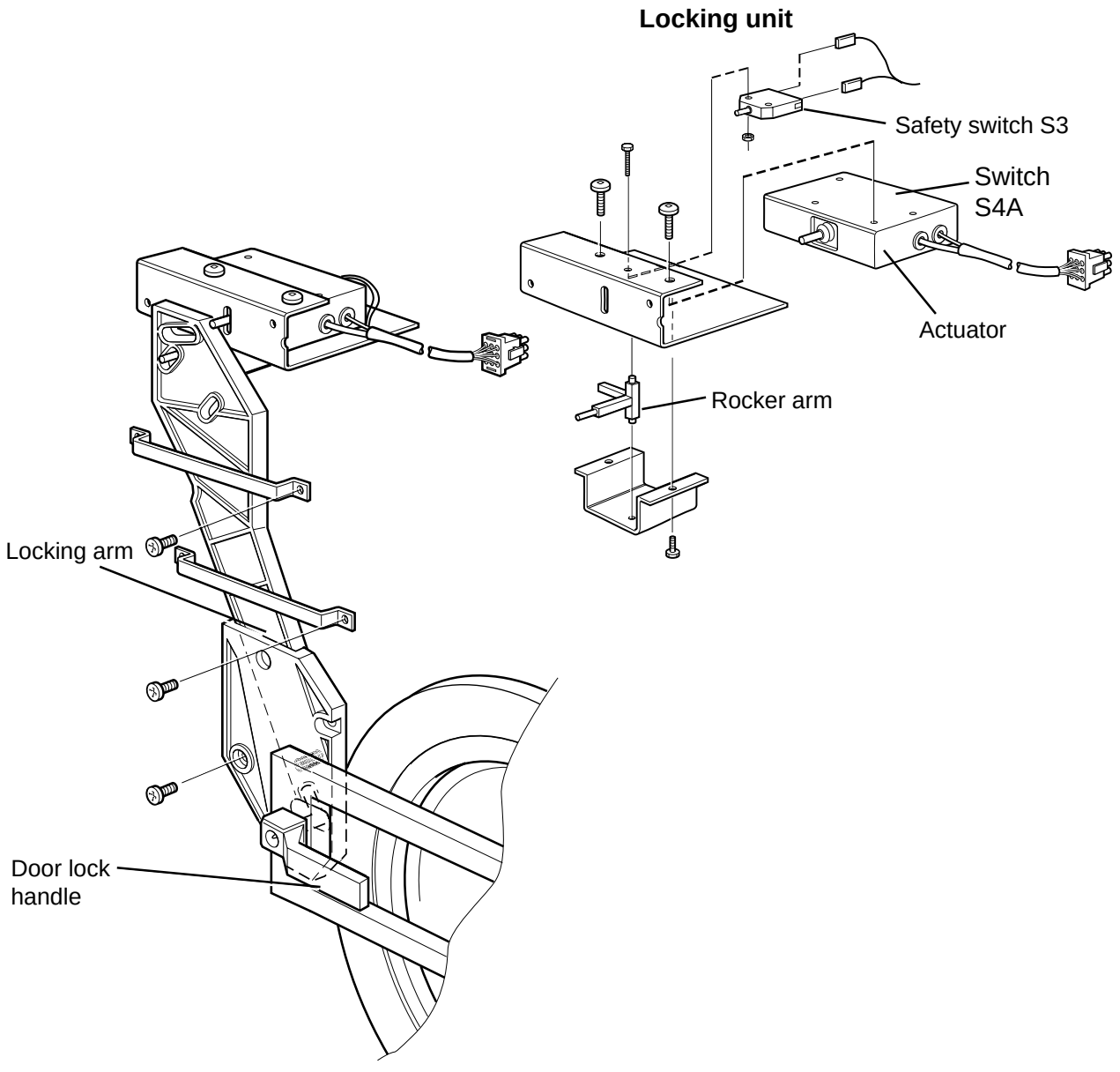


Door lock control unit

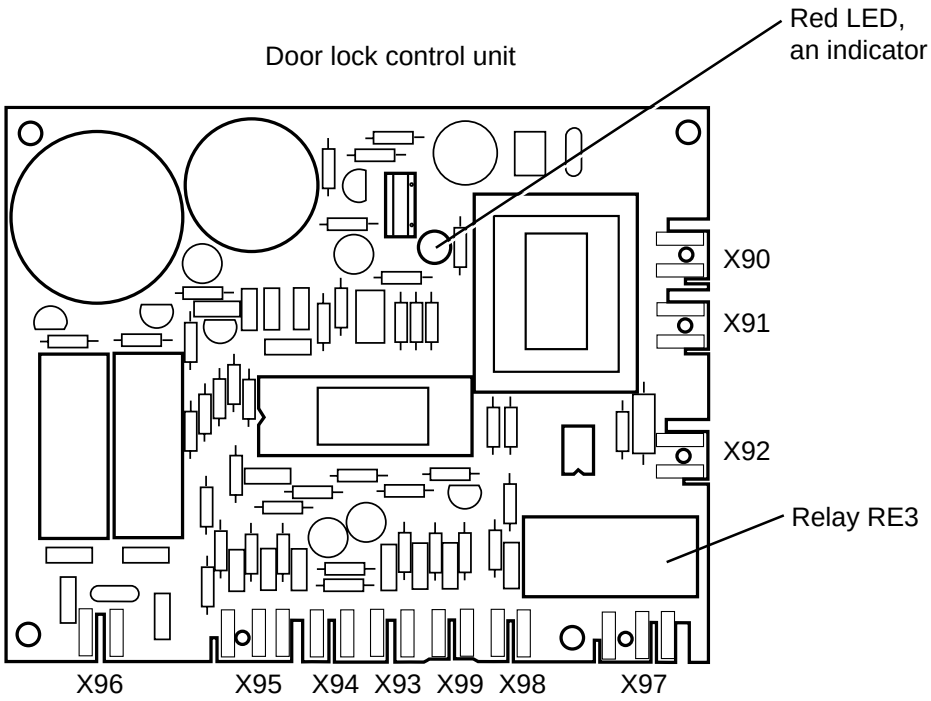
Fig. 27

The sole function of this control unit is to oversee the correct functioning of the door lock. The CPU board receives information from the motor control unit about motor rotation, and has its own level-monitoring device. The control unit also detects water level and motor speed through separate level measurement devices and the rotation guard (speed-monitoring device). Through this double monitoring, a very high level of safety can be achieved.

When the CPU board commands door locking, the control unit checks that there is no water in the drum and that the drum is not rotating. Only after that is a signal sent to the door lock. Level and rotation are checked in the same way before the door is allowed to open.

For even greater safety, the voltage feed to the I/O boards' outputs goes via both the emergency stop and the door lock switch. This means that no functions can proceed unless the emergency stop is in its normal position (not actuated) and the door is locked.

27



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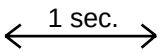
Error indication patterns

Fig. 28 If the door lock is working correctly, this is indicated by the red LED, by a pattern of flashes which indicates “OK”. The error indication patterns revealed by the LED flash at various frequencies for the various errors or faults. All error indication patterns have a frequency cycle of 50%, i.e. the LED will be on half the time, off half the time.

28

