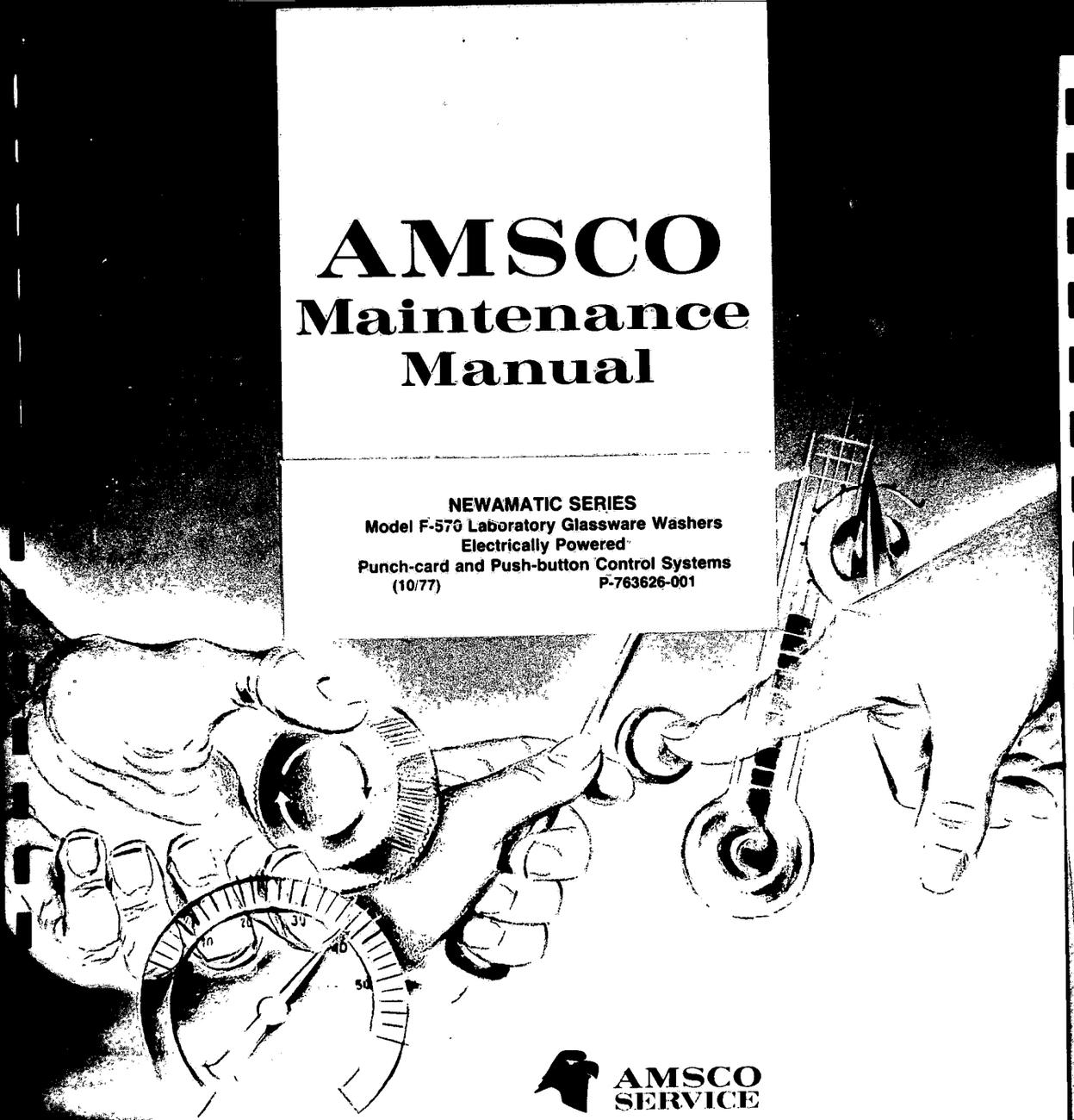
AMSCO Maintenance Manual

NEWAMATIC SERIES
Model F-570 Laboratory Glassware Washers
Electrically Powered
Punch-card and Push-button Control Systems
(10/77) **P-763626-001**



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SAFETY PRECAUTIONS

The following are personnel (WARNINGS) and equipment (CAUTIONS) safety precautions to be observed when operating or servicing this Washer. The page or pages on which they appear in the text of this manual is indicated by the number in the lower right-hand corner of the precaution.

WARNING: SURFACE OF WASHER BECOMES HOT DURING OPERATION. AVOID CONTACT WITH WASHER.
2-1

WARNING: BE SURE TO DISCONNECT ELECTRIC POWER TO WASHER BEFORE DOING ANY WORK IN CONTROL DRAWER OR COMPARTMENT BELOW CHAMBER. WHEN ELECTRIC POWER IS SUPPLIED TO WASHER, SEVERAL TERMINALS IN CONTROL DRAWER ARE ENERGIZED.
4-3, 5-1 & 6-1

CAUTION: Do not operate Washer without tank filter in wash tank. Wash pump and drain pump will be damaged if broken glass, etc. are not prevented from leaving the wash tank.
2-1, 2-2 & 4-3

CAUTION: Do not remove plastic sheet when servicing control components. Remove clip at rear of drawer and move plastic sheet aside. Be sure to secure plastic sheet with clip prior to pushing in control drawer.
6-3

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SECTION 1

GENERAL INFORMATION

1-1. APPLICATION AND DESIGN

The product literature included in this section contains technical data relating to the principal descriptive and identifying characteristics of particulars for Newamatic Series, Model F-570 Laboratory Glassware Washers. The literature is informational rather than instructional. It provides and conveys, textually and illustratively, a general concept of the equipment, its purpose, capabilities, limitations, and technical specifications.

1-2. SPECIAL TOOLS

The following metric tools will be required when servicing the Washer:

- 7, 8, 10 and 13 millimeter (mm) hex sockets
- 3 and 8 mm allen wrenches
- a set of metric open end (ignition) wrenches

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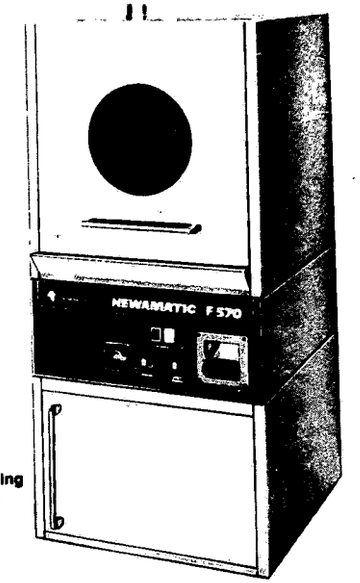
NEWAMATIC SERIES
Laboratory Glassware Washers

TECH DATA

SD-218
(6/76)

Counter-top Model

Undercounter Model



Freestanding Model

Typical only — some details may vary.

APPLICATION

A compact, versatile washer especially designed for use in hospital, research and industrial laboratories to automatically prerinse, wash and rinse a wide variety of common laboratory glassware.

TYPE AND SIZE

The washer may be for either counter-top or undercounter installation; or with the addition of an optional base, the counter-top model becomes a freestanding unit. A 22-3/8" (570 mm) diameter turntable moves glassware between fixed upper and lower wash and rinse spray systems for full load coverage.

DESIGN AND CONSTRUCTION

General. The washer, both interior and exterior, is constructed of stainless steel. Exposed surfaces are polished. We furnish all components necessary to obtain a complete working unit, ready for (but not including) installation and connection to building utility service lines. The washer will be arranged for operation on either 208-, 220- or 240-volt, 60 Hz, three-phase electrical service, as specified.

Chamber Assembly. The bottom of the chamber is sloped toward an integral wash tank at the left of the washer. A 700-watt, stainless-steel sheathed heater at the bottom of the chamber assists in removing moisture from the glassware when the treatment cycle including this phase is selected.

- **Wash Tank** extends the full depth of the chamber. It holds approximately two gallons and is automatically filled to and maintained at the proper level. The tank has a renewable, stainless-steel sheathed, immersion heater which operates during the first wash phase. The second purified-water rinse, if applicable, is also heated. The heater is rated at 6.8 kw, it has low water protection. The tank is pump drained after **each** cycle phase. A fine-mesh strainer basket which can be readily removed for cleaning protects the pump intake. The drain pump is driven by a 1/7-hp motor.

THE SELECTIONS CHECKED BELOW APPLY TO THIS EQUIPMENT

Installation
☐ Counter Top ☐ Undercounter
☐ Freestanding
☐ Base Without Door
☐ Base With Door

Control System
☐ Push Button ☐ Punch Card

Fresh Tap Water Rinse Assembly
☐ Cold ☐ Hot

Purified Water Rinse Assembly
☐ Circulating
☐ For 7 psi min. ☐ For 0-7 psi
☐ Noncirculating

Options
☐ 20 Gallon Storage Tank For Purified Water
☐ Materials Handling Accessories *(See separate product literature)*

Item No. _____
Location(s) _____

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- **Motor-driven Turntable** rotates at approximately two rpm. It has a 1/7-hp drive motor. The turntable will accept one or more of the many available baskets and racks ... see separate product literature. Its rotating, circular design eliminates unwashed glassware sometimes experienced when items are placed in the corners of a square accessory basket or rack.

Chamber Door is the vertical-lift type if washer is for counter-top installation, or bottom hinged if for undercounter installation. Both types include a tempered plate glass window for observation of the cleaning process. The vertical-lift door is counterbalanced. A cycle will not start if the door is not fully closed; washer operation will stop if the door is opened during a cycle.

Spray Systems consist of two sets of stainless-steel upper and lower stationary spray manifolds. Each has high-velocity machined ports (nearly 400 in all) which direct streams of high-pressure water onto the load from both above and below. The upper and lower manifolds are so aligned that, in conjunction with the proper loading accessories, the possibility of glassware being lifted out of the basket or rack is minimized. In addition, a water pressure control is supplied for the lower washing manifold. Each manifold has a hand-removable, stainless-steel end cap to facilitate cleaning; a brush is provided. The wash system spray pipes are also removable, without tools.

- **Wash Water.** A stainless-steel centrifugal pump circulates water between the tank and the wash spray piping at 30 psi (37 gallons per minute). The temperature of the water for the first wash phase is adjustable from 86 to 194 F (30 to 95 C). Interconnecting piping is stainless steel. The pump is powered by a 1-hp motor with grease-packed ball bearings. The motor is splashproof and has overload protection. The suction side of the pump is protected by the tank strainer.

Detergent is added to the wash water by an automatic dispensing system consisting of two dispensers. One dispenser accepts either liquid or powered detergent and is for the first wash phase. An alkaline detergent is recommended. Approximately two ounces of liquid detergent must be added to this dispenser before each cycle. The second dispenser accepts only liquid detergent, may be either alkaline or acidic (except HCL). It holds approximately ten ounces and utilizes a dosing pump to proportion the proper amount of detergent (one ounce) to the water for the second wash. One gallon of AMSCO liquid *sparkle-jet* detergent is furnished with each washer.

- **Fresh Tap-Water Rinse.** This system is noncirculating and totally independent of the wash water piping. Fresh hot or cold water is sprayed onto the load directly from the building water supply line. The sprays thoroughly rinse the load and washing chamber; soiled water is pumped directly to the drain. The hot or cold rinse water option allows the user to select the correct rinse water condition for his soil requirements (i.e., cold for protein soils and hot for non-protein soils).

- **Purified Water.** Purified water (e.g., distilled, deionized, softened) is circulated (pumped) through the wash water piping ... or when specified, the washer is arranged to spray the water through the noncirculating fresh tap water piping at supply line pressure. If the washer is specified to have circulating purified-water rinses, the water for the second rinse is heated to a selected temperature between 86 and 194 F (30 and 95 C). Supply line pressure must be at least 7 psig or else our optional 1/7-hp purified water pump will be required.

Noncirculating purified water can only be arranged if the washer is equipped with a punch-card control system. With this option, each cycle will include only one purified water rinse. Minimum supply pressure is 25 psig.

An optional, stainless-steel, 20-gallon storage tank is available for wall mounting adjacent to the washer. The tank has water-level controls.

AUTOMATIC CONTROLS

The washer will be equipped with either a push-button or a punch-card control system, as specified. The push-button system has four distinct, factory-set, fixed treatment schedules ... see chart on next page. The punch-card system comes with three standard preprogrammed punch cards. They are color coded and are the same as schedules I, II and IV described in the previously referenced chart. Special punch cards designed to meet individual cleaning requirements are available upon request.

All controls are in the area beneath the chamber door. Control panel instrumentation includes a main switch, wash-water thermostat, power switch, power indicating light, purified rinse thermostat (circulating rinse only), and either the push-button or punch-card control. After selecting the desired cycle, no further attention is necessary until the indicating light goes out signaling completion of the cycle.

OPTIONAL BASE

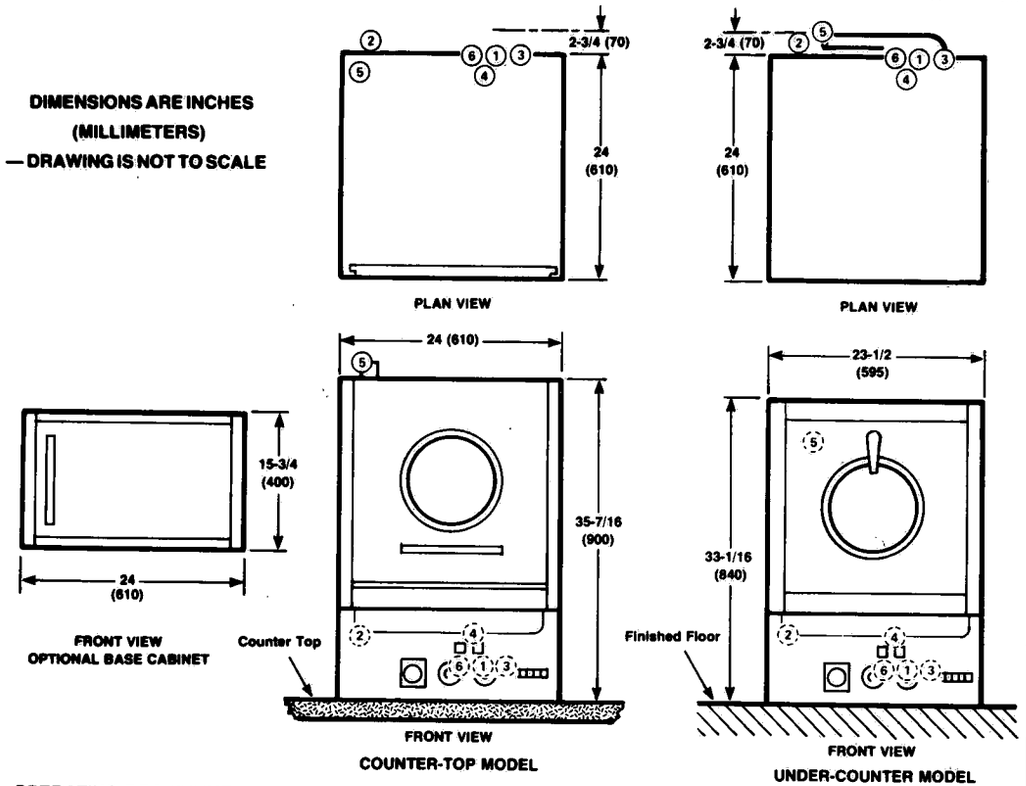
This stainless-steel base is required if a freestanding model is desired. It is only recommended for use with the counter-top washer (with vertical-lift door). The base may either be with or without a door. The door provides a cabinet in which accessories and detergents can be stored.

STANDARD CYCLES

CYCLE PHASE	TREATMENT SCHEDULE (Time in minutes*)			
	I	II	III	IV
Prerinse, Fresh Noncirculating Water, Cold or Hot	4	4	4	4
1st Wash, Heated Circulated Water, Proportioned Alkaline Detergent	4.5	7.5	10.5	10.5
Rinse, Circulating Water	1.5	1.5	1.5	1.5
2nd Wash, Circulating Water, Proportioned Alkaline or Acid Detergent	3	3	3	3
Rinse, Fresh Noncirculating Water, Cold or Hot	1	1	1	1
1st Purified Water Rinse, Circulating Water	2	2	2	2
2nd Purified Water Rinse, Heated Circulating Water	—	2	2	2
Drying Assist Heater On	—	—	—	7.5

* Does not include time required to heat circulating water. This is dependent on supply temperature.

DIMENSIONS ARE INCHES (MILLIMETERS) — DRAWING IS NOT TO SCALE



OPERATING REQUIREMENTS

1. **HOT WATER** — 3/4 NPT, 140 to 185 F (60 to 85 C) at 10 to 60 psig (0.70 to 4.22 kg per sq cm)
2. **COLD OR HOT WATER** —1/2 NPT 25 to 60 psig (1.76 to 4.22 kg per sq cm) See Note 2.
3. **PURIFIED WATER** (See Note 3) —
   - **Circulating Rinse** — 3/4 NPT, 7 psig (0.49 kg per sq cm) minimum, without optional pump
   - **Circulating Rinse:** 3/4 NPT, 0 to 7 psig (0 to 0.49 kg per sq cm) with optional pump
   - **Noncirculating Rinse:** 1/2 NPT 25 to 60 psig (1.76 to 4.22 kg per sq cm)
4. **DRAIN** — 1 inch (25 mm) I.D. tube, 27-1/2 inches (700 mm) long
5. **VENT** — For exhausting to room or building vent system, as required;
   - 2-3/8 inch (60 mm) O.D., counter-top model
   - 1-9/16 inch (40 mm) O.D., under-counter model
6. **ELECTRICAL** — 208 (41 Amp), 220 (39 Amp) or 240 (36 Amp) Volt, 60 Hz, 3 phase (includes pumps and heaters).

... CHECK LOCAL CODES ...

