

B13 B7S-B7SLED CONTROL SYSTEM WASHING MACHINE SERVICE HANDBOOK



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3. Security Warnings

This section includes security instructions which may help prevent the injuries and material damage risks. All kinds of warranties shall be invalid if these instructions are not observed.

3.1. General Security

- This product can be used by the children who are at the age of 8 and over and the people whose physical, sensory or mental skills are not fully developed or who do not have necessary required experience and knowledge as long as they are supervised or trained about the safe use of the product and its risks. Children should not play with the device. Cleaning and user maintenance procedures should not be performed by the children unless they are supervised by a person.
- Do not place the machine onto a floor covered with a carpet. Electrical parts will get overheated since air cannot circulate from under the device. This may lead to failures in machine.
- If the product is faulty, it should not be operated before it is repaired by the authorized service! Risk of electric shock!

3.1.1. Electrical safety

- This product is designed to resume operation when power is on again after a power cut. If you want to cancel a program, see the section titled "Cancelling a Program".
- Plug the product into a grounded outlet protected by a 16-ampere fuse. Be sure to make a qualified electrician arrange the grounding installation. If the machine is used without grounding which conform to the local regulations, our company will not be liable for any damages which may arise.

3.1.2. Product safety

- Water mains and drain hose should be fixed securely and undamaged. Otherwise, water leak may occur.
- While there is still water inside the product, never open the loading door or remove the filter. Probable injuries will take place due to flood or hot water.
- Do not force open the locked loading door. Door can be opened a few minutes after the washing cycle ends. If you force the loading door to open it, door and lock mechanism may be damaged.
- Unplug the product if it is not in use.
- Do not wash the product by spraying or pouring water onto it! Risk of electric shock!
- Never touch the plug with wet hands! Do not grab the power cord to unplug the machine, always unplug it by holding its plug.
- Use only the detergents, softeners and additives intended for washing machines.
- Observe the instructions on the label of textiles and the detergent package.
- Product should be unplugged during installation, maintenance, cleaning and repair procedures.

- Always make the **Authorized Service** perform installation and repair procedures. Manufacturer cannot be held responsible for any damages which might arise due to the operations performed by unauthorized persons.
- If the power cord is damaged, it should be replaced by the manufacturer, after-sale service or a similarly qualified, certified person (preferably an electrician) or a person to be designated by the importer, in order to prevent the risk.

3.2. Intended Use

- This product is for domestic use only. It is not suitable for commercial use and it must not be used out of its intended use.
- The product must only be used for washing and rinsing of laundry that are marked accordingly.
- The manufacturer waives any responsibility arisen from incorrect usage or transportation.
- Service life of the product you purchased is 10 years. This is the period of time when the spare parts are made available in order for the product to operate as specified.

3.3. Child Safety

- Packaging materials may be dangerous for the children. Keep the packaging materials out of the reach of the children.
- Electric products are dangerous for children. Keep the children away from the product when it is in use. Do not allow them to play with the product. Activate child lock to prevent the children to tamper with it.
- Do not forget to close the loading door when leaving the room where the product is located.
- Keep all detergents and additives in a safe place out of the reach of the children with their lids or packages are closed.

3.4. Compliance to RoHS Directive

- This product does not contain the harmful and prohibited substances which are specified in Directive “Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipments” (Turkey RoHS) issued by the Ministry of Environment and Forestry of Republic of Turkey.
- Complies with the EEE Directive.

3.5. Packaging information

Packaging materials of the product are manufactured from recyclable materials in accordance with our National Environment Regulations.

Do not dispose of the packaging materials together with the domestic or other wastes. Take them to the packaging material collection points designated by the local authorities.

3.6. Disposal of waste product

This product has been manufactured with high quality parts and materials which can be reused and are suitable for recycling.

For this reason, do not discard this product with the domestic products and other wastes at the end of its service life. Take the product to a collection point for the recycling of the electric and electronic equipments. Ask these collection points to the local administration in your region. Help contribute to the protection of environment and conservation of the natural resources by delivering the used products to the recycling points. Before disposing the product, cut its power cord and break the lock mechanism of the loading door and make it inoperable for the safety of children.

3.7. Points to consider during service

- During panel installation, make sure that the cables to be mounted onto the electronic card are not pinched between the bracket sheets. It should be ensured that all the sockets on the electronic card are seated well.
- It should be ensured that cable in the installation of cable group is not damaged. Stripped or damaged cables should not be installed. Cable route should be taken into account during installation; cable's coming into contact with sharp surfaces should be avoided and it should not be pinched.
- It should be ensured that the sockets of all components which are serviced are seated well. Arc may occur in case of inadequate contact.
- It should be checked that the serviced product is connected to a grounded outlet which is protected by a fuse with suitable current. Connection should not be made with extension cable or multiple outlet. Moreover, no extension should be made to the power cord or internal cables.
- Put the serviced product onto a firm ground; do not put it on a carpet with high pile or other similar surfaces. Electrical parts may get overheated since air cannot circulate from under the device.
- Do not put the serviced product onto its power cord or another cable.
- If you have to unplug the serviced product from the mains, never grab it from its power cord, always unplug it by holding its plug only.

- Check the power cord and plug of the serviced product. If its power cord or plug is faulty, replace the power cord group completely with a new group. Please make sure that the cables are not shortened, snapped, stripped, hardened and plug ends are not broken, cracked, oxidized or loosened.
- Check the outlet which the serviced product is plugged in. Product should not be plugged in the outlets which are loosened, dislocated from its housing, broken, in contact with water, dusty, dirty, oiled.
- Along the route of the power cord from the outlet to the machine, make sure that the cord does not come under heating sources, cupboards, devices, etc. which may damage the product.
- During service, do not perform hot works on the machine, such as soldering, welding, etc. Do not leave these devices on the machine.
- During service, do not wipe the machine with flammable and combustible substances such as thinner, alcohol, etc.
- After the machine is serviced, do not forget any paper-based materials inside the machine such as service slip, brochure, etc.

IMPORTANT:

When the machine is required to be serviced by being tilted to the front, its transport safety bolts should be installed.

This is required for the front components of the machine not to be damaged.

4. Product Installation / Installation Rules / Settings

Apply to the nearest Authorized Service agent for the installation of your product. In order to make your machine ready for use, before calling the authorized service, make sure that electrical installation, clean water installation and water drain are appropriate by checking the user manual. If this is not the case, call for a qualified electrician and technician and take necessary actions.

	Customer is liable to prepare the place of installation for the product, electricity, clean water and waste water installations.
	Installation and electrical connections of the product should be performed by Authorized Service. Manufacturer cannot be held responsible for any damages which might arise due to the operations performed by unauthorized persons.
	WARNING: Before use, check whether there is any damage on the product. If the product is damaged, do not have it installed. Damaged products pose a risk for your safety.
	Make sure that the water inlet and drain hoses and the power cord of the machine are not folded, pinched or broken during when the product is pushed into its place after the installation or cleaning works.

4.1. Correct Place for Installation

- Place the product on a hard floor. Do not put it onto a carpet with high pile or other similar surfaces.
- When the washing machine and drier are placed on top of each other, their total weight –when loaded– amounts to 180 kilograms. Place the product onto a sound and flat surface having an adequate load bearing capacity!
- Do not place the product on the power cable.
- Do not install the product in the environments where the temperature falls below 0 °C.
- Leave a minimum space of 1 cm between the machine and the furniture.

4.2. Removing the Package Support

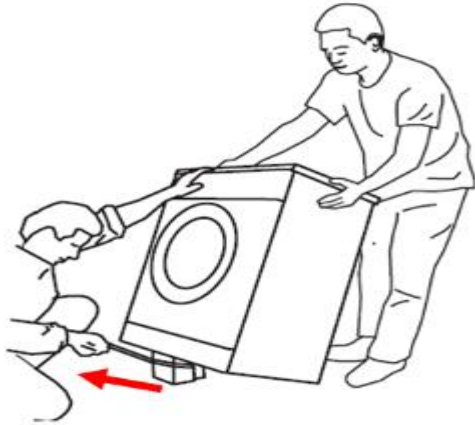


Figure 4.1

Tilt the machine backwards in order to remove the package support. Remove the packaging reinforcement by

4.3. Removing the Transport Safety Bolts



WARNING: Do not remove the transport safety bolts before removing the packaging support.



WARNING: Before operating the washing machine, remove the transport safety bolts! Otherwise, the product will be damaged.

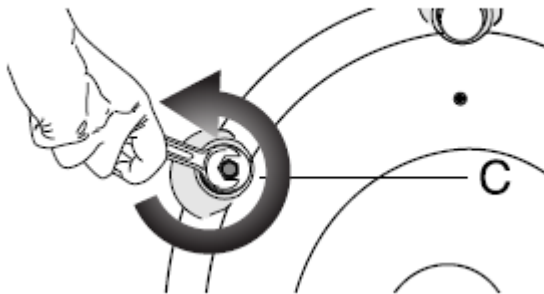


Figure 4.2

1. Loose all bolts with an appropriate key until they turn freely (C).

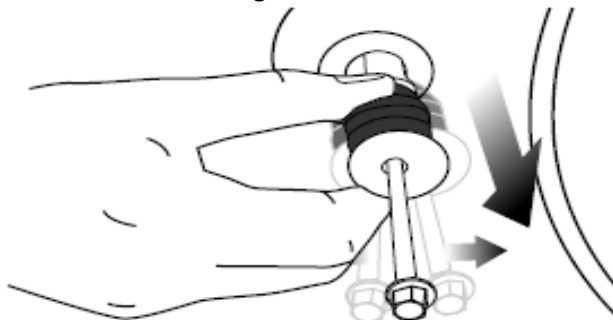


Figure 4.3

2. Remove transportation safety bolts by turning them gently.

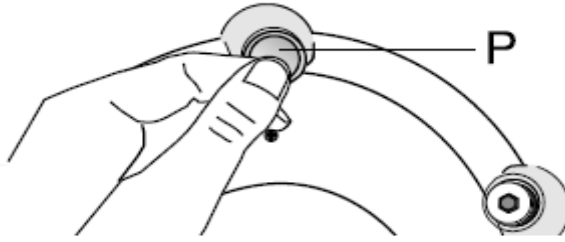


Figure 4.4

3. Attach the plastic covers supplied in the User Manual bag into the holes on the rear panel. (P)

	Keep the transportation safety bolts in a safe place to reuse when the washing machine needs to be moved again in the future.
	Never transport the machine unless its transport safety bolts are installed!

4.4. Connection to the Supply Water

	Required water pressure is between 1-10 bar (0.1-1 MPa) for the proper operation of the machine. For the healthy operation of the machine, 10 – 80 liters of water per minute should be supplied from a fully opened tap. If the water pressure is higher, attach a pressure decrease valve.
	If you will use the double water inlet product as a single water inlet (cold), before operating the product, make sure you insert the plug supplied with the product to the hot water inlet. (It applies to the products with which blind plug group is supplied.)

	WARNING: Single water inlet models should not be connected to the hot water tap. Laundry may be damaged or product may not operate according to the protection status.
	WARNING: Do not use the old or used water inlet hoses for the new product. It may leave stains on your laundry.

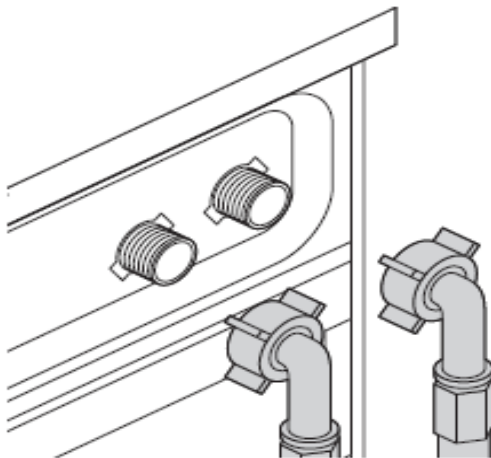


Figure 4.5

1. Connect the special hoses supplied with the product to the water inlets on the product. Hose with red inscriptions (left) (Max. 90 °C) is for hot water inlet, hose with blue inscriptions (right) (Max. 25 °C) is for cold water inlet.



WARNING: Make sure that the hot and cold water taps are connected correctly when the product is being installed. Your laundry may come out hot at the end of the washing cycle and wear out.

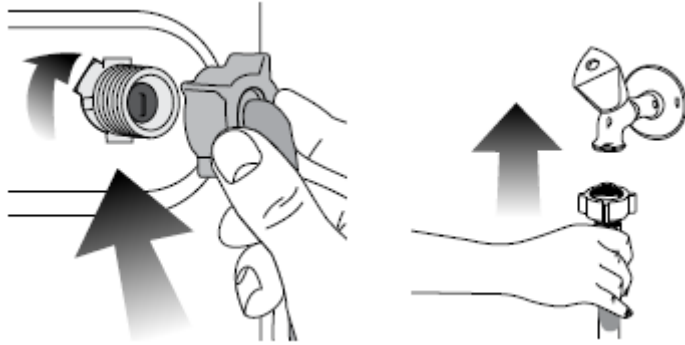


Figure 4.6

2. Tighten the nuts of the hose by hand. Never use a tool when tightening the nuts.

3. When hose connection is completed, check whether there is leak problems at the connection points by opening the taps fully. In case of any leakage, close the tap and remove the nut. Check the seal and tighten the nut again carefully. In order to prevent the water leaks and resultant damages, keep the taps closed when you do not use the product.

4.5. Connection to the water drain

- End of the drain hose should be attached directly to waste water drain, lavatory or bathtub.



WARNING: If the hose is dislocated during water draining, it will flood your house. Also, there is risk of burning by hot water due to washing at high temperatures. In order to prevent such situations and make sure that the machine performs water intake and discharge processes without any problem, fix the drain hose securely.

- The hose should be attached to a height of at least 40 cm, and 100 cm at most.

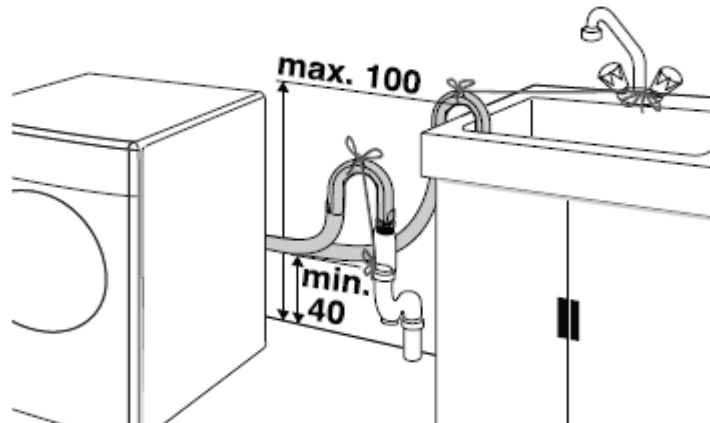


Figure 4.7

If the hose is placed at floor level or near to floor (less than 40 cm) and heightened later on, water drain becomes difficult and laundry may come out extremely wet. Therefore, follow the heights described in the figure.

- To prevent the waste water to go back into the machine again and to ensure easy drainage, do not immerse the end of the hose into the waste water or do not insert it into the drain for more than 15 cm. Shorten it if it is longer than enough.
- End of the hose should not be bent, it should be stepped on and Hose should not be folded between the drain and the machine.
- If the hose is not long enough, add the original extension hose to be supplied and use it in this way. Hose cannot be longer than 3.2 m. In order to prevent water leaks, fasten the extension hose and the drain hose of the product securely with a clips to prevent any leak.

4.6. Adjustment of legs



WARNING: Product should stand on its legs stable and in a balanced way in order for it to operate silently and without vibration. Ensure balance by setting its legs. Otherwise, the product may move from its place and cause crushing and vibration problems.

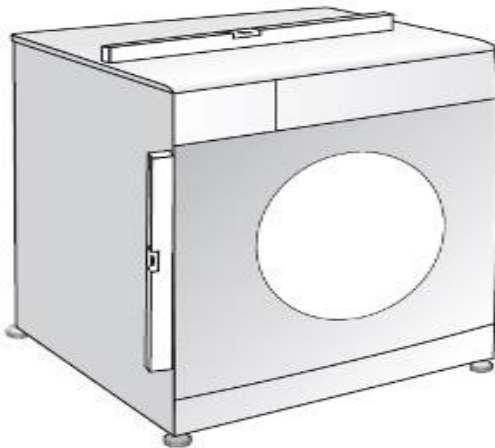


Figure 4.8

1. Loosen the lock nuts on the feet by hand.

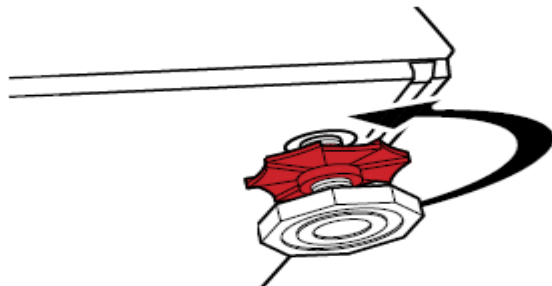


Figure 4.9

2. Adjust the legs until the product stands in a stable and balanced way. _____

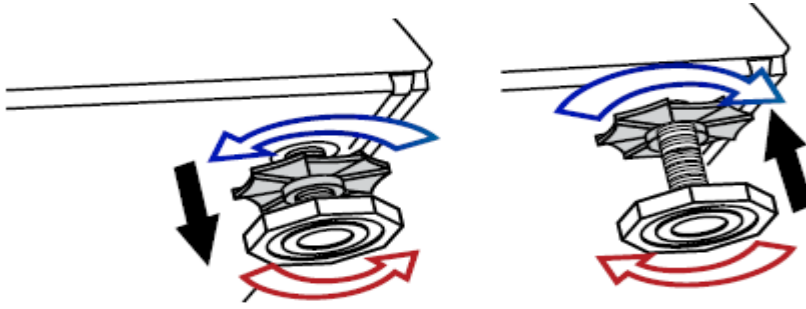


Figure 4.10

3. Tighten all lock nuts by hand again.

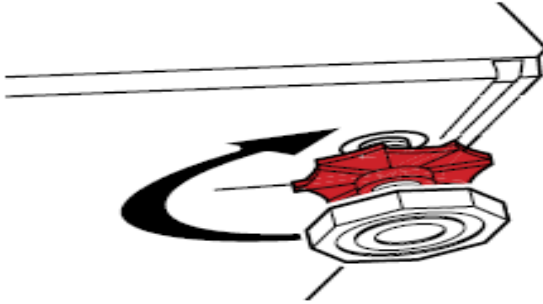


Figure 4.11



WARNING: Do not use any appliance or tool to loose the lock nuts. Otherwise, they may be damaged.

4.7. Electrical connection

Plug the product into a grounded outlet protected by a 16-ampere fuse. If the machine is used without grounding which conform to the local regulations, our company will not be liable for any damages which may arise.

- Connection should comply with the national regulations.
- Power cable's plug should be easily accessible after installation.
- If the current value of your fuse is below 16 amperes, make a qualified electrician connect a 16-ampere fuse.
- Voltage specified in the "Technical specifications" section should match the mains voltage.
- Do not connect to the extension cables or multiple outlets.



WARNING: Damaged power cables should be replaced by the Authorized Service.

4.8. Transportation of the product

1. Before transporting the product, unplug it from the mains.
2. Remove the connections of water drain and water mains.
3. Discharge the entire amount of water left inside the product.
4. Install the transport safety bolts in reverse order of the disassembly procedure.



Never transport the machine unless its transport safety bolts are installed!



WARNING: Packaging materials may be dangerous for the children. Keep the packaging materials out of the reach of the children.

5. Use of Product and Byproducts

5.1. Preparation

5.1.1. Sorting the Laundry

- Sort laundry according to type of fabric, color, and degree of soiling and allowable water temperature.
- Always obey the instructions given on the garment tags.

LAUNDRY WASH SYMBOLS												
 WASH	Machine Wash Symbols	 Normal wash	 No Iron	 Sensitive-Delicate wash	 Hand wash	 Not washable	 No Spin					
	Water Temperatures	Maximum	95°C	70°C	60°C	50°C	40°C	30°C				
		Symbol(s)	•••	••	••	•••	••	•				
 DRYING	Drying Symbols	 Suitable for dryer	 No Iron	 Sensitive / Delicate dry	 Do not dry with dryer	 Do not dry	 Do not dry-clean					
	Drying Settings	 At any temperature	 At high temperature	 At medium temperature	 At low temperature	 Without heating	 Hang to dry	 Lay to dry	 Hang wet to dry	 Lay in shadow to dry	 Dry-cleanable	
 IRON	Iron -	 Iron at high temperature	 Iron at medium temperature	 Iron at low temperature	 Do not iron	 Iron without steam						
	Dry or Steam	Iron at high temperature	Iron at medium temperature	Iron at low temperature	Do not iron	Iron without steam						
	Maximum temperature	200 °C	150 °C	110 °C								
 BLEACH	 All bleaches are allowed	 Bleach (sodium hypochlorite) can be used	 Bleach is not allowed	 Only bleaches without chlorine are allowed								

Figure 5.1 Washing Symbols

5.1.2. Preparation of the garments to be washed

- Laundry items which contain accessories such as support wire, buckle or metal button may damage the washing machine. Remove the metallic parts or wash the laundry by putting them into a bag or pillow case.

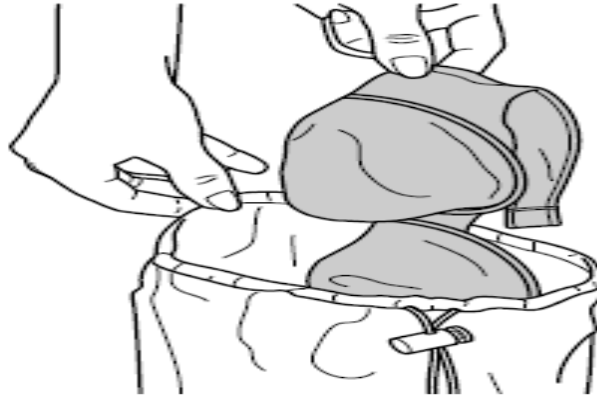


Figure 5.2

- Remove all objects such as coins, pens, paper clips, etc. and reverse the pockets and brush them. Such objects may damage the product or lead to sound problem.
- Put the small size laundry items such as children socks or nylon socks into a laundry bag or pillow case.
- Place the curtains without squeezing them. Remove the curtain fittings.
- Close the zips, sew the loose buttons, repair the tears and rips.
- Wash the items at appropriate programs according to “Machine Wash” or “Hand Wash” labels.
- Do not wash the colored items with whites. New, dark color cotton garments may release much dye. Wash them separately.
- Tenacious stains should be handled appropriately before wash. If you are not sure, check it with a dry cleaner.
- Only use the dyes / color changers and descaling agents which are appropriate to machine wash. Read the instructions on the packaging.
- Wash the pants and delicates by reversing them.
- Before washing the garments made of angora wool, wait them in the freezer compartment of the refrigerator for a few hours. Thus, the tuft amount which may be created will lessen.
- Before putting the laundry items which are frequently exposed to substances such as flour, lime powder, milk powder, etc., shake them well. Such dusts and powders on the laundry may build up on the inner parts of the machine in time and can cause damage.

5.1.3. Things to do for energy saving

- Following information will help you use the product in an ecological and energy-efficient manner.
- Operate the machine with the highest capacity permitted by the program you selected and do not over load it. See "Program and consumption table".
- Observe the temperature recommendations given on the detergent package.
- Wash your slightly soiled laundry at low temperatures.
- Prefer short programs for the slightly soiled and small amounts of laundry.
- Do not use pre-wash and high temperatures for your laundry which are not heavily soiled and stained.
- If you will dry your laundry in a drier, select the highest spin speed which is recommended for your washing program.
- Do not use detergent in excess of the amount recommended on the detergent package.

5.1.4. Correct load capacity

The maximum load capacity depends on the type of laundry, the degree of soiling and the washing programme desired.

Machine automatically adjusts the water amount according to the weight of the laundry put inside it.



WARNING: Observe the information written in the "Program and consumption table". When it is overloaded, washing performance of the machine will be decreased. Also, sound and vibration problems may occur.

Laundry type	Weight (g)
Bathrobe	1200
Napkin	100
Quilt cover	700
Bed sheet	500
Pillow case	200
Table cover	250
Towel	200
Hand towel	100
Night dress	200
Underwear	100
Men's smock	600
Men's shirt	200
Men's pajamas	500
Blouse	100

Figure 5.3 Laundry weights

5.1.5. Laundry loading

1. Open the laundry cover.
2. Put the garments into the machine in a loose manner.
3. Push and close the loading cover until you hear the locking sound. Make sure that the garments do not get pinched between the door.

	Loading door gets locked when operating. Door lock opens soon after the program finishes.
	WARNING: If the laundry is placed wrongly, sound and vibration problems may occur in the machine.

5.1.6. Use of detergent and softener

	When using detergent, softener, starch, fabric dye, bleach or lime scale remover; read the manufacturer's instructions on the package carefully and follow the suggested dosage values. Use measuring cup if available.
---	---

DETERGENT DISPENSER

Detergent dispenser consists of three compartments:

- (1) For prewash
- (2) For main wash
- (3) For softener
- (*) Moreover, there is a siphon part in the softener compartment.

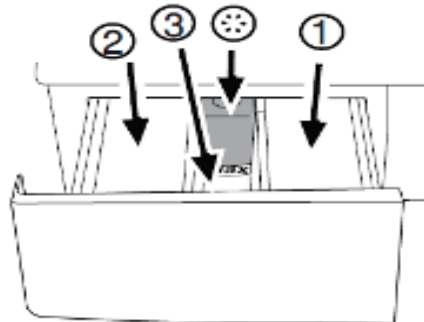


Figure 5.4 Compartments of the detergent dispenser

DETERGENT, SOFTENER AND OTHER CLEANING AGENTS

- Before starting the wash program, add detergent and softener.
- While the washing cycle is in progress, do not leave the detergent dispenser open!
- If you are using a program without prewash, do not add detergent into the prewash compartment (compartment number “1”).
- In a prewash program, do not add liquid detergent into the prewash compartment (compartment number “1”).

- If you are using detergent bag or dosage ball, do not select a prewash program. Place the detergent bag or dosage ball directly among the garments in the machine.
- If you are using liquid detergent, do not forget to place the liquid detergent container into the main wash compartment (compartment number "2").

DETERGENT SELECTION

Detergent type to be used depends on the fabric type and color.

- Use separate detergents for color and white laundry items.
- Wash your delicate garments only with the special detergents which are used for delicates (liquid detergent, wool shampoo, etc.).
- You are recommended to use liquid detergent when washing dark color garments or quilts.
- Only wash the woolens with the special detergent used for woolens.

	WARNING: Only use the detergents which are intended and manufactured for the washing machines.
	WARNING: Do not use soap powder.

ADJUSTMENT OF DETERGENT AMOUNT

Amount of detergent to be used depends on the laundry amount, soil degree and hardness of water.

- Do not exceed the dosages which are recommended on the detergent package in order to prevent the excessive foam and bad rinse results, to save detergent and to protect the environment.
- Use lower amounts of detergent for a small amount of laundry or slightly soiled items.

USE OF SOFTENER

Put the softener into the softener compartment of the detergent dispenser.

- Do not exceed the (>max<>) level sign on the softener compartment.
- If the softener lost its fluidity, dilute it with water before putting it into the compartment.

USE OF LIQUID DETERGENTS

If the product has a liquid detergent container

- Make sure that you place the liquid detergent container into the compartment number "2".
- If the liquid detergent lost its fluidity, dilute it with water before putting it into the detergent container.

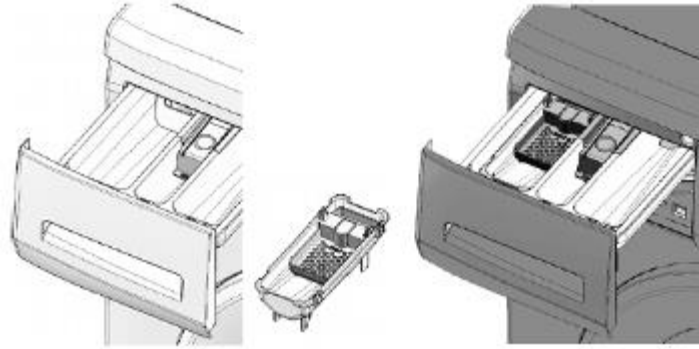


Figure 4.5 Use of liquid detergent container

If the product does not have a liquid detergent container

- In a prewash program, do not use liquid detergent for prewash.
- Liquid detergent leaves stains on your items when delayed start function is used. Do not use liquid detergent if you will use Delayed Start feature.