LED pattern of flashes during normal functioning



Pattern of flashes indicating “OK”, drum at standstill

Pattern of flashes indicating “OK”, drum rotating, 5 Hz

Error indication pattern	Meaning/cause
	Level-sensing device indicates water in drum when door lock is open. 2.19 Hz
	Auxiliary relay for motor indicates that the motor contactor is activated when the door lock is open (this error indication pattern does not occur when the excess-speed-monitoring device is selected). 1.88 Hz
	Signals from rotation sensor and auxiliary relay do not correspond. 1.56 Hz
	The control unit sensor circuits indicate fault/ error in drive circuits for door lock including its wiring. 0.85 Hz
	Armament circuits for RE1/RE2 activated (capacitor C8 charged when it should be discharged). 0.37 Hz

4686

Inlet valve, detergent

Construction

Fig. 29 The valve has a single-inlet with either one, two or three outlets, each with its own solenoid coil. The body is made of heat-resistant polyamid plastic and the solenoids encased in water-tight plastic.

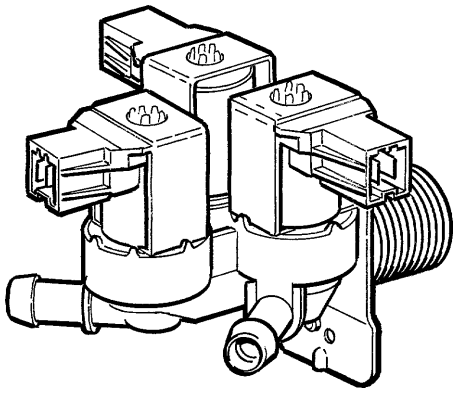
A filter screen on the inlet side prevents dirt from entering the valve. Flow restrictors can be placed at either the inlet or any of the outlets.

Operation

Fig. 30 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.

29



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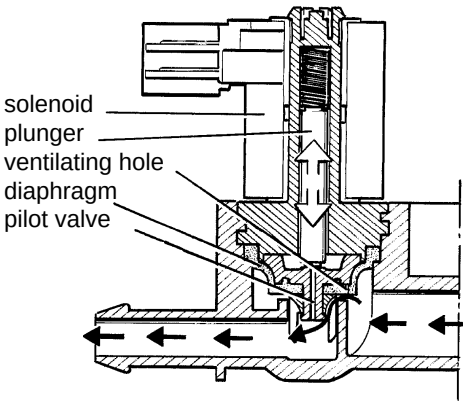

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Maintenance instructions

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

Fig. (31) 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.