NOTES

1. Pipe sizes shown indicate utility service terminals. Building service lines to and from the equipment should be increased one pipe size to ensure optimum equipment performance.
2. Connection of a cold-water supply is recommended for protein soil. For non-protein soils, a hot-water supply should be substituted.
3. If wall-mounted Storage Tank is required for the purified water, request separate roughing-in prints from your local AMSCO Regional Office as there would be special installation requirements. If purified water is not available or required, hot or cold water must be substituted.
4. A floor drain should be provided in the vicinity of the Washer.
5. Consumption Rates: **Water** — 18 gal/cycle (68 liters/cycle). **Purified Water** — 4 gal/cycle (15 liters/cycle). **Electric:** Wash Pump — 0.75 kw; Optional P.W. Rinse Pump — 0.10 kw; Electric Tank Heater — 6.8 kw.
6. Sensible Heat Loss: 1,590 BTU/HR at 176 F (80 C).
7. Weight:
   Washer — 250 lbs (114 kg)
   Optional Base — 50 lbs (22.8 kg)

This print is for guidance when planning space and utility services. Actual installation prints may be obtained from any AMSCO office or representative.

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AMSCO

MATERIALS HANDLING ACCESSORIES For NEWAMATIC Laboratory Glassware Washers

TECH DATA

SD-219
(6/76)

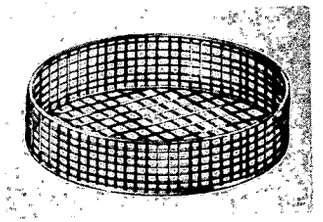
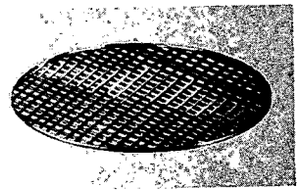
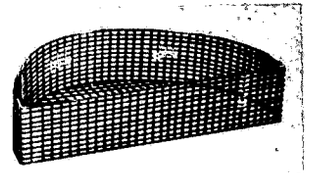
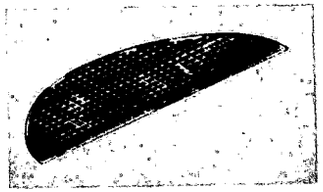
GENERAL

These accessories are circular in design. Their radius is the same as the turntable used in all Newamatic Series Glassware Washers. There are baskets, inserts and racks available for a wide variety of common laboratory glassware. Some of the accessories are designed for a specific type of glassware; others will accommodate several types. Full, half and quarter sizes allow multiple accessories to be utilized during a cycle ... depending on the types of glassware to be cleaned.

All of the accessories are electropolished stainless steel. Open framework assures full load coverage. Circular design eliminates the "dead corners" sometimes associated with square baskets and racks.

(Note: Selections checked apply to the equipment being specified.)

BASKETS

DESCRIPTION	SUGGESTED APPLICATION	
Full Size Basket, 200-mm high. ☐ DH00-000-006 *Qty:* ____	Heavy, tall glassware (e.g., AMSCO Square Pak Flasks, Container Bottles, etc.).	
Lid For Full Size Basket (or as hold down lid for Petri Dish Racks), includes handle. ☐ DH00-000-007 *Qty:* ____		
Half Size Basket, 120- or 200-mm high. ☐ DH00-000-003 (120 mm) *Qty:* ____ ☐ DH00-000-004 (200 mm) *Qty:* ____	Tall form beakers, 50 to 1000 ml. Short form beakers, 5 to 1000 ml.	
Lid For Half Size Basket, includes handle ☐ DH00-000-005 *Qty:* ____		

Item No. _____
Location(s) _____

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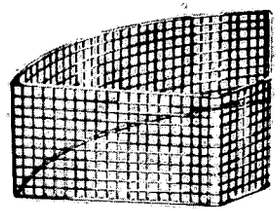
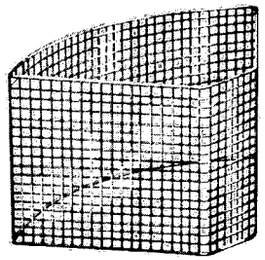
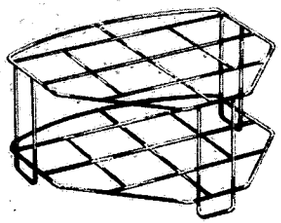
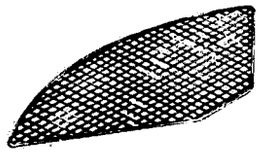
BASKETS (Cont'd)

DESCRIPTION	SUGGESTED APPLICATION
Quarter Size Basket, 120- or 200-mm high. Baskets may have either standard, fine mesh or reinforced wire bottom. ☐ DH00-000-008 (120 mm, standard) *Qty:* ____ ☐ DH00-000-010 (200 mm, standard) *Qty:* ____ ☐ DH00-000-011 (120 mm, fine mesh) *Qty:* ____ ☐ DH00-000-012 (200 mm, fine mesh) *Qty:* ____ ☐ DH00-000-013 (200 mm, reinforced) *Qty:* ____ ☐ DH00-000-018 (200 mm, extra fine) *Qty:* ____	Low form beakers (5 to 100 ml), test tubes (17x75 or 12x100 to 16x30 or 20x150 mm), and centrifuge tubes. Fine mesh framework ideal for narrow necked glassware; reinforced framework ideal for heavy glassware (AMSCO Square Pak Flasks).
Insert For Quarter Size Basket, 120- or 200-mm high. These inserts subdivide the basket for less than full capacity applications. A third version comes with a lid and is for small pieces. ☐ DH00-000-015 (120-mm) *Qty:* ____ ☐ DH00-000-016 (200-mm) *Qty:* ____ ☐ DH00-000-017 (with lid) *Qty:* ____	For use when baskets are not full or to keep items separated.
Lid For Quarter Size Basket, includes handle. ☐ DH00-000-014 *Qty:* ____	





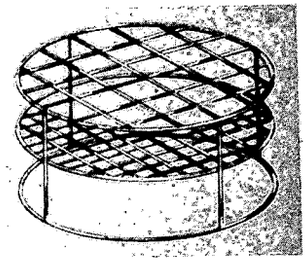


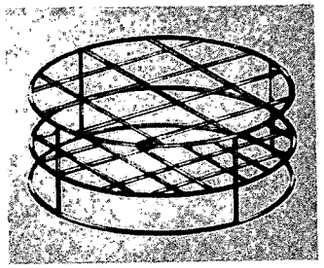


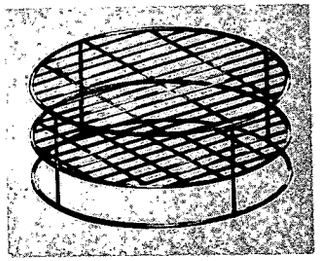
A-13

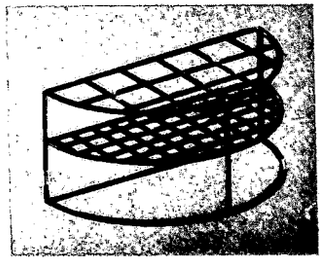
RACKS

DESCRIPTION	SUGGESTED APPLICATION
Full Size Rack, each has framework designed for specific application. The Petri dish racks may be stacked.	Flasks, I.V. Solution Bottles, and Petri Dishes
☐ DH00-000-020 *Qty:* ____	100- to 200-ml Erlenmeyer Flasks.
☐ DH00-000-021 *Qty:* ____	200- to 500-ml Erlenmeyer Flasks.
☐ DH00-000-022 *Qty:* ____	1000-ml Erlenmeyer Flasks.
☐ DH00-000-025 *Qty:* ____	50-ml I.V. Solution Bottles.
☐ DH00-000-026 *Qty:* ____	100-ml I.V. Solution Bottles, narrow top.
☐ DH00-000-027 *Qty:* ____	100-ml I.V. Solution Bottles, wide neck.
☐ DH00-000-028 *Qty:* ____	250-ml I.V. Solution Bottles.
☐ DH00-000-030 *Qty:* ____	500-ml I.V. Solution Bottles.
☐ DH00-000-031 *Qty:* ____	1000-ml I.V. Solution Bottles.
☐ DH00-000-033 *Qty:* ____	1000-ml Culture Flasks
☐ DH00-000-034 *Qty:* ____	Square Pak Flasks.
☐ DH00-000-037 *Qty:* ____	500- to 1000-ml Volumetric Flasks
☐ DH00-000-023 *Qty:* ____	100- to 110-mm diameter Petri Dishes.
☐ DH00-000-024 *Qty:* ____	50- to 70-mm diameter Petri Dishes.
Half Size Rack. ☐ DH00-000-036 *Qty:* ____	100- to 250-ml Volumetric Flasks.









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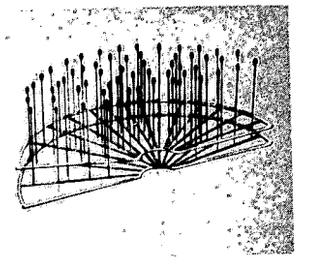
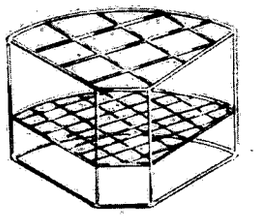
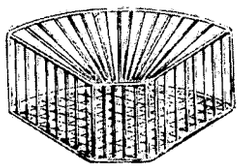
RACKS (Cont'd)

DESCRIPTION	SUGGESTED APPLICATION	
Half Size Spindle Rack, 135- or 300-mm high. Spindles are flexible. ☐ DH00-000-001 (135 mm) *Qty:* ____ ☐ DH00-000-002 (300 mm) *Qty:* ____	Assorted glassware. Ideal for small quantities of diverse types.	
Quarter Size Rack ☐ DH00-000-035 *Qty:* ____	Flasks and Slides. 5- to 50-ml Volumetric Flasks.	
☐ DH00-000-032 *Qty:* ____	75x25 mm Microscope Slides.	

SECTION 2

GENERAL OPERATING INSTRUCTIONS

2-1. GENERAL

The following instructions are intended to guide the serviceman when: (1) instructing operators in techniques designed to ensure optimum equipment performance; and (2) verifying the validity of operator complaints. See Section 5, TROUBLESHOOTING, if the Washer is not operating properly. Refer to Section 1, GENERAL INFORMATION, for capabilities of the equipment.

Figure 2-1 shows the controls in their approximate locations.

WARNING: SURFACE OF WASHER BECOMES HOT DURING OPERATION. AVOID CONTACT WITH WASHER.

2-2. BEFORE OPERATING THE EQUIPMENT

1. Be sure that building water supplies are connected to appropriate fittings on Washer according to instructions in Equipment Manual (P-384504-091).

2. Position the building supply disconnect switch (circuit breaker) at ON. Be sure the building water supply valves are open and drain hose is not more than 12 inches above bottom of Washer.

3. Open the chamber door.

4. Be sure that the wash and rinse spray pipes and tank filter are clean. Remove turntable and filter lid to gain access to filter.

5. Replace tank filter, lid and turntable; be sure tank filter is firmly inserted in tank outlet. Check the revolving turntable: be sure it rotates freely.

6. Check detergent supplies, replenish if necessary.

NOTE: Use *Sparkle-jet Detergent* or equivalent for best results. *Sparkle-jet Detergent* is available from your local AMSCO representative. First-wash dispenser requires 2 ounces of liquid detergent or equivalent powder detergent per load; the tall second-wash dispenser holds approximately ten ounces of liquid detergent and automatically doses approximately one ounce in each second wash phase. It must retain some detergent at all times.

7. Turn Main Power switch to position "1."

8. Remove gross soil from the items to be cleaned. Load the items into or onto the proper racks or baskets. Arrange the items so that all surfaces will receive maximum spray coverage.

9. Position the loaded rack(s) or basket(s) on the turntable. Use entire surface of the turntable.

10. Close the chamber door.

11. Push the Power switch to "on" and Power switch light will come on.

12. Select wash and purified rinse water temperatures (86 to 194 F).

2-3. OPERATING THE EQUIPMENT WITH PUSH-BUTTON CONTROL

CAUTION: Do not operate Washer without tank filter in wash tank. Wash pump and drain pump will be damaged if broken glass, etc. are not prevented from leaving the wash tank.

1. Be sure that you have followed instructions in Paragraph 2-2.

2. Select program by pressing the appropriate button. (Program cycle buttons are marked I, II III and IV; see Table 2-1.)

3. Press "S" (start) button. If chamber door is closed, Program Indicating light will come on and cycle will start and continue automatically to completion. Refer to Paragraph 3-2 for the cycle sequence; refer to Section 5, TROUBLESHOOTING, if cycle is not as desired.

4. When cycle is complete (turntable stops revolving and Program Indicating light goes off), open chamber door and remove basket(s) or rack(s).

TABLE 2-1
STANDARD CYCLES FOR PUSH-BUTTON CONTROL

CYCLE PHASE	TREATMENT SCHEDULE (Time in minutes*)			
	I	II	III	IV
Prerinse, Fresh Noncirculating Water, Cold or Hot	4	4	4	4
1st Wash, Heated Circulated Water, Proportioned Alkaline Detergent	4.5	7.5	10.5	10.5
Rinse, Circulating Water	1.5	1.5	1.5	1.5
2nd Wash, Circulating Water, Proportioned Alkaline or Acid Detergent	3	3	3	3
Rinse, Fresh Noncirculating Water, Cold or Hot	1	1	1	1
1st Purified Water Rinse, Circulating Water	2	2	2	2
2nd Purified Water Rinse, Heated Circulating Water	—	2	2	2
Drying Assist Heater On	—	—	—	7.5

*Times are approximate and do not include time required to heat circulating water. Heating time is dependent on supply temperature.

2-4. OPERATING THE EQUIPMENT WITH PUNCH-CARD CONTROL

CAUTION: Do not operate Washer without tank filter in wash tank. Wash pump and drain pump will be damaged if broken glass, etc. are not prevented from leaving the Wash tank.

1. Be sure that you have followed instructions in Paragraph 2-2.

2. Push down black lever while lifting its forward edge. Program is selected by inserting the appropriate punch card (see Table 2-2) into the slot in the punch-card control. (Special punch cards designed to meet individual cleaning requirements are available upon request.)

3. Lift forward edge of black lever while gently pulling up on it. If chamber door is closed, Program Indicating light will come on and cycle will start and continue automatically to completion. Refer to Paragraph 3-3 for the cycle sequence; refer to Section 5. TROUBLESHOOTING, if cycle is not as desired.

NOTE: After initiating cycle do not open door until cycle is complete.

4. When cycle is complete (turntable stops revolving and Program Indicating light goes off), open chamber door and remove basket(s) or rack(s).

2-5. AFTER OPERATING THIS EQUIPMENT

At End of Each Work Day ...

1. Press Power switch to "off" and Power switch light will go off.

2. Turn Main Power switch to position "0."

3. Close water valves.

4. Clean wash system manifolds.

5. Clean tank filter. After cleaning, be sure to install filter in tank.

6. Leave chamber door partially open during shutdown to permit airing of Washer interior.

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TABLE 2-2
STANDARD CYCLES FOR PUNCH-CARD CONTROL

CYCLE PHASE	TREATMENT SCHEDULE (Time in minutes*)		
	Yellow	Blue	Black
Prerinse, Fresh Noncirculating Water, Cold or Hot	4	4	4
1st Wash, Heated Circulated Water, Proportioned Alkaline Detergent	4.5	7.5	10.5
Rinse, Circulating Water	1.5	1.5	1.5
2nd Wash, Circulating Water, Proportioned Alkaline or Acid Detergent	3	3	3
Rinse, Fresh Noncirculating Water, Cold or Hot	1	1	1
1st Purified Water Rinse, Circulating Water†	2	2	2
2nd Purified Water Rinse, Heated Circulating Water†	—	2	2
Drying Assist Heater On	—	—	7.5

*Times are approximate and do not include time required to heat circulating water. Heating time is dependent on supply temperature.

†If Washer has noncirculating purified water rinse, special punch cards are required with only one purified water rinse phase and it is not heated.

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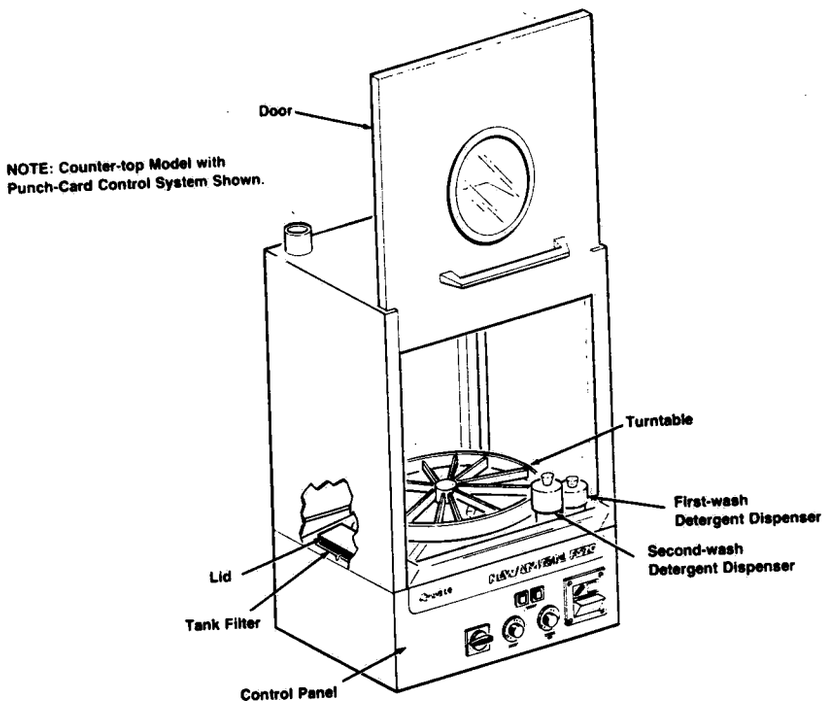
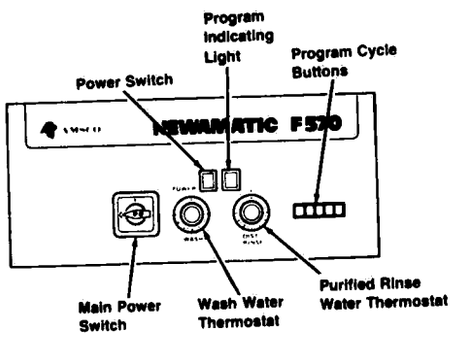
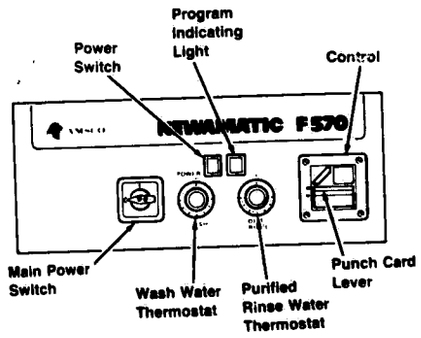




PUSH-BUTTON CONTROL PANEL



PUNCH-CARD CONTROL PANEL

Figure 2-1. CONTROL LOCATIONS.