Use of gel and tablet detergent

Apply the following actions when using tablet, gel detergents, etc.

- If the gel detergent is fluid and if your machine does not have a special liquid detergent container, put the gel detergent into the main wash detergent compartment during first intake of water. If your machine has a liquid detergent container, fill the detergent into this container before starting the program.
- If the gel detergent is not fluid or it is a capsule liquid tablet, put it directly into the drum before starting the washing cycle.
- Put the tablet detergents into the main wash compartment (number “2”) or directly into the drum before starting the washing cycle.

	Tablet detergents may leave a residue in the detergent compartment. If you encounter such a problem, place the tablet detergent among the laundry items at the bottom of the drum.
	Use the tablet or gel detergent without selecting the prewash function.

Use of Soda

- Put the liquid soda, powder soda or the fabric dye into the softener compartment.
- In a wash program, do not put softener and soda at the same time.
- After using soda, wipe the inside of the machine with a damp and clean cloth.

Use of bleach and decolorant

- Add the bleach at the beginning of the washing cycle by selecting a prewash program. Do not put detergent into the prewash compartment. As an alternative application, add the bleach while the machine is taking water from the detergent compartment in the first rinse step by selecting a program with additional rinse.
- Do not use bleach by mixing it with detergent.

- Use a small amount of bleach (1/2 tea glass-approx. 50 ml) and rinse the laundry well since bleach will cause skin irritation. Do not pour the bleach onto the laundry and do not use it with the colored items.
- When using oxygen-based decolorant, select a program which washes the laundry at a low temperature.
- Oxygen-based decolorant can be used with the detergent; however, if it is not at the same consistence, first put detergent in the compartment number “2” in the detergent dispenser and wait for the machine to flush the detergent when taking in water. While the machine continues taking in water, add decolorant in the same compartment.

Use of descaling agent

- When it is necessary, only use the descaling agents which are intended and manufactured for the washing machines.

5.1.7. First Use

Before starting to use the product make sure that the preparations are made which are in line with the “Important Safety Instructions” and the instructions in the “Installation” section.

In order to make the machine ready to wash laundry, perform the first washing cycle with the Drum Cleaning program. If your machine does not have a Cauldron Cleaning program. In order to make the machine ready to wash laundry, perform the first washing cycle in line with the method which is described under the heading Cleaning the Loading Door and Drum in section .



Figure 5.6 Cleaning the bellows

	Use an anti-limescale suitable for the washing machines.
	There might be a little amount of water left inside the product due to the quality control procedures during manufacturing. It is not harmful for the product.

5.2. Control panel

B13 B7S Introduction of LED Control System

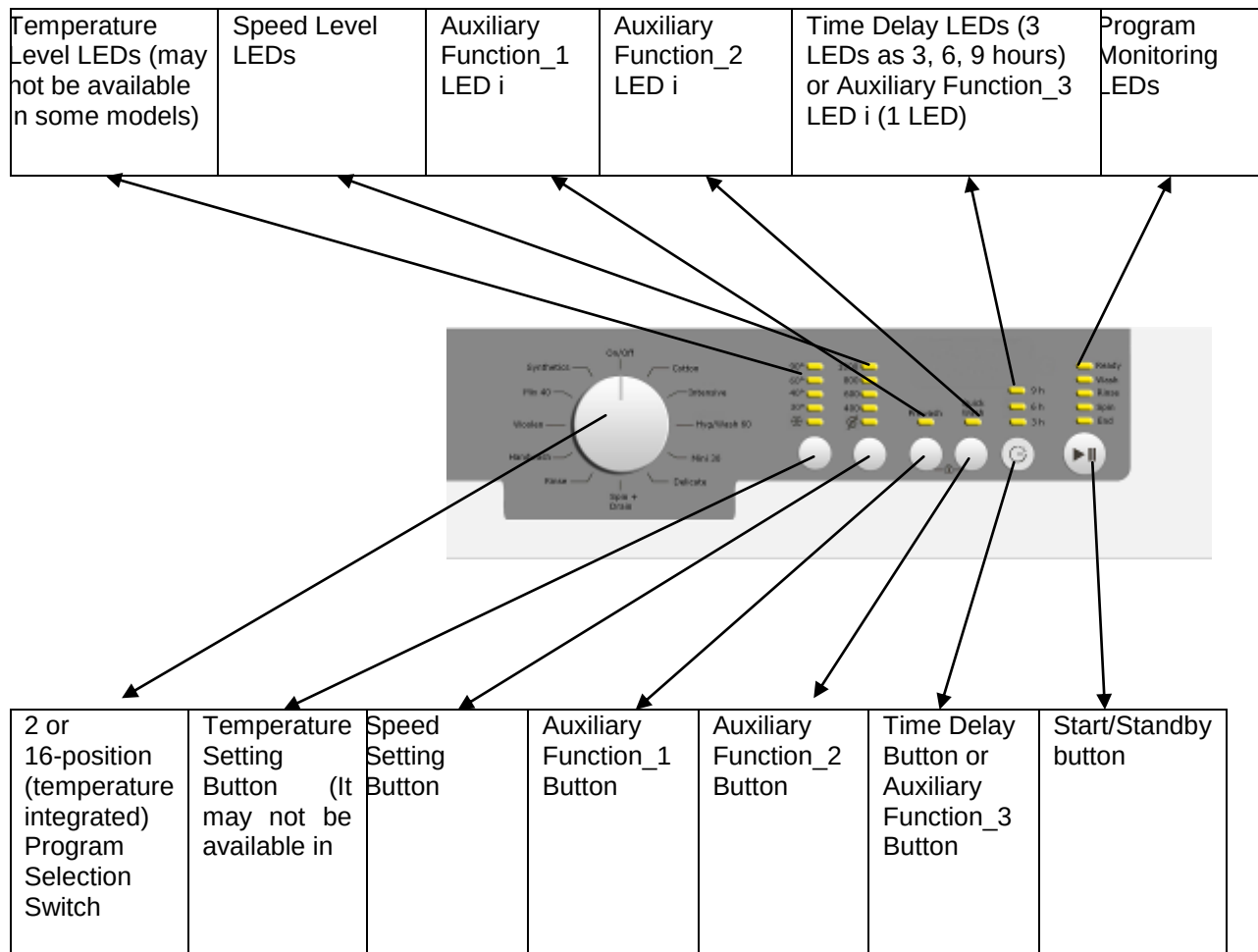


Figure 5.7 Control panel

- 1 - Program Selection knob (Uppermost position On / Off)
- 2 - Screen
- 3 - Delayed Start Indicator
- 4 - Program Follow-up indicator
- 5 - Start / Pause button
- 6 - Auxiliary Function buttons
- 7 - Spin Speed Adjustment button
- 8 - Temperature Adjustment button

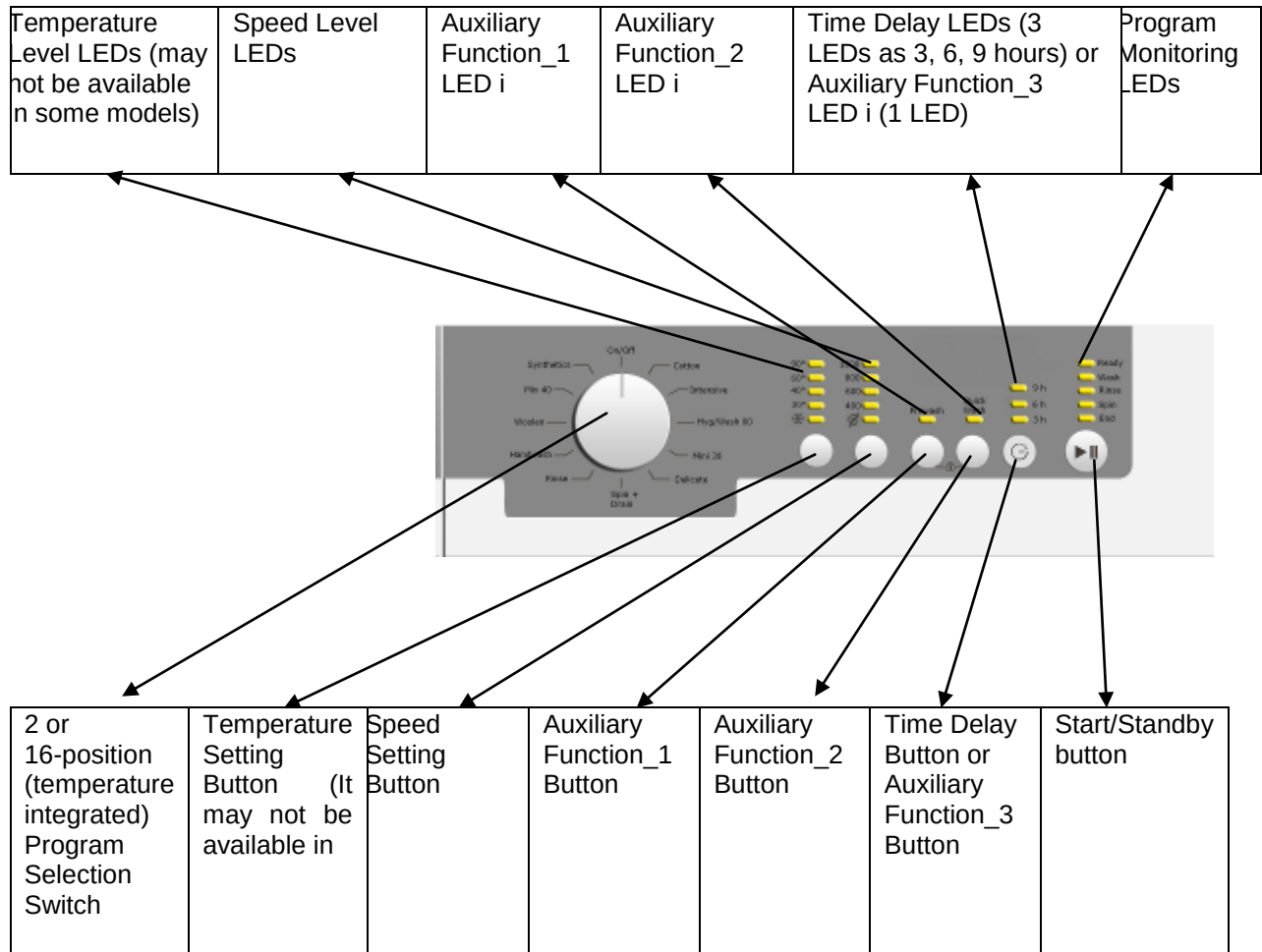
B13 B7S Introduction of LED Control System


Figure 5.8 Control panel

5.3. Preparing the Machine

1. Make sure that the hoses are secured tightly.
2. Plug in the machine.
3. Open the water tap fully.
4. Place the laundry inside the machine.
5. Add detergent and softener.

5.4. Program selection and tips for correct washing

1. Select the programme suitable for the type, quantity and soiling degree of the laundry in accordance with the "Programme and consumption table" and the temperature table below.
2. Select any program you want to use by using Program Selection switch.

		Clothes			
		Light Colored Items and Whites	Colored Items	Black/Dark Colored Items	Delicates/Woolens/Silk Items
		(Washing temperature range recommended for the soil amount: 40-90C)	(Washing temperature range recommended for the soil amount: cold-40C)	(Washing temperature range recommended for the soil amount: cold-40C)	(Washing temperature range recommended for the soil amount: cold-30C)
Soil Amount	Heavily Soiled (Tenacious stains such as grass, coffee, fruit, blood stains.)	Prewash may be necessary in order to perform a preliminary process for the stains. Powder and liquid detergents which are recommended for the whites can be used at the doses which are recommended for the heavily soiled laundry. It is recommended that powder detergents are used to clean the stains which are sensitive to the decolorants and the clay and soil stains.	Powder and liquid detergents which are recommended for the colored items can be used at the doses which are recommended for the heavily soiled laundry. It is recommended that powder detergents are used to clean the stains which are sensitive to the decolorants and the clay and soil stains. Detergents not containing decolorants should be used.	Liquid detergents which are appropriate for colored and black/dark items can be used at the doses which are recommended for the heavily soiled laundry.	Prefer the liquid detergents which are manufactured for the delicate laundry. Woolens or silk clothes should be washed with the detergents which are specially manufactured for woolens.
	Normally Soiled Items (Body dirt stains at the collars and cuffs are examples.)	Powder and liquid detergents which are recommended for the whites can be used at the doses which are recommended for the normally soiled laundry.	Powder and liquid detergents which are recommended for the colored items can be used at the doses which are recommended for the normally soiled laundry. Detergents not containing decolorants should be used.	Liquid detergents which are appropriate for colored and black/dark items can be used at the doses which are recommended for the normally soiled laundry.	Prefer the liquid detergents which are manufactured for the delicate laundry. Woolens or silk clothes should be washed with the detergents which are specially manufactured for woolens.
	Slightly Soiled (There are not visual stains.)	Powder and liquid detergents which are recommended for the whites can be used at the doses which are recommended for the slightly soiled laundry.	Powder and liquid detergents which are recommended for the colored items can be used at the doses which are recommended for the slightly soiled laundry. Detergents not containing decolorants should be used.	Liquid detergents which are appropriate for colored and black/dark items can be used at the doses which are recommended for the slightly soiled laundry.	Prefer the liquid detergents which are manufactured for the delicate laundry. Woolens or silk clothes should be washed with the detergents which are specially manufactured for woolens.

Table 5.1 Recommendations for correct washing

5.5. Main Programs

Depending on the type of fabric, use the following main programs.

Cottons

Use this programme for your cotton laundry (such as bed sheets, duvet and pillowcase sets, towels, bathrobes, underwear, etc.). Your laundry will be washed with vigorous washing action for a longer washing cycle.

Synthetics

Use this programme to wash your synthetic clothes (shirts, blouses, synthetic/cotton blends, etc.). Your laundry is washed with a softer washing movement and in a shorter period of time.

You are recommended to use Synthetics 40°C program for your curtains and tulle curtains by selecting the prewash and crease reduction functions. Wash tulle by putting a small amount of detergent into the main wash compartment since tulle creates too much foam due to its porous structure. Do not put detergent into the prewash compartment.

Woolens

You can wash your machine-washable woolen laundry at this program. Wash your laundry by selecting an appropriate temperature written on its label. It is recommended that you use appropriate detergent for woolens.

5.6. Additional programs

For special cases, additional programmes are available in the machine.



Additional programmes may differ according to the model of the machine.

Cottons Eco

By washing normally soiled cotton and linen laundry in this programme, you can ensure higher energy and water efficiency than other cotton programmes do. Actual water temperature may be different from the stated wash temperature. When you load the machine with less laundry (e.g. ½ capacity or less), programme time may automatically get shorter in the later stages. In this case, energy and water consumption will reduce for a more economic wash. This feature is provided in the models with the remaining time indicator.

Delicate

Use it to wash your delicate laundry. It washes with a gentler action without any interim spins compared to the Synthetics program. It should be used for laundry for which sensitive wash is recommended.

Hand wash

Use this programme to wash your woolen/delicate clothes that bear “not machine-washable” tags and for which hand wash is recommended. It washes laundry with a very gentle washing action to not to damage clothes.

Mini

Use this programme to wash your lightly soiled cotton clothes in a short time.

Quick 14

Use this programme to wash your little amount of lightly soiled cotton clothes in a short time. Your clothes will be washed at 30 °C in a short time like 14 minutes.

Dark colored items

Use this programme to wash your dark colored laundry or the laundry that you do not want it get faded. Washing is performed by a low mechanical movement and at a low temperature. Liquid detergent or wool shampoo are recommended for colored items.

Mix

Use this programme to wash your cotton and synthetic clothes together without sorting them.

Shirts

Use this programme to wash the shirts made of cotton, synthetic and synthetic blended fabrics together.

Sports

Use this programme to wash your garments that are worn for a short time such as sportswear. It is suitable to wash little amount of cotton / synthetic blended garments.

5.7. Special programs

For specific applications, select any of the following programmes.

• Rinse

Use this programme when you want to rinse or starch separately.

• Spin+Pump

Use this programme to apply an additional spin cycle for your laundry or to drain the water in the machine.

Before selecting this programme, select the desired spin speed and press Start / Pause button. First, the machine will drain the water inside of it. Then, it will spin the laundry with the set spin speed and drain the water coming out of them.

If you wish to drain only the water without spinning your laundry, select the Pump+Spin programme and then select the No Spin function with the help of Spin Speed Adjustment button. Press Start / Pause button.



Use lower spin speeds for delicate laundries.

5.8. Temperature selection

Whenever a new programme is selected, the maximum temperature for the selected programme appears on the temperature indicator.

To decrease the temperature, press the Temperature Adjustment button.

Temperature will decrease gradually.



If the programme has not reached the heating step yet, you can change the temperature without switching the machine to Pause mode.

5.9. Program and consumption table

EN						Auxiliary functions							Selectable temperature range °C
Programme		Max. Load (kg)	Water Consumption (l)	Energy Consumption (kWh)	Max. Speed***	Prewash	Quick Wash	Rinse Plus	Anti-Creasing	Rinse Hold	Soaking	Pet hair removal	
Cotton Economic	60**	8	53	1.07	1600					•			40-60
	60**	4	48	0.70	1600					•			40-60
	40**	4	48	0.68	1600					•			40-60
Cottons	90	8	80	2.60	1600	•	•	•	•	•	•	•	Cold-90
	60	8	80	1.80	1600	•	•	•	•	•	•	•	Cold-90
	40	8	80	0.90	1600	•	•	•	•	•	•	•	Cold-90
Synthetics	60	4	60	1.00	800	•	•	•	•	•	•	•	Cold-60
	40	4	60	0.58	800	•	•	•	•	•	•	•	Cold-60
Daily express	90	8	70	2.20	1400			•		•			Cold-90
	60	8	70	1.13	1400			•		•			Cold-90
	30	8	70	0.31	1400			•		•			Cold-90
Super short express	30	2	50	0.11	1400			•		•			Cold-30
Darkwash	40	4	75	0.63	800			*		•			Cold-40
Mix40	40	4	60	0.70	800	•	•	•	•	•	•	•	Cold-40
Hand wash	20	1.5	35	0.18	600								20
Woollens	40	2	54	0.35	600			•		•			Cold-40
Shirts	60	4	85	1.29	600	•	•	•	*	•	•		Cold-60
BabyProtect	90	8	100	2.60	1600	•		*		•	•		30-90
Hygiene 20°	20	4	98	0.42	1600			*		•	•		20
Delicate 20°	20	4	45	0.15	600			•	•	•	•		20

• : Selectable

* : It is selected automatically, cannot be cancelled.

** : Energy Label programme (EN 60456 Ed.3)

*** : If the machine's maximum spinning speed is lower, selection can be performed up to maximum spinning speed.

- : See the programme description for maximum load.

	** "Cotton eco 40°C and Cotton eco 60°C are standard programmes." These programmes are known as '40°C cotton standard programme' and '60°C cotton standard programme' and shown on the panel with   symbols.
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	Water and energy consumption may differ from the values given in the table depending on the water pressure, hardness and temperature, ambient temperature, laundry type and amount, auxiliary functions selected, spinning speed and the fluctuations in the mains voltage.
	You can see the washing time of the program which you selected on the screen of your machine. It is normal that there are small differences between the duration seen on the display and the actual washing duration.
	Auxiliary functions on the table may vary depending on the model of the machine.

5.10. Auxiliary function selection

Select the auxiliary functions before starting the program. Furthermore, you may also select or cancel auxiliary functions that are suitable to the running programme without pressing the Start / Pause button when the machine is operating. For this, the machine must be in a step before the auxiliary function you are going to select or cancel.

If the auxiliary function cannot be selected or canceled, light of the relevant auxiliary function will blink 3 times to warn the user.

	Some functions cannot be selected at the same time. For example, Prewash and Quick Wash.
	If an auxiliary function which is incompatible with the first selected auxiliary function before the machine is operated, first selected function will be cancelled and the last selected auxiliary function will remain selected. For instance, if Prewash is selected first and then Quick Wash is wanted to be selected, prewash becomes cancelled, quick wash remains valid.
	Auxiliary functions which are not compatible with the program cannot be selected. (See "Program and consumption table")
	Auxiliary function buttons may vary according to the model of the machine.

Prewash

Prewash is necessary for heavily soiled laundry only. If you do not use a prewash cycle, you save energy, water, detergent and time.

	Prewash without detergent is recommended for tulle and curtains.
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Quick

This function can be used for Cottons and Synthetics programs. It makes it possible to shorten the wash time of the not very soiled laundry and decreases the rinse number.



When you select this function, load laundry which is just the half of the maximum laundry load specified in the program table.

Extra rinse

This function will make sure that the machine performs an extra rinse in addition to the rinse applied after the main program. Therefore, you can avoid the risk of affecting the sensitive skins (baby skins, allergic skins, etc.) by the small amount of leftovers on the laundry.

Extra water

This function makes sure that you wash and rinse your laundry at Cottons, Synthetics, Delicates and Woolens programs with plenty of water. Use this function for the delicate laundry which are easily creased.



When you select this function, load laundry which is just the half of the maximum laundry load specified in the program table.

Crease reduction

This function ensures that the laundry is creased less when being washed. Drum rotation movements are lessened and spinning speed is limited in order to reduce the crease level. In addition to them, wash is performed at a high water level.

Rinse Hold

If you are not going to unload your clothes immediately after the programme completes, you can use rinse hold function to keep your laundry in the final rinsing water in order to prevent them from getting wrinkled when there is no water in the machine. Press Start / Pause button after this process if you want to drain the water without spinning your laundry. Programme will resume and complete after draining the water.

If you want to spin the laundry held in water, adjust the Spin Speed and press Start / Pause button.

Program will continue. Water is drained, laundry is spun and the programme is completed.

Pet hair removal

This function helps to remove pet hair that remain on your garments more effectively. When you select this function, Prewash and Extra Rinse steps are added to the normal programme. Thus, washing is performed with more water (30%) and the pet hair is removed more effectively.



CAUTION: Never wash your pets in the washing machine.

Delayed Start

With the Delayed Start function the startup of the program may be delayed up to 19 hours. Delayed start time can be increased by increments of 1 hour.



Do not use liquid detergents when you set Delayed Start! There is risk of staining the laundry.

1. Open the loading door, load the laundry and fill in detergent, etc.

2. Select the wash program, temperature, spinning speed and the auxiliary functions if necessary.
3. Set the desired time by pressing the Delayed Start button.
4. Press Start / Pause button. The delayed start time you have set is displayed. Delayed start countdown starts. “_” symbol next to the delayed start time moves up and down on the display.



Additional laundry may be loaded during the delayed start period.

5. At the end of the countdown, duration of the selected programme will be displayed. “_” symbol will disappear and the selected programme will start.

Changing the delayed start period

If you want to change the time during countdown:

1. Press Delayed Start button. Time will increase by 1 hour each time you press the button.
2. If you want to decrease the delayed start time, press Delayed Start button repeatedly until the desired delayed start time appears on the display.

Canceling the Delayed Start function

If you want to cancel the delayed start countdown and start the programme immediately:

1. Set the Delayed Start period to zero or turn the Programme Selection knob to any programme. Thus, Delayed Start function will be canceled. The End/Cancel light flashes continuously.
2. Then, select the programme you want to run again.
3. Press Start / Pause button to start the programme.

5.11. Starting the program

1. Press Start / Pause button to start the programme.
2. Programme follow-up light showing the startup of the programme will turn on.



If no programme is started or no key is pressed within 1 minute during programme selection process, the machine will switch to Pause mode and the illumination level of the temperature, speed and loading door indicator lights will decrease. Other indicator lights and indicators will turn off. Once the Programme Selection knob is rotated or any button is pressed, indicator lights and indicators will turn on again.

5.12. Child Lock

You can prevent the children to play with the machine by means of the child lock function. You can prevent any change to be effected for any program in progress by activating this function.



If the Programme Selection knob is turned when the Child Lock is active, "Con" appears on the display. The Child Lock does not allow any change in the programmes and the selected temperature, speed and auxiliary functions.



Even if another programme is selected with the Programme Selection knob while the Child Lock is active, previously selected

	programme will continue running.
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To activate the Child Lock:

1st and 2nd Press the Auxiliary Function buttons for 3 seconds. The lights on the 1st and 2nd Auxiliary Function buttons will flash while you keep the buttons pressed for 3 seconds, and "C03", "C02", "C01" will appear on the display respectively. Then, "Con" will appear on the display indicating that the Child Lock is activated. If you press any button or turn the Programme Selection knob when the Child Lock is active, same phrase will appear on the display. The lights on the 1st and 2nd auxiliary function buttons that are used to deactivate the Child Lock will blink 3 times. To deactivate the Child Lock:

While any programme is running 1st and 2nd Press the Auxiliary Function buttons for 3 seconds. The lights on the 1st and 2nd Auxiliary Function buttons will flash while you keep the buttons pressed for 3 seconds, and "C03", "C02", "C01" will appear on the display respectively. Then, "COF" will appear on the display indicating that the Child Lock is deactivated.

	In addition to the method above, to deactivate the Child Lock, switch the Programme Selection knob to On / Off position when no programme is running, and select another programme.
	Child Lock is not deactivated after power failures or when the machine is unplugged.

5.13. Progress of the Program

Progress of a running programme can be followed from the Programme Follow-up indicator. At the beginning of every programme step, the relevant indicator light will turn on and light of the completed step will turn off.

You can change the auxiliary functions, speed and temperature settings without stopping the programme flow while the programme is running. To do this, the change you are going to make must be in a step after the running programme step. If the change is not compatible, relevant lights will flash for 3 times.

	If the machine does not pass to the spinning step, Rinse Hold function might be active or the automatic unbalanced load detection system might be activated due to the unbalanced distribution of the laundry in the machine.
---	---

5.14. Lock of the loading door

There is a locking system on the loading door of the machine that prevents opening of the door in cases when the water level is unsuitable.

Loading door light will start flashing when the machine is switched to Pause mode. Machine checks the level of the water inside. If the level is suitable, Loading Door light illuminates steadily within 1-2 minutes and the loading door can be opened. If the level is unsuitable, Loading Door light turns off and the loading door cannot be opened. If you are obliged to open the loading door while the Loading Door light is off, you must cancel the current programme. See "Cancelling a Program".

5.15. Changing the selections after the program started

Switching the machine to pause mode

Press the Start / Pause button to switch the machine to pause mode while a programme is running. The light of the step which the machine is in starts flashing in the Programme Follow-up indicator to show that the machine has been switched to the pause mode.

Also, when the loading door is ready to be opened, Loading Door light will also illuminate continuously in addition to the programme step light.

Changing the auxiliary function, speed and temperature

Depending on the step the programme has reached, you can cancel or activate the auxiliary functions. See "Auxiliary function selection".

Moreover, you can also change the speed and temperature settings. See "Speed Selection" and "Temperature Selection"



If no change is allowed, the relevant light will flash for 3 times.

Addition or removal of laundry

1. Press Start / Pause button to switch the machine to pause mode. The programme follow-up light of the relevant step during which the machine was switched into the pause mode will flash.
2. Wait until the Loading Door can be opened.
3. Open the Loading Door and add or take out the laundry.
4. Close the Loading Door.
5. Make changes in auxiliary functions, temperature and speed settings if necessary.
6. Press Start / Pause button to start the machine.

5.16. Cancellation of program

To cancel the programme, turn the Programme Selection knob to select another programme. Previous programme will be cancelled. End / Cancel light will flash continuously to notify that the programme has been canceled.

Pump function is activated for 1-2 minutes regardless of the programme step, and whether there is water in the machine or not. After this period, your machine will be ready to start with the first step of the new programme.



Depending on the step where the programme was canceled in, you may have to put detergent and softener again for the programme you have selected anew.

5.17. Program end

"End" appears on the display at the end of the programme.

1. Wait until the loading door light illuminates steadily.
2. Press On / Off button to switch off the machine.
3. Take out your laundry and close the loading door. Your machine is ready for the next washing cycle.