Trouble shooting

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

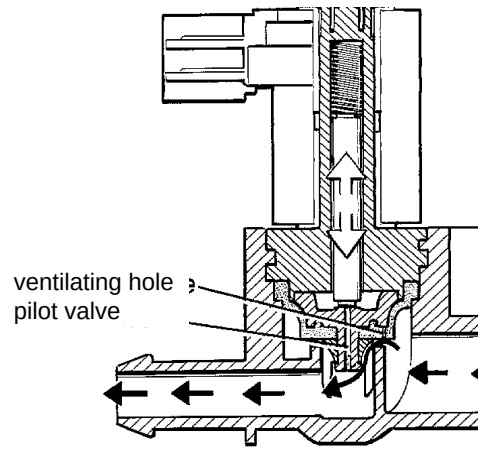
- Check that the coil is not live. The valve is normally closed when the magnet is not energised.
- Check the return spring.
- Check the diaphragm (pilot pressure opening).

Dismantling the valve

Fig. (32)
- Pull the coil straight upwards. Use a screwdriver if necessary to carefully undo the coil.

Fig. (33)
- Use the tool supplied with the machine (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.

31



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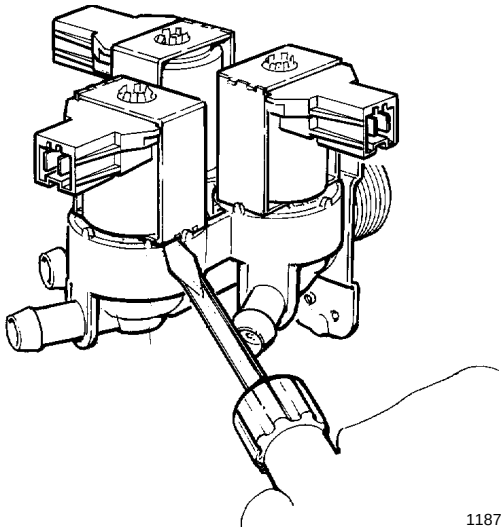

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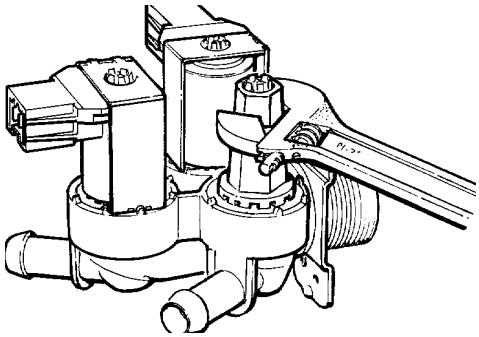

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Inlet valves

Fig. 34 The water inlet valves have brass bodies with larger cross section of the outlet in order to achieve a shorter filling time for the machine.

Construction

Fig. 35 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.

To strip, clean, re-assemble and troubleshoot the inlet valve, follow the instructions outlined for the supply injector valve.

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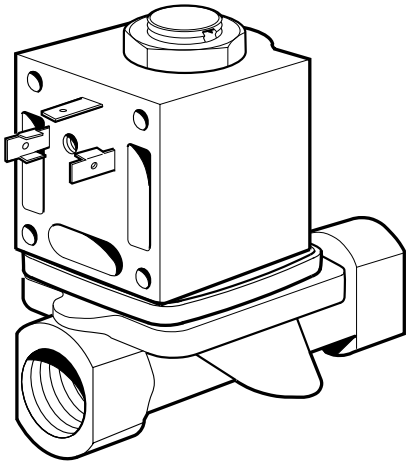

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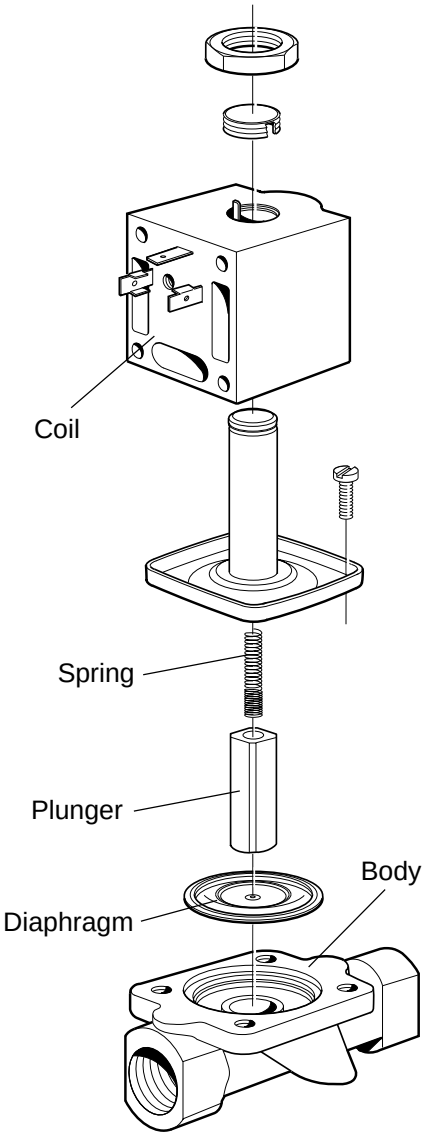

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Soap supply box

Fig. 36 The three-compartment soap supply box is located at the top of the machine. Viewed from the front, the compartments marked with figures 1, 2 and 3 are used as follows:

Compartment 1

This compartment is used for adding detergent to the wash at the start of the Soak cycle.