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SECTION 3

CONTROL SYSTEMS

3-1. GENERAL

The F-570 Newamatic Washer is designed with an automatic control system. A program motor in conjunction with various temperature and pressure sensors regulates the Washer throughout the operational phases. When a cycle is begun, the Washer will proceed through the various cycle phases without further attention.

Within the system are fuses and an overload device which prevent circuits from becoming overloaded. Before checking a faulty or malfunctioning control system, make sure that these devices are in place and operable; that electric switches are in correct position; that water supply lines are connected and valves are in correct position; and that electricity and water are available at the prescribed requirements.

3-2. CYCLE OPERATION FOR WASHER WITH PUSH-BUTTON CONTROL

Cycle I

NOTE: All times are approximations.

Cycle I may be started when Power switch light is on and chamber door is closed. After selecting the desired wash water temperature and pressing program cycle buttons "I" then "S" (start), the Washer will automatically proceed through the following cycle:

1. Turntable starts rotating and Program Indicating light comes on. Load is rinsed with either hot or cold tap water (as connected) for 4 minutes while drain pump empties the tank.

2. At the completion of the prerinse phase, the tank fills with hot tap water. Detergent is mixed with water entering the chamber. When water in tank reaches the operating level, heater controlled by Wash Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. After water in tank reaches selected temperature, the water is circulated for 4½ minutes. At the end of the wash phase, the drain pump empties the tank.

3. At start of circulating rinse phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 1½ minutes. At end of the circulating rinse phase, drain pump empties the tank.

4. At start of second wash phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water. Dosing pump adds detergent into tank water. After adding detergent into water, the wash pump circulates water for 3 minutes. At end of the second wash phase, drain pump empties the tank.

5. At start of fresh rinse phase, the load is rinsed with either hot or cold tap water (as connected) for one minute while drain pump empties the tank.

6. At the completion of the fresh rinse phase, the tank fills with purified water. When water in tank reaches the operating level, wash pump circulates water for 2 minutes. At end of purified-water rinse phase, drain pump empties the tank.

7. Turntable stops revolving and Program Indicating light goes off.

Cycle II

NOTE: All times are approximations.

Cycle II may be started when Power switch light is on and chamber door is closed. After selecting the desired wash and purified rinse water temperatures and pressing program cycle buttons "II" then "S," the Washer will automatically proceed through the following cycle:

1. Turntable starts rotating and Program Indicating light comes on. Load is rinsed with either hot or cold tap water (as connected) for 4 minutes while drain pump empties the tank.

2. At the completion of the prerinse phase, the tank fills with hot tap water. Detergent is mixed with water entering the chamber. When water in tank reaches the operating level, heater controlled by Wash Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. After water in tank reaches selected temperature, the water is circulated for 7½ minutes. At the end of the wash phase, the drain pump empties the tank.

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3. At start of circulating rinse phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 1½ minutes. At end of the circulating rinse phase, drain pump empties the tank.

4. At start of second wash phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water. Dosing pump adds detergent into tank water. After adding detergent into water, the wash pump circulates water for 3 minutes. At end of the second wash phase, drain pump empties the tank.

5. At the start of fresh rinse phase, the load is rinsed with either hot or cold tap water (as connected) for one minute while drain pump empties the tank.

6. At the completion of the fresh rinse phase, the tank fills with purified water. When water in tank reaches the operating level, wash pump circulates water for 2 minutes. At end of first purified-water rinse phase, drain pump empties the tank.

7. At start of second purified-water rinse phase, the tank fills with purified water. When water in tank reaches operating level, heater controlled by Purified Rinse Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. When water in tank reaches selected temperature, wash pump circulates water for 2 minutes. At the end of the second purified-water rinse phase, drain pump empties the tank.

8. Turntable stops revolving and Program Indicating light goes off.

Cycle III

NOTE: All times are approximations.

Cycle III may be started when Power switch light is on and chamber door is closed. After selecting the desired wash and purified rinse water temperatures and pressing program cycle buttons "III" then "S," the Washer will automatically proceed through the following cycle:

1. Turntable starts rotating and Program Indicating light comes on. Load is rinsed with either hot or cold tap water (as connected) for 4 minutes while drain pump empties the tank.

2. At the completion of the prerinse phase, the tank fills with hot tap water. Detergent is mixed with water entering the chamber. When water in tank reaches the operating level, heater controlled by Wash Water thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. After water in tank reaches selected temperature, the water is circulated for 10½ minutes. At the end of the wash phase, the drain pump empties the tank.

3. At start of circulating rinse phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 1½ minutes. At end of the circulating rinse phase, drain pump empties the tank.

4. At the start of second wash phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water. Dosing pump adds detergent into tank water. After adding detergent into water, the wash pump circulates water for 3 minutes. At end of the second wash phase, drain pump empties the tank.

5. At the start of fresh rinse phase, the load is rinsed with either hot or cold tap water (as connected) for one minute while drain pump empties the tank.

6. At the completion of the fresh rinse phase, the tank fills with purified water. When water in tank reaches the operating level, wash pump circulates water for 2 minutes. At end of first purified-water rinse phase, drain pump empties the tank.

7. At start of second purified-water rinse phase, the tank fills with purified water. When water in tank reaches operating level, heater controlled by Purified Rinse Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. When water in tank reaches selected temperature, wash pump circulates water for 2 minutes. At the end of the second purified-water rinse phase, drain pump empties the tank.

8. Turntable stops revolving and Program Indicating light goes off.

Cycle IV

NOTE: All times are approximations.

Cycle IV may be started when Power switch light is on and chamber door is closed. After selecting the desired wash and purified rinse water temperatures and pressing program cycle buttons "IV" then "S," the Washer will automatically proceed through the following cycle.

1. Turntable starts rotating and Program Indicating light comes on. Load is rinsed with either hot or cold tap water (as connected) for 4 minutes while drain pump empties the tank.

2. At the completion of the prerinse phase, the tank fills with hot tap water. Detergent is mixed with water entering the chamber. When water in tank reaches the operating level, heater controlled by Wash Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. After water in tank reaches selected temperature, the water is circulated for 10½ minutes. At the end of the wash phase, the drain pump empties the tank.

3. At start of circulating rinse phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 1½ minutes. At end of the circulating rinse phase, drain pump empties the tank.

4. At the start of second wash phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water. Dosing pump adds detergent into tank water. After adding detergent into water, the wash pump circulates water for 3 minutes. At end of the second wash phase, drain pump empties the tank.

5. At start of fresh rinse phase, the load is rinsed with either hot or cold tap water (as connected) for one minute while drain pump empties the tank.

6. At the completion of the fresh rinse phase, the tank fills with purified water. When water in tank reaches the operating level, wash pump circulates water for 2 minutes. At end of first purified-water rinse phase, drain pump empties the tank.

7. At start of second purified-water rinse phase, the tank fills with purified water. When water in tank reaches operating level, heater controlled by Purified Rinse Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. When water in tank reaches selected temperature, wash pump circulates water for 2 minutes. At the end of the second purified-water rinse phase, drain pump empties the tank.

8. At the completion of the second purified-water rinse phase, the drying heater is energized for 7½ minutes.

9. Turntable stops revolving and Program Indicating light goes off.

3-3. CYCLE OPERATION FOR WASHER WITH PUNCH-CARD CONTROL

Yellow Coded Punch Card Cycle

NOTE: All times are approximations.

This cycle may be started when Power switch light is on and chamber door is closed. After selecting the desired wash water temperature, inserting the yellow coded punch card into the punch-card control, and lifting the black lever on the control, the Washer will automatically proceed through the following cycle:

1. Turntable starts rotating and Program Indicating light comes on. Load is rinsed with either hot or cold tap water (as connected) for 4 minutes while drain pump empties the tank.

2. At the completion of the prerinse phase, the tank fills with hot tap water. Detergent is mixed with water entering the chamber. When water in tank reaches the operating level, heater controlled by Wash Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. After water in tank reaches selected temperature, the water is circulated for 4½ minutes. At the end of the wash phase, the drain pump empties the tank.

3. At start of circulating rinse phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 1½ minutes. At end of the circulating rinse phase, drain pump empties the tank.

4. At start of second wash phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 3 minutes. Dosing pump adds detergent into tank water while water is being circulated. At end of the second wash phase, drain pump empties the tank.

5. At start of fresh rinse phase, the load is rinsed with either hot or cold tap water (as connected) for one minute while drain pump empties the tank.

6. At completion of the fresh rinse phase, tank fills with purified water. When water in tank reaches the operating level, wash pump circulates water for 2 minutes. At end of purified-water rinse phase, drain pump empties the tank.

7. Turntable stops revolving and Program Indicating light goes off.

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Blue Coded Punch Card Cycle

NOTE: All times are approximations.

This cycle may be started when Power switch light is on and chamber door is closed. After selecting the desired wash and purified rinse water temperatures, inserting the blue coded punch card into the punch-card control, and lifting the black lever on the control, the Washer will automatically proceed through the following cycle:

1. Turntable starts rotating and Program Indicating light comes on. Load is rinsed with either hot or cold tap water (as connected) for 4 minutes while drain pump empties the tank.

2. At the completion of the prerinse phase, the tank fills with hot tap water. Detergent is mixed with water entering the chamber. When water in tank reaches the operating level, heater controlled by Wash Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. After water in tank reaches selected temperature, the water is circulated for 7½ minutes. At the end of the wash phase, the drain pump empties the tank.

3. At start of circulating rinse phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 1½ minutes. At end of the circulating rinse phase, drain pump empties the tank.

4. At start of second wash phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 3 minutes. Dosing pump adds detergent into tank water while water is being circulated. At end of the second wash phase, drain pump empties the tank.

5. At start of fresh rinse phase, the load is rinsed with either hot or cold tap water (as connected) for one minute while drain pump empties the tank.

6. At the completion of the fresh rinse phase, tank fills with purified water. When water in tank reaches the operating level, wash pump circulates water for 2 minutes. At end of first purified-water rinse phase, drain pump emptias the tank.

7. At start of second purified-water rinse phase, the tank fills with purified water. When water in tank reaches operating level, heater controlled by Purified Rinse Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. When water in tank reaches selected temperature, wash pump circulates water for 2 minutes. At the end of the second purified-water rinse phase, drain pump empties the tank.

8. Turntable stops revolving and Program Indicating light goes off.

Black Coded Punch Card Cycle

NOTE: All times are approximations.

This cycle may be started when Power switch light is on and chamber door is closed. After selecting the desired wash and purified rinse water temperatures, inserting the black coded punch card into the punch-card control, and lifting the black lever on the control, the Washer will automatically proceed through the following cycle:

1. Turntable starts rotating and Program Indicating light comes on. Load is rinsed with either hot or cold tap water (as connected) for 4 minutes while drain pump empties the tank.

2. At the completion of the prerinse phase, the tank fills with hot tap water. Detergent is mixed with water entering the chamber. When water in tank reaches the operating level, heater controlled by Wash Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. After water in tank reaches selected temperature, the water is circulated for 10½ minutes. At the end of the wash phase, the drain pump empties the tank.

3. At start of circulating rinse phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 1½ minutes. At end of the circulating rinse phase, drain pump empties the tank.

4. At start of second wash phase, the tank fills with hot tap water. When water in tank reaches the operating level, wash pump circulates water for 3 minutes. Dosing pump adds detergent into tank water while water is being circulated. At end of the second wash phase, drain pump empties the tank.

5. At start of fresh rinse phase, the load is rinsed with either hot or cold tap water (as connected) for one minute while drain pump empties the tank.

6. At the completion of the fresh rinse phase, tank fills with purified water. When water in tank reaches the operating level, wash pump circulates water for 2 minutes. At end of first purified-water rinse phase, drain pump empties the tank.

7. At start of second purified-water rinse phase, the tank fills with purified water. When water in tank reaches operating level, heater controlled by Purified Rinse Water Thermostat starts to heat the water and wash pump circulates the water. Program motor will not advance until water is at selected temperature. When water in tank reaches selected temperature, wash pump circulates water for 2 minutes. At the end of the second purified-water rinse phase, drain pump empties the tank.

8. At the completion of the second purified-water rinse phase, the drying heater is energized for 7½ minutes.

9. Turntable stops revolving and Program Indicating light goes off.

NOTE: Only cycle operation and cycle control circuit descriptions for standard punch cards are presented in this Manual. If cycle operation and cycle control circuit descriptions are required for special punch cards (including punch cards for units with noncirculating purified-water rinse) contact your local AMSCO sales representative.

3-4. CYCLE CONTROL CIRCUIT DESCRIPTIONS GENERAL CONDITIONS

Before using the following cycle circuit descriptions (Paragraphs 3-5 through 3-8 or 3-9 through 3-11), several things should be understood about the electrical schematic (Figure 3-20 or 3-32), namely, the general conditions.

1. The line numbers on the left-hand side of the schematic are used in the following circuit descriptions to aid in locating the components.

2. The schematic is shown with power off and the chamber door open.

3. When Main Power switch is turned to position "1," the transformer (line 1) is energized. The power switch light H1 (line 11) is energized when the Power switch is pressed on.

NOTE: This completes the cycle control circuit descriptions general conditions. Refer to page 3-6 for the cycle 1 button circuit description.

B-9

B-10

3-5. CYCLE I BUTTON CIRCUIT DESCRIPTION

NOTE: The following description is given in sequential paragraphs numerically identifiable to the referenced circuit diagram for the particular phase. Refer to the diagram and consult the legend for a circuit to description cross reference. Refer to Figure 3-20 for the schematic in its entirety.

While energized through the 6.2k ohm resistor, the program motor actuates switches as motor advances cycle one step approximately every 30 seconds.

Start (Fig. 3-1)

1. When chamber door is closed and program cycle buttons "I" then "S" (start) are pushed, relay D1 (line 13) is energized through closed switch 3 (line 13) and contacts of START button (line 13). The N.O. contacts (line 15) on D1 close energizing program motor M2 (line 26). The "S" button returns to open position when released.

Prerinse Phase (Fig. 3-1)

2. Cycle is at starting point. Switch 3 opens de-energizing relay D1. Switches 6 (line 26), 10 (line 30) and 12 (line 34) close, and contact 33 (line 15) on relay switch is energized through contact 34 (line 17) on relay switch. Program Indicating Light (line 19) and turntable motor M3 (line 18) are energized through relay switch contact 33. Program motor M2 is energized through switch 6 and 6.2k ohm resistor. Drain pump motor M5 (line 30) is energized through switch 10, N.C. contacts (line 30) on C2 and N.C. contacts (line 10) on D1. Cold water valve S3 (line 33) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 12.

NOTE: If water level in tank is too high, contact 32 on safety level switch B3 opens de-energizing components that were energized through it. Contact 33 (line 31) on B3 closes energizing drain pump motor M3 through N.C. contacts on C2 and N.C. contacts on D1. This circuit is not accented on Figure 3-1.

3. After program motor advances cycle 4 steps (approximately 2 minutes), switch 12 opens de-energizing cold water valve S3.

4. As cycle is advanced through the next 4 steps, switch 12 closes at steps 1 and 3, opens at steps 2 and 4. Cold water valve S3 is energized when switch 12 is closed, de-energized when switch is open.