5.18. There is a "Standby Mode" in your machine

After you switch on your machine with On-Off button, if no program is started or no other procedure is performed at the selection step or no action is taken within approx. 2 minutes after the your selected program ends, your machine will switch to the

energy saving mode automatically. Brightness level of the indicator LEDs will be decreased. Moreover, if there is a display on your product showing the program duration, this display will turn off completely. If you turn the program switch or touch any other button, LEDs and display will get back its original settings. Selections which made while exiting the energy saving mode may change. Before you start the program, check the accuracy of your selections. If necessary, repeat them. This is not an error.

6. MAINTENANCE AND CLEANING

Service life of product extends and frequently experienced problems will be reduced if it is cleaned at regular intervals.

6.1. Cleaning the detergent dispenser

Clean the detergent drawer at regular intervals (every 4-5 washing cycles) as shown below in order to prevent accumulation of powder detergent in time.

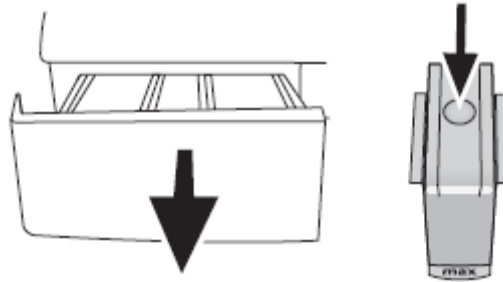


Figure 6.1 Cleaning the detergent compartment

1. Pull the detergent compartment towards yourself and remove it out by pushing onto the marked point of the siphon on the softener compartment.



If water and softener more than a normal amount start to stay on the softener compartment, siphon cleaning should also be performed.

2. Wash the dispenser and the siphon in the lavatory with an ample amount of lukewarm water. In order to prevent the residues to contact your skin, clean it with an appropriate brush by wearing a pair of gloves.
3. After the cleaning, replace the dispenser in order to make sure that the siphon is seated into its place well .

6.2. Cleaning the Loading Door and the Drum

Softener, detergent and dirt residues may accumulate in your machine in the course of the time and lead to complaints of odor and bad wash results. To prevent this, use **Drum Cleaning** program. If your machine does not have **Drum Cleaning** program, use the Cottons-90 program by selecting the Extra **Water** or **Extra Rinse** auxiliary function. Run these processes definitely without any laundry and when the machine is empty. Before starting the program, put one teaspoon (max. 100 g) powder descaling agent into the main wash detergent compartment (number 2). If the descaling agent is a tablet, put one tablet into the compartment number 2. After the program finishes, wipe dry the inside of the bellows with clean cloth.



Repeat the drum cleaning work at every 2 months.



Use a descaling agent which is appropriate for the washing machines.

Make sure that there is not any foreign bodies left inside the drum after each wash.

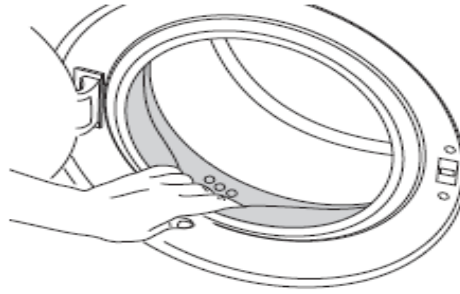


Figure 6.2 Cleaning the bellows

If the holes in the bellows shown in the Figure are clogged, open the holes by means of a toothpick.



Rust stains may form inside the drum due to the metal objects. Clean the stains on the surface of the boiler with stainless steel cleaning agents. Never use steel wool or wire wool.



WARNING: Never use sponge or scrub materials. These will damage the painted and plastic surfaces.

6.3. Cleaning the body and control panel

Wipe the body of the machine with soapy water or non-corrosive mild gel detergents as necessary, and dry with a soft cloth.

Use only a soft and damp cloth to clean the control panel.

6.4. Cleaning the water inlet filters

There is a filter at the end of each water intake valve at the rear of the machine and also at the end of each water intake hose where they are connected to the tap.

These filters prevent the foreign substances and dirt in the supply water to enter into the machine. Filters should be cleaned when they become dirty.

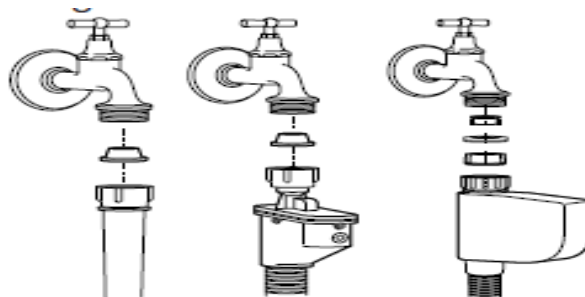


Figure 6.3

1. Shut the taps.
2. Remove the nuts of the water inlet hoses and clean the sediments on the filters of the water inlet valves with an appropriate brush. If the filters are too dirty, remove them from their places with a pliers and clean in this way.
3. Remove the filters on the flat end of the water inlet hoses along with their seals and wash them under running water well.

4. Replace the seals and filters carefully and tighten their nuts by hand.

6.5. Draining the remaining water and cleaning the pump filter

The filter system in your machine prevents solid items such as buttons, coins and fabric fibers clogging the pump impeller during discharge of washing water. Therefore the waste water is discharged without any problems and the service life of the pump is increased.

If the machine does not drain the water, pump filter may have been clogged. Filter should be cleaned when clogged or once in 3 months. In order to clean the pump filter, first the water should be drained.

Also, before transporting the machine (for example when moving to new house) and when the water has the risk of freezing, water may have to be fully drained.



WARNING: Foreign objects which stay inside the pump filter may damage your machine or cause noise problem.



WARNING: If the product is not being used, tap should be shut, mains pipe should be removed and the water inside the machine should be emptied against any likely freezing.



WARNING: Shut the tap which the mains pipe of the product is connected to after each use.

In order to clean the soiled filter and drain the water:

1. Unplug the machine and disconnect the power.



WARNING: Temperature of the water inside the machine may rise up to 90 °C. In order to avoid the burning risk, filter should be cleaned after the water inside the machine is cooled down.

2. Open the filter cover.



Figure 6.4 Cleaning the filter - 1

3. Some of our products have emergency draining hose and some do not have. Follow the steps below to discharge the water.

Discharging the water when the product has an emergency draining hose:

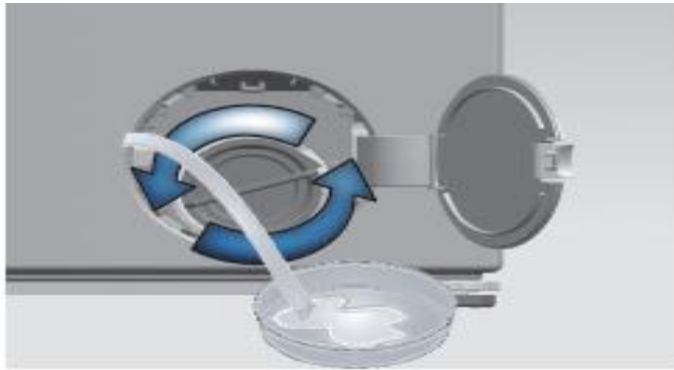


Figure 6.6 Cleaning the pump - 2

- Pull away the emergency water draining hose from its housing.
- Put the larger end of the hose into a large vessel. Pull and remove the plug at the end of the hose and drain the water into a vessel. When the vessel is full, shut the nozzle of the hose by inserting the plug into it. After you empty the vessel, repeat above procedures and drain the water inside the machine fully.
- When the water drainage is complete, block its nozzle again with the plug and secure the hose into its place.



Figure 6.6 Cleaning the pump filter - 3

- Turn and remove the pump filter.

Discharging the water when the product does not have an emergency draining hose:



Figure 6.7 Cleaning the pump filter - 4

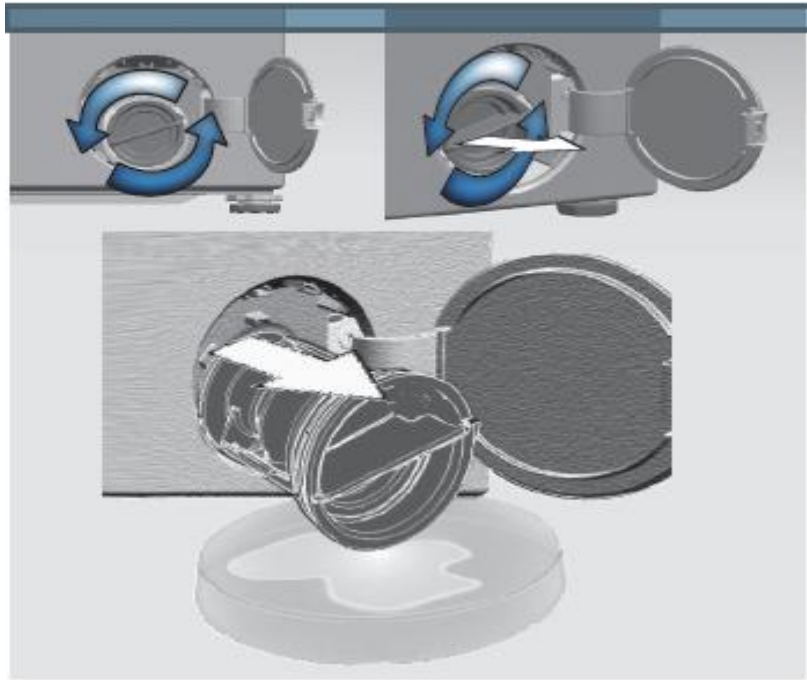


Figure 6.7 Cleaning the pump filter - 5

- a. In order to collect the water to flow out of the filter, place a large vessel in front of the filter.
- b. Turn and loosen the pump filter until water starts to flow (counterclockwise). Fill the flowing water into the vessel which you put in front of the filter. Always keep a piece of cloth handy to absorb any spilled water.
- c. When the water in the machine ceases, turn the pump filter and remove it fully.
4. Clean the residues inside the filter as well as the lint, if any, around the propeller.
5. Replace the filter.
6. Close the filter cap by pressing on the place of the tab.

7. GENERAL OPERATING PRINCIPLE

7.1. Water Intake Profile

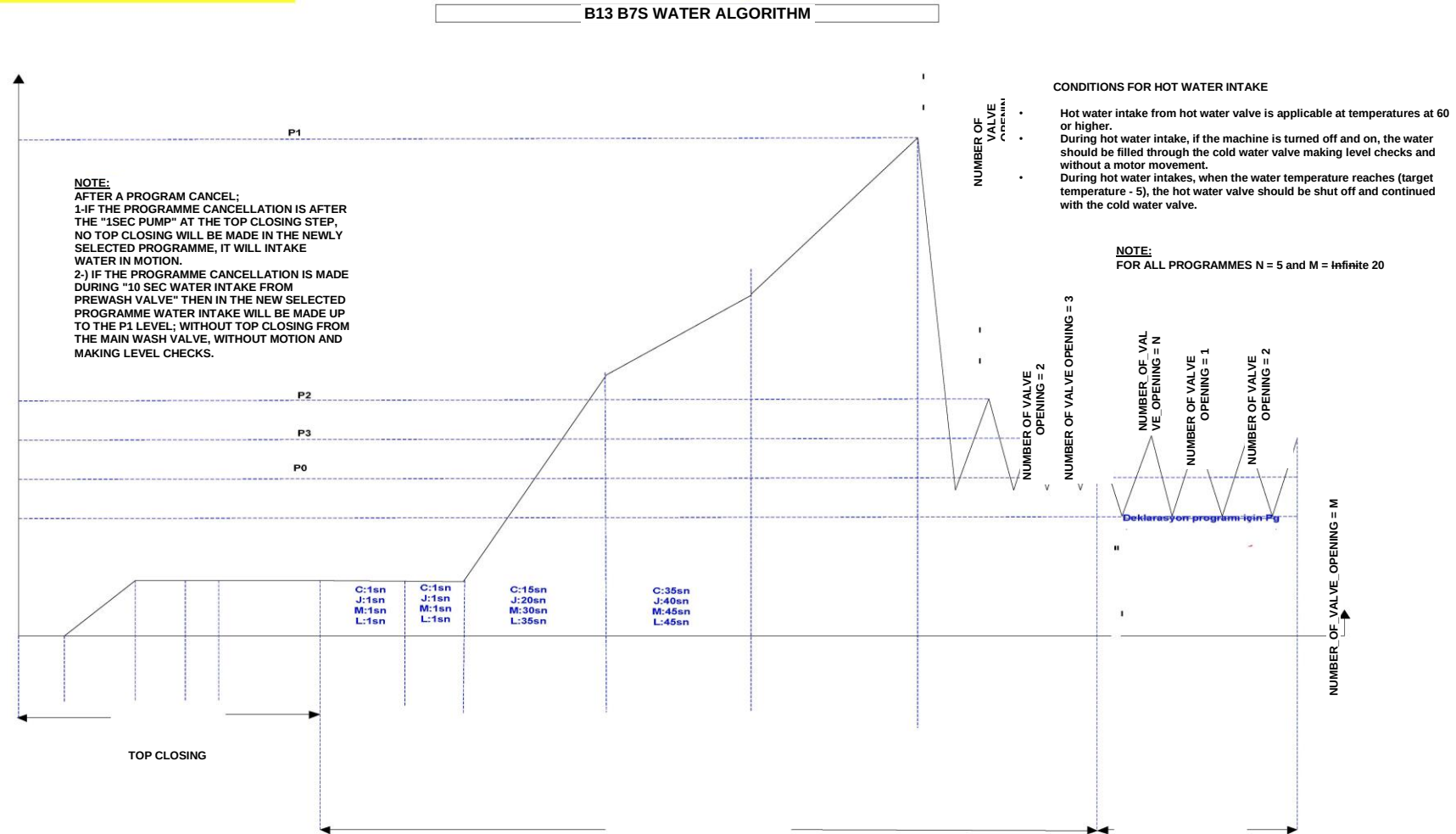
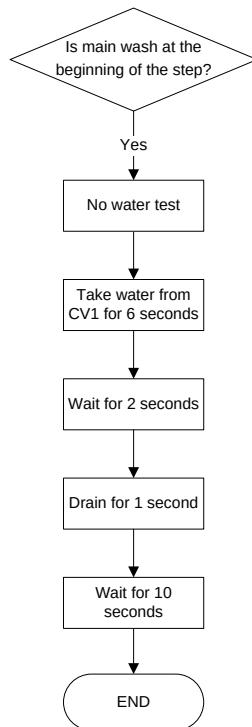


Figure 7.1 Water intake graphic

1. Water intakes in all programmes are realized by water level sensor. Whether or not the water level has dropped below levels determined according to the steps is checked by the water level sensor. If the water level has dropped, water will be intaken against checking the the water level sensor.
2. Top closure algorithm is applied during programme startup.

TOP CLOSURE ALGORITHM



Top closure algorithm is not applied under following conditions:

- If previous programme is cancelled and a new programme started, top closure algorithm is not applied in the newly selected programme.

Figure 7.2 Top closure algorithm

3. Later water intakes are realized according to the levels determined according to the programmes. If the selected programme temperature is 60C or higher than 60C, water intakes are made via hot water valve. Otherwise, water is taken through cold water valve.
4. Amount of load in the machine is determined according to number of valve opening in this step. Max. water intake number may change according to energy declaration target.



Depending on the low, medium or high load, washing parameters such as heating step time, rinse water amount are changed.

5. When water level drops below Psafety (Pg) level in washing steps during and after heating, heater is turned off. Water is taken from the main wash valve.

7.2. Heating Profile

Hysteresis profile is used for all programmes.

Information about the amount of hysteresis according to the programme is included in the variable file.

In programmes where there is risk of damaging textiles such as woolens or hand wash, hysteresis value is maintained high. For this reason, heating profiles of these programmes can be seen as hysteresis. However, under bad conditions like very low water inlet temperature, hysteresis can be seen.

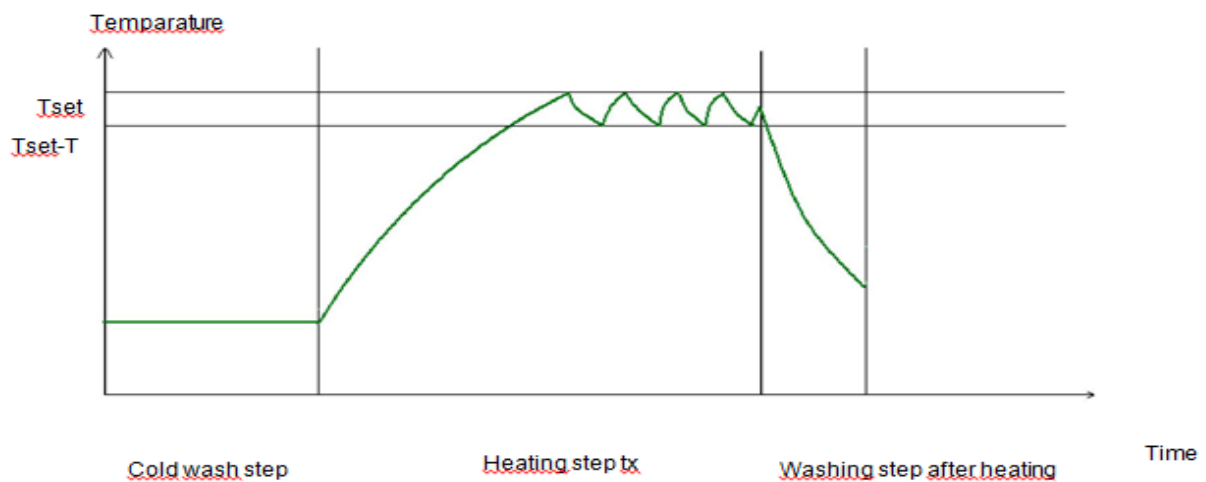


Figure 7.3 Graphic for heating with hysteresis

Once the machine reaches the max. set temperature (T_{set}) for the machine, heater is deactivated, but remains in heating step.

When temperature drops in the amount determined in the software, (T) heater is reactivated.

This process goes on until the time designated for heating step is completed (t_x).

When heating profile with hysteresis is used, adverse affecting possibility of max. reached temperature by the following is minimized:

- Input temperature of water lower than ambient temperature,
- Low input voltage,
- Excessive water intake by the machine,
- Adding water from the detergent dispenser.

7.3. Anti-foaming Profile

Following profile is used to decrease foaming at the end of main wash:

- Discharge the water inside the machine after main washing step is finished. (If additional water is taken without discharging water, foam overflow will occur.)
 - Movement in discharging 80 rpm – 12 s on – 10 s off)
- Wait 2 sec.
- Intake water by time. (10 s; may vary according to control systems.)
- Wash for 5 min. in woolen washing percentage. (to extinguish foam)
 - Movement 30 rpm – 3 s on – 80 s off)
- Discharge the water and continue with main wash end spin.
 - Movement in discharging 80 rpm – 12 s on – 10 s off)

7.4. Foam Detecting and Extinguishing Algorithm

If foaming occurred in the machine is determined by water level check during spin; if foam occurred, profile is applied to extinguish and discharge.

- If the measured level is higher than the determined foam level;
 - Motor is stopped for 280 s, (motionless waiting)
 - Water is taken for 4 s,
 - Motor is stopped for 30 s, (motionless waiting)
 - Psafety 4 + 6 s pumping performed.
 - Water is taken for 4 s,
 - Motor is stopped for 30 s, (motionless waiting)
 - Psafety 4 + 6 s pumping performed.
 - Water is taken for 4 s,
 - Motor is stopped for 30 s, (motionless waiting)
 - Psafety 4 + 6 s pumping performed.
 - Spinning starts again.
- This control is repeated 3 time in each spin.
- If the foam level is still high at the end of all 3 trials, spin is skipped to switch to the next step.
- Extra rinse is determined according to the number of foam detecting.
 - If 1-2-3, 1 rinse,
 - If 4-5, 2 rinses,
 - If more than 5, 3 rinses are added.
- If the foam level is still high after trying 3 times in the last spin step, programme is finished without spinning.

7.5. Programme Flows

TIME	VALVE	TEMPERATURE	SPIN SPEED	STEPS
NA	NA			Check up
2	NA			Drain
15'	Prewash Valve			prewash
2'	NA			Drain
10'	Prewash Valve			Top Closure
15'	Main Wash Valve			Cold washing
10'	Main Wash Valve			Soaking
60'	Main Wash Valve			Soaking
5-60'	Main Wash Valve			Heating
5'	Main wash valve			Washing after heating
5'	Main wash valve			Warming up
2	NA			Drain
5'	Main Wash Valve			Intermediate Spin
5'	Prewash valve			Rinse 1
2'	Main wash valve			Drain
5'	Main wash valve			Intermediate Spin
5'	Prewash Valve			Rinse
2'	Main wash valve			Drain
5'	Main wash valve			Intermediate Spin
5'	Prewash Valve			Rinsing Extra
2'	Main wash valve			Drain
	Main wash valve			Intermediate Spin
5'	Main wash valve			Rinsing Foam
2'	Main wash valve			Drain
5'	Main wash valve			Intermediate Spin
5'	Pre & Main wash valve			Softener
NA	NA			Soaking
2'	Main wash valve			Drain
3'	Main wash valve			Preliminary Intermediate Spinning

	END	NA END		END	Final Spin END
--	-----	-----------	--	-----	-------------------

Figure 8.4 Programme flow example

	Programme steps	Cottons Eco	Cottons	Synthetics	Delicate	Woolens
		Cottons Eco	Cottons	Synthetics	Finishing Protection	Woolens
Wash Steps	Control	✓	✓	✓	✓	✓
	Drain	☒	☒	☒	☒	☒
	Prewash	If prewash auxiliary function is selected	If prewash auxiliary function is selected	If prewash auxiliary function is selected	If prewash auxiliary function is selected	☐
	Drain	If prewash auxiliary function is selected	If prewash auxiliary function is selected	If prewash auxiliary function is selected	If prewash auxiliary function is selected	☐
	Top Closure	✓	✓	✓	✓	✓
	Cold washing	✓	✓	✓	✓	✓
	Soaking	If soaking auxiliary function is selected	✓	✓	☒	☒
	Heating	✓	✓	✓	✓	✓
	Washing after heating	✓	✓	✓	✓	✓
	Warming up	☒	If the selected temperature is >= 60° or >= 40°C and anticreasing auxiliary function is selected, then water will be intaken.	If the selected temperature is >= 60° or >= 40°C and anticreasing auxiliary function is selected, then water will be intaken.	Water will be intaken at all conditions.	✓
	Drain	✓	✓	✓	✓	✓
	Intermediate Spin	✓	✓	✓	✓	☐
	Rinse 1	✓	✓	✓	✓	☐
	Drain	✓	✓	✓	✓	✓
	Intermediate Spin	✓	✓	✓	✓	☐
	Rinse 2	At full load;if Tset=60C then step will be bypassed if Tset = 40C then step will be run. At half load;if Tset=60C then step will be bypassed. If Tset=40C then step will be run.	✓	✓	☒	✓
Wash Steps	Programme steps	Cottons Eco	Cottons	Synthetics	Delicate	Woolens
		Cottons Eco	Cottons	Synthetics	Finishing Protection	Woolens

	At full load;if Tset=60C then step will be bypassed if Tset = 40C then step will be run. At half load;if Tset=60C then step will be bypassed. If Tset=40C then step will be run.	✓	✓	☒	✓
Drain					
Intermediate Spin	At full load;if Tset=60C then step will be bypassed if Tset = 40C then step will be run. At half load;if Tset=60C then step will be bypassed. If Tset=40C then step will be run.	☒	☒	☒	☒
Extra rinse pilot pump	if extra rinse auxiliary function is selected	☒	☒	☒	☒
Rinsing Extra	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	☒	if extra rinse auxiliary function is selected
Drain	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	☒	if extra rinse auxiliary function is selected
Intermediate Spin	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	☒	☒
Rinsing Foam	If foam is detected	If foam is detected	If foam is detected	If foam is detected	If foam is detected
Drain	If foam is detected	If foam is detected	If foam is detected	If foam is detected	If foam is detected
Intermediate Spin	If foam is detected	If foam is detected	If foam is detected	If foam is detected	☒
Softener pilot pump	☒	☒	☒	☒	☒
Softener	✓	✓	✓	✓	✓
Soaking	☒	If soaking is selected	✓	If soaking is selected	If soaking is selected
Drain	✓	✓	✓	✓	✓
Preliminary Spinning	☒	✓	☒	☒	☒
Final Spin	✓	✓	✓	✓	✓
Pump	✓	✓	✓	✓	✓

	Programme steps	Hand Wash	Shirts	Rinse	Spinni ng	Mini 14	Mini	AquaPerfec t
		Hand Wash	Cottons	Rinse	Spinni ng	Mini 14	Mini	40°C 40 min
Wash Steps	Control	✓	✓	✓	✓	✓	✓	✓
	Drain	☒	☒	☒	☒	☒	☒	☒
	Prewash	☒	If prewash auxiliary function is selected	☒	☒	☒	☒	☒
	Drain	☒	If prewash auxiliary function is selected	☒	☒	☒	☒	☒
	Top Closure	✓	✓	☒	☒	✓	✓	✓
	Cold washing	✓	✓	☒	☒	✓	✓	✓
	Soaking	☒	✓	☒	☒	☒	☒	☒
	Heating	✓	✓	☒	☒	✓	✓	✓
	Washing after heating	✓	✓	☒	☒	✓	✓	☐
	Warming up	☒	If the selected temperature is >= 60° or >= 40°C and anticreasing auxiliary function is selected, then water will be intaken.	☒	☒	☒	If selected temperature is >=60°C water will be intaken.	☒
	Drain	✓	✓	☒	☒	✓	✓	✓
	Intermediate Spin	☒	☒	☒	☒	✓	✓	✓
	Rinse 1	✓	✓	☒	☒	☒	✓	☒
	Drain	✓	✓	☒	☒	☒	✓	☒
	Intermediate Spin	☒	☒	☒	☒	☒	✓	☒
	Rinse 2	☒	✓	☒	☒	☒	☒	☒

	Programme steps	Hand Wash	Shirts	Rinse	Spinning	Mini 14	Mini	AquaPerfect
		Hand Wash	Cottons	Rinse	Spinning	Mini 14	Mini	40°C 40 min
Wash Steps	Drain	☒	✓	☒	☒	☒	☒	☒
	Intermediate Spin	☒	☒	☒	☒	☒	☒	☒
	Extra rinse pilot pump	☒	☒	if extra rinse auxiliary function is selected	☒	☒	☒	☒
	Rinsing Extra	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	☒	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	☒
	Drain	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	☒	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	☒
	Intermediate Spin	☒	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	☒	if extra rinse auxiliary function is selected	if extra rinse auxiliary function is selected	☒
	Rinsing Foam	☒	If foam is detected	☒	☒	If foam is detected	If foam is detected	If foam is detected
	Drain	☒	If foam is detected	☒	☒	If foam is detected	If foam is detected	If foam is detected
	Intermediate Spin	☒	☒	☒	☒	If foam is detected	If foam is detected	If foam is detected
	Softener pilot pump	☒	☒	if extra rinse auxiliary function is selected	☒	☒	☒	☒
	Softener	✓	✓	✓	☒	✓	✓	✓
	Soaking	☐	If soaking is selected	If soaking is selected	☒	If soaking is selected	If soaking is selected	If soaking is selected
	Drain	✓	✓	✓	✓	✓	✓	✓
	Preliminary Spinning	✓	✓	✓	✓	☒	☒	☒
	Balanced Load Spinning	✓	✓	✓	✓	☒	☒	☒
	Final Spin	✓	✓	✓	✓	✓	✓	✓
	Pump	✓	✓	✓	✓	✓	✓	✓

8. COMPONENT WORKING PRINCIPLES

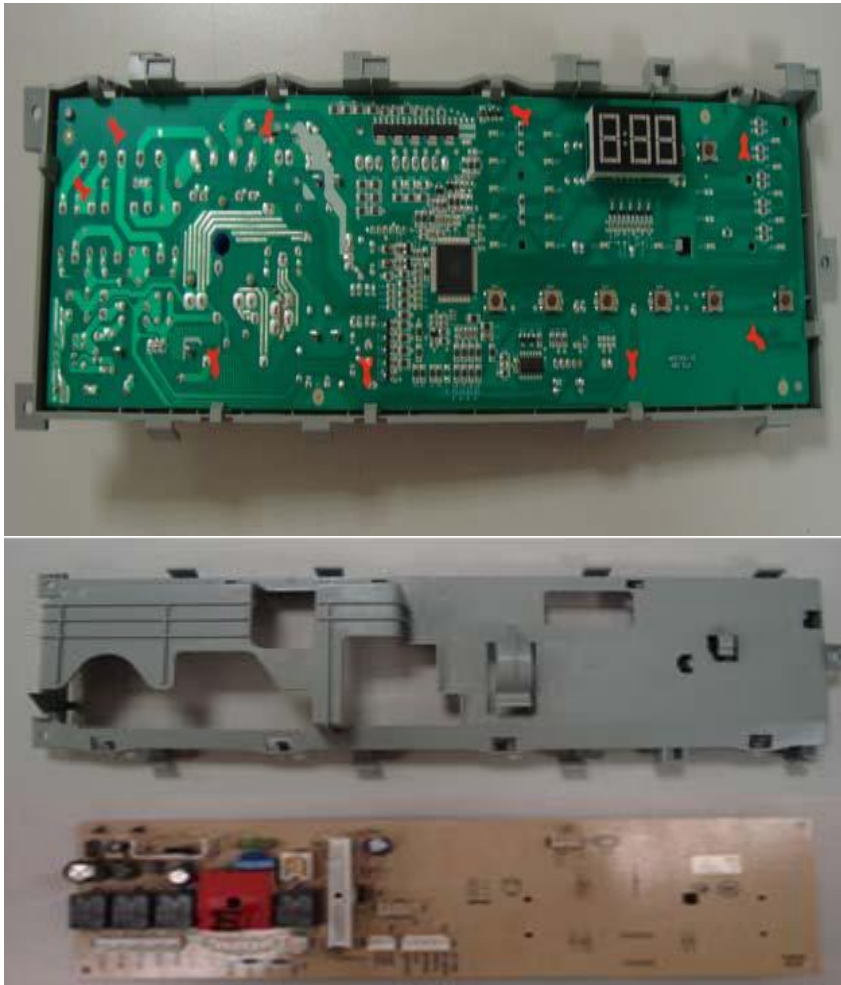
8.1. Electronic Control and Visual Card

By means of the control and visual card which is designed to have a single face and manufactured by ARÇELİK; the wash programs which are written onto the microprocessor, washing and spinning motor profiles, protection algorithms and components (motor, heater, pump, valves, door safety lock, ntc, water level selection switch, spinning/temperature selection potentiometer) are controlled.