Compartment 2

This compartment is used for adding supplies to the wash at the beginning of the Wash cycle.

The insert is used to help prevent oversudsing.

Compartment 3

The small compartment is used for adding liquid fabric softener, which is flushed down by a siphon action at the start of the third rinse.

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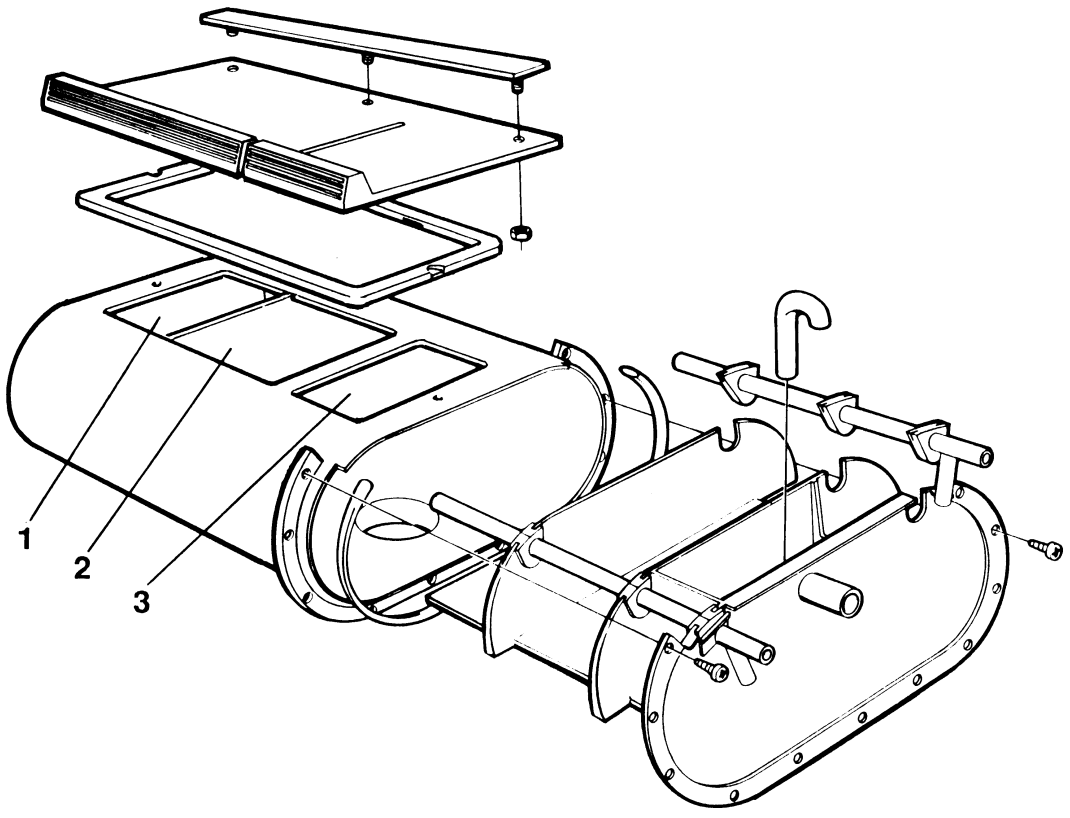

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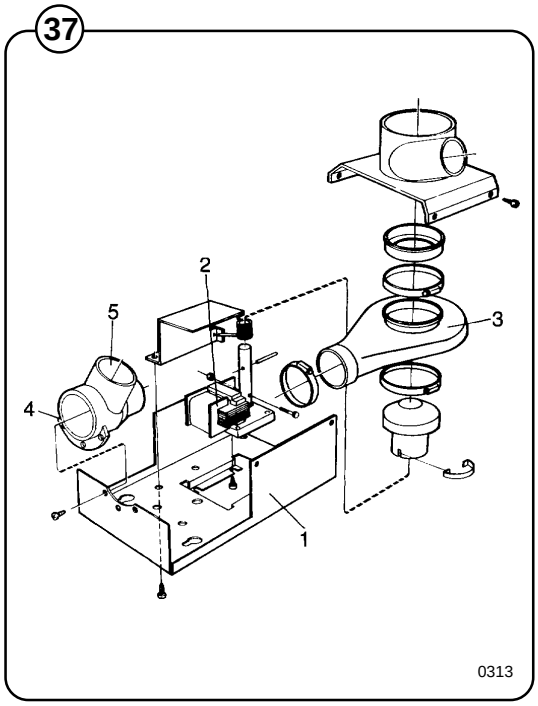
Drain valve



Description

Fig. (37) 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.

Operation

The drain valve is normally open, i.e. the motor does not close the valve until it receives current via a contact of the timer. 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.

Procedure for use

Preparations

Sort the laundry according to the types of wash cycle listed on the control panel. Check washing instructions on garment tags.