B-11

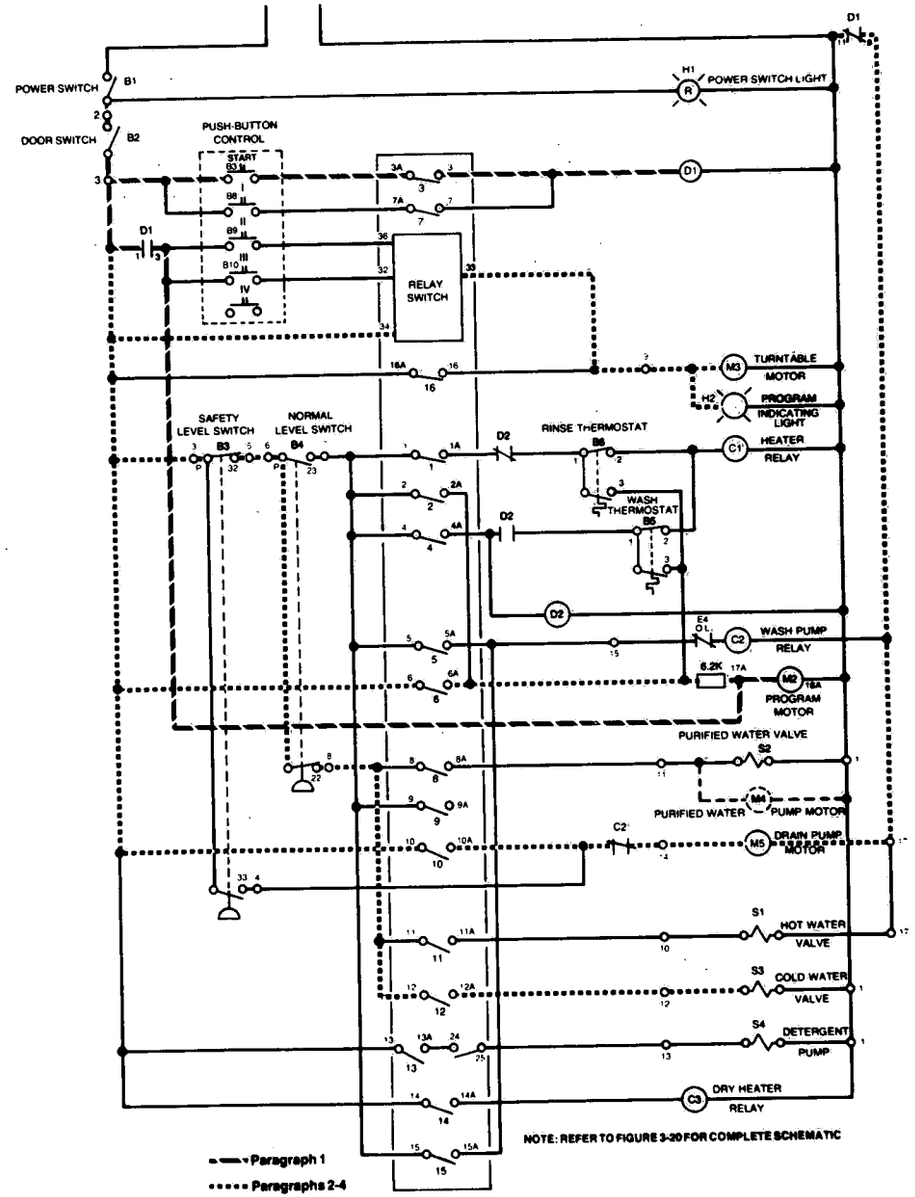


Figure 3-1. START AND PRERINSE PHASE CIRCUITS FOR CYCLE I.

B-12

First Wash Phase (Fig. 3-2)

5. Cycle is advanced one step. Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30), and switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switches 4 (line 22), 11 (line 32) and 15 (line 37) close. Hot water valve S1 (line 32) is energized through contact 22 (line 28) on normal level switch B4 and switch 11.

6. When the water level in the tank reaches the operating level, contact 23 (line 20) on normal level switch B4 closes, and contact 22 on B4 opens de-energizing the hot water valve S1. Relay D2 is energized through contact 23 on B4 and switch 4. Heater relay C1 (line 20) is energized through contact 23 on B4, switch 4, closed N.O. contacts (line 22) on D2 and contact 2 on wash thermostat B5. Wash pump relay C2 (line 25) is energized through contact 23 on B4 switch 15. N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

7. When water in tank reaches selected temperature, contact 2 on B5 opens de-energizing heater relay C1 and contact 3 (line 23) on B5 closes energizing program motor M2 through 6.2k ohm resistor. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

8. When cycle moves one step after program motor M2 was re-energized, switch 7 (line 14) closes energizing relay D1 (line 13) through cycle "I" button contacts (line 13). Normally closed contacts (line 10) on D1 open de-energizing wash pump relay C2. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. The program motor M2 is energized through closed N.O. contacts (line 15) on D1.

9. The program motor advances the cycle in approximately 5 seconds to the position where switch 7 opens de-energizing D1 and switch 6 (line 26) closes energizing program motor M2 through 6.2k ohm resistor. Open N.C. contacts (line 10) on D1 closes energizing wash pump relay C2. Wash pump motor M1 is energized through closed N.O. contacts on C2.

10. Cycle is advanced one step and switch 11 opens.

11. The program motor advances cycle 8 steps (approximately 4 minutes). Switch 7 closes energizing relay D1 through cycle "I" button contacts. The program motor is energized through closed N.O. contacts on D1. Normally closed contacts on D1 open de-energizing wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open.

12. The program motor advances the cycle in approximately 5 seconds to the position where switch 7 opens de-energizing D1. Switch 4 opens de-energizing wash thermostat B5 and relay D2 and switch 15 opens. Switch 10 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1. The program motor M2 remains energized through 6.2k ohm resistor and switch 6. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

B-13

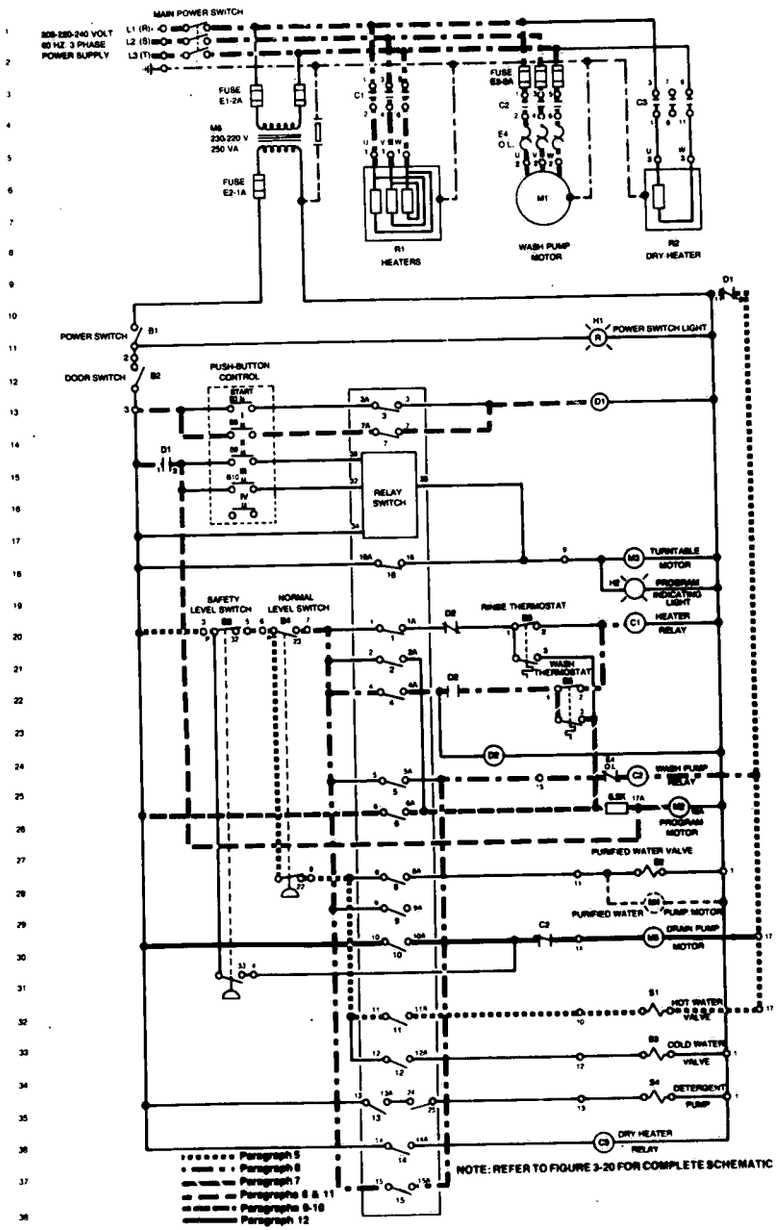


Figure 3-2. FIRST WASH PHASE CIRCUIT FOR CYCLE I.

B-14

Circulating Rinse Phase (Fig. 3-3)

13. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 11 (line 32) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) normal level switch B4, switch 11, and N.C. contacts (line 10) on D1.

14. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes, and contact 22 on B4 opens de-energizing the hot water valve S1. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

15. The cycle is advanced 3 steps after program motor M2 was re-energized. Switch 5 opens de-energizing wash pump relay C2 and switch 11 opens. Switch 2 opens and switch 6 closes to hold program motor M2 energized through 6.2k ohm resistor. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2 and N.C. contacts on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

Second Wash Phase (Fig. 3-3)

16. Program motor advances cycle one step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 11 (line 32) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11, and N.C. contacts (line 10) on D1.

17. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes, and contact 22 on B4 opens de-energizing the hot water valve S1. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

18. Cycle is advanced one step after program motor was re-energized. Switch 2 opens and switch 6 closes keeping program motor M2 energized through 6.2k ohm resistor.

19. The cycle is advanced one step. Switch 11 opens and switch 13 (line 35) closes. After approximately 6 seconds, switch between contacts 24 and 25 (line 35) closes energizing the detergent pump S4 (line 35). The switch between contacts 24 and 25:

- remains closed for approximately 2 seconds,
- opens for approximately 6 seconds,
- closes for approximately 2 seconds,
- opens for approximately 5 seconds,
- closes for approximately 2 seconds,
- opens for approximately 5 seconds, then
- closes for remainder of step (approximately 2 seconds).

20. After cycle is advanced to next step, switch 13 opens de-energizing the detergent pump S4.

21. The cycle is advanced 5 steps (approximately 2½ minutes). Switch 5 opens de-energizing wash pump relay C2. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2 and N.C. contacts (line 10) on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

C-1

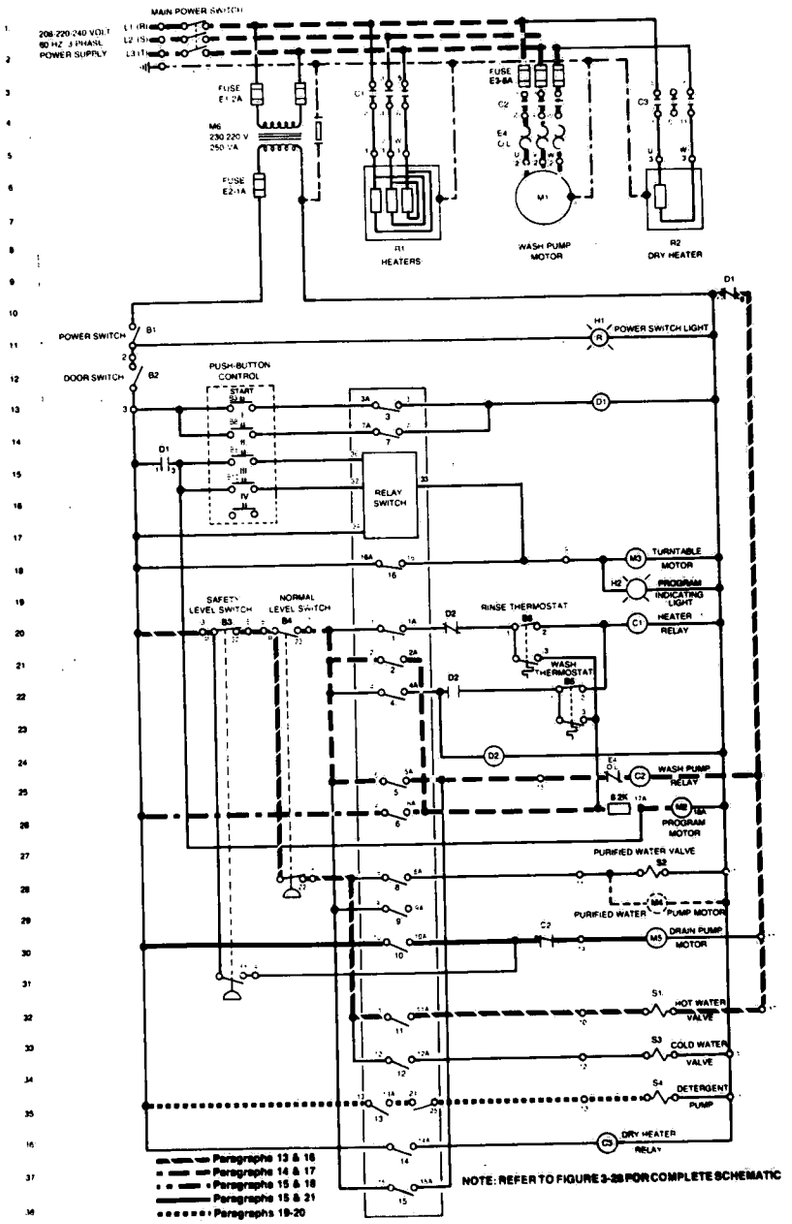


Figure 3-3. CIRCULATING RINSE AND SECOND WASH PHASE CIRCUITS FOR CYCLE I.

C-2

Fresh Rinse Phase (Fig. 3-4)

22. Program motor advances cycle one step. Switch 2 (line 21), 12 (line 33) and 16 (line 18) close. Turntable motor M3 (line 18) and Program Indicating Light (line 19) are energized through switch 16 and contact 33 (line 15) on relay switch. Cold water valve S3 (line 33) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 12.

23. After cycle is advanced 2 steps, switch 12 opens de-energizing the cold water valve S3.

Purified-water Rinse Phase (Fig. 3-4)

24. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Contact 33 (line 15) on relay switch is de-energized. The turntable motor M3 and Program Indicating Light remain energized through switch 16. Switches 5 (line 24) and 8 (line 28) close. Purified-water valve S2 (line 28) and, if provided, the optional purified-water pump motor M4 (line 29) are energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 8.

25. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes, and contact 22 on B4 opens de-energizing the purified-water valve S2. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

26. Program motor advances cycle 3 steps after being re-energized. Switch 6 closes; program motor M2 is energized through 6.2k ohm resistor and switches 2 and 6.

27. Cycle is advanced one step. Switches 2, 5 and 8 open. Program motor M2 remains energized through 6.2k ohm resistor and switch 6. Wash pump relay C2 is de-energized. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2 and N.C. contacts (line 10) on D1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

28. When cycle is advanced to next step, switches 10 and 6 open and switch 7 closes. Relay D1 (line 13) is energized through cycle "I" button contacts (line 13) and switch 7. The program motor M2 is energized through closed N.O. contacts (line 15) on D1.

29. The program motor advances the cycle in approximately 5 seconds to the position where switch 7 opens de-energizing D1. Switch 6 closes energizing program motor M2 through 6.2k ohm resistor.

30. The cycle is advanced one step. Switches 6 and 16 open de-energizing turntable motor M3, Program Indicating Light and program motor M2.

C-3

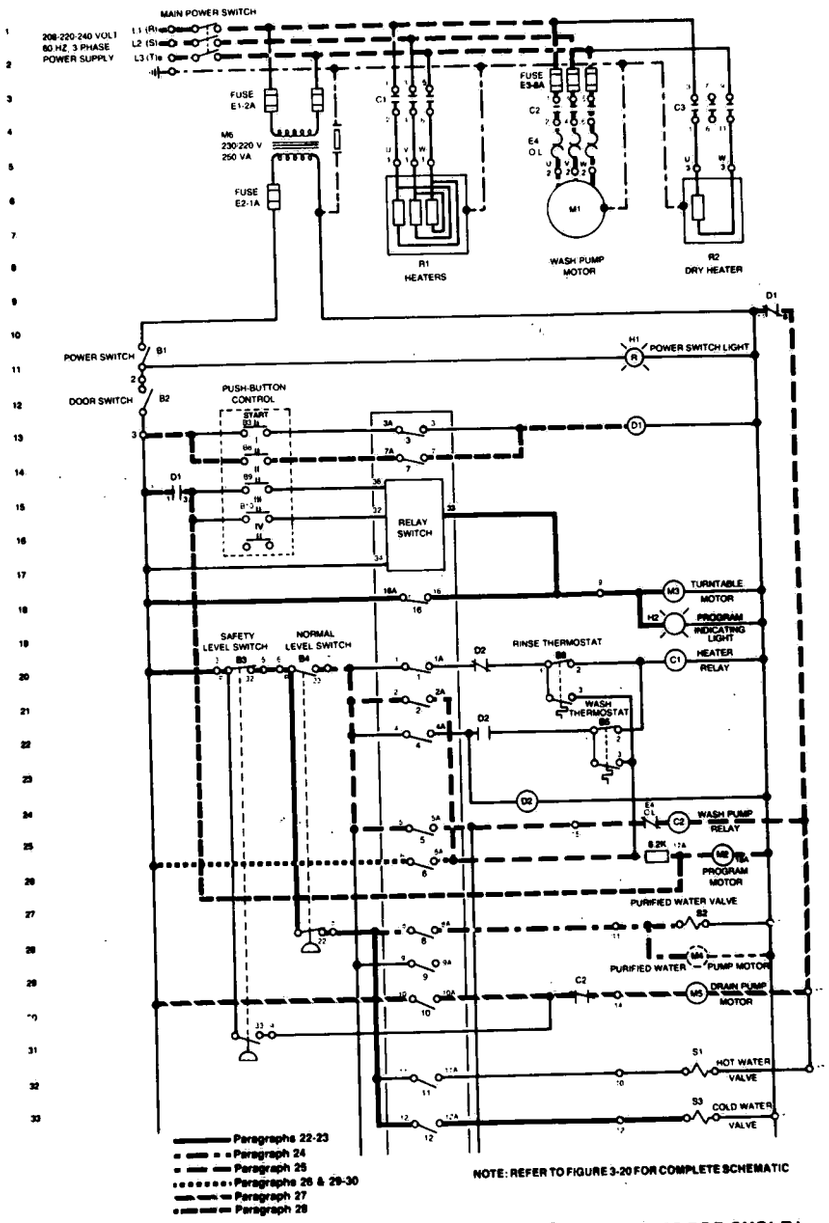


Figure 3-4. FRESH RINSE AND PURIFIED-WATER RINSE PHASE CIRCUITS FOR CYCLE I.

C-4

3-6. CYCLE II BUTTON CIRCUIT DESCRIPTION

NOTE: The following description is given in sequential paragraphs numerically identifiable to the referenced circuit diagram for the particular phase. Refer to the diagram and consult the legend for a circuit to description cross reference. Refer to Figure 3-20 for the schematic in its entirety. While energized through the 6.2k ohm resistor, the program motor actuates switches as motor advances cycle one step approximately every 30 seconds.