There are feeding circuit on the front face of the card (smpts), motor and other component control circuits -triac and relays - and component connection terminals and on its rear face there are microprocessor, function and time delay button and LEDs and program tracking LEDs.

Necessary wash program is operated in line with the information read from the program selection switch which is connected to the card (rotary switch), spinning/temperature setting potentiometer, auxiliary function and Time Delay switches.

From the card, auxiliary function, speed/temperature and time delay options and functions can be selected.



Picture 8.1 Control kartı

8.2. Safety Switch (Door Lock)



Picture 8.2 Safety switch

Rated Operating Voltage	: 250V 50-60Hz
Operating Current	: 10-50 mA
PTC Resistance	: Min. ≥ 50 ohm
Contact Locking time	: ≤ 8 s
Contact Engaging time	: 35...70s
Operating Temperatures	: T85

PTC door safety lock was used. When any wash program is started after the door is closed, PTC disk is heated and the door is locked and it is prevented to be opened when the program is in progress.

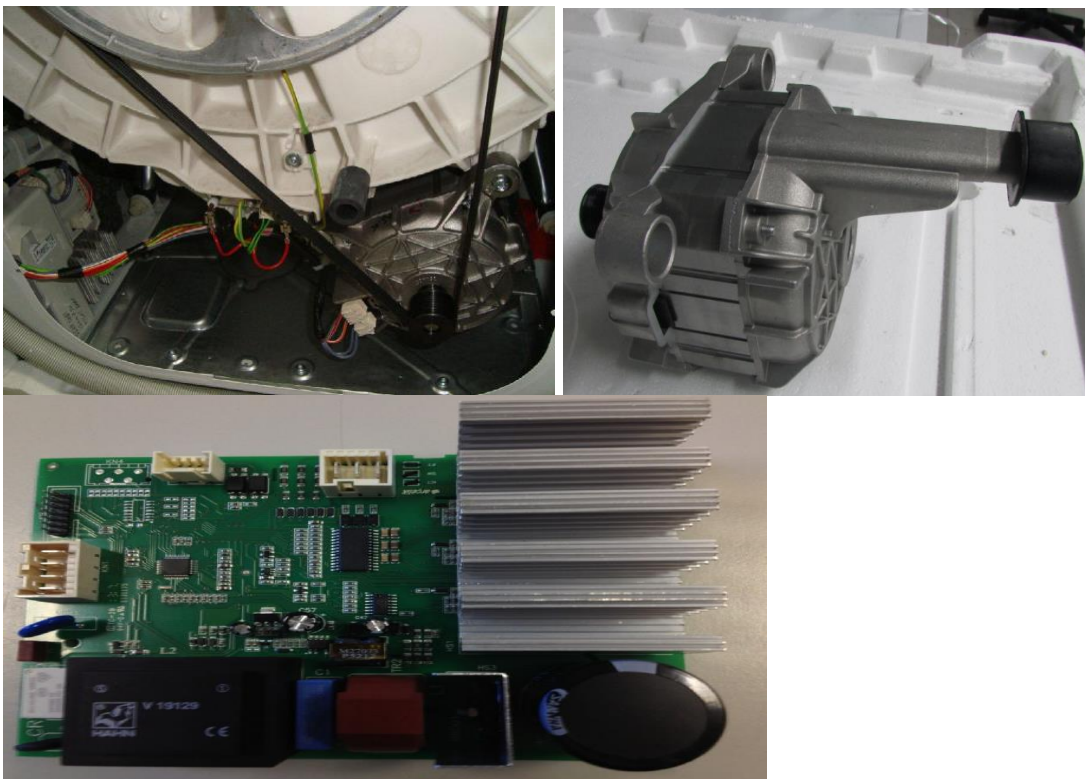
After the program finishes, PTC cools down in 70s and the door is unlocked.

Current of all components passes over the door safety lock. Machine will not work in case it is faulty.

When 220V is supplied between the contacts numbered 3 and 1, the distance between the contacts numbered 3 and 2 should switch to closed position.

8.3. Motor

8.3.1. Atlas Motor



Picture 8.3 Motor (Atlas motor and motor card)(discrete)

Brushless motor is used. Motor stator is composed of 3-phase coil and there are magnets on rotor. Rotor position is detected on the Askoll type hall sensor and stator coils are energized with the help of an inverter. In Atlas version, Rotor position is detected without using hall sensor and stator coils are energized with the help of an inverter.

Besides the main board, there is also an integrated motor driver card on the Askoll type motor. However, Atlas type motor card is discrete. While the motor and the motor card can be serviced individually on Atlas type, grouped service is given in Askoll type as the motor and motor card are integrated. Motor card and main card communicates with each other to ensure motor speed control. Main board is the prevailing unit; what the reference speed will be is determined by the main board. However, all other control algorithms required for motor driving are realized by the motor driver card. While motor speed measurement is detected by hall sensor on Askoll type, speed detection on Atlas type is provided by software without using an additional sensor.

Under abnormal conditions (like continuous locked rotor status), thermic component is used to protect motor from overheating. In addition, locked rotor status can also detected by the software to ensure protection.

8.4. Heater

It is used to heat the water inside the drum.

Since it is an electronically controlled machine, there is a double thermocouple at each of the heater inlets.

When the heater operates dry, the overheated thermocouple open circuits the heater. Open circuited heater cannot be used again. In order to prevent the heater to operate without water “during heating”, heater safety water level is defined to the microprocessor (Psafety). When the water level which is measured by the water level sensor comes under the defined Psafety level, heater is disabled.

When the water temperature which is read by NTC reaches to the “selected temperature”, heater is disabled by the microprocessor.



Picture 8.4 Heater

Operating Voltage : 230VAC 50-60 Hz
Power : 1950W
Resistance : $26\Omega \pm 3\Omega$

When the resistance is measured from both ends with multimeter, approx. 26Ω should be read.

8.5. Valve

There is 2-way valve in the models which have a single water inlet and there is 2-way valve and extra single valve in the hot-water inlet machines. Valves are driven by the triacs on the electronic board; and they are driven with both valves in the softener step by use of crashed water directing system and the water is directed to the medium compartment of the detergent dispenser.



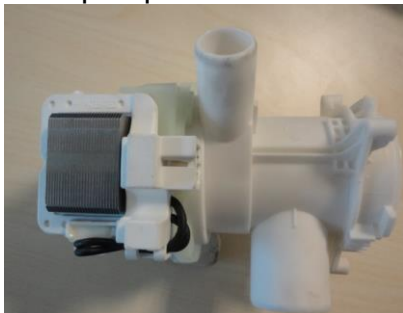
Picture 8.5 Valve

Rated Voltage	220-240	V
50/60 Hz		
Rated Power	5-8 W	
Winding Resistance	3400-4500 ohm	
Flow	10 l/min	

8.6. Drain Pump

It is a synchronous motor equipped with a mono-phase bipolar magnet rotor. At the draining step, electronic control card is activated by the triac on it. It is protected by impedance for continuous operation and blocking situation of the rotor.

Drain pump drains the water inside the drum.



Picture 8.6 Drain pump

Rated Voltage	220-240 V 50Hz
Resistance	145 ohm
Current	<0.2A
Flow	>14 l/min
Starting performance	<=4s (160V)

8.7. Ntc

It is a component which is used to measure the water temperature inside the drum and resistance of which decreases when the temperature increases.

When the water temperature reaches to the adjusted temperature, heater is disabled by means of the heater relay on the card.



Picture 8.7 NTC

Resistance (25 °C)	: 4773 ohm (±4.2%, Siemens)- 4837 ohm (±3.2%, elth)
Operating Temperature	: -10°C...+100°C
Thermal time constant	: 16 ±2 s

Resistance values which are read from the NTC ends by means of multimeter are compared to the below table. These approximate values should be read.

Temperature (°C)	Nom. Resistance RNom (Ω)
-10	26424
-5	20205
0	15589
5	12119
10	94-99
15	74-9 S
20	5962
25	4773
30	3346
35	3118
40	2544
45	2037
50	1721
55	1428
60	1190
65	996.9
70	839
75	709.4
80	602.4
85	513.7
90	439.9
95	373.1
100	326.3

Table 8.1 NTC values

8.8. Water Level Sensor

An analog water level sensor which is fed by 5 V voltage is used. This sensor ensures that the water level is determined instantly with the frequency values which it generates against the pressure created. There are frequency values corresponding to the all pressure values. An infinite number of levels can be determined in the analog water level sensor. Water levels change according to the wash criteria of the designed program depending on the selected program, temperature and auxiliary function.

Analog water level sensors are pressure – displacement inverter components in general.

Analog water level sensors generate frequency modulation as output.

There are basically 2 capacitors, 1 coil and an inverter circuit on itself or the control system to which it is connected.

Pressure increase pushes a ferrite part inside the sensor into the coil. Therefore L (inductance) value of coil winding changes and the output value of the sensor – inverter system changes. Therefore pressure value can be measured in an analog manner.

The amount of water to be taken in for the programs is controlled by the water meters. Water level sensor serves the basic functions of deciding to take in water again, control the heater safety level, door opening level or foam level.

Also, if there are any error in the water meters or its connections, water is taken in with the water level sensor.



Cable inputs
5VDC / Data / GND.

Operating Voltage : 5 VDC

When it is empty, 625 ± 2 Hz frequency value should be read from the Data and GND terminals.

Picture 8.8 Water level sensor

9. SERVICE FUNCTION TEST

Following points should be paid attention to during service test:

➤ Entrance Method to Service Mode:

By pressing the "Start/Pause" button, you can switch to "Service" mode when you turn the button to the first program from the rotary "ON/OFF" position CW.

➤ To activate the components which are controlled in each step of the service mode, the door has to be mechanically locked, that is, components must be powered. For example, to rotate the motor, the door must be locked, in other words motor must be energized.

➤ After the service mode is entered, if door contact is not closed for any reason (door lock is faulty or door lock triac is faulty), that is electronic card is energized but the driven components (heater, motor, pump, etc.) are not:

a) In Models with LED: "Ready" follow up LED will be lit steadily. In the meantime, if EEPROM has a

"Error Code", they will be coded at "Spin Level" LEDs (in decimal system (BCD format)). If there is no error, all of the "Spin Level" LEDs will be turned off.

Also, if "Start/Pause" button is pressed, then no change will take place in the above mentioned issues and as the door is not locked in real "Service Mode" steps will not be progressed and "Error Code" will be shown steadily.

b) In 75 models : If you have an "Error Code" on EEPROM, this will be shown on 7S display as "E?"

If there is no error, "E--" will be shown on 7S display.

Also, if "Start/Pause" button is pressed, then no change will take place in the above mentioned issues and as the door is not locked in real "Service Mode" steps will not be progressed and "Error Code" will be shown steadily.

➤ If the energy of the machine is interrupted due to any reason whatsoever at any stage of service test (due to "ON/OFF" or power cut), WM goes back to "Selection Mode" when it is energized again.

If more than 2 minutes are waited at a service test step, WM goes back to selection mode. At the service mode, components are activated one by one by pressing the Start/Pause button. In turn:

1) At startup, "Error Code" which is created last and recorded to EEPROM is shown.

Following points should be paid attention when "**Error Code**" is displayed:

I) In 7S Models:

If there is an "Error Code", counterpart of this code in the decimal system (in BCD format) is displayed on 7S by adding "E" to the beginning. Example; "E09" or "E13".

If there is no "Error Code", this is displayed on 7S as "E--".

II. Only in Models with LED:

If there is an "Error Code", counterpart of this code in the decimal system (in BCD format) is encoded to the "Spin Level LEDs". When encoding is performed, weights of the orders from the bottom to the top are as follows 20=1, 21=2, 22=4, 23=8 Hertz in turn. For example, if the "Error Code" is "03" then the bottom most 1st and 2nd LEDs will be turned on while others are turned off. If the "Error Code" is "08" then only the 4th LED from the bottom will be turned on while others are turned off.

If there is no "Error Code" then all LEDs should be turned off.

Next step is taken by pressing the "**Start/Pause**" button;

2) "Error Code" and other information stored in EEPROM (point to resume) are deleted from EEPROM and in 7S models 3-digit software version is displayed, and to switch to the next step "Start/Pause" button is pressed; Only in Models with LEDs the next step will be automatically progressed (without pressing "Start/Pause" button).

3) By flashing all segments of 7S and all LEDs "Display" test is realized.

When "Start/Pause" button is pressed, all segments of 7S and all LEDs are turned off to end "Display" test and switch to next step;

4) Turned for 52rpm to right (CW). Meanwhile, in 7S models, "4", which is the "service mode step number" of this step is displayed. In Models with LED, of the "Program Tracking LEDs" above the "Start/Pause" button, the 3rd LED from the bottom will be turned on (weight of orders from bottom to top are 20=1, 21=2, 22=4, 23=8, 24=16); Next step is taken by pressing the "Start/Standby" button;

5) Turned for 52rpm to left (CW). Meanwhile, in 7S models, "5", which is the "service mode step number" of this step is displayed. In Models with LED, of the "Program Tracking LEDs" above the "Start/Pause" button, the 1st and 3rd LED from the bottom will be turned on (weight of orders from bottom to top are 20=1, 21=2, 22=4, 23=8, 24=16); Next step is taken by pressing the "Start/Standby" button;

6) In the previous movement, motor movement is stopped and following checks were performed and tester was informed in different ways: If the Water Level Value read on the Water Level Sensor is out of the limits (if Water Level Sensor socket is properly fitted or if it is loose), next step "7" is taken. This way, there is not any drum movement in step 6 and if step 7 is taken automatically, person making the test will sense this condition as "Water Level Sensor Error" .

b) although the Water Level Value read on the sensor is within the limits if it is above "Safety Level", pump is operated and when the level drops below the "Safety Level" basic controls of this step are carried out (meanwhile drain pump is active).

These are, in the order of priority;

I. If there is NTC error, 100rpm is applied;

II. If there is no NTC error, but if the values read at Line Voltage Reading Inlets (Line_Voltage_ADC) are below 185 Volts or above 265 Volts, 140 rpm is applied. This error could be caused by two conditions:

Either the ADC inlets of microprocessor are defective or it is indeed out of the line voltage limits

III. If there is no any NTC error and no error on Line_Voltage_ADC inlets, "MAX_SPEED / 2" "MAX_SPEED" rotation is applied. "MAX_SPEED/ 2" (Rev03_28112012):

Modified as MAX_SPEED. Meanwhile, "6", which is the service mode step number is displayed on screen of 7S Models;

In Models with LED, of the "Programme Tracking LEDs" above the "Start/Pause" button the 2nd and 3rd LEDs from the bottom will be turned on (weight of orders from bottom to top are 20=1, 21=2, 22=4, 23 = 8, 24 = 16);

Next test step is taken by pressing the "**Start/Pause**" button.

7) Motor movement which is started in the previous step is stopped and pump is shut. "PRE_WASH_VALVE" which is the main test of this step is opened and checked.

Meanwhile, "7", which is the service mode step number is displayed on screen of 7S

Models;

In Models with LED, of the "Programme Tracking LEDs" above the "Start/Pause" button the 2nd and 3rd LEDs from the bottom will be turned on (weight of orders from bottom to top are 20=1, 21=2, 22= 4, 23 = 8, 24 = 16);

Next test step is taken by pressing the "Start/Standby" button.

8) "PRE_WASH_VALVE" which is opened for test in the previous step is shut.

"MAIN_WASH_VALVE" which is the main test of this step is opened and checked.

Meanwhile, "8", which is the service mode step number is displayed on screen of 7S

Models;

In Models with LED, of the "Programme Tracking LEDs" above the "Start/Pause" button the 2nd and 3rd LEDs from the bottom will be turned on (weight of orders from bottom to top are 20=1, 21=2, 22=4, 23= 8, 24 = 16);

Next test step is taken by pressing the **"Start/Pause"** button.

9) "MAIN_WASH_VALVE" which is opened for test in the previous step is shut.

"SOFTENER_VALVE" which is the main test of this step is opened and checked.

Meanwhile, "9", which is the service mode step number is displayed on screen of 7S

Models;

In Models with LED, of the "Programme Tracking LEDs" above the "Start/Pause" button the 1st and 4th LEDs from the bottom

will be turned on (weight of orders from bottom to top are 20=1, 21=2, 22= 4, 23 = 8, 24 = 16);

Next test step is taken by pressing the **"Start/Pause"** button.

10) "SOFTENER_VALVE" which is opened for test in the previous step is shut.

"HOT_WATER_VALVE" which is the basic test of this step is opened to check if available on the machine being tested (if no hot water valve is available, this step is automatically skipped").

Meanwhile, "10", which is the service mode step number is displayed on screen of 7S

Models;

In Models with LED, of the "Programme Tracking LEDs" above the "Start/Pause" button the 2nd and 4th LEDs from the bottom will be turned on (weight of orders from bottom to top are 20=1, 21=2, 22= 4, 23 = 8, 24 = 16);

Next test step is taken by pressing the **"Start/Pause"** button.

11) "HOT_WATER_VALVE" which is opened for test in the previous step is shut.

HEATER test which is the main test of this step is conducted as follows;

If the Water Level Value read on the Water Level Sensor is out of the limits (if Water Level Sensor socket is properly fitted or if it is loose), next step "12" is taken. This way, if there is not any increase in power in step 11 in terms of washing machine consumption and if step 12 is taken automatically, person making the test will sense this condition as "Water Level Sensor Error".

(Rev02_07102011): b) Although the Water Level Sensor readings are within limits if the water level is below "Safety_Level + 20 units" then all valves will be opened to top up the water level. When the water level exceeds "Safety Level + 20 units" the open valves will be shut off automatically. After this stage there are 2 conditions:

i) On a machine without "Main Wash Flow Meter":

HEATER is turned on automatically and 52rpm is applied to right. (With REV_04, 52 rpm to right at Heating step is removed.) Tester checks whether there is an increase in the power which is consumed by WM and check heater. ii) On a machine with "Main Wash

Flow Meter":

"Main_Wash_Flow_Meter" will be checked to see if it is higher than "50" or not.

If it is higher than 50, then Flow_Meter is operating correctly; HEATER will turn on automatically and a 52rpm right turn will be applied. (In models with flow meter, there is motor movement) If it is below 50, then the Flow_Meter is faulty and therefore the heater will not be "DRIVEN" and proceeded to the next step of the service mode ("step_12").

In this way Flow_Meter error will be identified.

Meanwhile, "11", which is the service mode step number is displayed on screen of 7S Models;

In Models with LED, of the "Programme Tracking LEDs" above the "Start/Pause" button the 1st, 2nd and 4th LEDs from the bottom will be turned on (weight of orders from bottom to top are 20=1, 21=2, 22= 4, 23 = 8, 24 = 16);

Next test step is taken by pressing the "Start/Standby" button.

12) "HEATER" which is opened for test in the previous step is shut. Also, the motor movement which is started in the previous step is finalized and all valves are shut.

"PUMP" which is the main test of this step is opened and water inside the WM is drained below "Safety_Level". When the water level comes below "Security_Level", pump is shut off.

At the beginning of the drain process, MAIN_WASH and HOT_WATER valves will be turned on for 5 seconds (Rev01_22072011)

Meanwhile, "12", which is the service mode step number is displayed on screen of 7S Models;

In Models with LED, of the "Programme Tracking LEDs" above the "Start/Pause" button the 3rd and 4th LEDs from the bottom will be turned on (weight of orders from bottom to top are 20=1, 21=2, 22= 4, 23 = 8, 24 = 16);

"At the spinning stage, if no error, "turn at max/2 speed" "rule is modified as "turn at max speed"

.

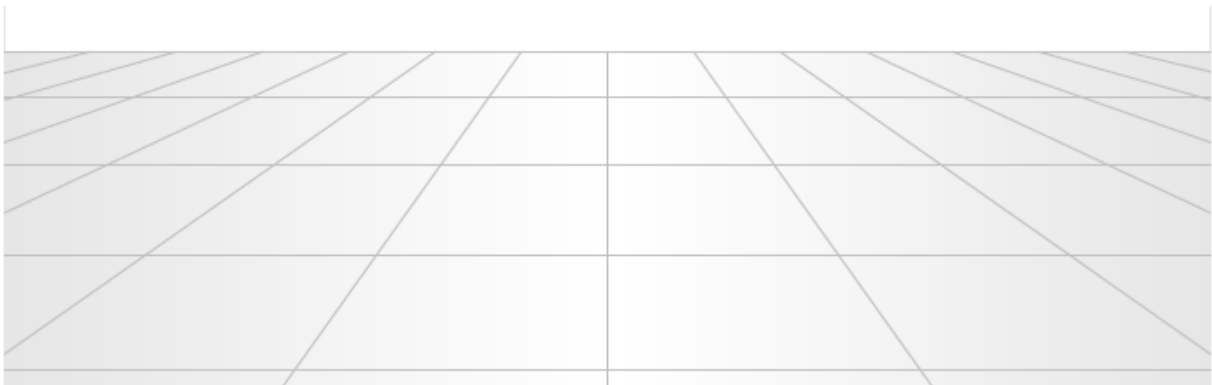
The 52 RPM right turn movement at the heater stage is removed.

Since this step is the last stage of the service test, if the "Start/Pause" button is pressed for one more time, this will return to step 1.