Empty pockets and close zippers.

Open door, put laundry in the machine and close door.

Start

Fig. 38 Turn selector knob to desired wash program.

Add detergent and fabric softener in the compartments on top of the machine:

Fig. 39
- pre-wash detergent in compartment 1
- regular detergent in compartment 2
- liquid fabric softener in compartment 3

Follow dosage instructions on detergent package.

Liquid detergent can only be added at the beginning of the specific cycle.

Insert coins or tokens. When the right amount has been added the machine starts automatically. For manual start machines depress the START button.

Finish

Fig. 40 When the wash program is finished, open the door and take out the laundry.

When necessary, clean the door gasket and detergent compartments. Wipe off the machine with a damp cloth.

Leave the door open when the machine is not in use.

Leave the machine in the condition you would expect to find it.

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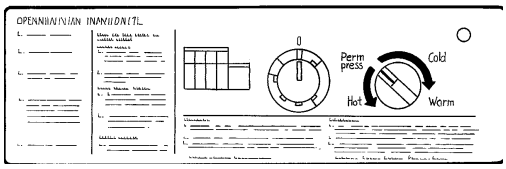

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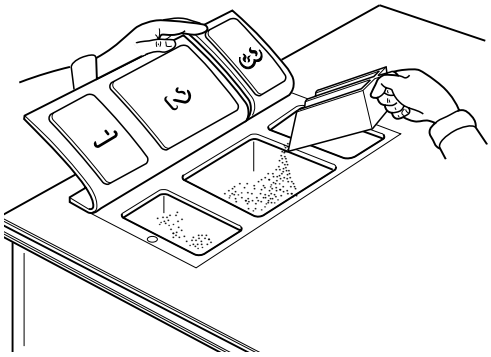

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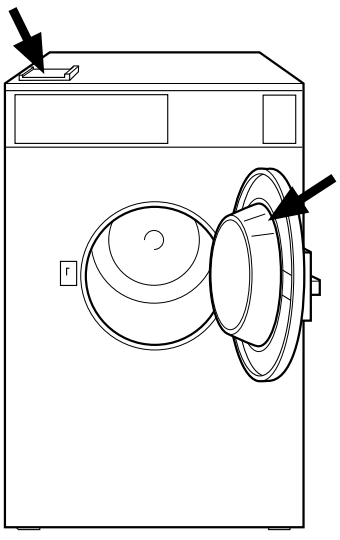

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Wash Programs

Fig. 41

In the figure below is an overview of the four wash programs.

On the following pages you will find a more detailed description of the programs.

41

	HOT			WARM			COLD			PERM PRESS		
	Time (Min.)	Temp.	Water Level	Time (Min.)	Temp.	Water Level	Time (Min.)	Temp.	Water Level	Time (Min.)	Temp.	Water Level
Prewash	3	Warm	High	3	Warm	High	3	Cold	High	3	Warm	High
Detergent 1												
Drain	1			1			1			1		
Mainwash	6	Hot	High	6	Warm	High	6	Cold	High	6	Warm	High
Detergent 2												
Drain	1			1			1			1		
Rinse 1	1	Cold	High	1	Cold	High	1	Cold	High	1	Cold	High
Drain	1			1			1			1		
Extract	0.5			0.5			0.5			0.5		
Rinse 2	1	Cold	High	1	Cold	High	1	Cold	High	1	Cold	High
Drain	1			1			1			1		
Extract	0.5			0.5			0.5			0.5		
Rinse 3	2	Cold	High	2	Cold	High	2	Cold	High	2	Cold	High
Detergent 3												
Drain	1			1			1			1		
Extract	4			4			4			1		
Shake-out	1.5			1.5			1.5			1.5		
Total time (water fill time not included)		24.5			24.5			24.5			21.5	

Wash program HOT

Fig. 42 After the machine has started and the door automatically locked, the drain valve will close and the hot and cold water valves will open to fill the machine with mixed hot and cold water to the level determined by the level control.

When this level is reached, both water valves will close. During filling and then through the wash program the drum has a reversing rotation.

At the end of the prewash, the drain valve will open to drain the water whereafter hot water will fill to the level determined by the level control. At the same time detergent from compartment 2 is flushed down with the incoming hot water.

The water level controlled machine will now wash the fabrics for 6 minutes. The machine is then emptied.

Cold water is filled to the high level for the first rinse which lasts one minute, followed by spin extraction for 30 seconds. After the extraction comes the second rinse in cold water, ending with spin extraction, whereafter the third rinse is started. Fabric softener is automatically admitted during the third rinse. The fabrics are rinsed in cold water for two minutes followed by a spin extraction of four minutes duration. Finally there is a shake out for one and a half minutes.