Start (Fig. 3-5)

1. When chamber door is closed and program cycle buttons "II" then "S" (start) are pushed, relay D1 (line 13) is energized through closed switch 3 (line 13) and contacts of START button (line 13). The N.O. contacts (line 15) on D1 close energizing program motor M2 (line 26). The "S" button returns to open position when released.

Prerinse Phase (Fig. 3-5)

2. Cycle is at starting point. Switch 3 opens de-energizing relay D1; switches 6 (line 26), 10 (line 30) and 12 (line 34) close; and contact 33 (line 15) on relay switch is energized through contact 34 (line 17) on relay switch. Program Indicating Light (line 19) and turntable motor M3 (line 18) are energized through relay switch contact 33. Program motor M2 is energized through switch 6 and 6.2k ohm resistor. Drain pump motor M5 (line 30) is energized through switch 10, N.C. contact (line 30) on C2 and N.C. contacts (line 10) on D1. Cold water valve S3 (line 33) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 12.

NOTE: If water level in tank is too high, contact 32 on safety level switch B3 opens de-energizing components that were energized through it. Contact 33 (line 31) on B3 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1. This circuit is not accented on Figure 3-5.

3. After program motor advances cycle 4 steps, switch 12 opens de-energizing cold water valve S3.

4. As cycle is advanced through the next 4 steps, switch 12 closes at steps 1 and 3, opens at steps 2 and 4. Cold water valve S3 is energized when switch 12 is closed, de-energized when switch is open.

C-5

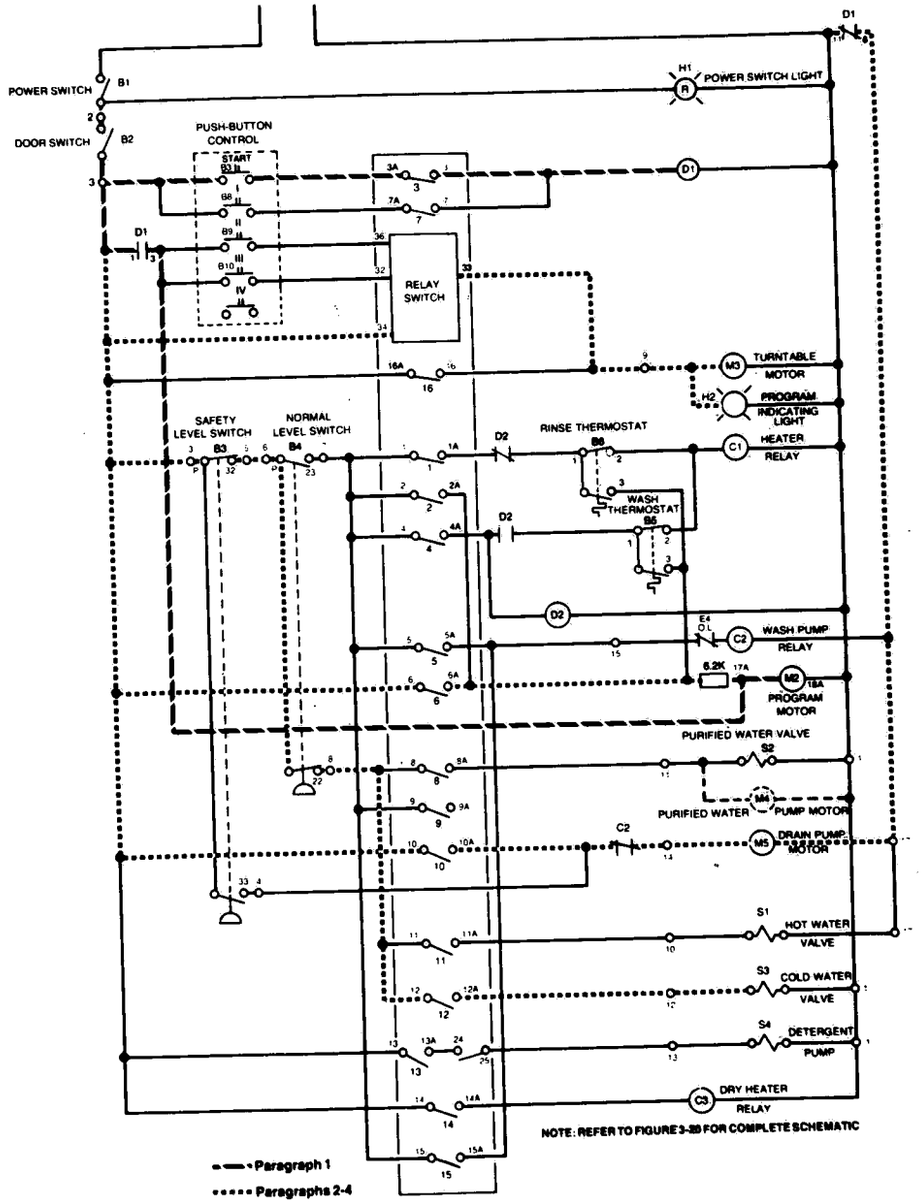


Figure 3-5. START AND PRERINSE PHASE CIRCUITS FOR CYCLE II.

C-6

First Wash Phase (Fig. 3-6)

5. Cycle is advanced one step. Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switches 4 (line 22), 11 (line 32) and 15 (line 37) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11 and N.C. contacts (line 10) on D1.

6. When the water level in the tank reaches the operating level, contact 23 (line 20) on normal level switch B4 closes, and contact 22 on B4 opens de-energizing the hot water valve S1. Relay D2 is energized through contact 23 on B4 and switch 4. Heater relay C1 (line 20) is energized through contact 23 on B4, switch 4, closed N.O. contacts (line 22) on D2 and contact 2 on wash thermostat B5. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 15, N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

7. When water in tank reaches selected temperature, contact 2 on B5 opens de-energizing heater relay C1 and contact 3 (line 23) on B5 closes energizing program motor M2 through 6.2k ohm resistor. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

8. Cycle is advanced to next step after program motor was re-energized. Switch 6 closes and holds program motor M2 energized through 6.2k ohm resistor.

9. Program motor advances cycle to next step, and switch 11 opens.

10. The program motor advances cycle 8 steps (approximately 4 minutes). Contact 36 (line 15) on relay switch is energized. Program motor M2 is energized through cycle "II" button contacts (line 15).

11. Program motor advances the cycle in approximately 5 seconds to the position where contact 36 on relay switch is de-energized. The program motor remains energized through 6.2k ohm resistor and switch 6.

12. The program motor advances cycle 6 steps (approximately 3 minutes). Switch 15 opens de-energizing wash pump relay C2. Switch 4 opens de-energizing wash thermostat B5 and relay D2. Switch 10 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1. Closed N.O. contacts of C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

C-7

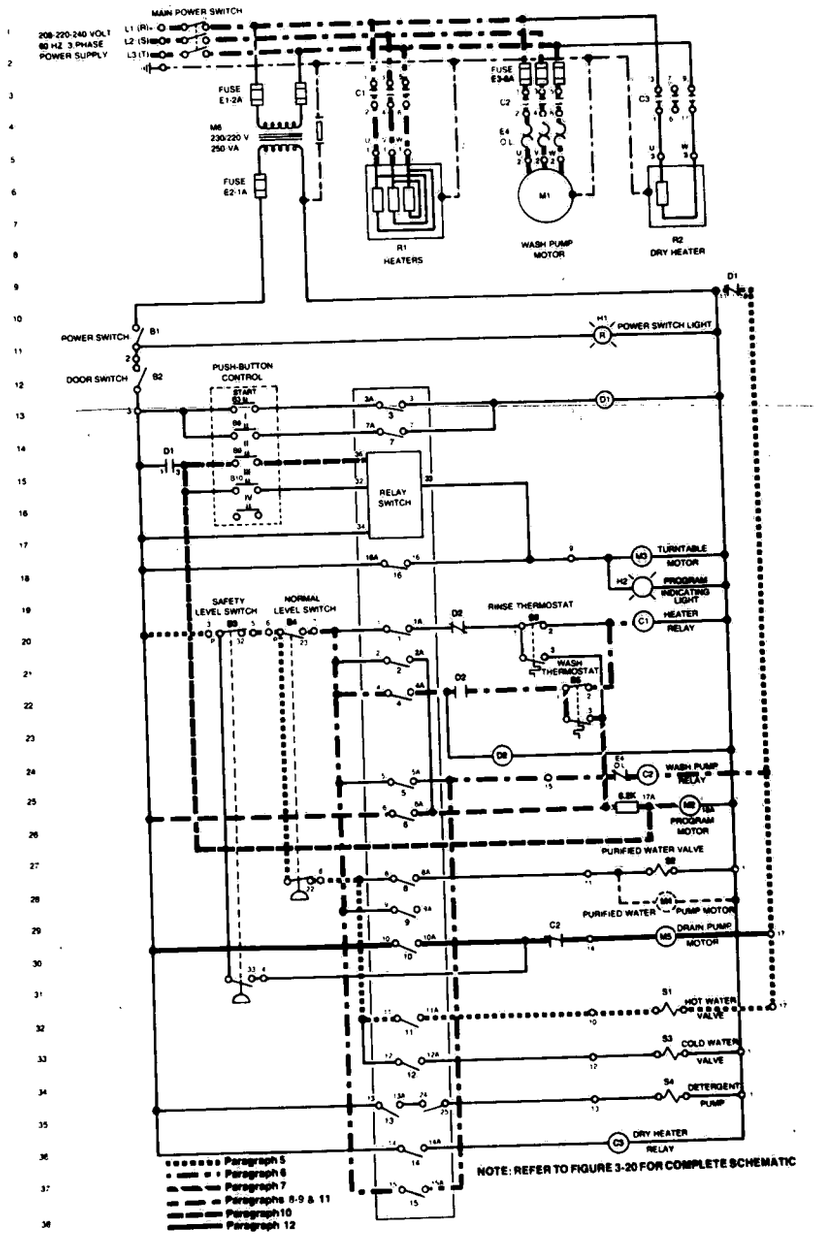


Figure 3-6. FIRST WASH PHASE CIRCUIT FOR CYCLE II.

C-8

Circulating Rinse Phase (Fig. 3-7)

13. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 11 (line 32) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11, and N.C. contacts (line 10) on D1.

14. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes, and contact 22 on B4 opens de-energizing the hot water valve S1. Program motor M2 is energized through contact 23 on B4 switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

15. The cycle is advanced 3 steps after program motor M2 was re-energized. Switch 5 opens de-energizing wash pump relay C2 and switch 11 opens. Switch 2 opens and switch 6 closes to hold program motor M2 energized through 6.2k ohm resistor. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2 and N.C. contacts on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

Second Wash Phase (Fig. 3-7)

16. Program motor advances cycle one step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 11 (line 32) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11, and N.C. contacts (line 10) on D1.

17. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes, and contact 22 on B4 opens de-energizing the hot water valve S1. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

18. Cycle is advanced one step after program motor was re-energized, switch 2 opens and switch 6 closes. The program motor M2 is now energized through switch 6 and 6.2k ohm resistor.

19. The cycle is advanced one step. Switch 11 opens and switch 13 (line 35) closes. After approximately 6 seconds, switch between contacts 24 and 25 (line 35) closes energizing the detergent pump S4 (line 35). The switch between contacts 24 and 25:

- remains closed for approximately 2 seconds,
- opens for approximately 6 seconds,
- closes for approximately 2 seconds,
- opens for approximately 5 seconds,
- closes for approximately 2 seconds,
- opens for approximately 5 seconds, then
- closes for remainder of step (approximately 2 seconds).

20. After cycle is advanced to next step, switch 13 opens de-energizing the detergent pump S4.

21. The cycle is advanced 5 steps (approximately 2½ minutes). Switch 5 opens de-energizing wash pump relay C2. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2 and N.C. contacts (line 10) on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

C-9

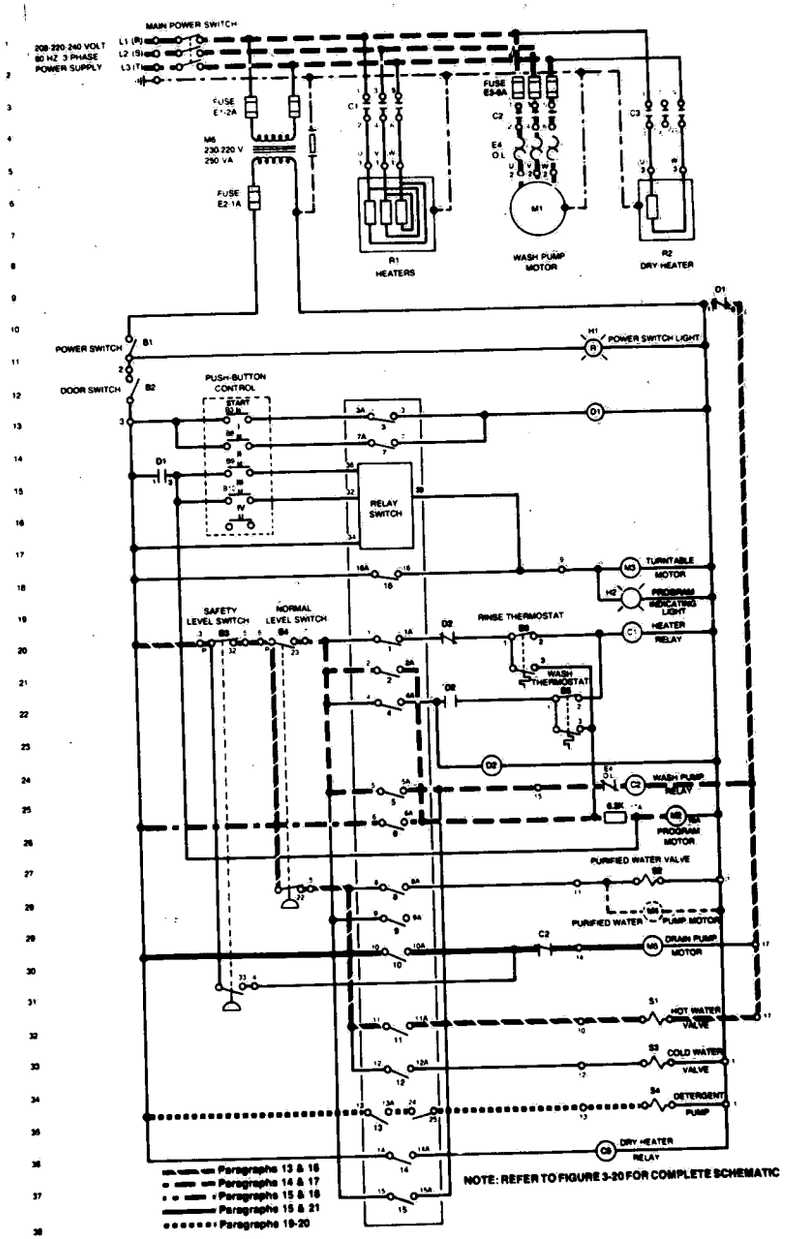


Figure 3-7. CIRCULATING RINSE AND SECOND WASH PHASE CIRCUITS FOR CYCLE II.

C-10

Fresh Rinse Phase (Fig. 3-8)

22. Program motor advances cycle one step. Switches 2 (line 21), 12 (line 33) and 16 (line 18) close. Turntable motor M3 (line 18) and Program Indicating Light (line 19) are energized through switch 16 and contact 33 (line 15) on relay switch. Cold water valve S3 (line 33) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 12.

23. After cycle is advanced 2 steps, switch 12 opens de-energizing the cold water valve S3.

First Purified-water Rinse Phase (Fig. 3-8)

24. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Contact 33 (line 15) on relay switch is de-energized. The turntable motor M3 and Program Indicating Light remain energized through switch 16. Switches 5 (line 24) and 8 (line 28) close. Purified-water valve S2 (line 28) and, if provided, the optional purified-water pump motor M4 (line 29) are energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 8.

25. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the purified-water valve S2. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

26. Program motor advances cycle 3 steps after being re-energized, and switch 6 closes. Program motor M2 is energized through 6.2k ohm resistor and switches 2 and 6.