10.B13 B7S B7SLED FAILURE FLOW DIAGRAM

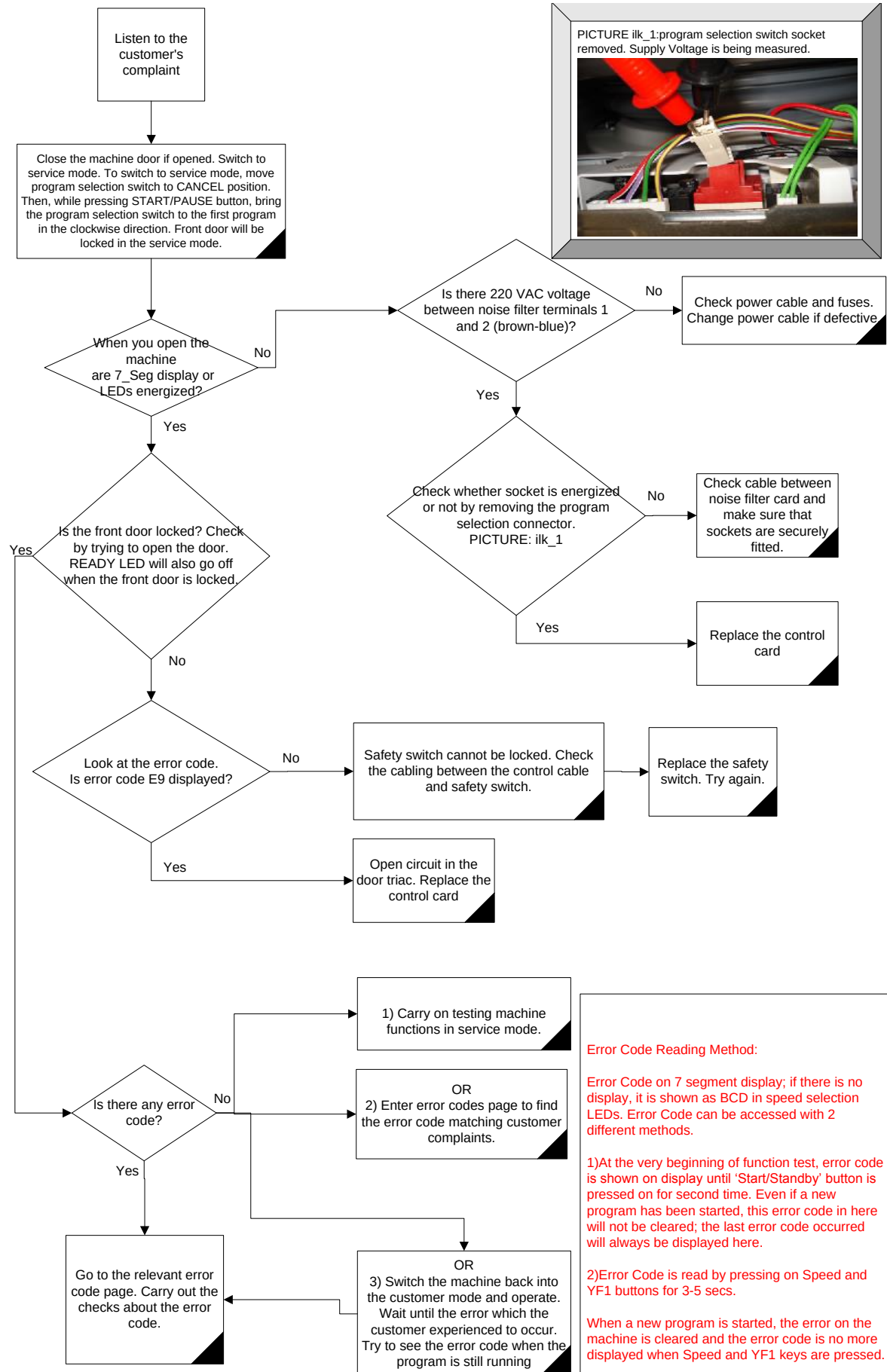
Revisions: 13.10.2014

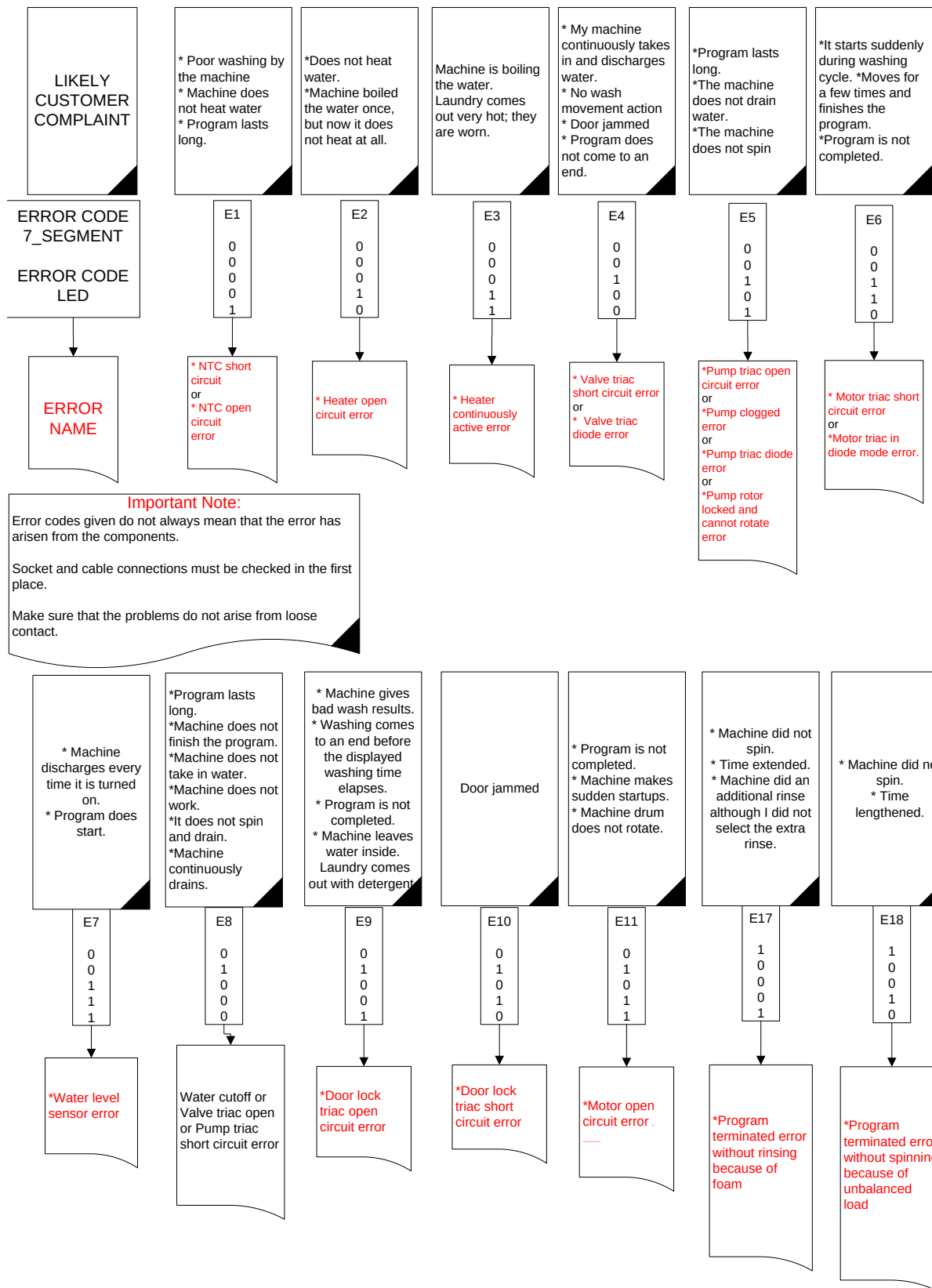
Rev. 01 07.05.2015

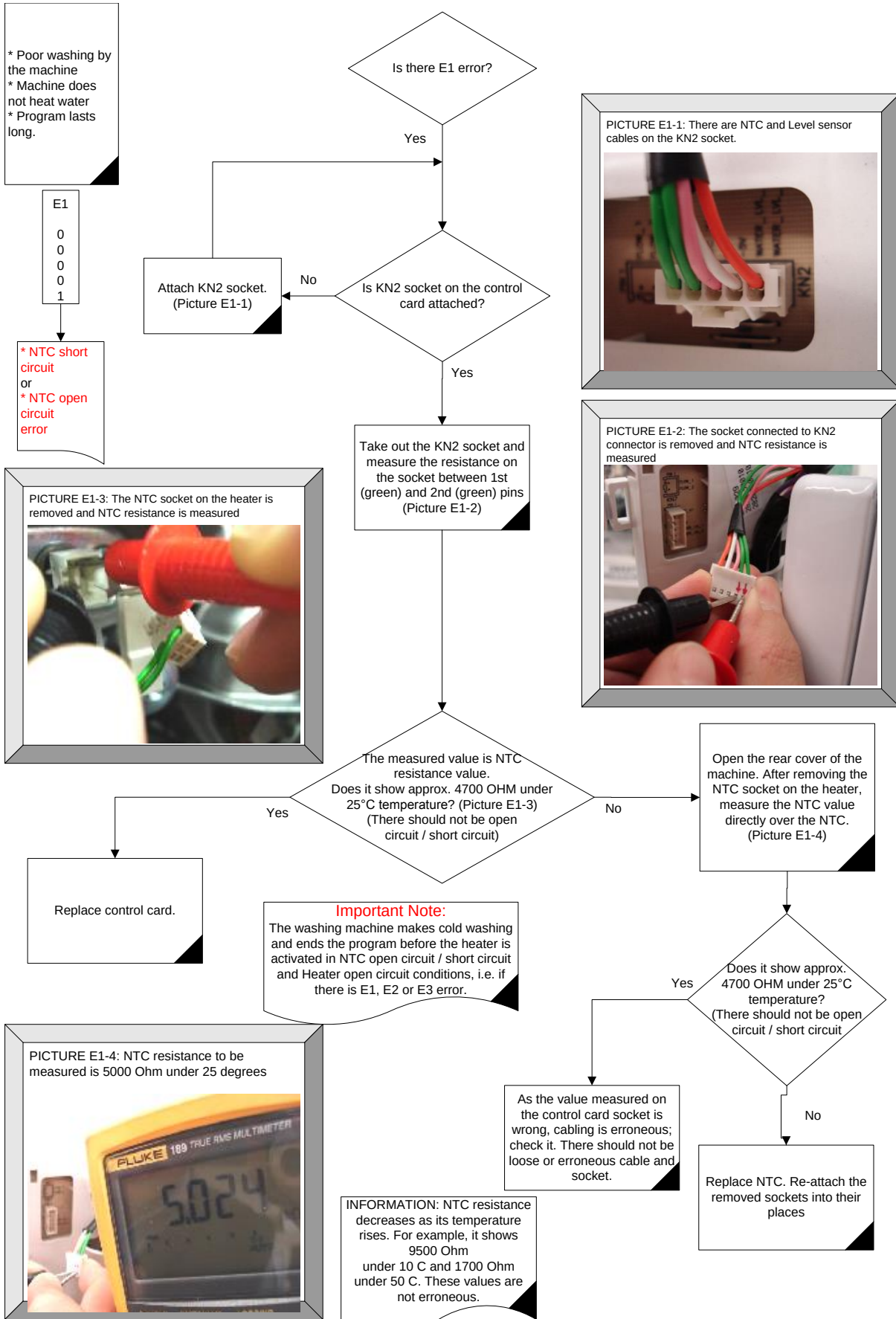


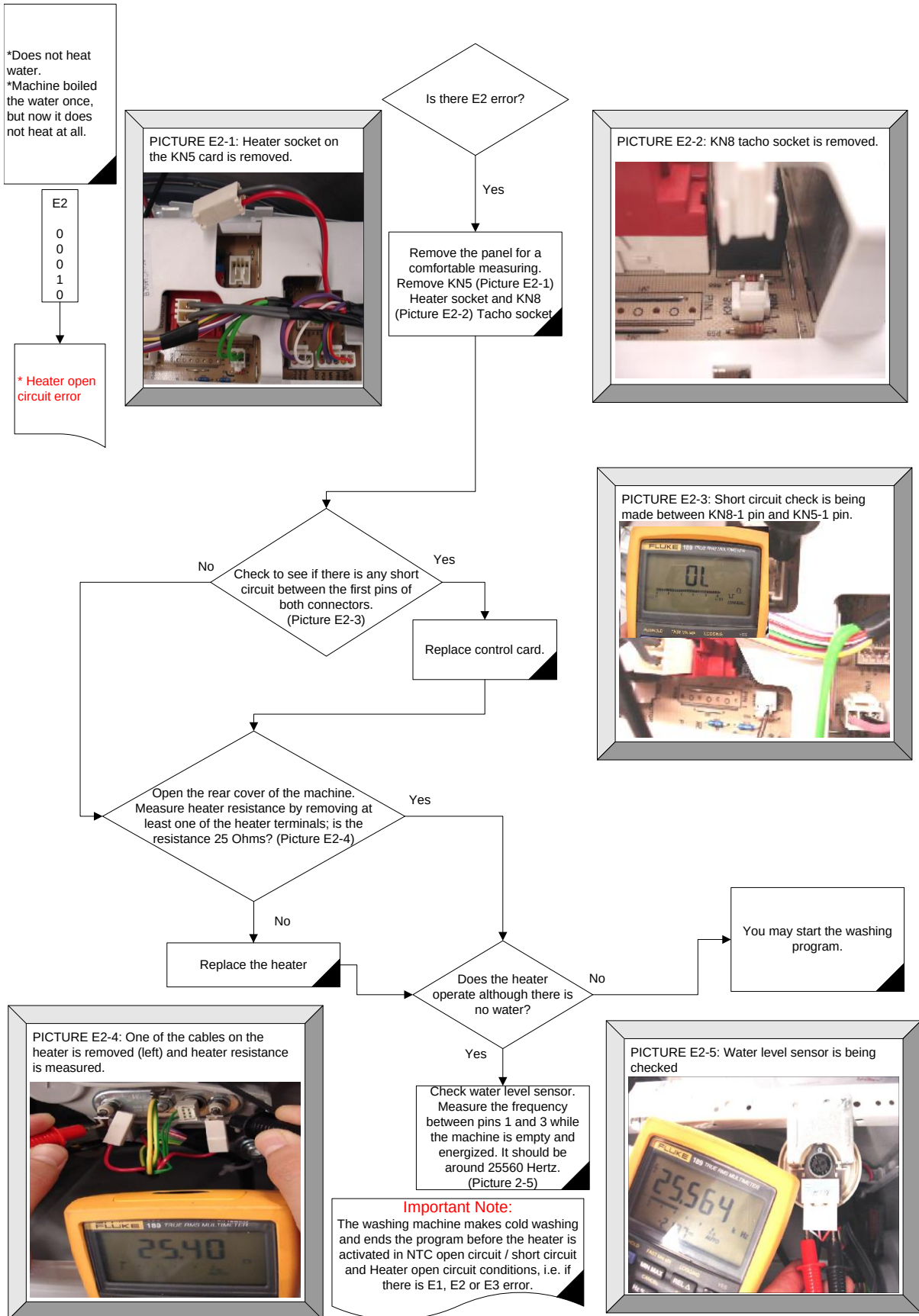
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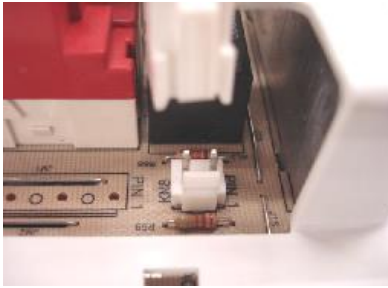
Machine is boiling the water. Laundry comes out very hot; they are worn.

E3

0
0
0
1
1

* Heater continuously active error

PICTURE E2-2: KN8 tacho socket is removed.



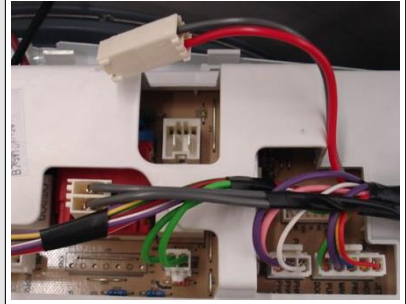
PICTURE E2-3: Short circuit check is being made between KN8-1 pin and KN5-1 pin.



PICTURE E2-4: One of the cables on the heater is removed (left) and heater resistance is measured.



PICTURE E2-1: Heater socket on the KN5 card



Important Note:

The washing machine makes cold washing and ends the program before the heater is activated in NTC open circuit / short circuit and Heater open circuit conditions, i.e. if there is E1, E2 or E3 error.

Is there E3 error?

Yes

Remove the panel for a comfortable measuring. Remove KN5 (Picture E2-1) Heater socket and KN8 (Picture E2-2) Tacho socket

Check to see if there is any short circuit between the first pins of both connectors. (Picture E2-3)

No

Does the heater operate although there is no water?

Yes

Check water level sensor. Measure the frequency between pins 1 and 3 while the machine is empty and energized. It should be around 25560 Hertz. (Picture 2-5)

Replace control card.

Open the rear cover of the machine. Measure heater resistance by removing at least one of the heater terminals; is the resistance 25 Ohms? (Picture E2-4)

No

Replace the heater

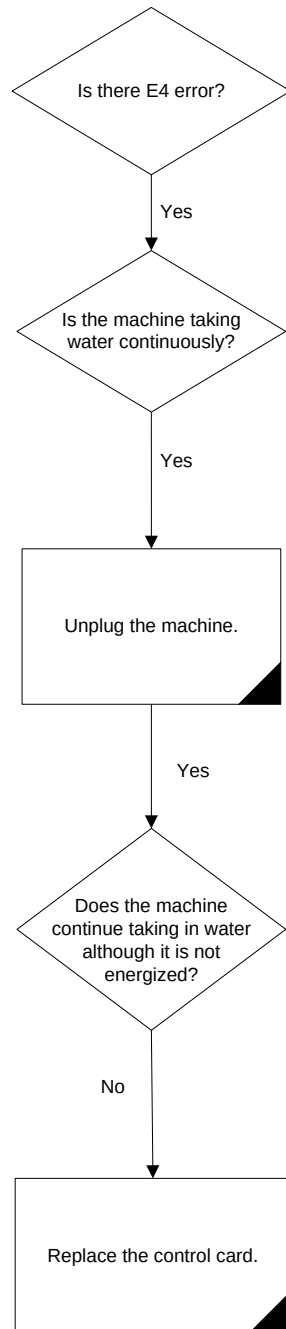
PICTURE E2-5: Water level sensor is being checked



* Machine takes in water continuously.
* No washing movement
* Door cannot be opened
* Programme does not come to an end.

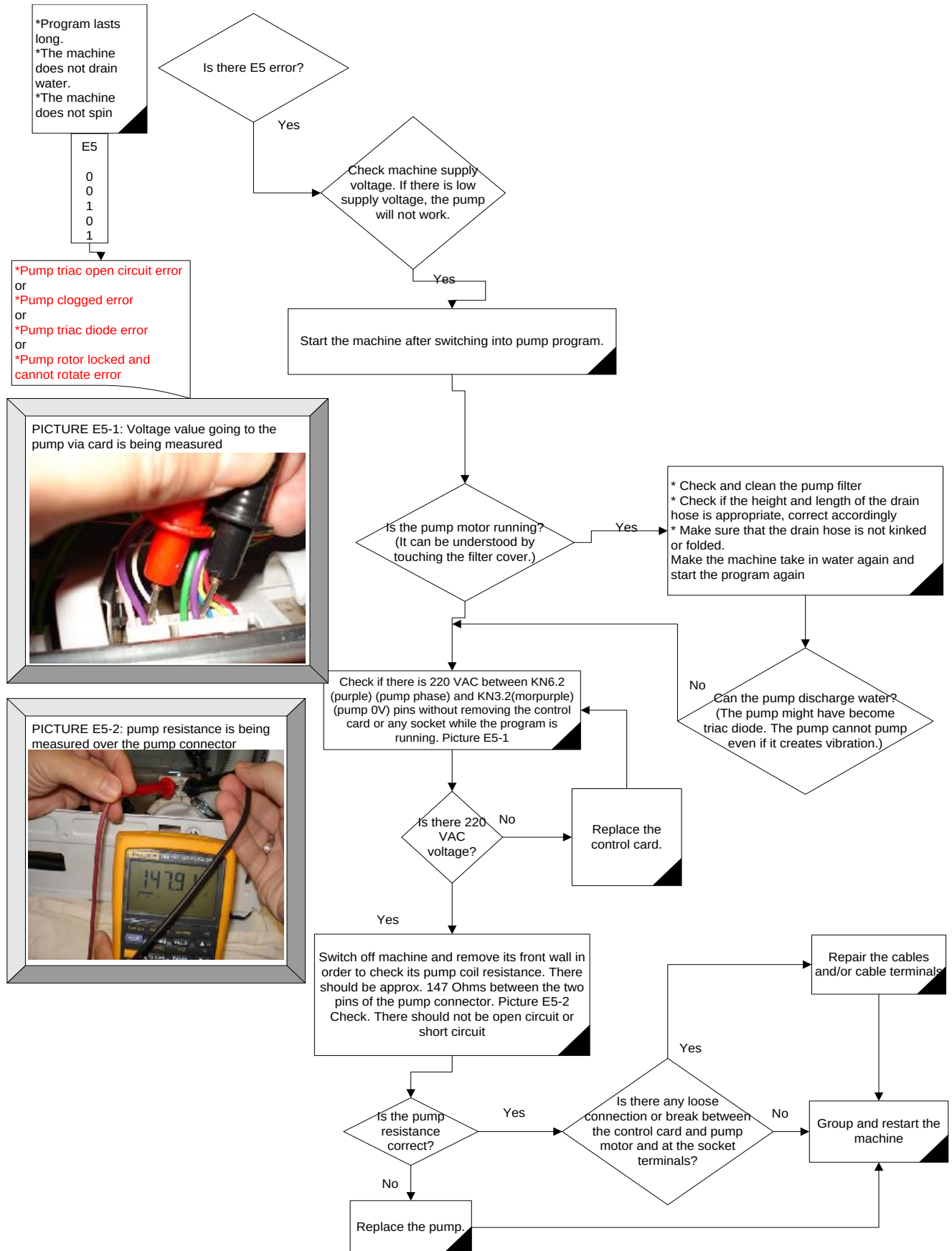
**E
4**

* Valve triac short circuit
or
* Valve triac diode error



PICTURE E4-1: Water intake valves



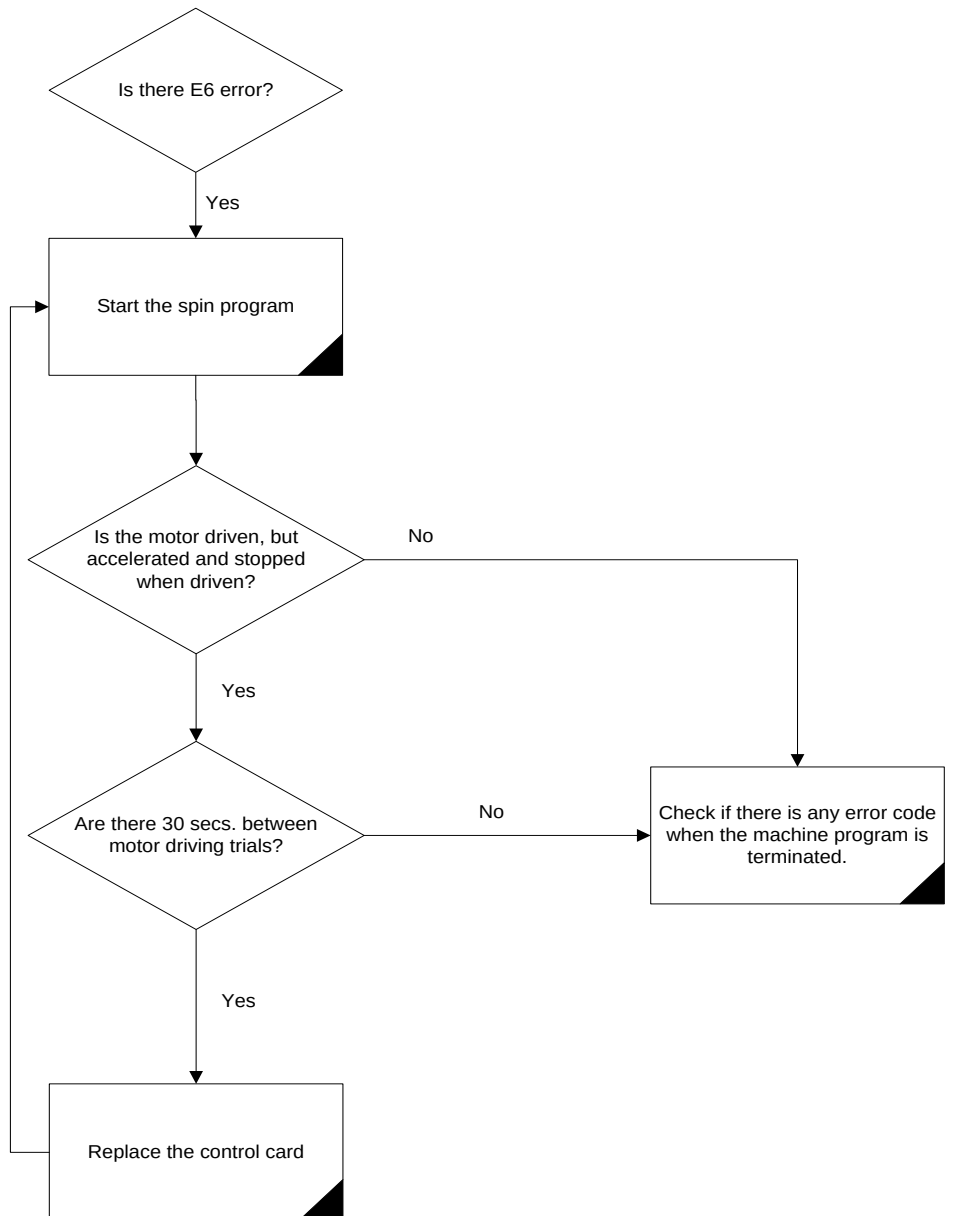


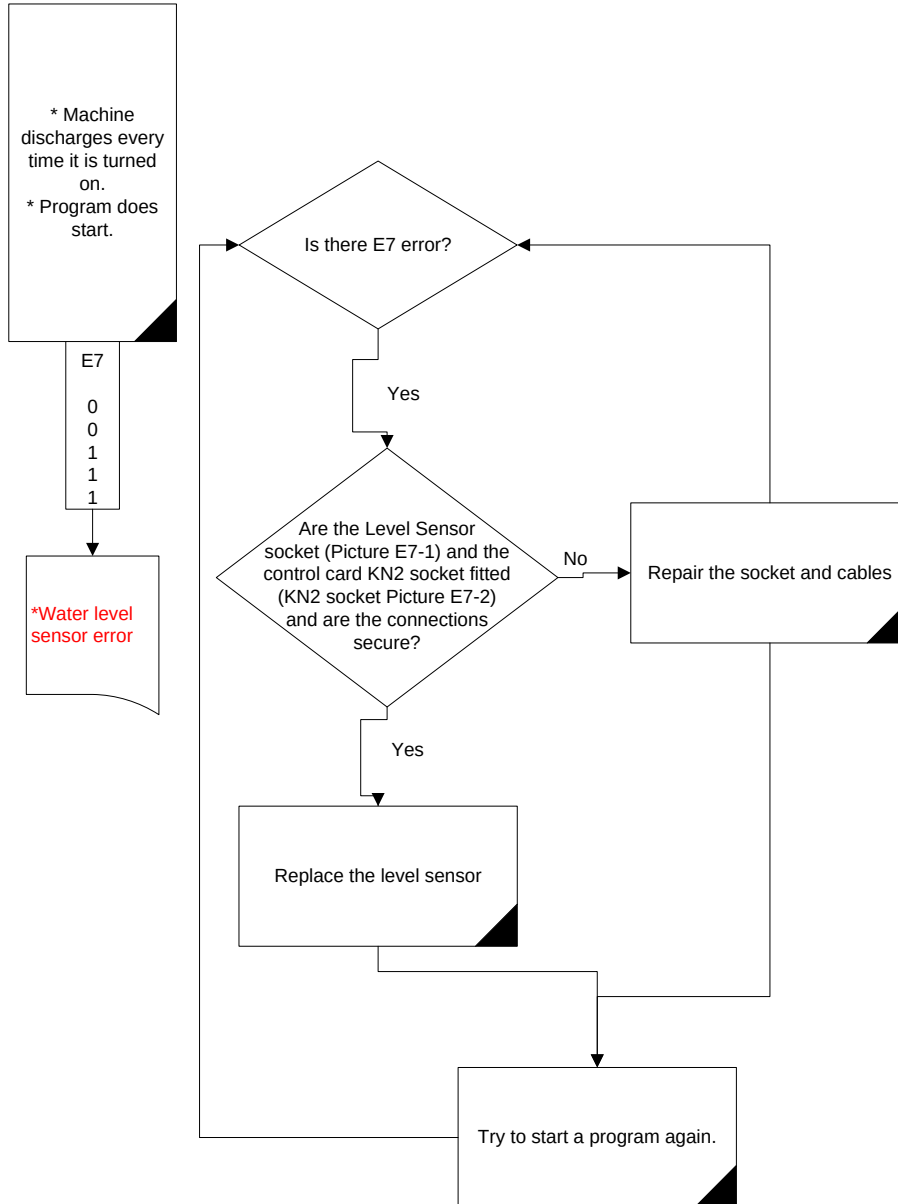
*It starts suddenly during washing cycle. *Moves for a few times and finishes the program.
*Program is not completed.

E6

0
0
1
1
0

* Motor triac short circuit error
or
*Motor triac in diode mode error.

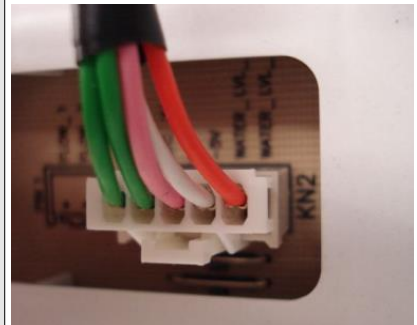




PICTURE E7-1: The socket on the level sensor must be fitted.



PICTURE E7-2: Socket to which the KN2 level sensor cables are attached

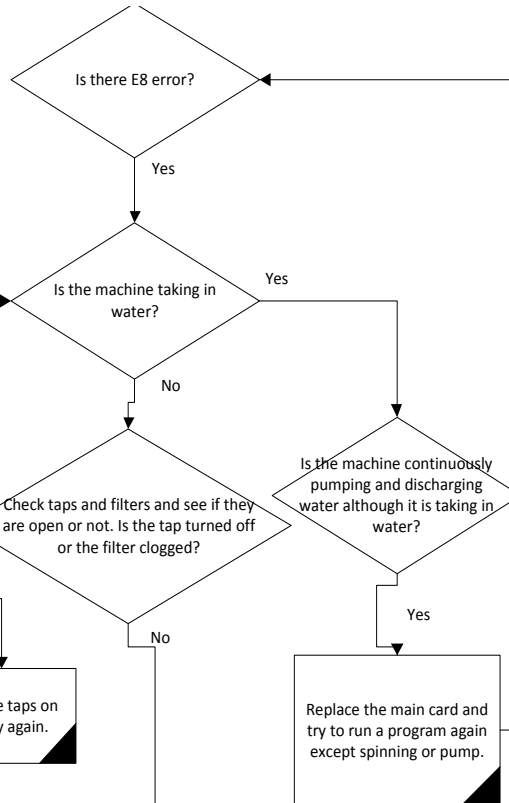


*Program lasts long.
*Machine does not finish the program.
*Machine does not take in water.
*Machine does not work.
*It does not spin and drain.
*Machine continuously drain

E8

0
1
0
0
0

*Water cutoff



PICTURE E8-2: KN3 connector connector on the card

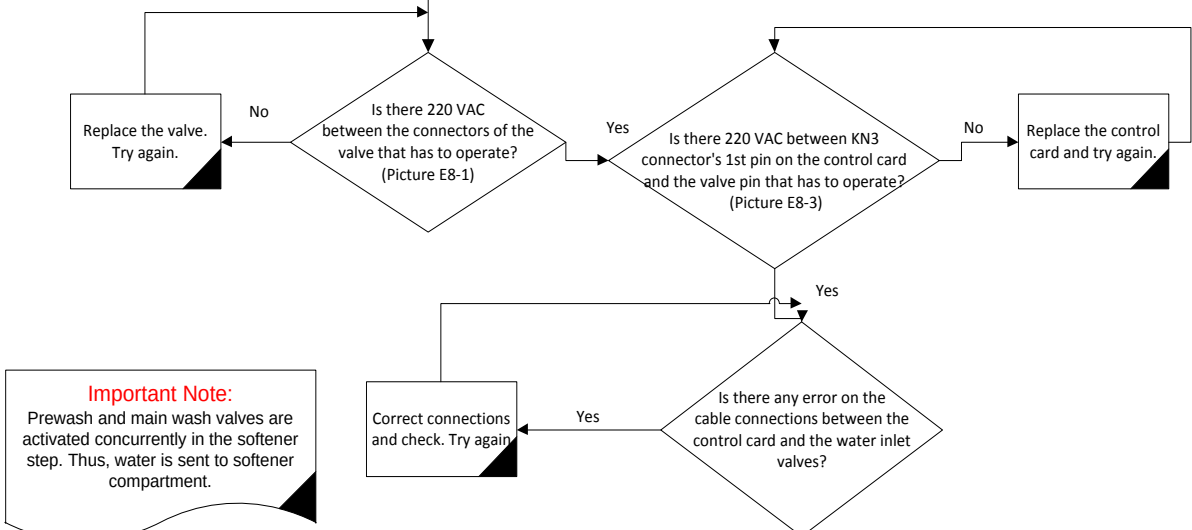


INFORMATION: Main wash pin 3 blue
Prewash pin 4 yellow
Hot wash pin 5 red

PICTURE E8-1: AC voltage is being measured over valve connectors



PICTURE E8-3: AC voltage is being measured over valve connectors



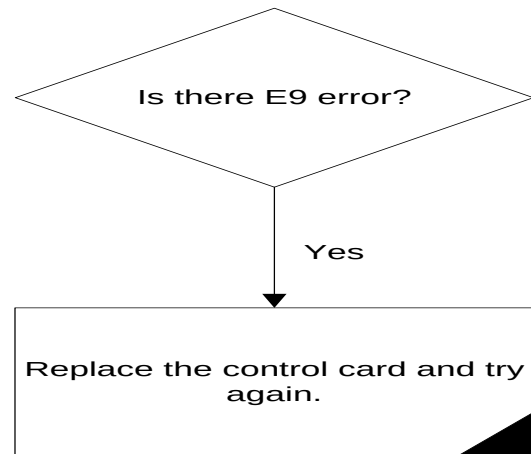
Important Note:
Prewash and main wash valves are activated concurrently in the softener step. Thus, water is sent to softener compartment.