42

	HOT		
	Time (Min.)	Temp.	Water Level
Prewash	3	Warm	High
Detergent 1			
Drain	1		
Mainwash	6	Hot	High
Detergent 2			
Drain	1		
Rinse 1	1	Cold	High
Drain	1		
Extract	0.5		
Rinse 2	1	Cold	High
Drain	1		
Extract	0.5		
Rinse 3	2	Cold	High
Detergent 3			
Drain	1		
Extract	4		
Shake-out	1.5		
Total time (water fill time not included)		24.5	

1203

Wash Program WARM

Fig. 43

On starting the machine, the door will automatically be locked, and the prewash carried out as previously described, whereafter the main wash is started.

As the main wash is started, the drain valve closes, detergent is admitted and mixed hot and cold water is filled to the level determined by the level control.

On reaching this level, the water valves are closed.

The water level controlled machine will now wash the fabrics for six minutes. The machine is then emptied.

Cold water is filled for the first rinse which lasts one minute, followed by spin extraction for 30 seconds.

After this extraction comes the second rinse in cold water ending with spin extraction, whereafter the third rinse is started. Fabric softener is automatically admitted during the third rinse. The fabrics are rinsed with cold water for two minutes followed by a spin extraction of four minutes duration. Finally there is a shake out for one and a half minutes.

43

	WARM		
	Time (Min.)	Temp.	Water Level
Prewash	3	Warm	High
Detergent 1			
Drain	1		
Mainwash	6	Warm	High
Detergent 2			
Drain	1		
Rinse 1	1	Cold	High
Drain	1		
Extract	0.5		
Rinse 2	1	Cold	High
Drain	1		
Extract	0.5		
Rinse 3	2	Cold	High
Detergent 3			
Drain	1		
Extract	4		
Shake-out	1.5		
Total time (water fill time not included)		24.5	

1204

Wash Program COLD

Fig. 44

On starting the machine, the door will automatically be locked, the drain valve closed, the cold water valve opened and the prewash carried out as previously described, whereafter the main wash is started.

As the main wash is started, the drain valve closes, detergent is admitted and cold water is filled to the level determined by the level control.

On reaching this level, cold water is closed.

The water level controlled machine will now wash the fabrics for six minutes. The machine is then emptied.

Cold water is filled for the first rinse which lasts one minute, followed by spin extraction for 30 seconds.

After this extraction comes the second rinse in cold water concluded with spin extraction, whereafter the third rinse is started.

Fabric softener is automatically admitted during the third rinse. The fabrics are rinsed with cold water for two minutes followed by a spin extraction of four minutes duration. Finally there is a shake out for one and a half minutes.

44

	COLD		
	Time (Min.)	Temp.	Water Level
Prewash	3	Cold	High
Detergent 1			
Drain	1		
Mainwash	6	Cold	High
Detergent 2			
Drain	1		
Rinse 1	1	Cold	High
Drain	1		
Extract	0.5		
Rinse 2	1	Cold	High
Drain	1		
Extract	0.5		
Rinse 3	2	Cold	High
Detergent 3			
Drain	1		
Extract	4		
Shake-out	1.5		
Total time (water fill time not included)		24.5	

1205

Wash Program PERMANENT PRESS

Fig. 45

On starting the machine, the door will automatically be locked, the drain valve closed, the hot and cold water valves opened and the prewash will be carried out as previously described, whereafter the main wash is started.

As the main wash is started, the drain valve closes, detergent is admitted and mixed hot and cold water is filled to the level determined by the level control.

On reaching this level, the water valves are closed and the wash motor starts its reversing rotation.

The water level controlled machine will now wash the fabrics for six minutes. The machine is then emptied.

Cold water is filled for the first rinse which lasts one minute, followed by spin extraction for 30 seconds.

Fabric softener is automatically admitted during the third rinse. The fabrics are rinsed with cold water for two minutes followed by a spin extraction of one minutes duration. Finally there is a shake out for one and a half minutes.

45

	PERM PRESS		
	Time (Min.)	Temp.	Water Level
Prewash	3	Warm	High
Detergent 1			
Drain	1		
Mainwash	6	Warm	High
Detergent 2			
Drain	1		
Rinse 1	1	Cold	High
Drain	1		
Extract	0.5		
Rinse 2	1	Cold	High
Drain	1		
Extract	0.5		
Rinse 3	2	Cold	High
Detergent 3			
Drain	1		
Extract	1		
Shake-out	1.5		
Total time (water fill time not included)		21.5	

1206

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.

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.
- Clean the soap supply box 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. 46

- 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

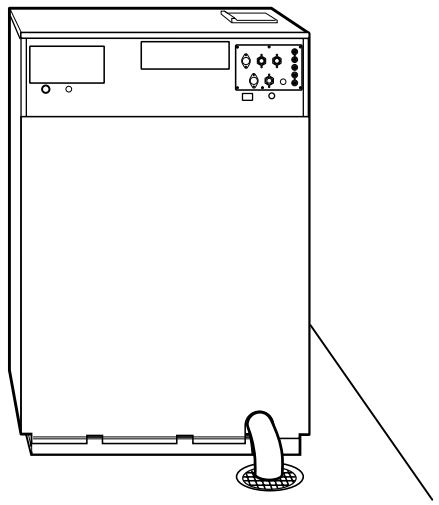
- Remove hose from drain connection and clean inside drain valve.