27. Cycle is advanced one step. Switches 2, 5 and 8 open. Program motor M2 remains energized through 6.2k ohm resistor and switch 6. Wash pump relay C2 is de-energized. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

C-11

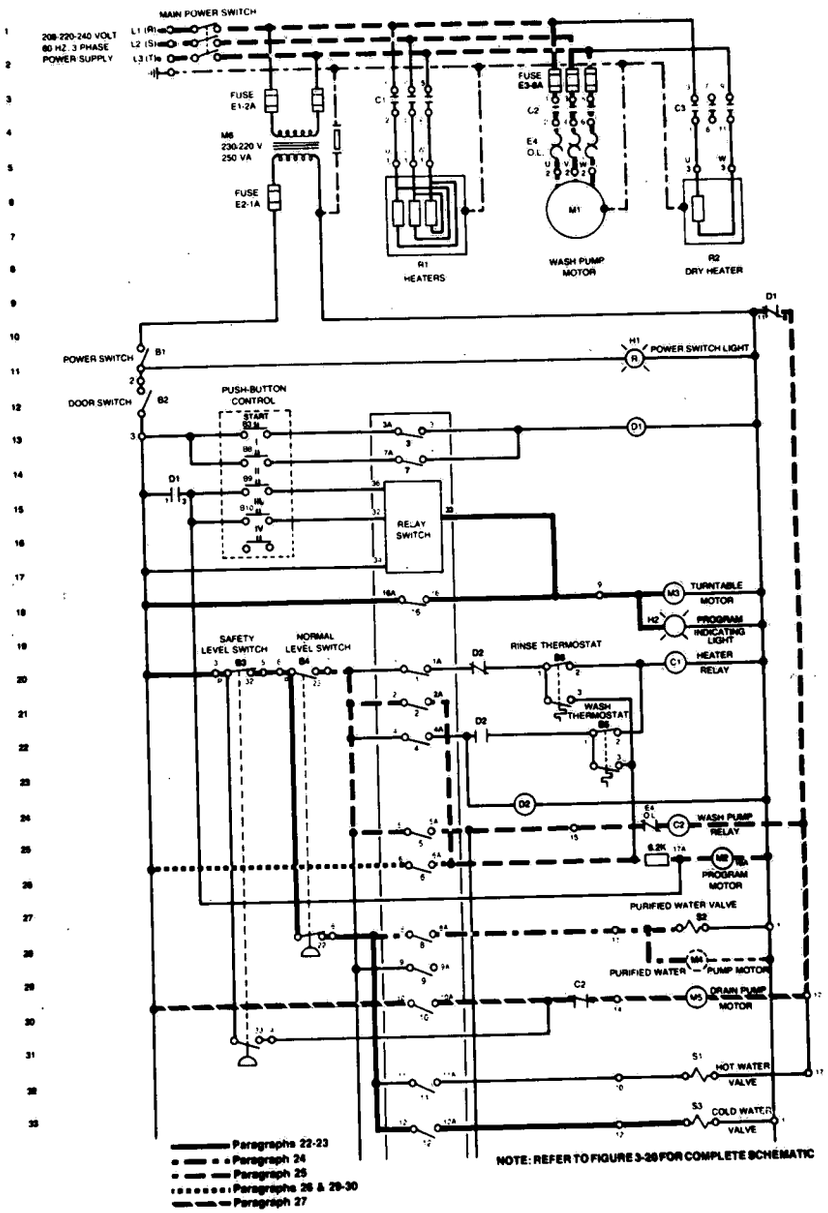


Figure 3-8. FRESH RINSE AND FIRST PURIFIED-WATER RINSE PHASE CIRCUITS FOR CYCLE II.

C-12

Second Purified-water Rinse Phase (Fig. 3-9)

28. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 8 (line 28) close. Purified-water valve S2 (line 28) and, if provided, the optional purified-water pump motor M4 (line 29) are energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 8.

29. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the purified-water valve S2. Program motor M2 is energized through contact 23 on B4, switch 2, and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

30. Program motor advances cycle one step after being re-energized. Switch 2 opens de-energizing program motor M2. Switch 1 (line 20) closes energizing heater relay C1 (line 20) through contact 23 on B4, N.C. contacts (line 20) on D2 and contact 2 on rinse thermostat B6. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1. Switch 5 opens and switch 15 (line 37) closes; wash pump relay C2 remains energized.

31. When water in tank reaches selected temperature, contact 2 on B6 opens de-energizing heater relay C1 and contact 3 (line 21) on B6 closes energizing program motor M2 through 6.2k ohm resistor. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

32. Program motor advances cycle one step after being re-energized and switch 6 closes. Switch 15 opens and switch 5 closes; wash pump relay C2 remains energized.

33. Cycle is advanced one step, and switch 8 opens.

34. Program motor advances cycle two steps. Switch 1 opens de-energizing rinse thermostat. Program motor M2 remains energized through switch 6 and 6.2k ohm resistor.

35. After cycle is advanced one step, switch 5 opens de-energizing wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Switch 10 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1.

36. The program motor advances cycle to next step. Contact 36 (line 15) on relay switch is energized. Program motor M2 is energized through cycle "II" button contacts (line 15).

37. Program motor advances cycle in approximately 5 seconds to the position where contact 36 on relay switch is de-energized. The program motor M2 remains energized through 6.2k ohm resistor and switch 6.

38. Cycle is advanced to next step. Switches 6 and 16 (line 18) open de-energizing program motor M2, turntable motor M3 (line 18) and Program Indicating Light (line 19).

C-13

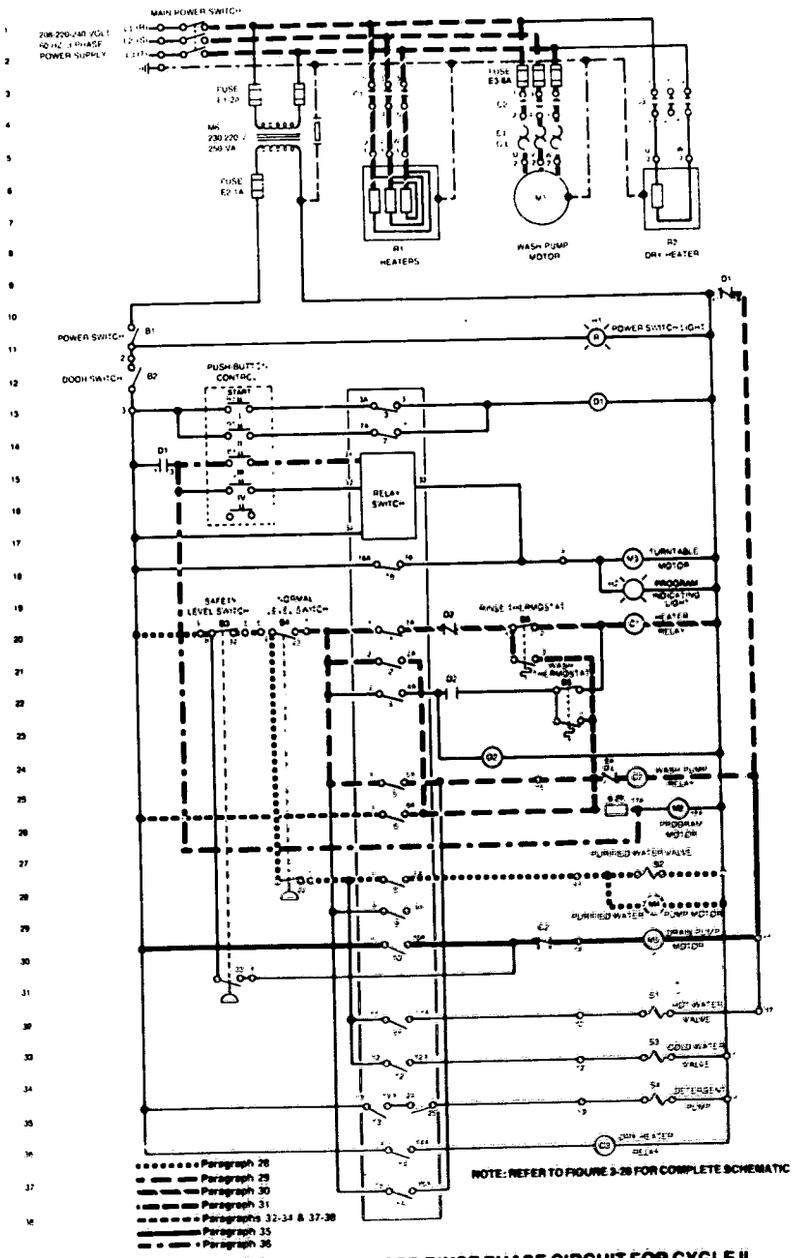


Figure 3-9. SECOND PURIFIED-WATER RINSE PHASE CIRCUIT FOR CYCLE II.

C-14

3-7. CYCLE III BUTTON CIRCUIT DESCRIPTION

NOTE: The following description is given in sequential paragraphs numerically identifiable to the referenced circuit diagram for the particular phase. Refer to the diagram and consult the legend for a circuit to description cross reference. Refer to Figure 3-20 for the schematic in its entirety.

While energized through the 6.2k ohm resistor, the program motor actuates switches as motor advances cycle one step approximately every 30 seconds.

Start (Figure 3-10)

1. When chamber door is closed and program cycle buttons "III" then "S" (start) are pushed, relay D1 (line 13) is energized through closed switch 3 (line 13) and contacts of START button (line 13). The N.O. contacts (line 15) on D1 close energizing program motor M2 (line 26). The "S" button returns to open position when released.

Pre-rinse Phase (Fig. 3-10)

2. Cycle is at starting point. Switch 3 opens de-energizing relay D1. Switches 6 (line 26), 10 (line 30) and 12 (line 34) close. Contact 33 (line 15) on relay switch is energized through contact 34 (line 17) on relay switch. Program Indicating Light (line 19) and turntable motor M3 (line 18) are energized through relay switch contact 33. Program motor M2 is energized through switch 6 and 6.2k ohm resistor. Drain pump motor M5 (line 30) is energized through switch 10, N.C. contacts (line 30) on C2, and N.C. contacts (line 10) on D1. Cold water valve S3 (line 33) is energized through contact 32 (line 20) on safety level switch B3 and switch 12.

NOTE: If water level in tank is too high, contact 32 on safety level switch B3 opens de-energizing components that were energized through it. Contact 33 (line 31) on B3 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1. This circuit is not accented on Figure 3-10.

3. After program motor advances cycle 4 steps (approximately 2 minutes), switch 12 opens de-energizing cold water valve S3.

4. As cycle is advanced through the next 4 steps, switch 12 closes at steps 1 and 3, opens at steps 2 and 4. Cold water valve S3 is energized when switch 12 is closed, de-energized when switch is open.

D-1

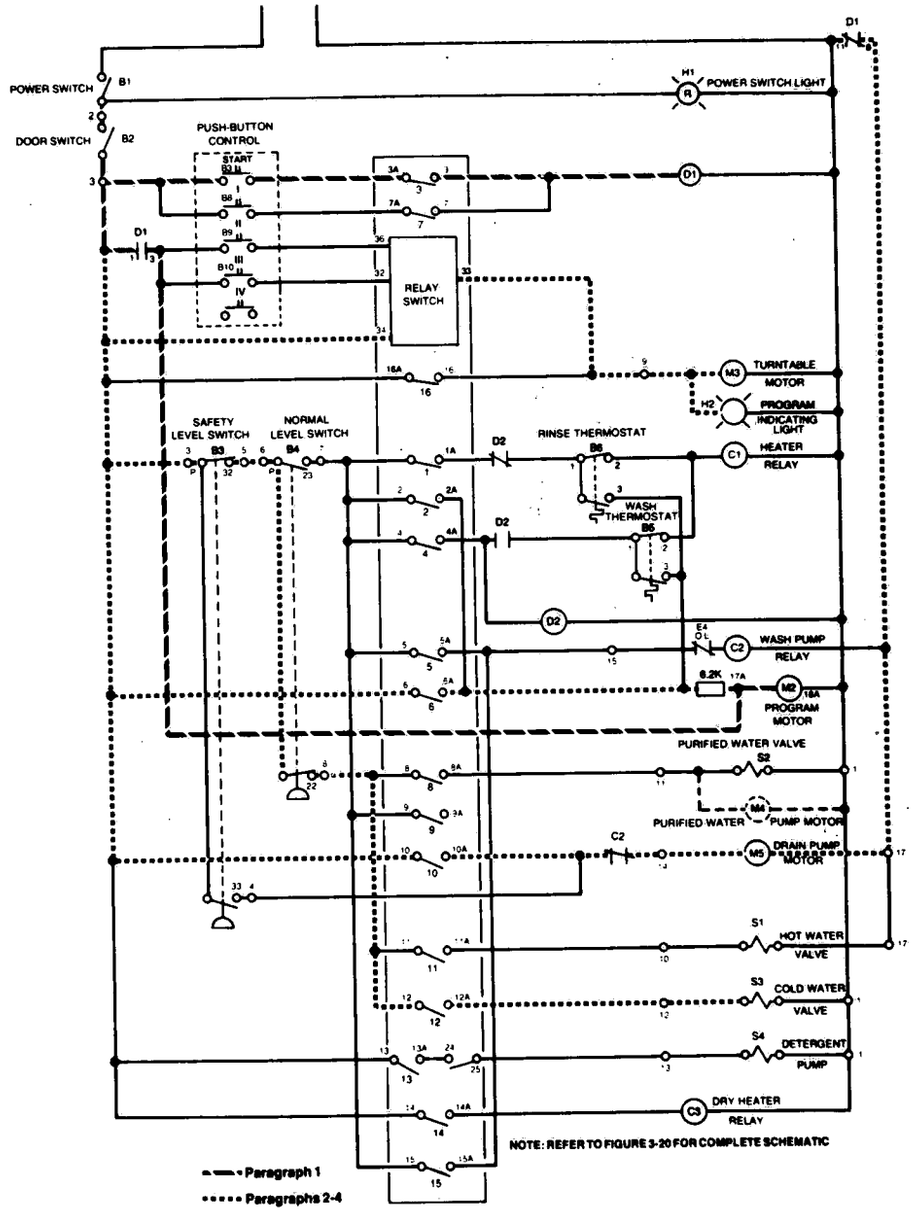


Figure 3-10. START AND PRERINSE PHASE CIRCUITS FOR CYCLE III.

D-2

First Wash Phase (Fig. 3-11)

5. Cycle is advanced one step. Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switches 4 (line 22), 11 (line 32) and 15 (line 37) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11, and N.C. contacts (line 10) on D1.

6. When the water level in the tank reaches the operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the hot water valve S1. Relay D2 is energized through contact 23 on B4 and switch 4. Heater relay C1 (line 20) is energized through contact 23 on B4, switch 4, closed N.O. contacts (line 22) on D2 and contact 2 on wash thermostat B5. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 15, N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1. Wash pump motor M1 (line 7) is energized through N.O. contacts (line 3) on C2.

7. When water in tank reaches selected temperature, contact 2 on B5 opens de-energizing heater relay C1 and contact 3 (line 23) on B5 closes energizing program motor M2 through 6.2k ohm resistor. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

8. Cycle is advanced to next step after program motor was re-energized. Switch 6 closes and holds program motor M2 energized through 6.2k ohm resistor.

9. Program motor advances cycle to next step, and switch 11 opens.

10. The program motor advances cycle 20 steps (approximately 10 minutes). Switch 15 opens de-energizing wash pump relay C2. Switch 4 opens de-energizing wash thermostat B5 and relay D2. Switch 10 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

D-3

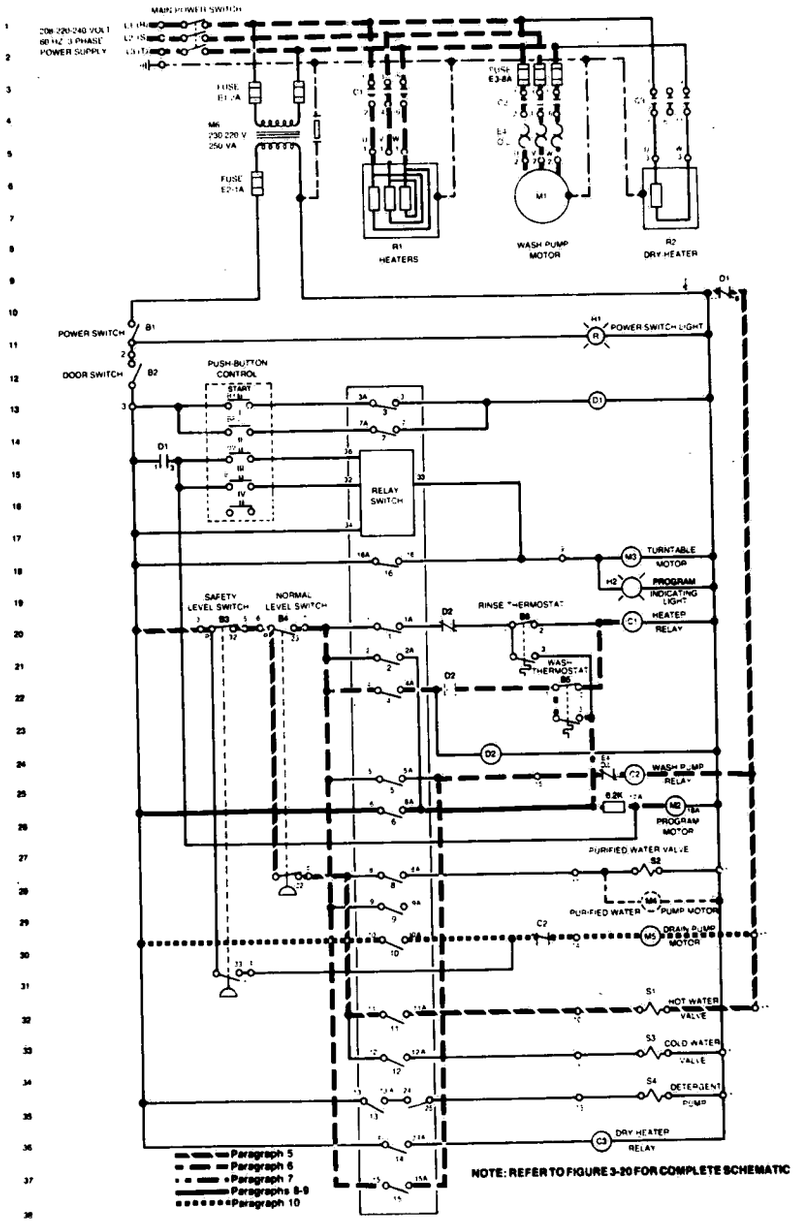


Figure 3-11. FIRST WASH PHASE CIRCUIT FOR CYCLE III.

D-4

Circulating Rinse Phase (Fig. 3-12)

11. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 11 (line 32) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11 on N.C. contacts (line 10) on D1.

12. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing hot water valve S1. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

13. The cycle is advanced 3 steps after program motor M2 was re-energized; switch 11 opens. Switch 5 opens de-energizing wash pump relay C2. Switch 2 opens and switch 6 closes to hold program motor M2 energized through 6.2k ohm resistor. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) of C2 and N.C. contacts on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

Second Wash Phase (Fig. 3-12)

14. Program motor advances cycle one step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 11 (line 32) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11 and N.C. contacts (line 10) on D1.

15. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the hot water valve S1. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

16. Cycle is advanced one step after program motor was re-energized, switch 2 opens and switch 6 closes. The program motor M2 is now energized through switch 6 and 6.2k ohm resistor.