- * Machine gives bad wash results.
- * Washing comes to an end before the displayed washing time elapses.
- * Program is not completed.
- * Machine leaves water inside. Laundry comes out with detergent

E9

0
1
0
0
1

*Door lock
triac open
circuit error

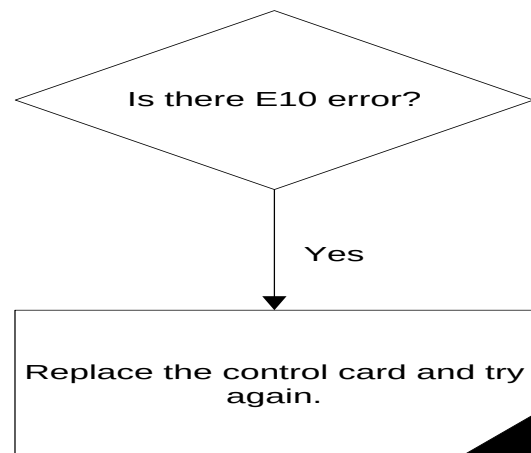


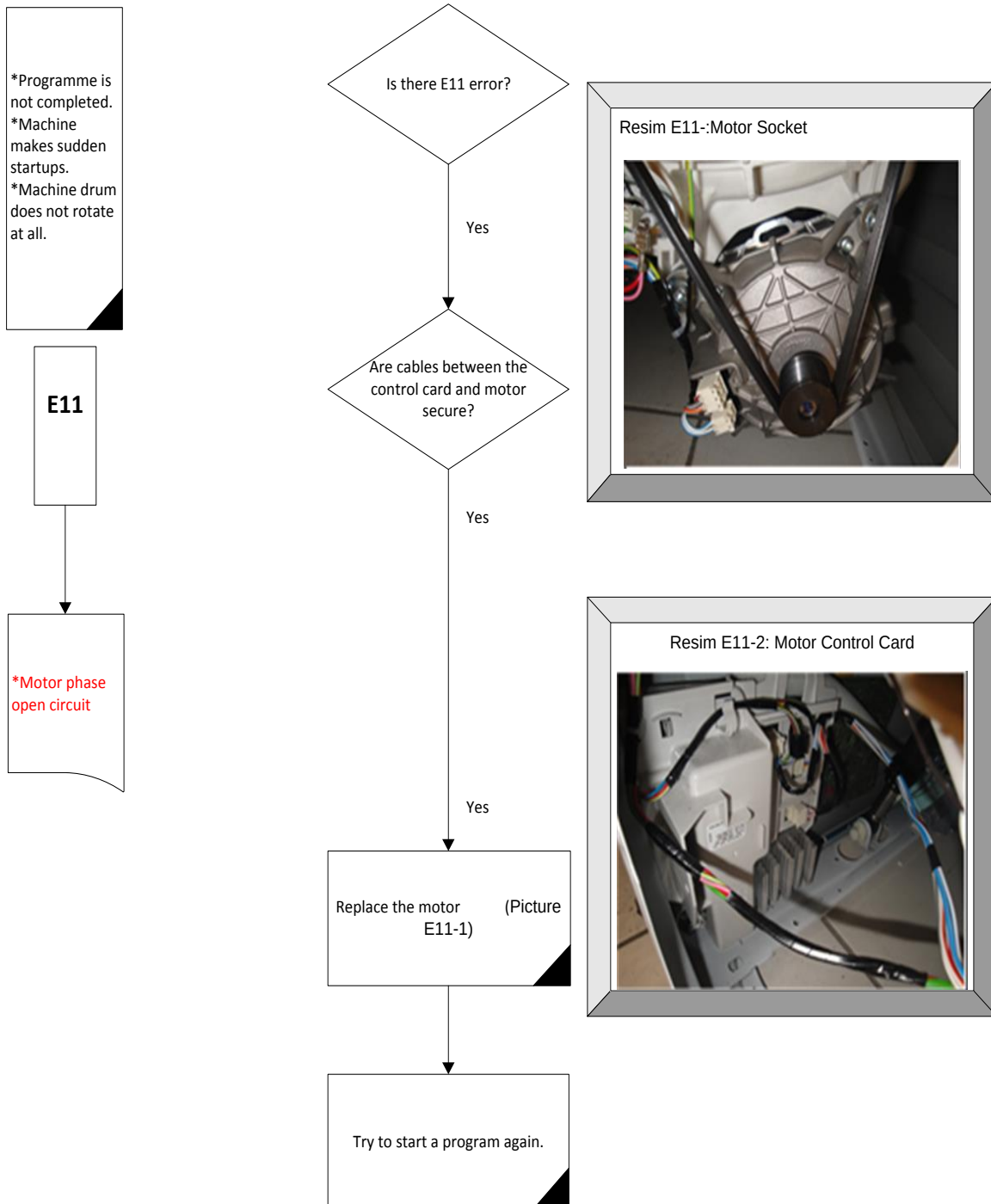
Door jammed

E10

0
1
0
1
0

*Door lock
triac short
circuit error





* Machine washes poorly.
,* It ends the programme.

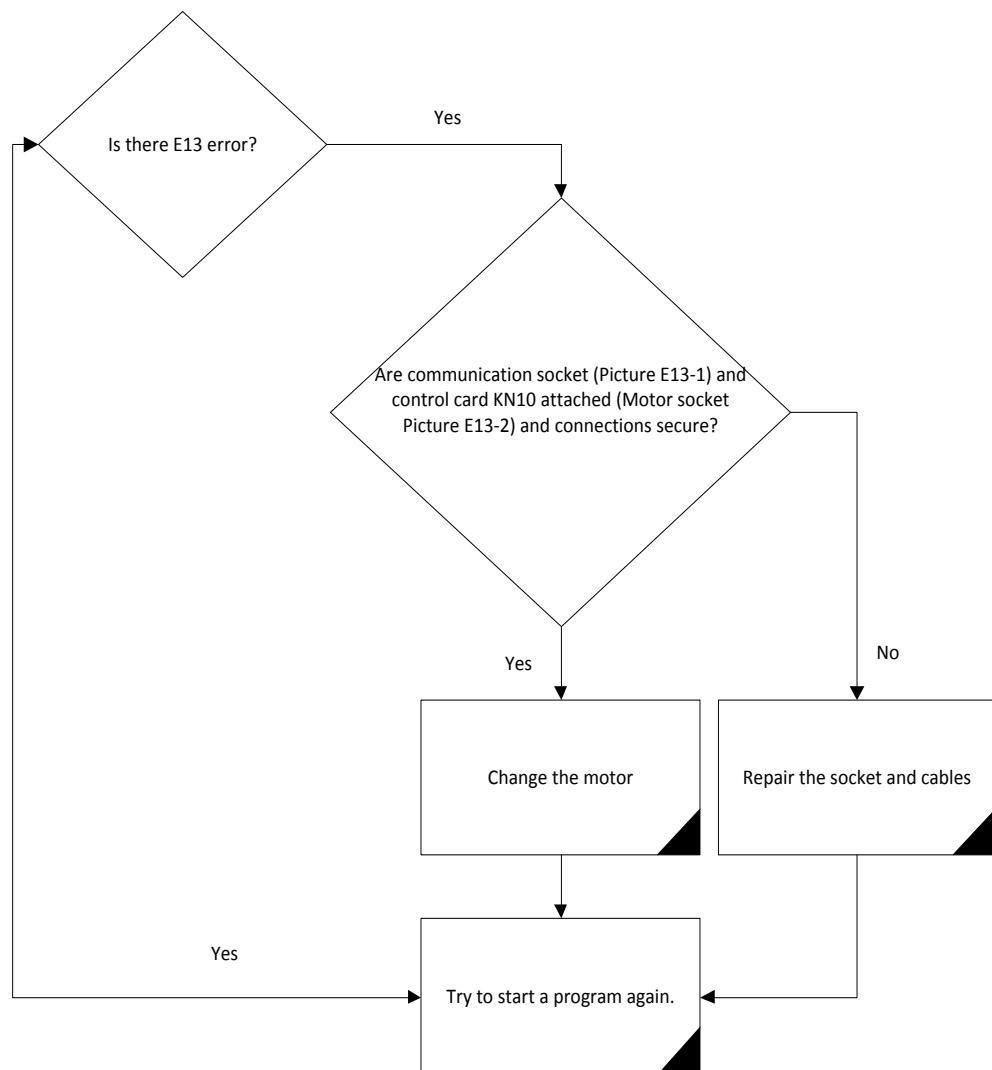
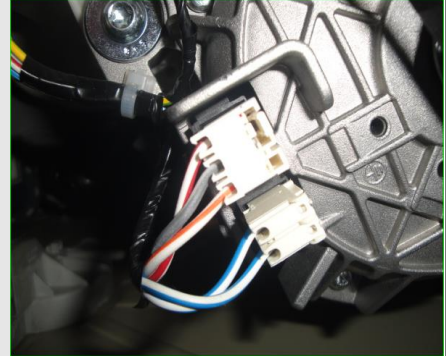
E13

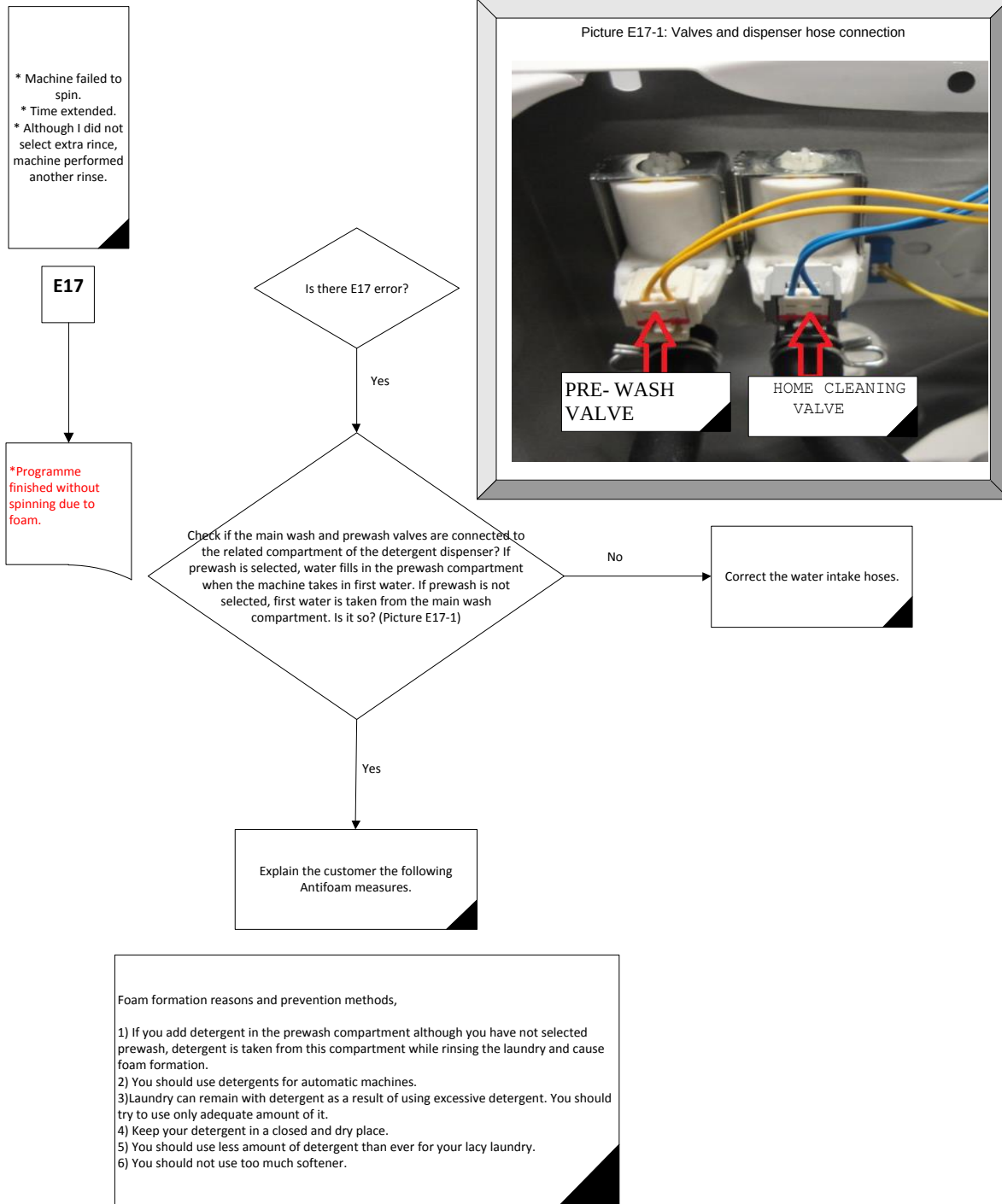
*Communication cable open circuit.

Picture E13-1: KN10 connector connection on the card



Picture E13-2: Communication connector connection on the motor





* Machine did not spin.
* Time lengthened.

E18

1
0
0
1
0

*Program terminated error without spinning because of unbalanced load

Is there E18 error?

Yes

Explain the customer the following unbalanced load preventive actions.

Reasons for ending the program without spinning as a result of unbalanced load detection

- 1) Laundry may pile up on one side of the drum when you run your machine with less laundry. There is the risk of damaging the washing machine when it is operated in higher speeds with unbalanced load. Therefore, when the unbalanced load in the machine is calculated more than the limit value, the machine does not spin for safety reasons.
- 2) Piling up of laundry at one point in the drum will be higher when the machine is operated with a single pullover, bathrobe or towel. Avoid washing such laundry as one piece as much as you can.

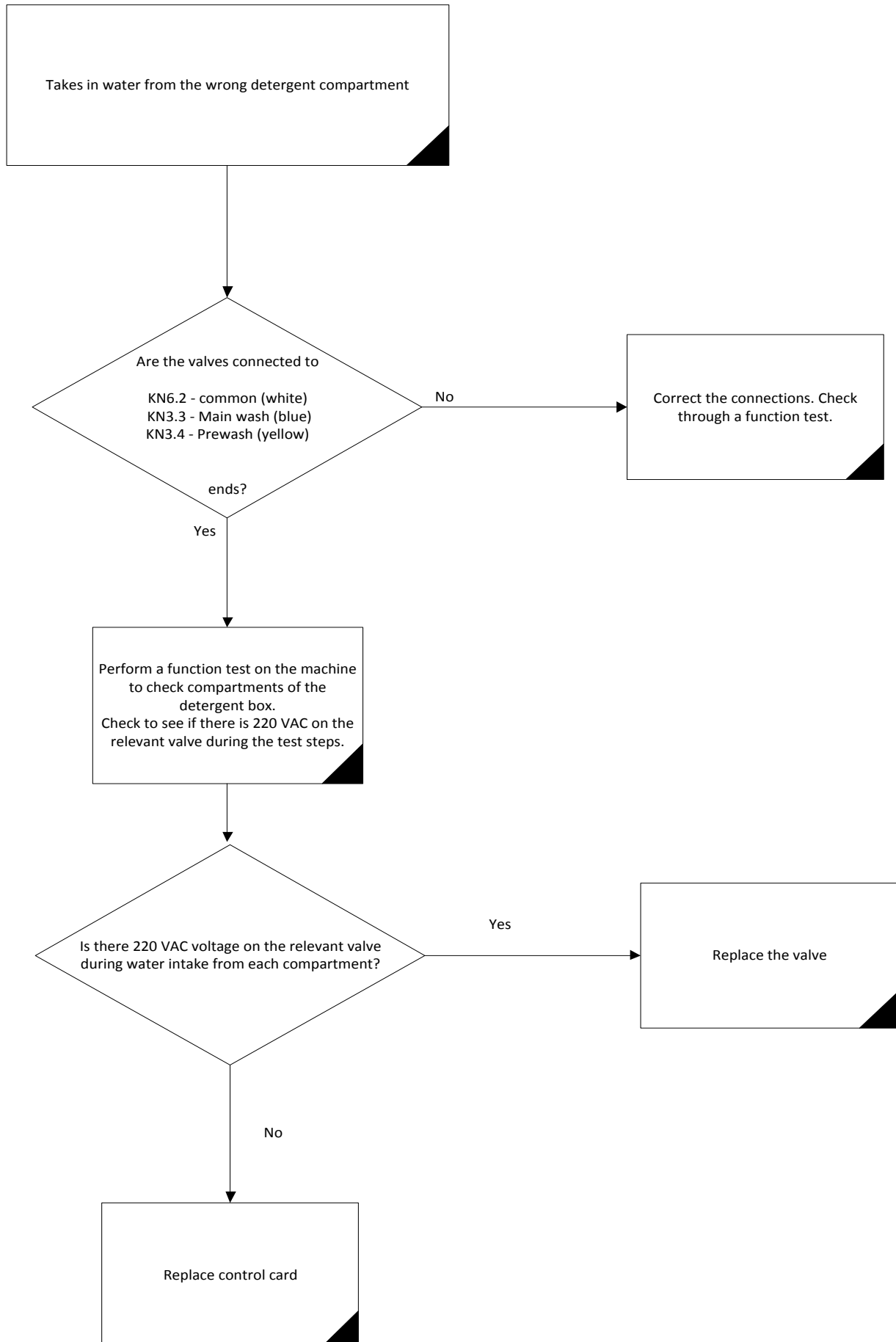
Yes

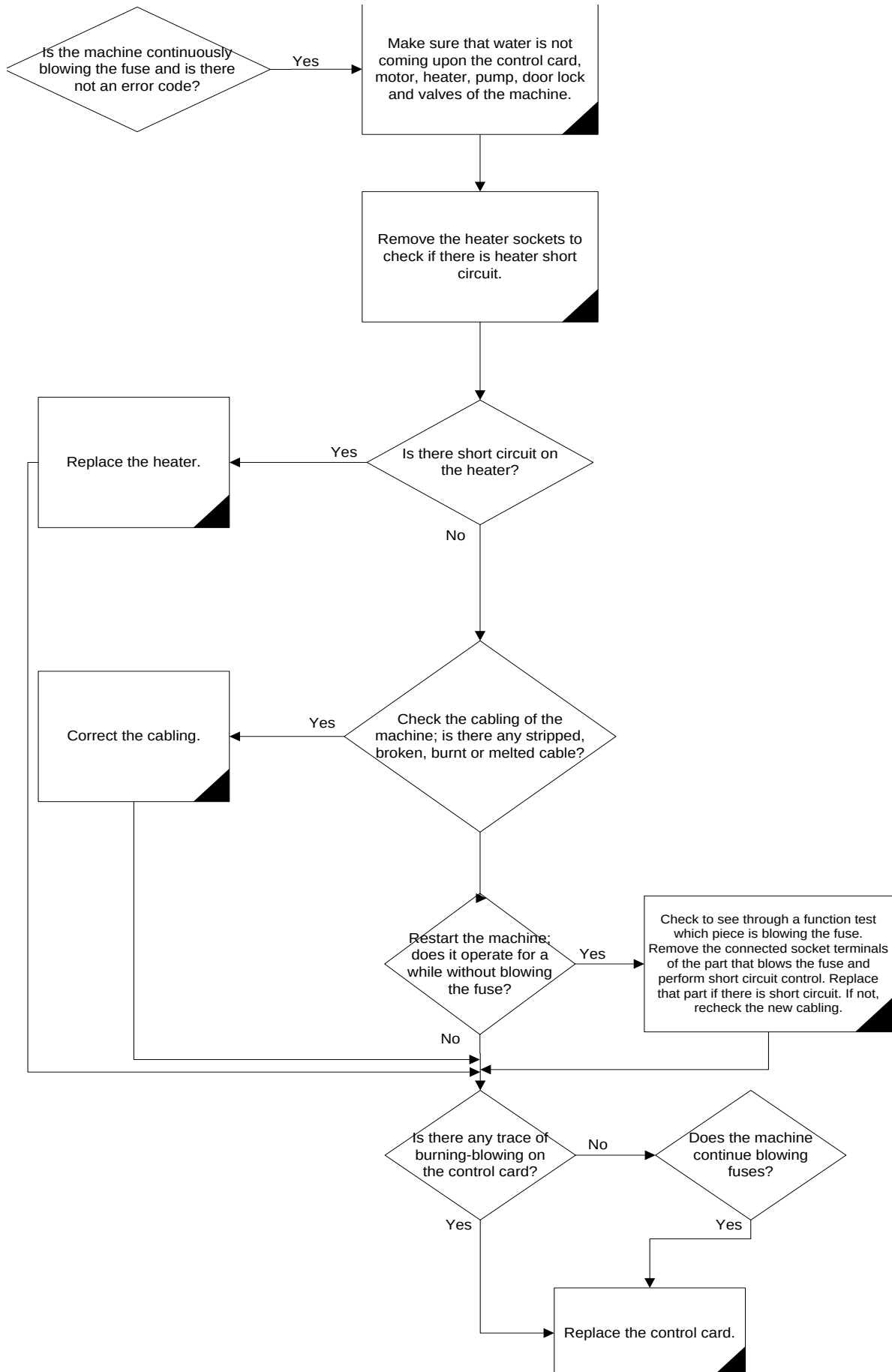
Program selection switch does not function.
Or the
selected program and the running program are not identical
or
some programs cannot be selected.

For example, although spinning is selected, the machine
takes in water.



Replace the control card.





Error code is shown on the screen in case of 7_segment display. Nothing is shown on the speed indication LEDs.	Spin speed adjustment LEDs error display (speed LEDs are used to show error codes in models not equipped with 7_segment display)					ERROR
	Speed 5 MAX	Speed_4	Speed_3	Speed_2 (rinse hold)	Speed_1 (no spin)	
E01						*Heater ntc open circuit error or *Heater ntc short circuit error
E02						*Heater open circuit error
E03						Heater continuously active error
E04						* Valve triac short circuit or 'Valve triac diode error
E05						'Pump triac open circuit or Pump blocked or Pump triac diode or 'Pump rotor locked and does not rotate error
E06						*Motor triac short circuit or *Motor in triac diode mode error.
E07						*Water level reading error
E08						*Water cut off or *Valve triac open or *Pump triac short circuit error
E09						'Door lock triac open circuit error
E10						'Door lock triac short circuit error
E11						*Motor open circuit or * Tacho open circuit
E17						*Program terminated error without spinning because of foam
E18						*Program terminated error without spinning because of unbalanced load

11. List of Equipment/Apparatus to be used in Component Assembly / Disassembly

11.1. Shock Absorber Pin Punching Apparatus



Shock absorber pin punching apparatus

Picture 11.1 Shock Absorber Pin Punching Apparatus



Before the shock absorber is punched into its place, practice is performed at the bushings.

Picture 11.2



Shock absorber is attached onto the bracket and drum.

Picture 11.3



Picture 11.4

Only softener is applied onto the shock absorber pins.



Picture 11.5

Pin is attached onto it.



Picture 11.6

Punching gun is seated onto the bracket and pin.



Picture 11.7

Punching gun is squeezed and assembly is completed.



Picture 11.8

Punching gun is squeezed to the very end and assembly is completed.



Picture 11.9

It will be checked after assembly.

12.COMPONENT ASSEMBLY / DISASSEMBLY



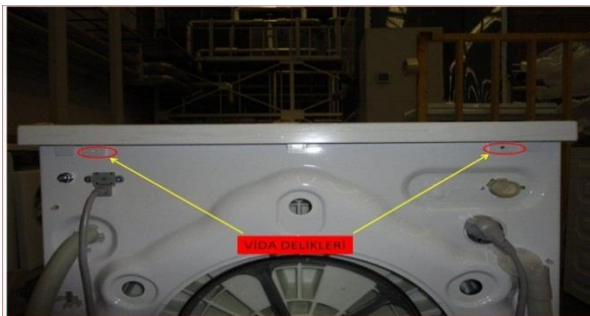
Front view of the machine is given in the Picture 12.1.

Picture 12.1 General appearance

12.1. Upper Table Assembly / Disassembly

2 sheet metal screws fixing the upper table to the body are removed.

Upper table is removed by being lifted to backwards and then upwards.

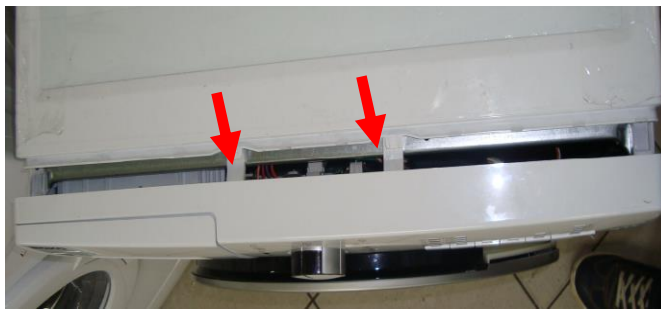


2 screws shown in Picture 12.2 are removed.

Picture 12.2 Upper table Disassembly/Assembly



Picture 12.3 Upper table Disassembly/Assembly



Picture 12.4 Upper table Disassembly/Assembly

Upper table is pulled back and removed from the tabs which are shown in the Picture 12.4.

12.2. Front Door Group Assembly/Disassembly

Front door is opened.

2 screws of the hinge holder that serves as front door holder by the hinge are unscrewed and the holder is removed. Front door is separated from the hinge.

2 hinge screws fixing the hinge to the front door are removed and hinge is removed from the front door.



Picture 12.5 Front door Disassembly /Assembly



Picture 12.6 Front door Disassembly /Assembly



Picture 12.7 Front door Disassembly /Assembly

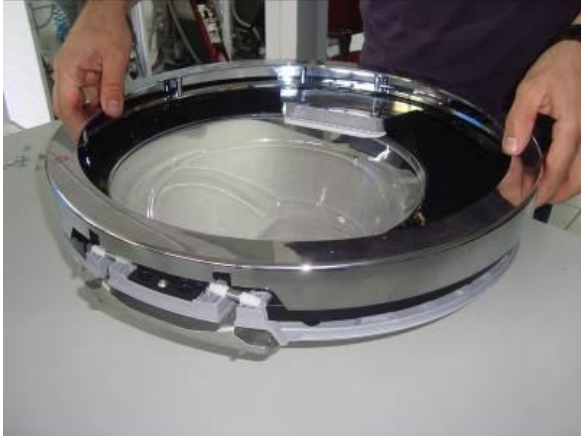
12.2.1. Exterior Door

The bolts connecting the exterior door and interior door are removed.



Picture 12.8

Exterior door will be removed from the interior door manually.



Picture 12.9

12.2.2. Hinge

Exterior door is removed.

After the exterior door is removed the hinge can be removed together with the bushing.



Picture 12.10 Hinge

12.2.3. Handle cover

The tabs (2 pieces) connecting the handle cover to the decorative cover is removed with a screwdriver.