Every three months

Fig. 47

- 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.

46



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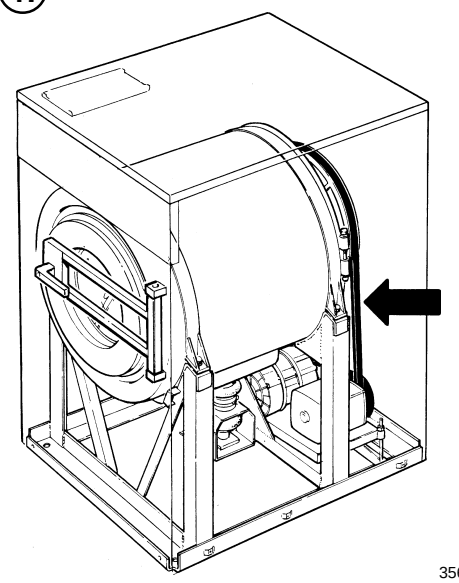

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Make certain that all electrical power to the machine is shut off before removing top or rear panels.

If the machine does not start

Fig. 48

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

B Check the door safety switches.

C Check the glass cartridge fuse.

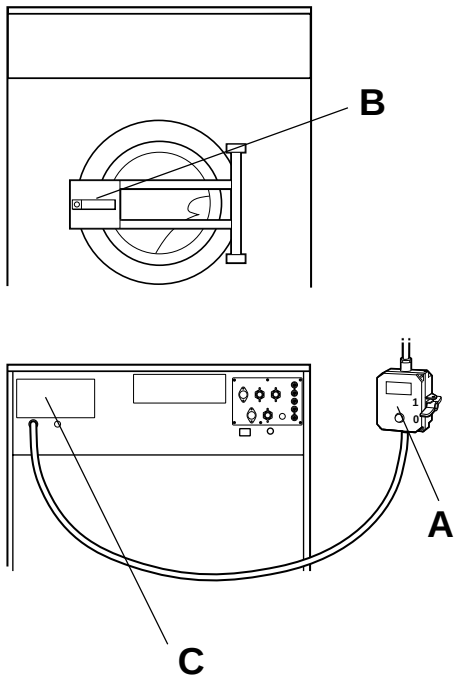
If water does not drain

Fig. 49

A Check the drain valve and drain solenoid for proper operation.

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

48



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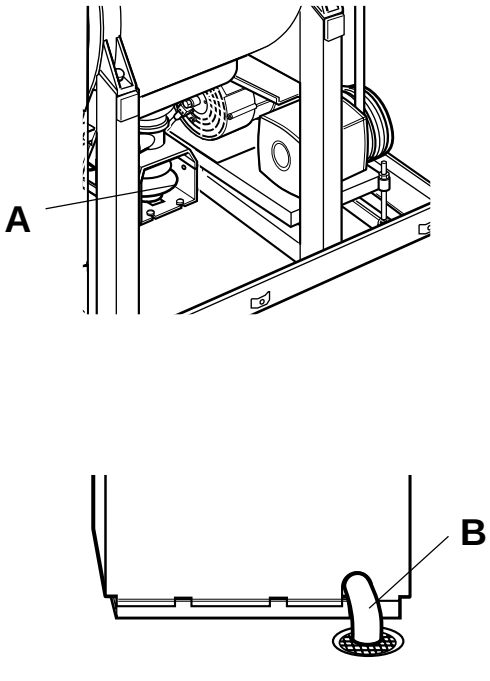

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If the machine does not extract

Fig. 50

A Check the extract relay and relay coil for proper operation.

If the motor does not operate at wash speed

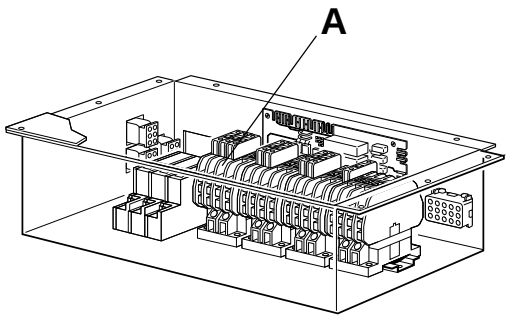
Fig. 51

A Check the wash relays.

B Check the motors and V-belts.

C Check auxilliary contact on extract relay.