17. The cycle is advanced one step. Switch 11 opens and switch 13 (line 35) closes. After approximately 6 seconds, switch between contacts 24 and 25 (line 35) closes energizing the detergent pump S4 (line 35). The switch between contacts 24 and 25:

- remains closed for approximately 2 seconds,
- opens for approximately 6 seconds,
- closes for approximately 2 seconds,
- opens for approximately 5 seconds,
- closes for approximately 2 seconds,
- opens for approximately 5 seconds, then
- closes for remainder of step (approximately 2 seconds).

18. After cycle is advanced to next step, switch 13 opens de-energizing detergent pump S4.

19. The cycle is advanced 5 steps (approximately 2½ minutes). Switch 5 opens de-energizing wash pump relay C2. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2 and N.C. contacts (line 10) on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

D-5

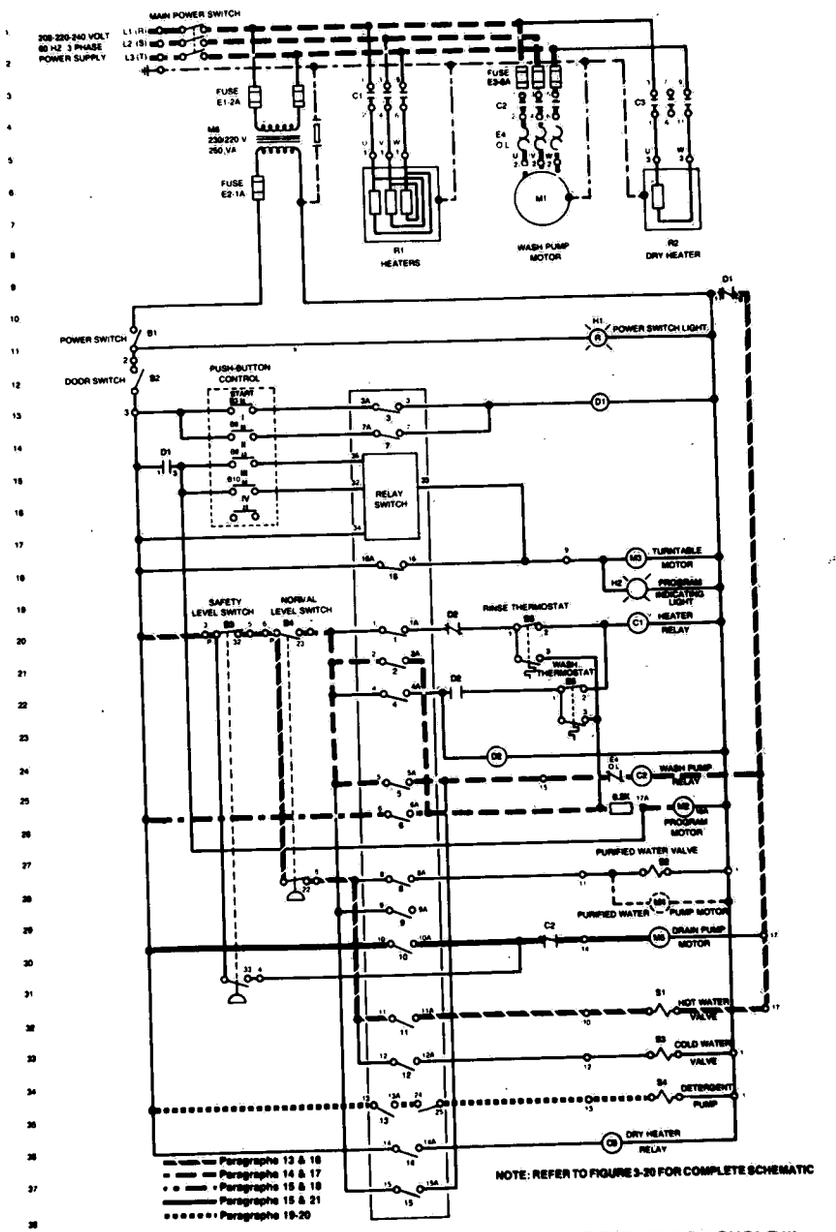


Figure 3-12. CIRCULATING RINSE AND SECOND WASH PHASE CIRCUITS FOR CYCLE III.

D-6

Fresh Rinse Phase (Fig. 3-13)

20. Program motor advances cycle one step. Switches 2 (line 21), 12 (line 33), and 16 (line 18) close. Turntable motor M3 (line 18) and Program Indicating Light (line 19) are energized through switch 16 and contact 33 (line 15) on relay switch. Cold water valve S3 (line 33) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 12.

21. After cycle is advanced 2 steps, switch 12 opens de-energizing the cold water valve S3.

First Purified-water Rinse Phase (Fig. 3-13)

22. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Contact 33 (line 15) on relay switch is de-energized. The turntable motor M3 and Program Indicating Light remain energized through switch 16. Switches 5 (line 24) and 8 (line 28) close. Purified-water valve S2 (line 28) and, if provided, the optional purified-water pump motor M4 (line 29) are energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 8.

23. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the purified-water valve S2. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

24. Program motor advances cycle 3 steps after being re-energized, and switch 6 closes. Program motor M2 is energized through 6.2k ohm resistor and switches 2 and 6.

25. Cycle is advanced one step. Switches 2, 5 and 8 open. Program motor M2 remains energized through 6.2k ohm resistor and switch 6. Wash pump relay C2 is de-energized. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

D-7

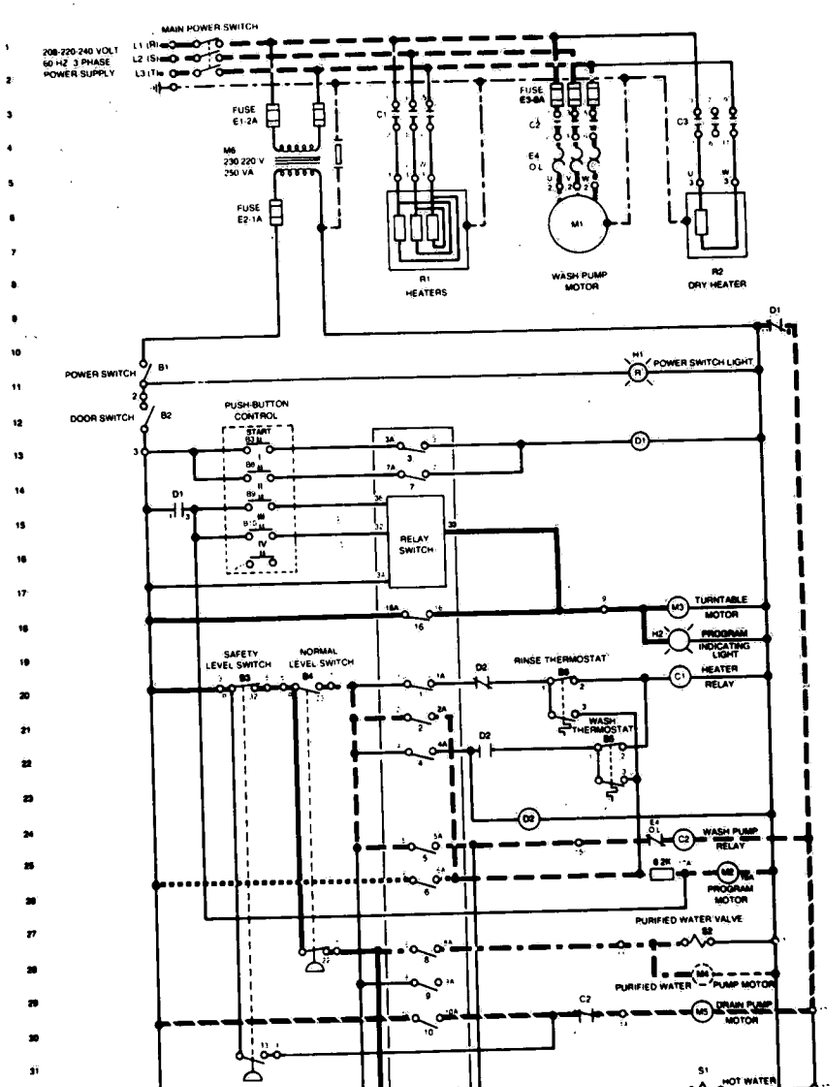


Figure 3-13. FRESH RINSE AND FIRST PURIFIED-WATER RINSE PHASE CIRCUITS FOR CYCLE III.

D-8

Second Purified-water Rinse Phase (Fig. 3-14)

26. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 8 (line 28) close. Purified-water valve S2 (line 28) and, if provided, the optional purified-water pump motor M4 (line 29) are energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 8.

27. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the purified-water valve S2. Program motor M2 is energized through contact 23 on B4, switch 2, and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5 N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

28. Program motor advances cycle one step after being re-energized. Switch 2 opens de-energizing program motor M2. Switch 1 (line 20) closes energizing heater relay C1 (line 20) through contact 23 on B4, N.C. contacts (line 20) on D2 and contact 2 on rinse thermostat B6. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1. Switch 5 opens and switch 15 (line 37) closes; wash pump relay C2 remains energized.

29. When water in tank reaches selected temperature, contact 2 on B6 opens de-energizing heater relay C1 and contact 3 (line 21) on B6 closes energizing program motor M2 through 6.2k ohm resistor. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

30. Program motor advances cycle one step after being re-energized and switch 6 closes. Switch 15 opens and switch 5 closes; wash pump relay C2 remains energized.

31. Cycle is advanced one step and switch 8 opens.

32. Program motor advances cycle 2 steps. Switch 1 opens de-energizing rinse thermostat. Program motor M2 remains energized through switch 6 and 6.2k ohm resistor.

33. After cycle is advanced one step, switch 5 opens de-energizing wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Switch 10 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1.

34. The program motor advances cycle to next step. Contact 32 (line 15) on relay switch is energized. Program motor M2 is energized through cycle "III" button contacts (line 15).

35. Program motor advances cycle in approximately 5 seconds to the position where contact 32 on relay switch is de-energized. The program motor M2 remains energized through 6.2k ohm resistor and switch 6.

36. Cycle is advanced to next step. Switches 6 and 16 (line 18) open de-energizing program motor M2, turntable motor M3 (line 18) and Program Indicating Light (line 19).

D-9

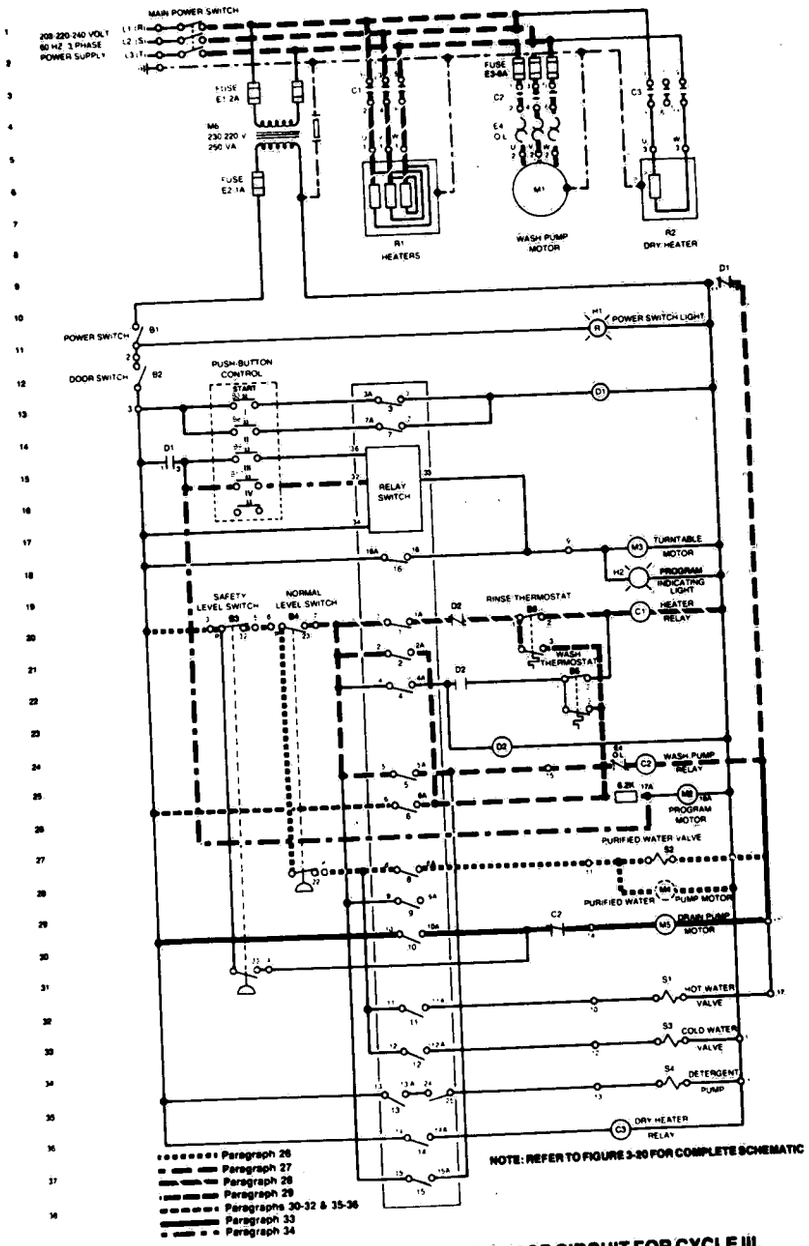


Figure 3-14. SECOND PURIFIED-WATER RINSE PHASE CIRCUIT FOR CYCLE III.

D-10

3-8. CYCLE IV BUTTON CIRCUIT DESCRIPTION

NOTE: The following description is given in sequential paragraphs numerically identifiable to the referenced circuit diagram for the particular phase. Refer to the diagram and consult the legend for a circuit to description cross reference. Refer to Figure 3-20 for the schematic in its entirety.

While energized through the 6.2k ohm resistor, the program motor actuates switches as motor advances cycle one step approximately every 30 seconds.

Start (Fig. 3-15)

1. When chamber door is closed and program cycle buttons "IV" then "S" (start) are pushed, relay D1 (line 13) is energized through closed switch 3 (line 13) and contacts of START button (line 13). The N.O. contacts (line 15) on D1 close energizing program motor M2 (line 26). The "S" button returns to open position when released.

Pre-rinse Phase (Fig. 3-15)

2. Cycle is at starting point. Switch 3 opens de-energizing relay D1. Switches 6 (line 26), 10 (line 30) and 12 (line 34) close. Contact 33 (line 15) on relay switch is energized through contact 34 (line 17) on relay switch. Program Indicating Light (line 19) and turntable motor M3 (line 18) are energized through relay switch contact 33. Program motor M2 is energized through switch 6 and 6.2k ohm resistor. Drain pump motor M5 (line 30) is energized through switch 10, N.C. contacts (line 30) on C2, and N.C. contacts (line 10) on D1. Cold water valve S3 (line 33) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 12.

NOTE: If water level in tank is too high, contact 32 on safety level switch B3 opens de-energizing components energized through it. Contact 33 (line 31) on B3 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1. This circuit is not accented on Figure 3-15.

3. After program motor advances cycle 4 steps (approximately 2 minutes), switch 12 opens de-energizing cold water valve S3.

4. As cycle is advanced through the next 4 steps, switch 12 closes at steps 1 and 3, opens at steps 2 and 4. Cold water valve S3 is energized when switch 12 is closed, de-energized when switch is open.

D-11

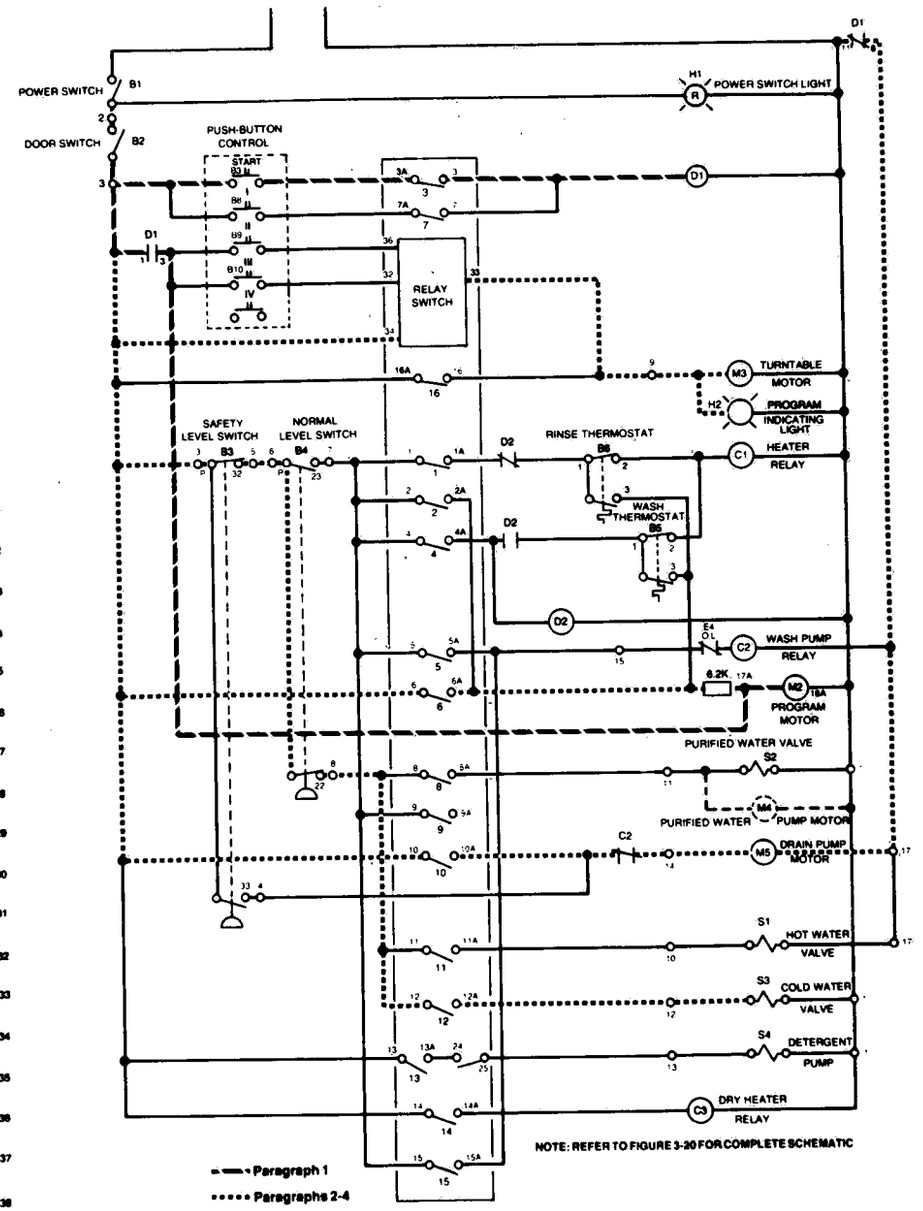


Figure 3-15. START AND PRERINSE PHASE CIRCUITS FOR CYCLE IV.