Picture 12.11 Assembly/Disassembly of Handle Cover



Picture 12.12

Pry the handle cover from its corners and separate it from the decorative part.



Picture 12.13

12.2.4. Handle

The handle pin is removed as shown below removing the pin using a pliers.



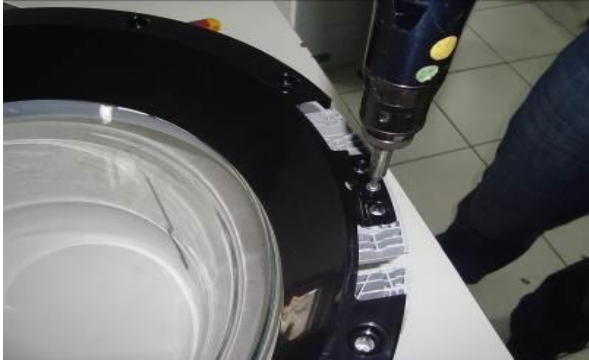
Figure 12.14 Handle

12.2.5. Lock Hook- Spring

It will be removed easily after the handle pin is removed.

12.2.6. Decorative cover

It will be removed after removing the bolts connecting decorative cover and interior door and dismantling the tabs.



Picture 12.15 Decorative cover



Picture 12.16

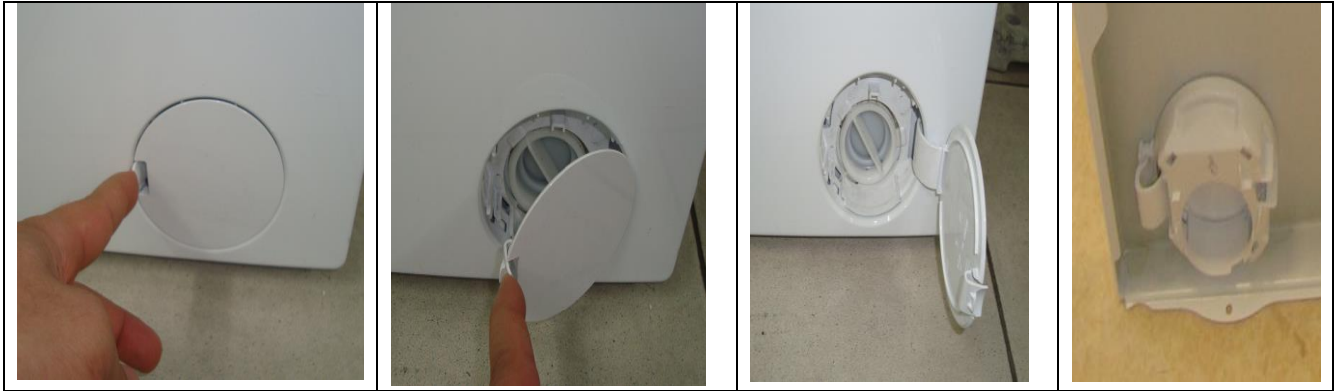
12.2.7. Glass

After the all parts are removed, the glass and the interior door can be separated easily.

Pry the handle cover from its corners and separate it from the decorative part.

12.3. Pump cover assembly/disassembly

Pump cover which is located on the right bottom side of the front wall is opened by being pushed from the tab.



Picture 12.17 Pump cover Disassembly/Assembly

12.4. Front Wall Disassembly/Assembly

Front door group is removed.

Body bellows clamp fixing the drum bellows to the front door is removed by use of a special bellows clamp pliers.

Door locking screws are removed.

Lock is pushed from its place inwards.

At the upper position of the panel connection, 2 screws ensuring the connection of the ears are removed.



Picture 12.18 Front Wall Disassembly / Assembly



Picture 12.19 Front Wall Disassembly / Assembly



Picture 12.20 Front Wall Disassembly / Assembly



Picture 12.21 Front Wall Disassembly / Assembly

12.5. Dispenser panel

Dispenser is pulled backwards from the detergent compartment.



Picture 12.22 Disassembly/Assembly of Detergent Dispenser

Dispenser is removed by pressing on the area shown with arrow on the siphon.



Picture 12.23 Disassembly/Assembly of Detergent Dispenser

12.6. Panel

Dispenser is removed.



Picture 12.24 Panel Disassembly/Assembly

3 pt screws which fix the panel to the panel reinforcement bracket and the detergent compartment and shown separately in the following pictures are removed. Tabs fixing the panel to the reinforcement bracket are released and the panel is detached from the reinforcement bracket.



1 pt screw fixing the panel to the panel reinforcement bracket is removed.



1 pt screw fixing the panel to the panel reinforcement bracket is removed.

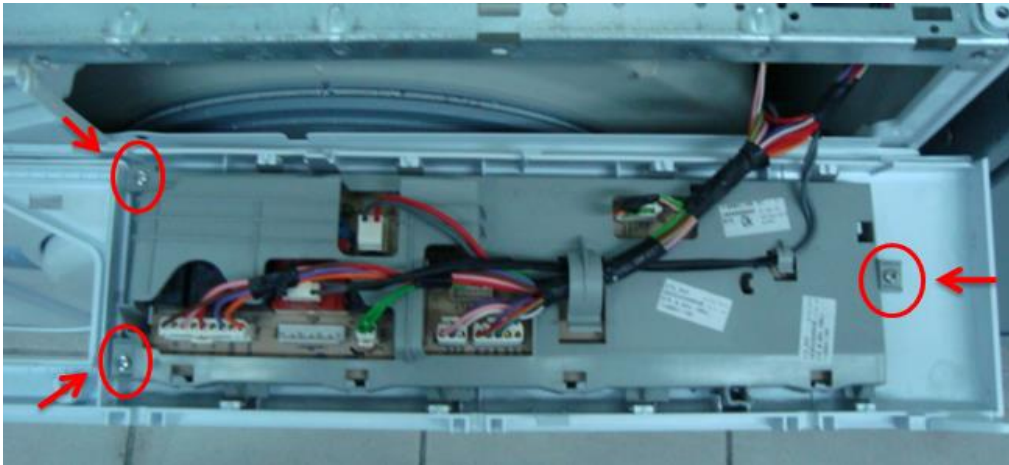
Picture 12.25 Panel Disassembly/Assembly



3 pt screw fixing the panel to the panel reinforcement bracket is removed.

Picture 12.26 Panel Disassembly/Assembly

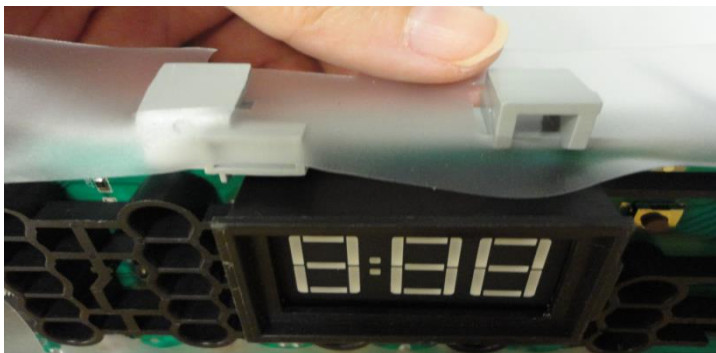
Pt screws on the areas shown with arrow sign are removed and card group is detached from panel.



Picture 12.27 Panel Disassembly/Assembly

12.7. Protective Foil

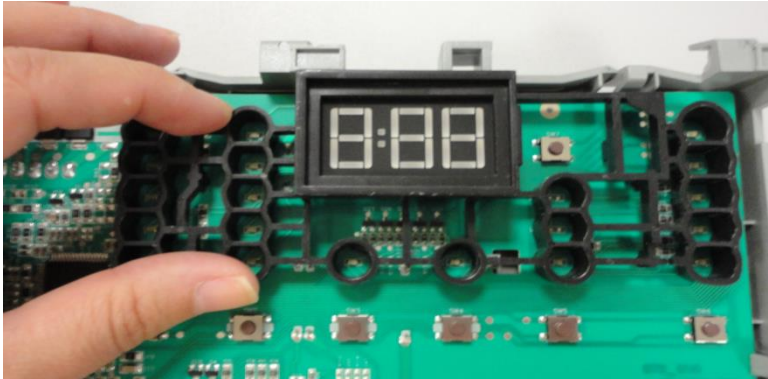
Protective foil is released from the tabs on the card holder.



Picture 12.28 Protective Foil Disassembly/Assembly

12.8. Reflector

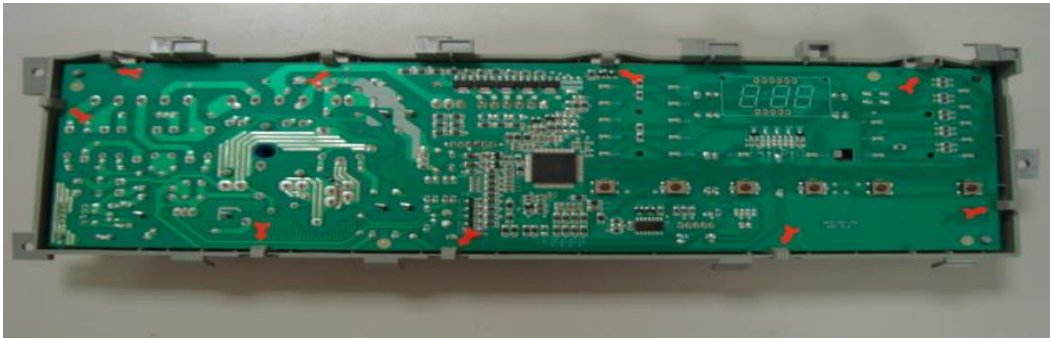
Reflector is detached from its place on the card.



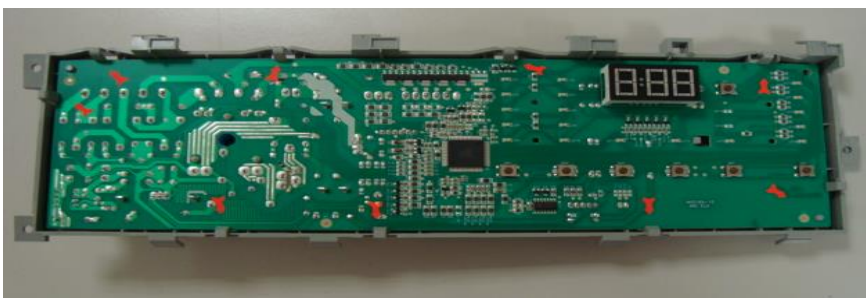
Picture 12.29 Reflector Disassembly/Assembly

12.9. Program Control Card

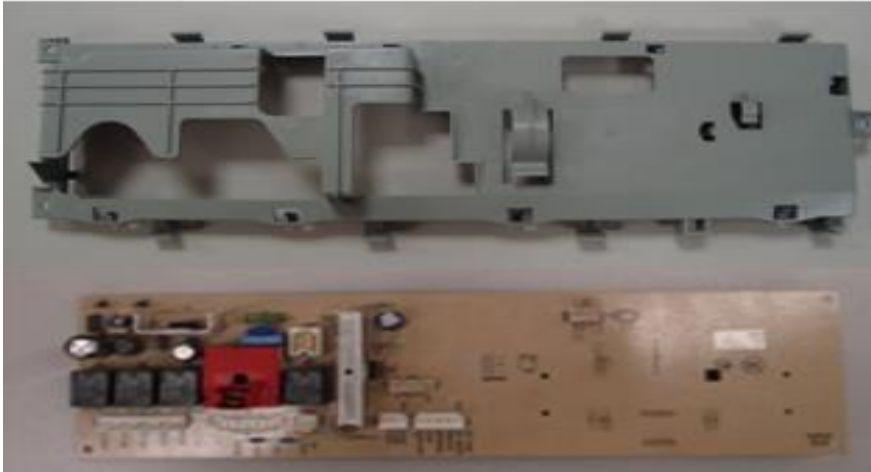
Card is detached from the tabs on the card holder shown with an arrow.



Picture 12.30 Control card Disassembly/Assembly



Picture 12.31 Control card Disassembly/Assembly



Picture 12.32 Control card Disassembly/Assembly

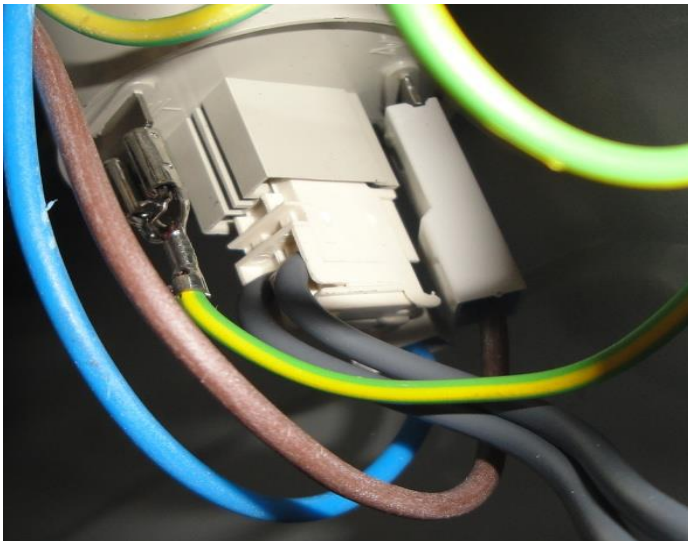
12.10. Parasite Filter

Upper table is removed.

Parasite Filter cable terminals are removed.

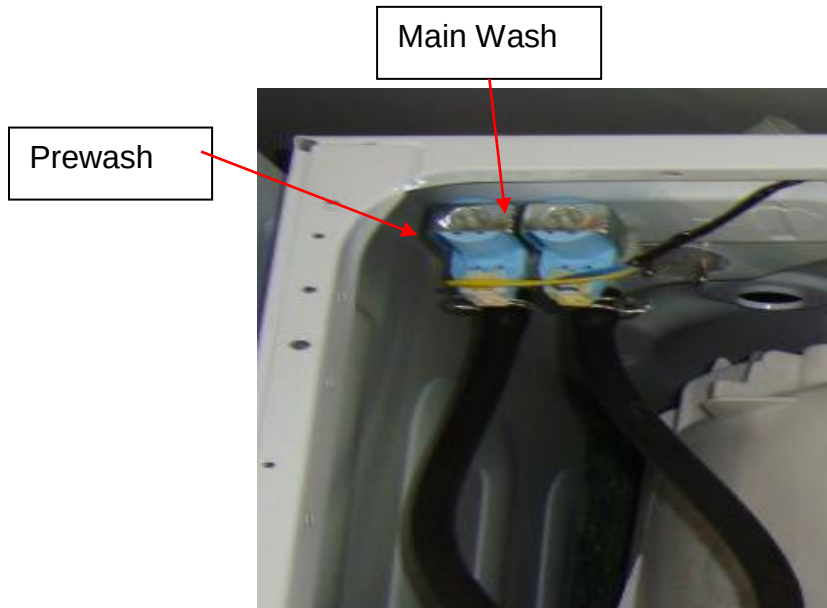
2 screws, at the back of the body, attaching the terminal group to the body are removed.

M8 nut which attaches the parasite filter to the terminal group is held by double-ended wrench and the parasite filter is removed by turning manually.



Picture 12.33 Disassembly/assembly of parasite filter

12.11. Detergent Compartment Connection Group



Picture 12.34 Detergent compartment connection group

12.12. Single Valve

Upper table is removed.

Single valve cable terminals are removed.

Single Valve Hose clamp is pulled back over the hose.

Hose is ejected from the end on the valve.

At the back of the body, the tab fixing the valve to the body is pushed inside with a screwdriver and the valve is turned towards left.

12.13. Two-way Valve

Upper table is removed.

Valve cables are removed.

Hose clamp is pulled back from over the hose.

Hoses of the two-way valve are removed.



Picture 12.35 Disassembly/Assembly of Two-way Valve

12.14. Safety Switch

Door is opened by pulling from the handle.

Drum bellows clamp fixing the drum bellows is removed.

2 screws fixing the safety switch to the front door are removed.

Safety Switch cable ends are removed.



Picture 12.36 Disassembly/assembly of safety switch

12.15. Heater

Front wall or back wall is removed.

Heater cable terminals are removed.

By loosening the M6 nut, heater is pulled and removed from the back part of the drum.

(It should be checked that the heater is attached to the Heater Fixing Wire inside the Drum. Also, before the M6 nut is tightened, NTC should be grabbed securely and installed to its place on the heater, later M6 nut should be tightened.)



Picture 12.37 Disassembly/assembly of Heater

12.16. Pump

Water inside the machine is drained.

Front Wall is removed.

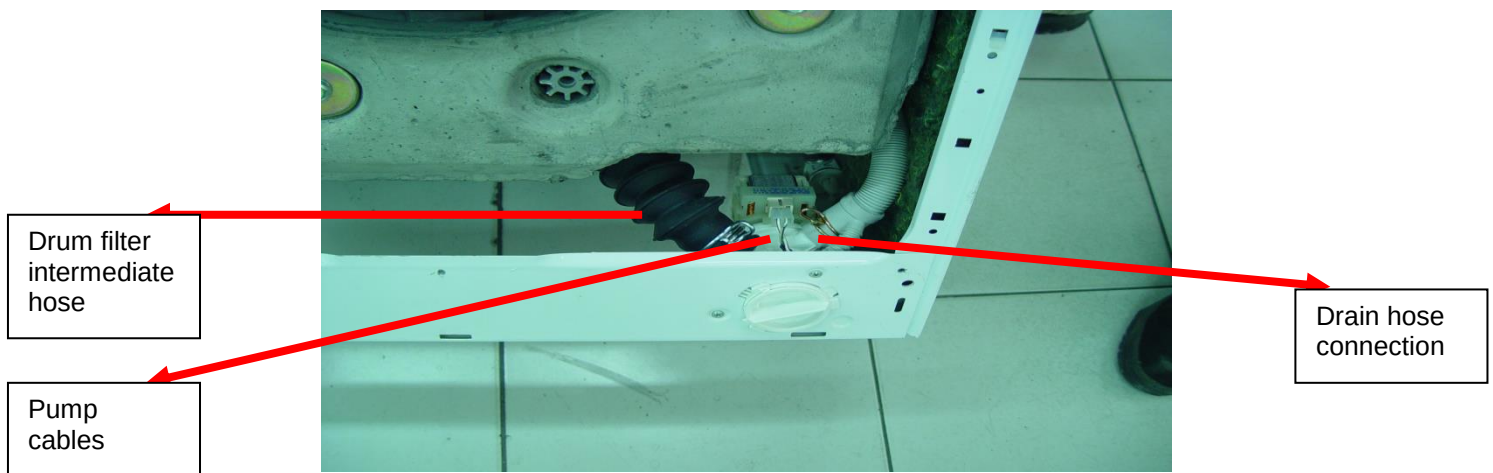
Pump cable terminals are removed.

Drum Filter Hose is removed from the pump.

When the drum filter intermediate hose is being attached again, the marks on the pump and the hose should be aligned and hose should be attached so.

Discharge Hose is removed from the pump.

Pump is turned and removed from the body.



Picture 12.38 Disassembly/assembly of Pump

12.17. Drum Bellows

Front wall is removed.

Spiral spring connecting the bellows to the drum is removed.

Bellows is pulled and removed manually from the front door.



Picture 12.39 Disassembly/Assembly of Drum Bellows

12.18. Drum Bellows Assembly

The areas marked with arrows on the bellows and the drum cover are superimposed as to face each other.

The large area on the bellows water drain and the drum front cover (marked areas in the picture) are combined in a balanced way and the bellows is stroked from below to the upper part to perform the assembly. There should be no bending on the bellows when the operation is finished.



Helical spring is attached to the bellows.

Picture 12.40 Disassembly/Assembly of Drum Bellows

12.19. Water Inlet Hose

Front wall is removed.

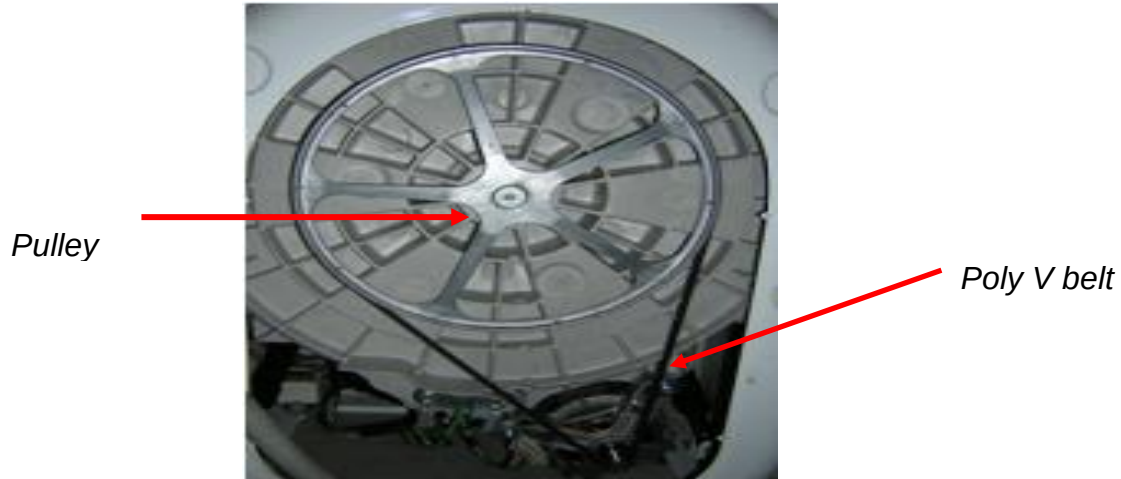
The clamp attaching the other end of the water inlet hose to the drum is removed.

The nozzle connecting the water inlet hose to the detergent compartment is seated well into its place in the compartment and the rubber hook is fixed to the tab in the compartment.

12.20. Poly V Belt

Rear cover is removed.

Poly V belt is turned and removed from over the drum pulley.



Picture 12.41 Disassembly/assembly Poly V Belt

12.21. Pulley

Rear cover is removed.

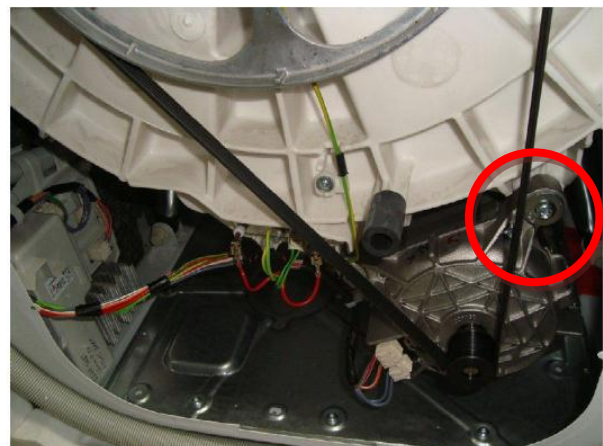
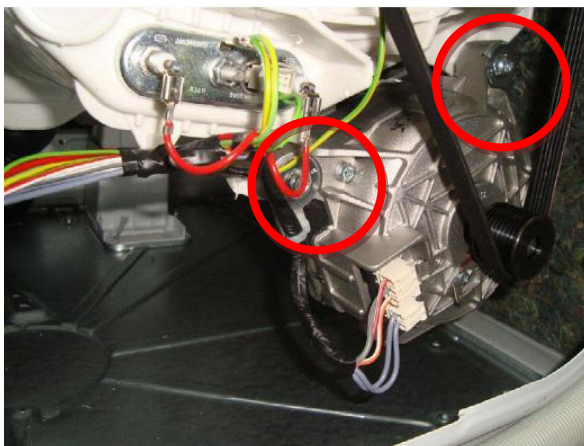
Poly V belt is turned and removed from over the pulley.

Bolt attaching the pulley to the drum shaft is removed.

Pulley is removed from the drum shaft.

12.22. Motor

12.22.1. Atlas motor



Picture 12.42 Motor

Rear wall is removed. Poly-V belt is taken out.

Motor-Drum connection screws are removed (2 pieces).

Motor is connected to the drum at three points; 2 in the front and 1 at the back.

Power and communication connections are removed.

Check that the rear connection and the rubber gasket on it seat well during mounting.

12.23. Power Cable

Cable Holder Screw is removed.

Power Cord is removed with its terminals being detached from the parasite filter.



Picture 12.43 Disassembly/assembly of Power Cable

12.24. Upper Counterweight

Upper table is removed.

Upper Counterweight is removed with its retaining bolts detached.



Picture 12.44 Disassembly/assembly of upper counterweight

12.25. Lower Counterweight

Front wall is removed.

Lower Counterweight Retaining Bolts are removed. (When the upper and lower counterweights are assembled, torque value should be 2100 Ncm (-900 Tolerance).



Picture 12.45 Disassembly/assembly of lower counterweight

IMPORTANT: When the machine is required to be serviced by being tilted to the front, its transport safety bolts should be installed, if this is not necessary, lower counterweight bolts should not be fully removed.

12.26. Discharge Hose

Front Wall is removed.

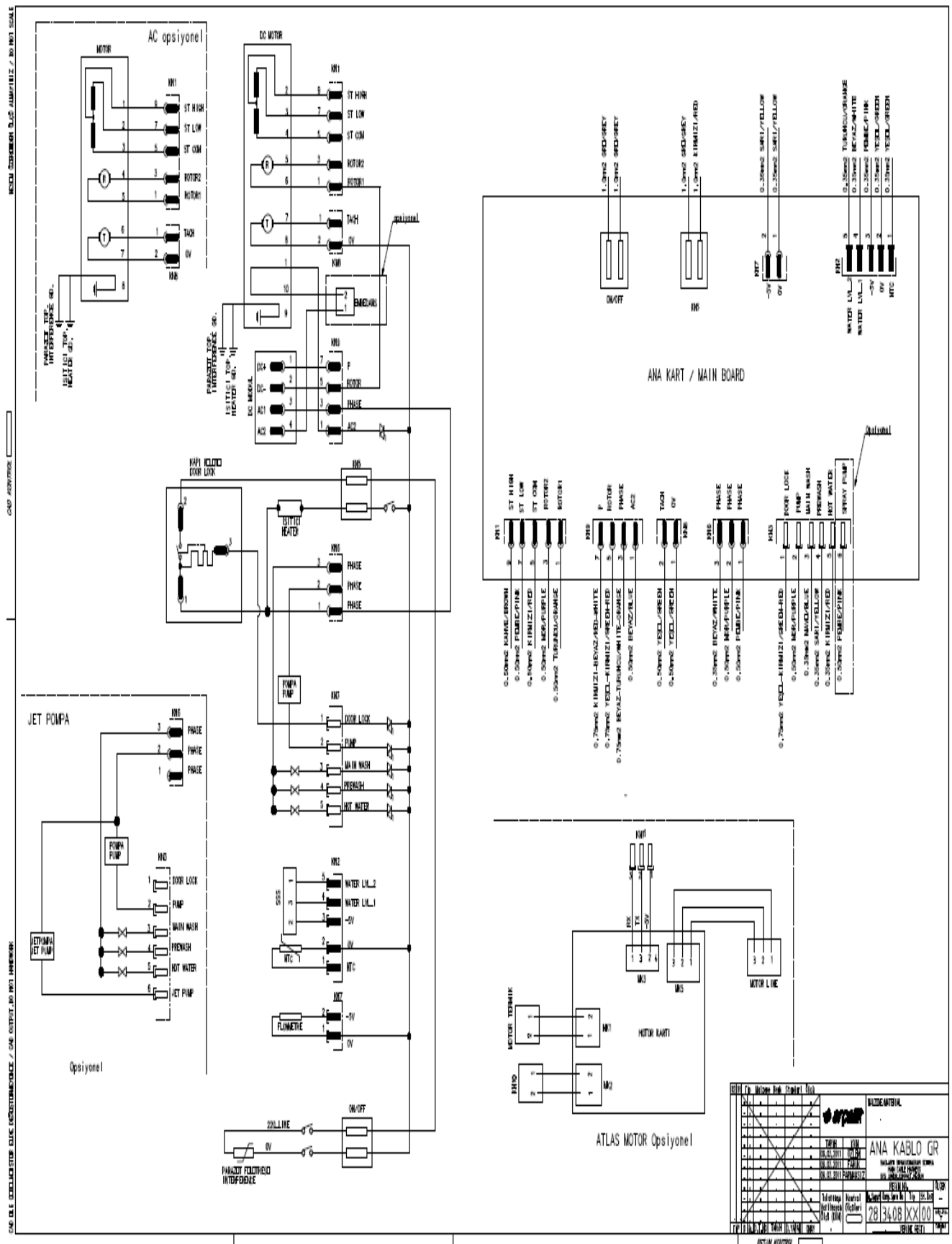
Clamp at the pump inlet of the discharge hose is pulled backwards.