50



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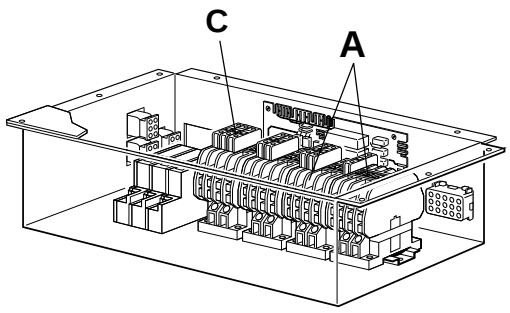

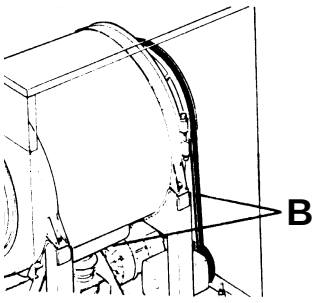

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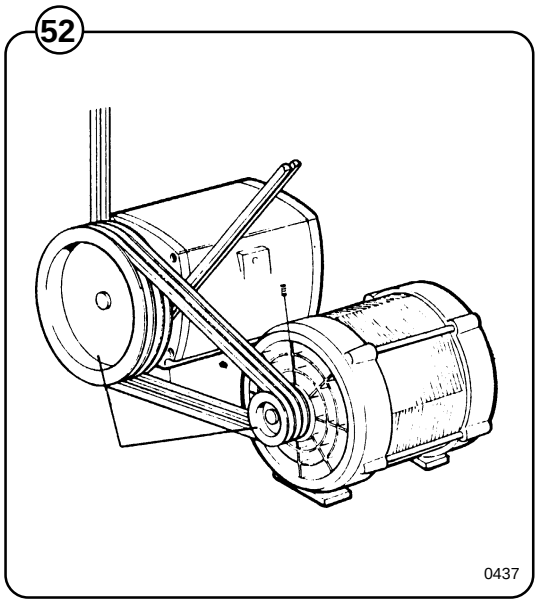
If the machine runs slowly on wash speed or there is a slapping or thumping noise

Fig. 52 A Replace V-belts

If a metallic noise can be heard at rear of machine

B Tighten the pulley on motor shaft.



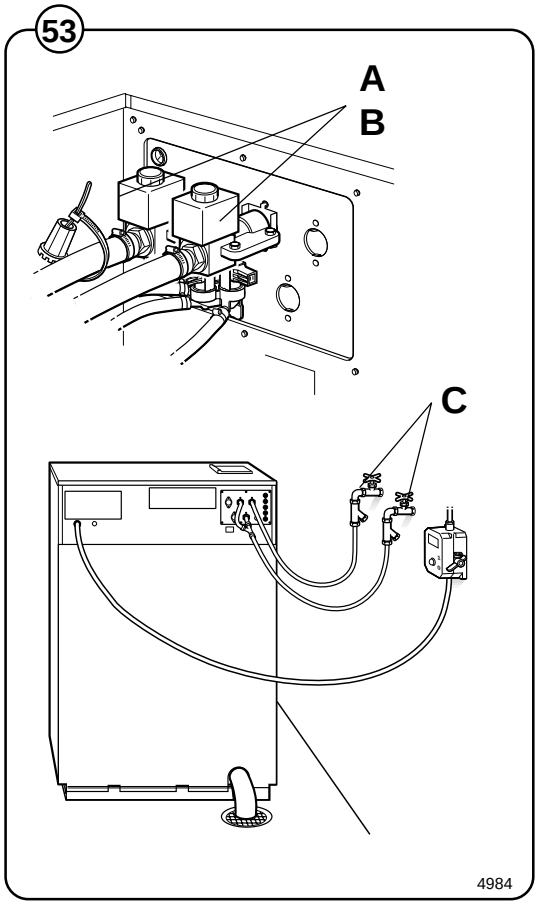
If water does not enter the machine

Fig. 53

A Check the valve coils on the inlet valves.

B Check wires leading to the valve coils.

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



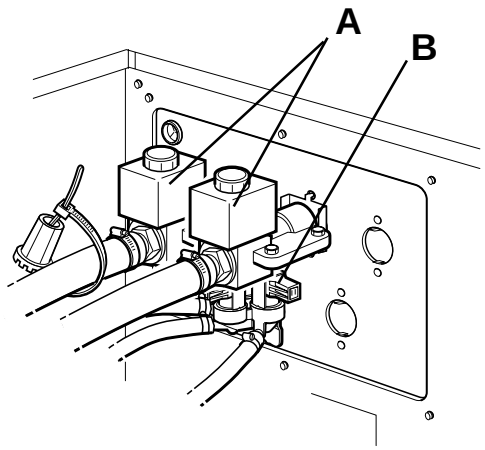
If water continues to fill without stopping

Fig. 54 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. 55 A Check seating of drain valve.

54



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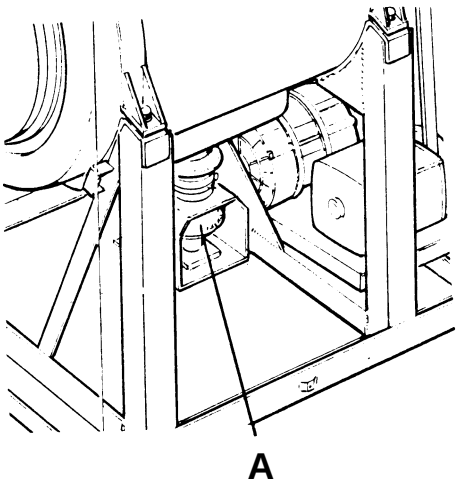

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