Discharge Hose is removed from the Pump.

Hose at the back of the body is removed from the holding tabs.

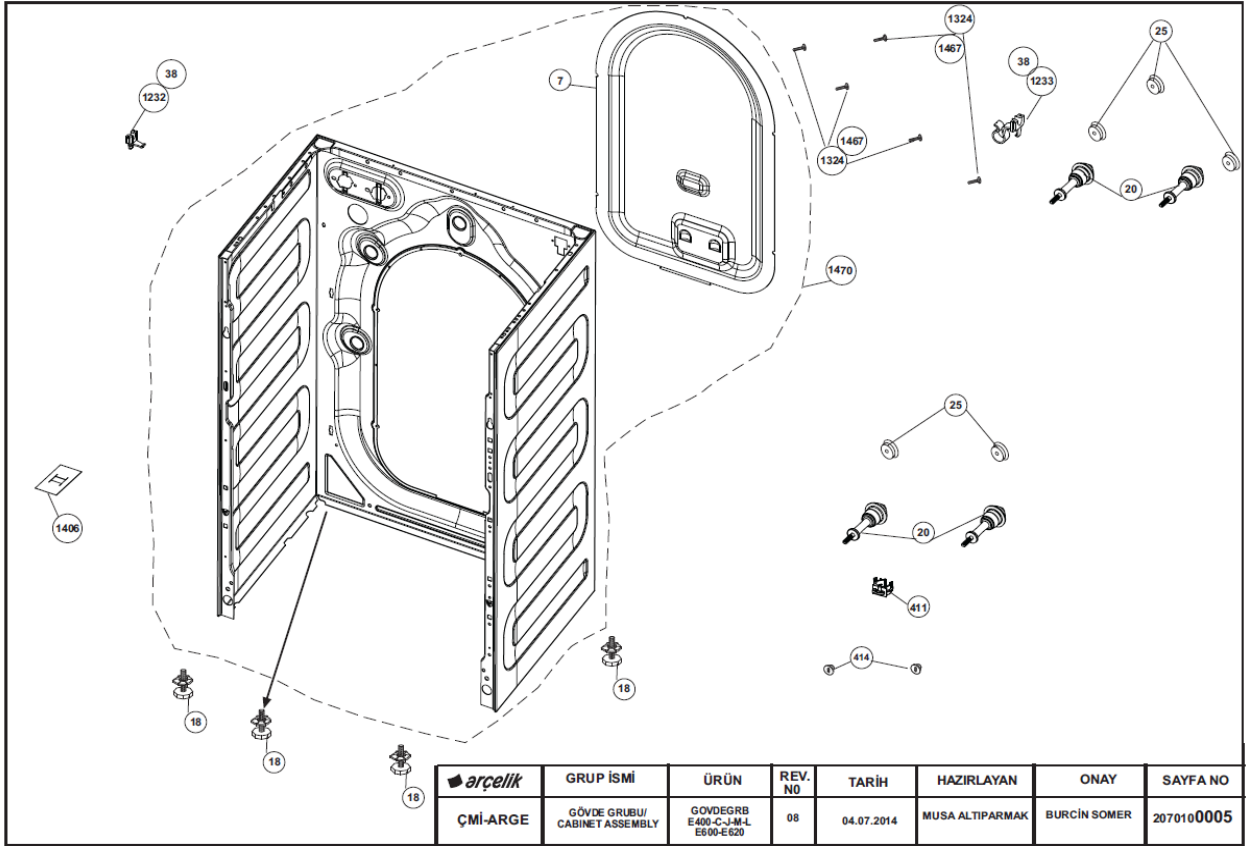
Hose is removed from front of the machine.

13. POWER CIRCUIT DIAGRAM

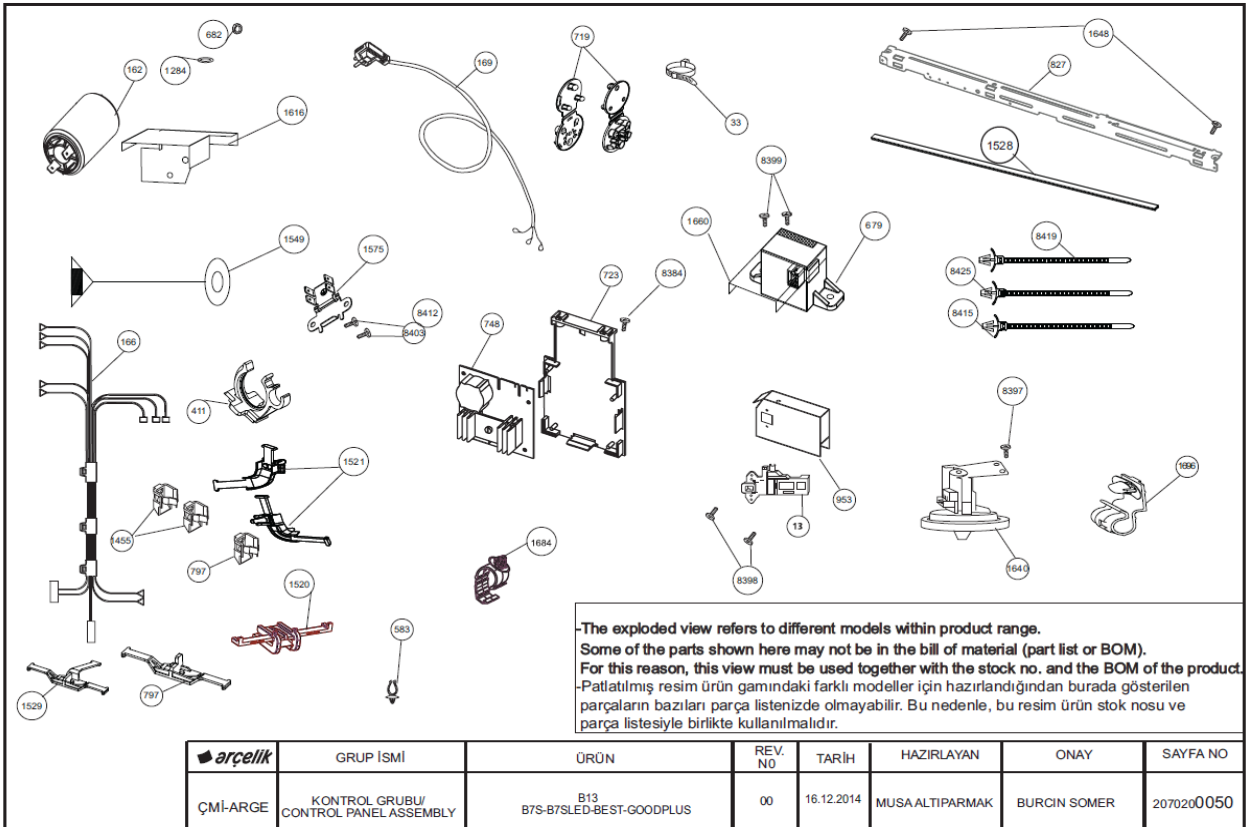


14. EXPLODED DRAWINGS

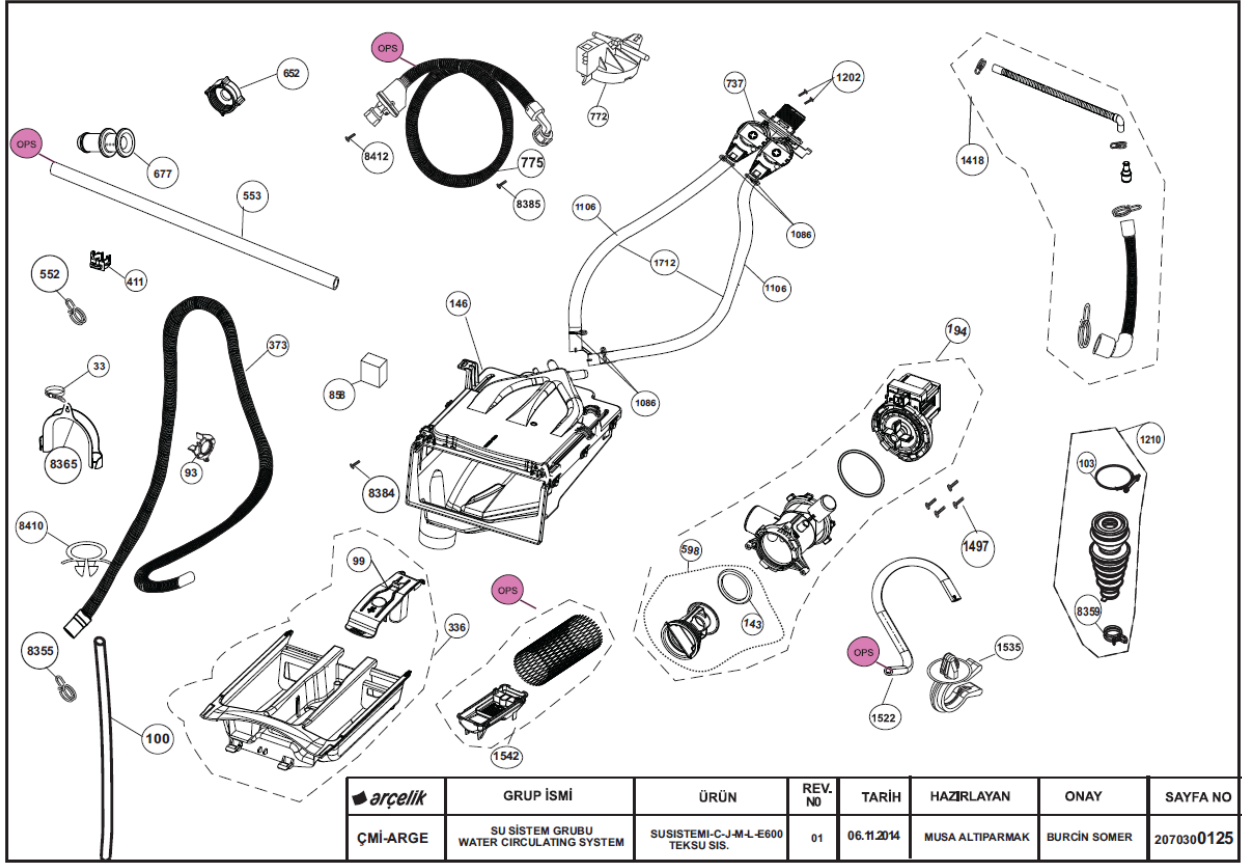
14.1. Body Group



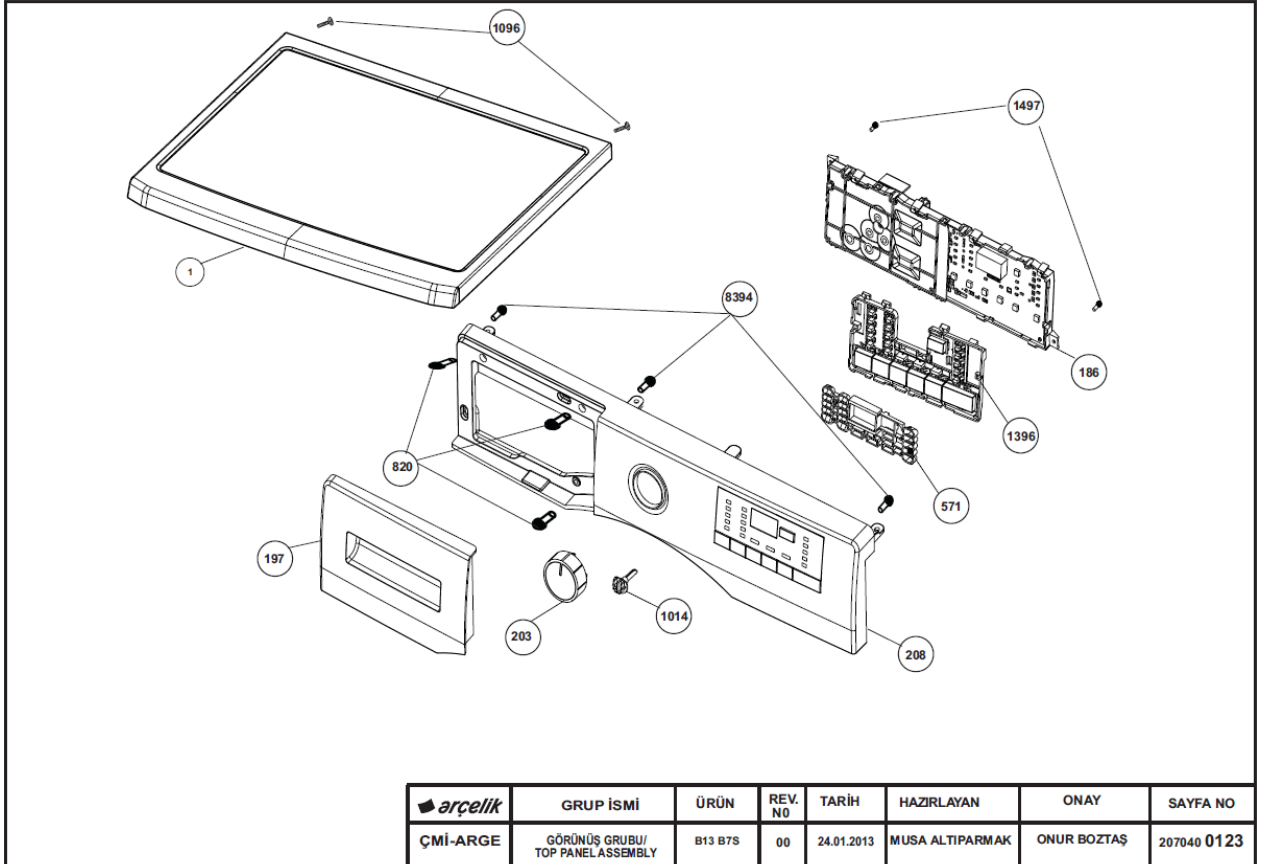
14.2. Control Group



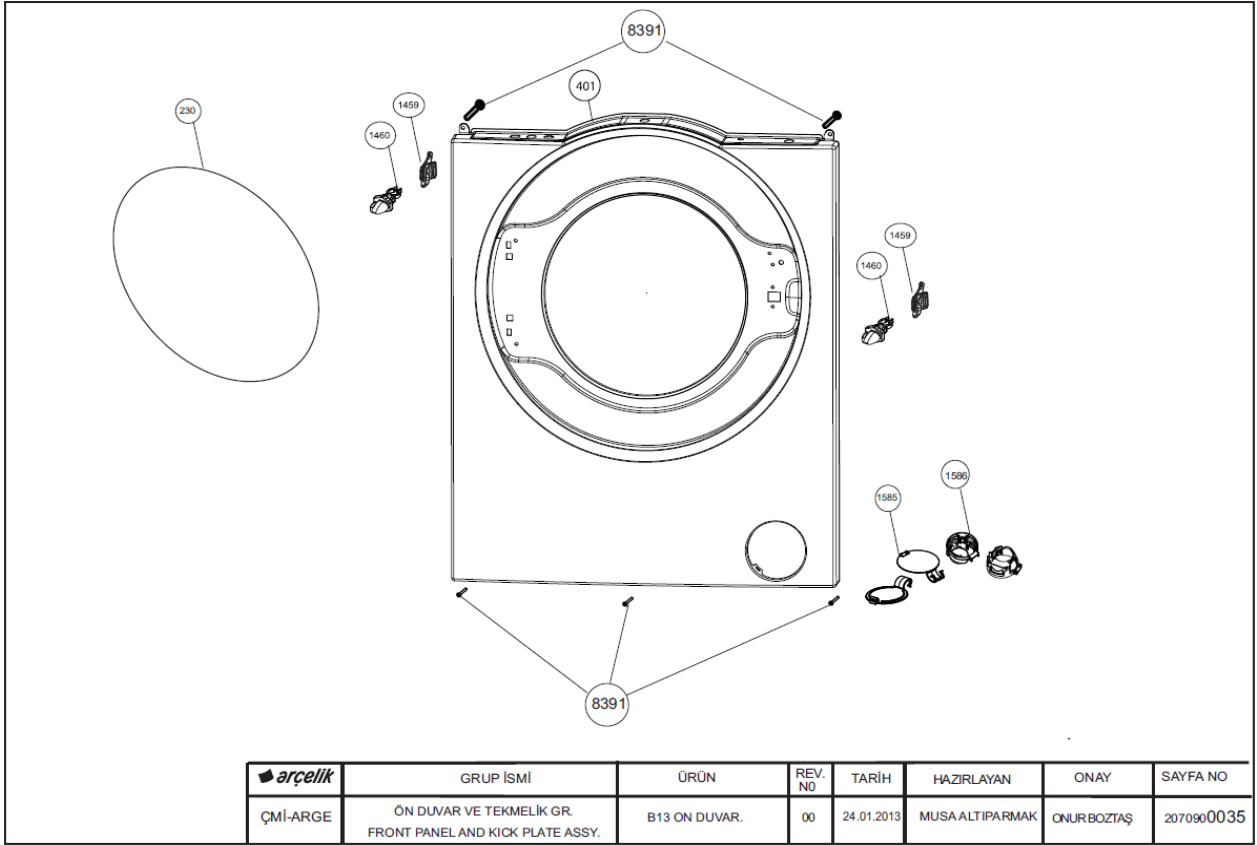
14.3. Water System



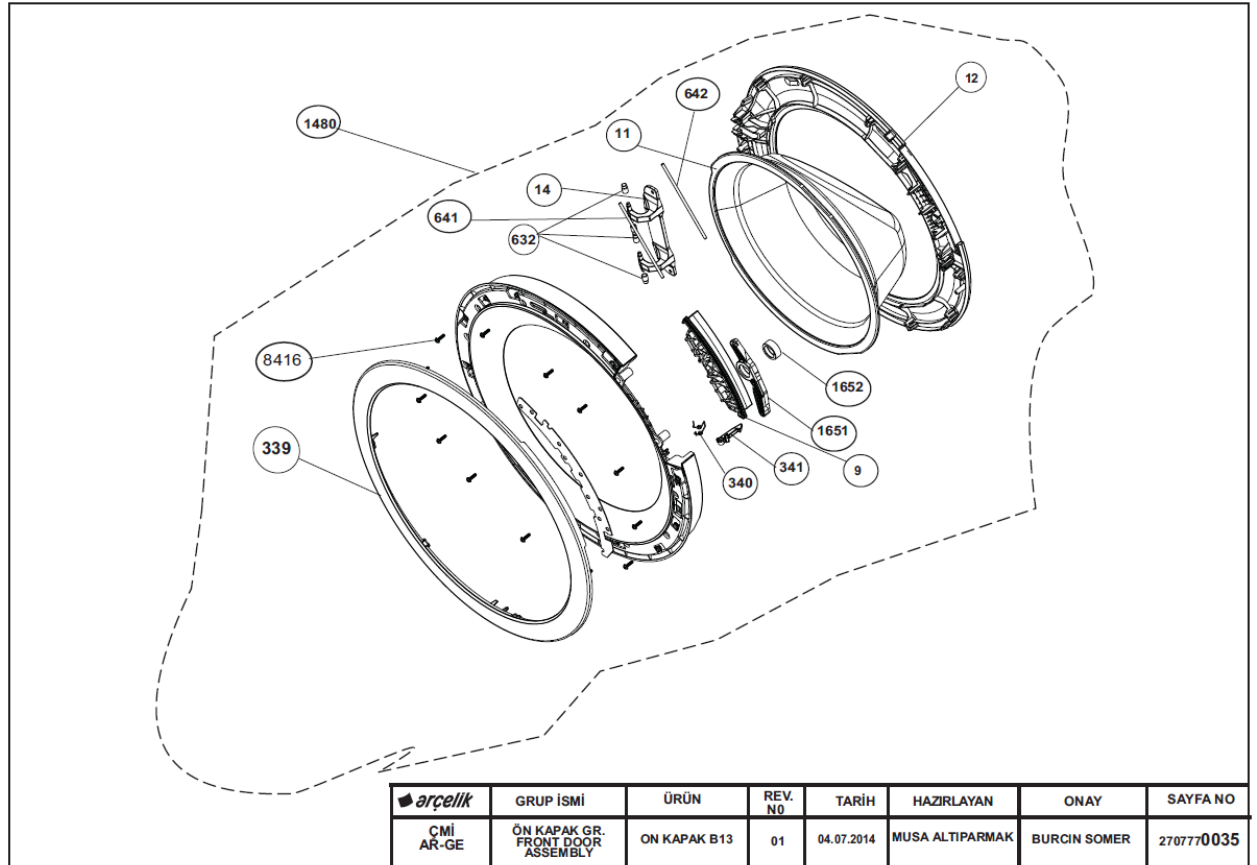
14.4. Visual Group



14.5. Front Wall Group

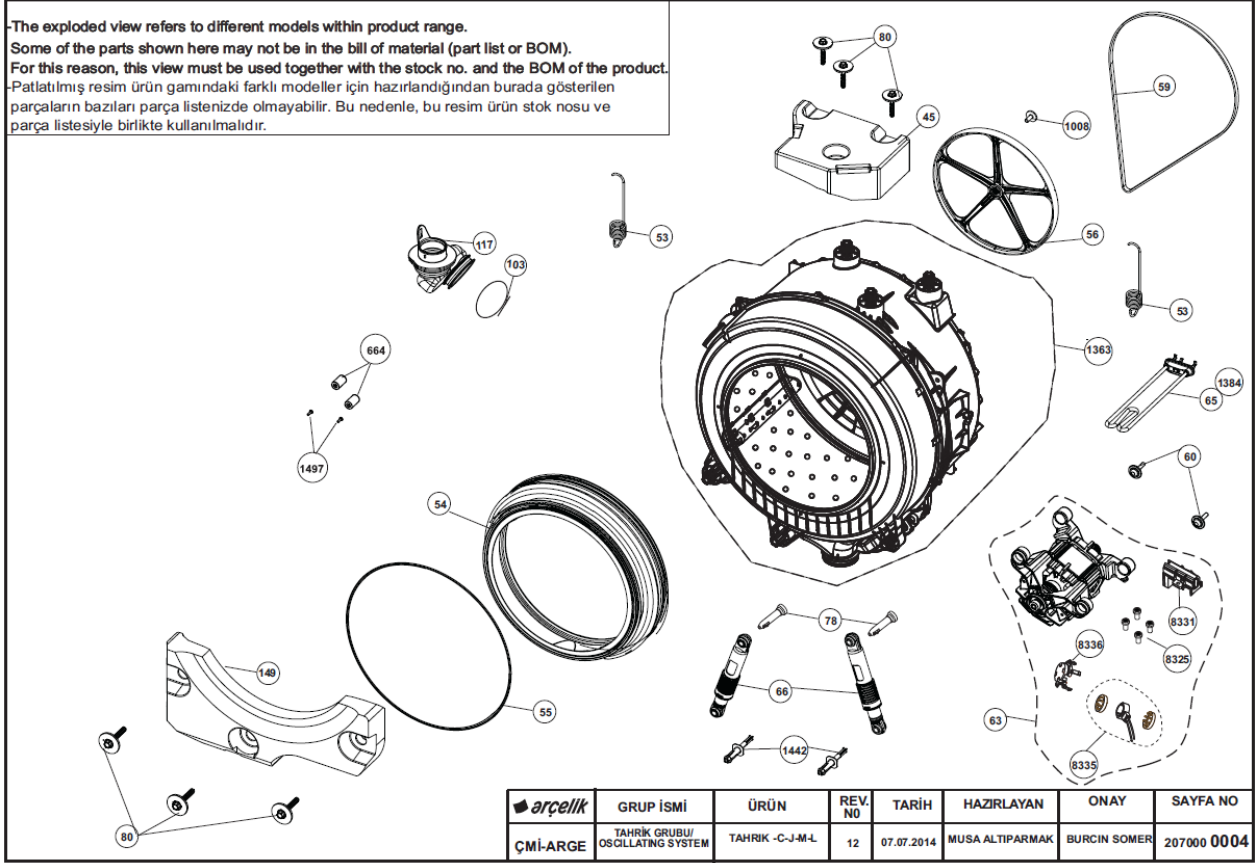


14.6. Front door

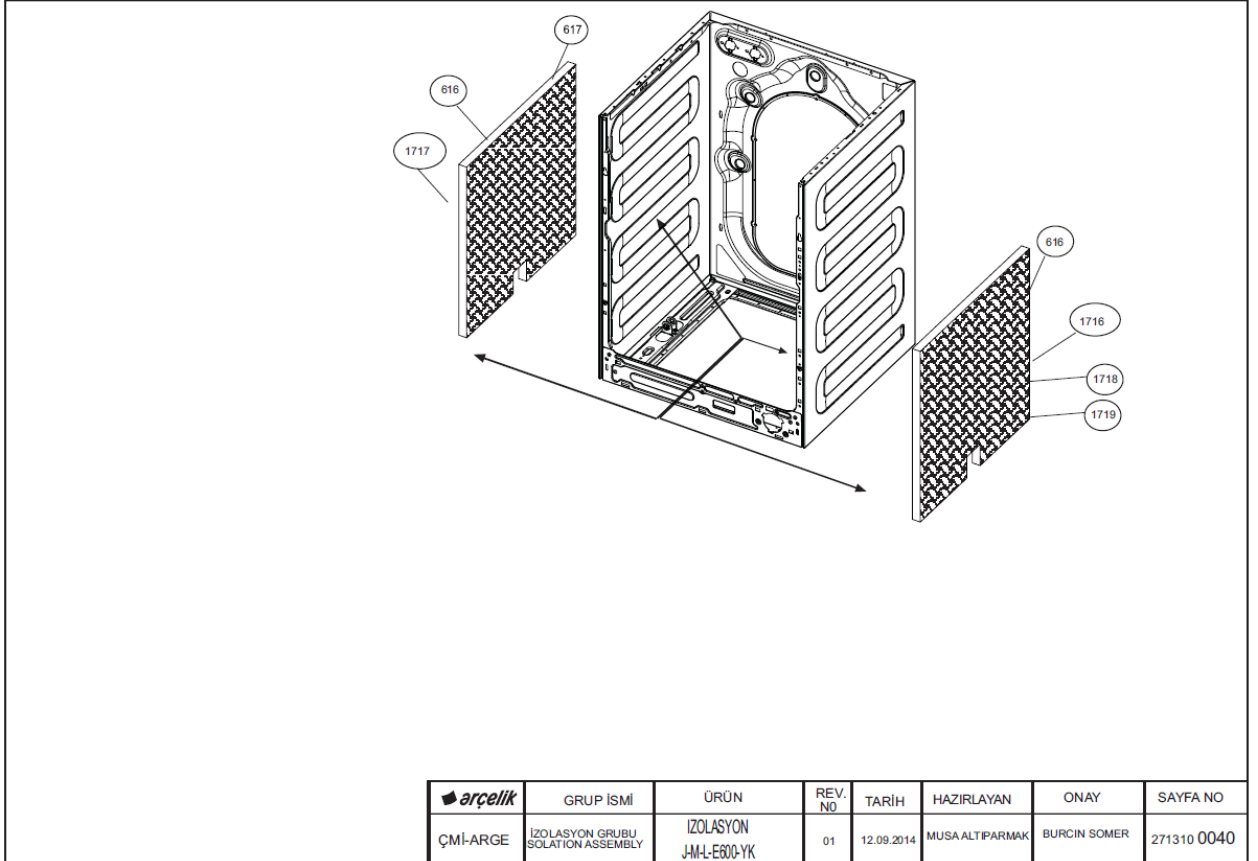


14.7. Driving Group

-The exploded view refers to different models within product range.
Some of the parts shown here may not be in the bill of material (part list or BOM).
For this reason, this view must be used together with the stock no. and the BOM of the product.
-Patlatılmış resim ürün gamındaki farklı modeller için hazırlandığından burada gösterilen parçaların bazıları parça listenizde olmayabilir. Bu nedenle, bu resim ürün stok nosu ve parça listesiyle birlikte kullanılmalıdır.



14.8. 16.6. Isolation Group



15. Part List

SAP should be taken as a basis for the part list.

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