D-12

First Wash Phase (Fig. 3-16)

5. Cycle is advanced one step. Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switches 4 (line 22), 11 (line 32) and 15 (line 37) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11, and N.C. contacts (line 10) on D1.

6. When the water level in the tank reaches the operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the hot water valve S1. Relay D2 is energized through contact 23 on B4 and switch 4. Heater relay C1 (line 20) is energized through contact 23 on B4, switch 4, closed N.O. contacts (line 22) on D2 and contact 2 on wash thermostat B5. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 15, N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1. Wash pump motor M1 (line 7) is energized through N.O. contacts (line 3) on C2.

7. When water in tank reaches selected temperature, contact 2 on B5 opens de-energizing heater relay C1 and contact 3 (line 23) on B5 closes energizing program motor M2 through 6.2k ohm resistor. Heaters R1 are de-energized when closed N.O. contacts of C1 open.

8. Cycle is advanced to next step after program motor was re-energized. Switch 6 closes and holds program motor M2 energized through 6.2k ohm resistor.

9. Program motor advances cycle to next step, and switch 11 opens.

10. The program motor advances cycle 20 steps (approximately 10 minutes). Switch 15 opens de-energizing wash pump relay C2. Switch 4 opens de-energizing wash thermostat B5 and relay D2. Switch 10 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

D-13

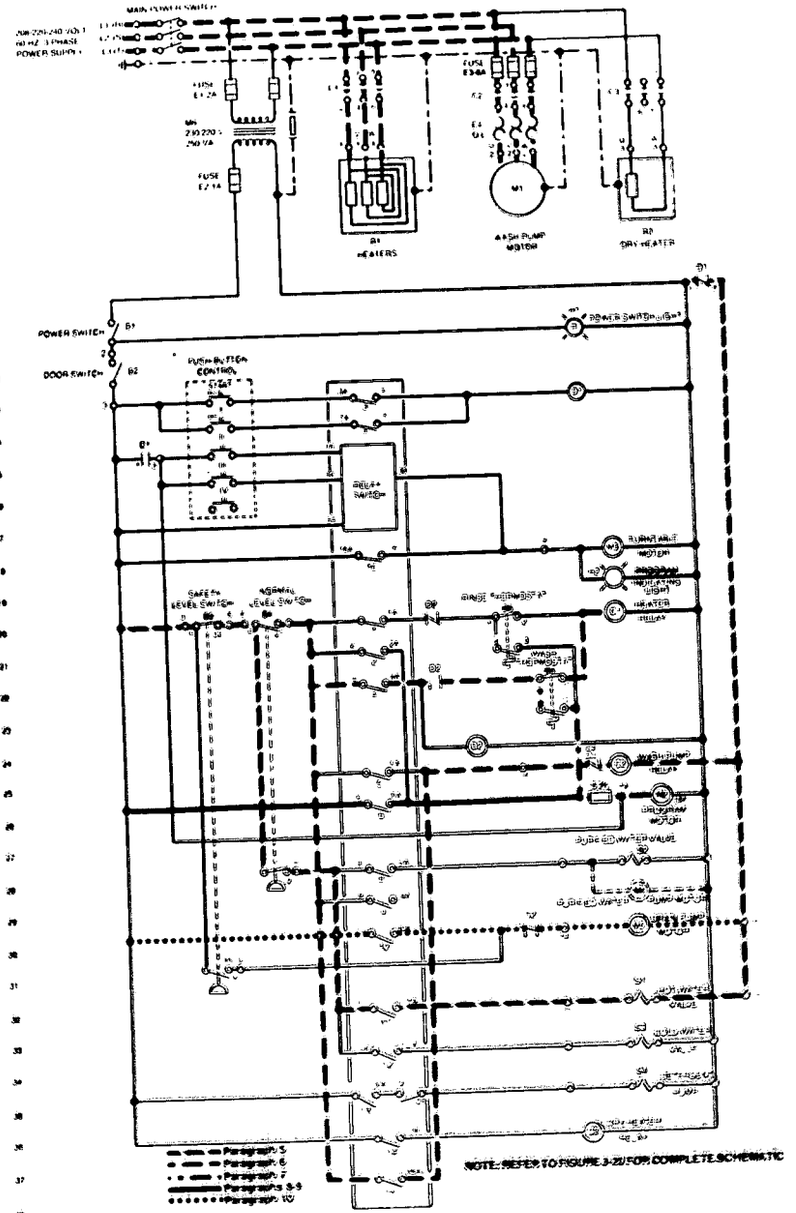


Figure 3-16. FIRST WASH PHASE CIRCUIT FOR CYCLE IV.

D-14

Circulating Rinse Phase (Fig. 3-17)

11. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 11 (line 32) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11 and N.C. contacts (line 10) on D1.

12. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing hot water valve S1. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

13. The cycle is advanced 3 steps after program motor M2 was re-energized; switch 11 opens. Switch 5 opens de-energizing wash pump relay C2. Switch 2 opens and switch 6 closes to hold program motor M2 energized through 6.2k ohm resistor. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) of C2 and N.C. contacts on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tanks falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

Second Wash Phase (Fig. 3-17)

14. Program motor advances cycle one step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 11 (line 32) close. Hot water valve S1 (line 32) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4, switch 11 and N.C. contacts (line 10) on D1.

15. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the hot water valve S1. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

16. Cycle is advanced one step after program motor was re-energized, switch 2 opens and switch 6 closes. The program motor M2 is now energized through switch 6 and 6.2k ohm resistor.

17. The cycle is advanced one step. Switch 11 opens and switch 13 (line 35) closes. After approximately 6 seconds, switch between contacts 24 and 25 (line 35) closes energizing the detergent pump S4 (line 35). The switch between contacts 24 and 25:

- remains closed for approximately 2 seconds,
- opens for approximately 6 seconds,
- closes for approximately 2 seconds,
- opens for approximately 5 seconds,
- closes for approximately 2 seconds,
- opens for approximately 5 seconds, then
- closes for remainder of step (approximately 2 seconds).

18. After cycle is advanced to next step, switch 13 opens de-energizing detergent pump S4.

19. The cycle is advanced 5 steps (approximately 2½ minutes). Switch 5 opens de-energizing wash pump relay C2. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2 and N.C. contacts (line 10) on D1. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

E-1

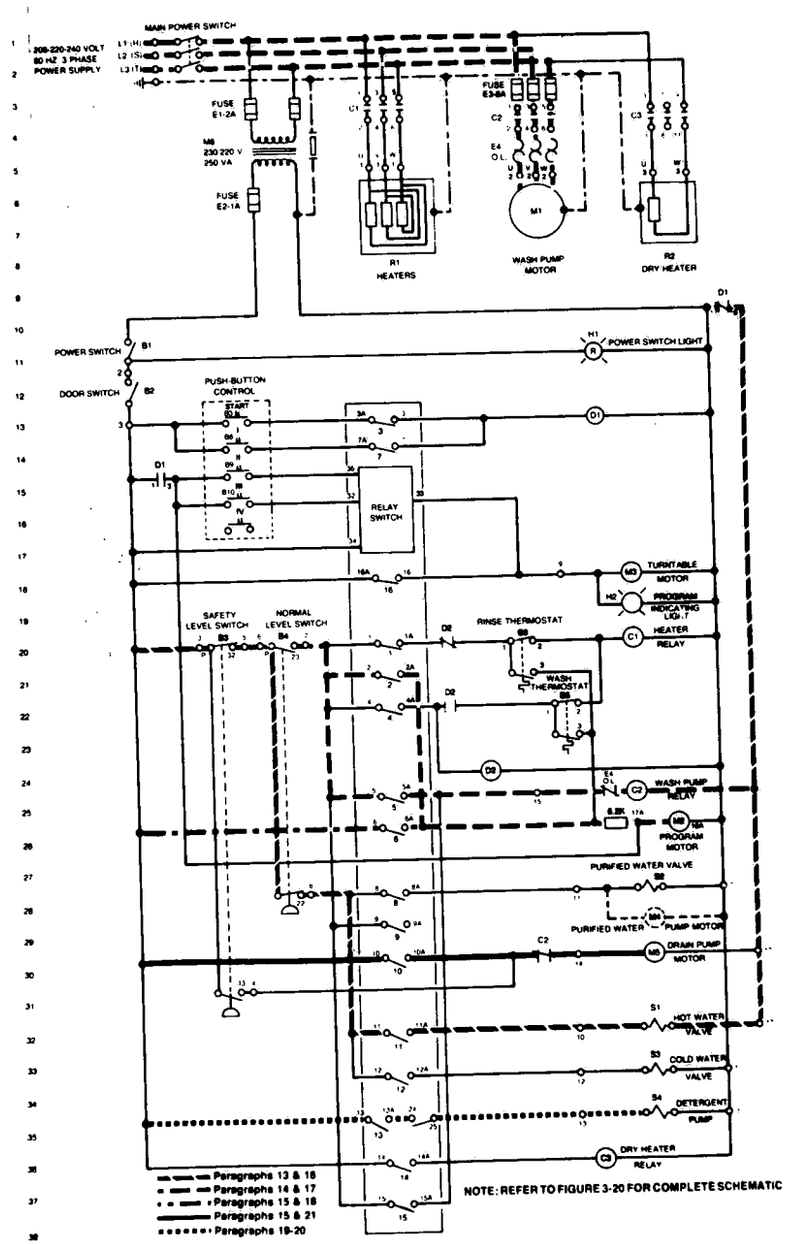


Figure 3-17. CIRCULATING RINSE AND SECOND WASH PHASE CIRCUITS FOR CYCLE IV.

E-2

Fresh Rinse Phase (Fig. 3-18)

20. Program motor advances cycle one step. Switches 2 (line 21), 12 (line 33), and 16 (line 18) close. Turntable motor M3 (line 18) and Program Indicating Light (line 19) are energized through switch 16 and contact 33 (line 15) on relay switch. Cold water valve S3 (line 33) is energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 12.

21. After cycle is advanced 2 steps, switch 12 opens de-energizing the cold water valve S3.

First Purified-water Rinse Phase (Fig. 3-18)

22. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Contact 33 (line 15) on relay switch is de-energized. The turntable motor M3 and Program Indicating Light remain energized through switch 16. Switches 5 (line 24) and 8 (line 28) close. Purified-water valve S2 (line 28) and, if provided, the optional purified-water pump motor M4 (line 29) are energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 8.

23. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the purified-water valve S2. Program motor M2 is energized through contact 23 on B4, switch 2 and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

24. Program motor advances cycle 3 steps after being re-energized, and switch 6 closes. Program motor M2 is energized through 6.2k ohm resistor and switches 2 and 6.

25. Cycle is advanced one step. Switches 2, 5 and 8 open. Program motor M2 remains energized through 6.2k ohm resistor and switch 6. Wash pump relay C2 is de-energized. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

E-3

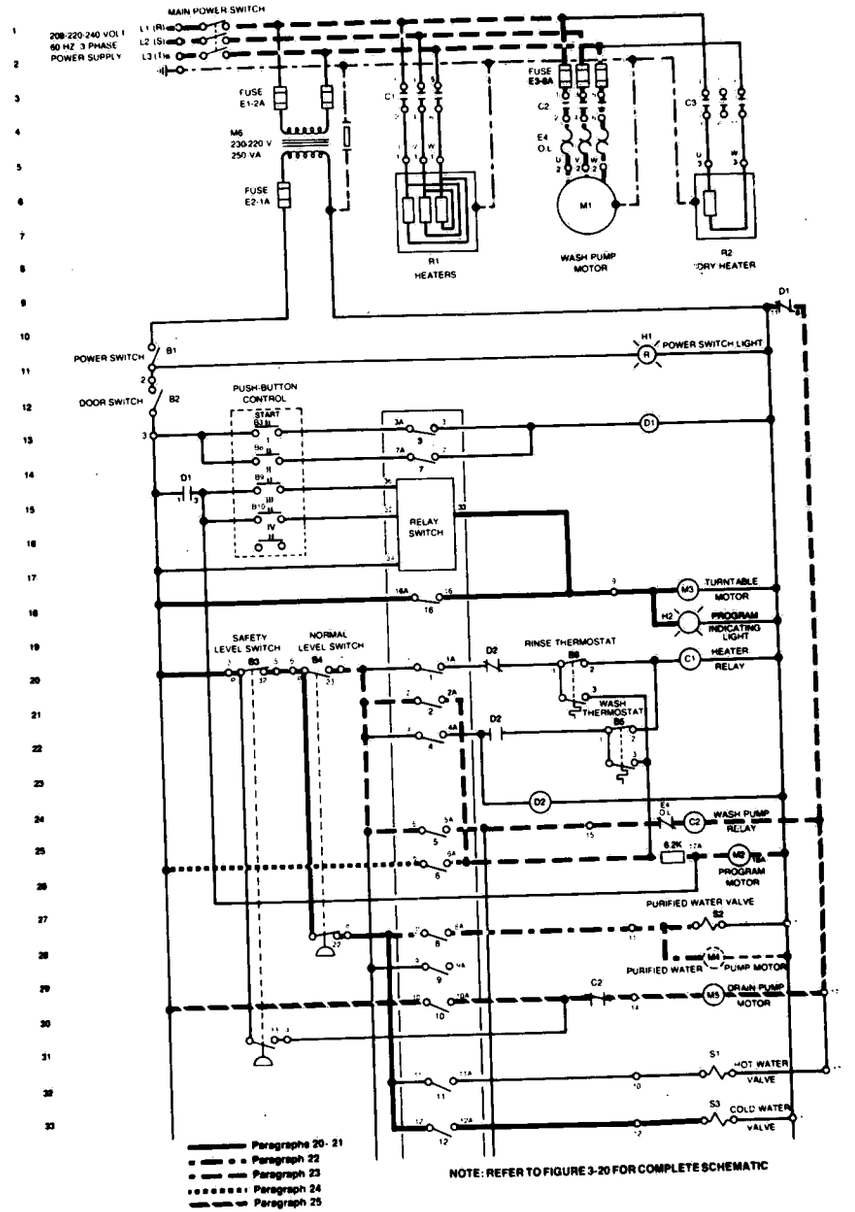


Figure 3-18. FRESH RINSE AND FIRST PURIFIED-WATER RINSE PHASE CIRCUITS FOR CYCLE IV.

E-4

Second Purified-water Rinse Phase (Fig. 3-19)

26. Program motor advances cycle to next step. Switch 6 (line 26) opens de-energizing program motor M2 (line 26). Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switches 2 (line 21), 5 (line 24) and 8 (line 28) close. Purified-water valve S2 (line 28) and, if provided, the optional purified-water pump motor M4 (line 29) are energized through contact 32 (line 20) on safety level switch B3, contact 22 (line 28) on normal level switch B4 and switch 8.

27. When water level in tank reaches operating level, contact 23 (line 20) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the purified-water valve S2. Program motor M2 is energized through contact 23 on B4, switch 2, and 6.2k ohm resistor. Wash pump relay C2 (line 25) is energized through contact 23 on B4, switch 5, N.C. contacts (line 25) of overload E4 and N.C. contacts (line 10) on D1. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

28. Program motor advances cycle one step after being re-energized. Switch 2 opens de-energizing program motor M2. Switch 1 (line 20) closes energizing heater relay C1 (line 20) through contact 23 on B4, N.C. contacts (line 20) on D2 and contact 2 on rinse thermostat B6. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1. Switch 5 opens and switch 15 (line 37) closes; wash pump relay C2 remains energized.

29. When water in tank reaches selected temperature, contact 2 on B6 opens de-energizing heater relay C1 and contact 3 (line 21) on B6 closes energizing program motor M2 through 6.2k ohm resistor. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

30. Program motor advances cycle one step after being re-energized and switch 6 closes. Switch 15 opens and switch 5 closes; wash pump relay C2 remains energized.

31. Cycle is advanced one step and switch 8 opens.

32. Program motor advances cycle 2 steps. Switch 1 opens de-energizing rinse thermostat. Program motor M2 remains energized through switch 6 and 6.2k ohm resistor.

33. After cycle is advanced one step, switch 5 opens de-energizing wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Switch 10 closes energizing drain pump motor M5 through N.C. contacts on C2 and N.C. contacts on D1.

Drying Phase (Fig. 3-19)

34. Program motor advances cycle to next step. Switch 10 (line 30) opens de-energizing drain pump motor M5 (line 30). Switch 14 (line 36) closes energizing dry heater relay C3 (line 36). Dry heater R2 (line 7) is energized when N.O. contacts (line 3) on C3 close.

35. The cycle is advanced 15 steps (approximately 7½ minutes). Switch 10 closes energizing drain pump motor M5 through N.C. contacts (line 30) on C2 and N.C. contacts (line 10) on D1.

36. Cycle is advanced one step. Switches 10 and 14 open de-energizing drain pump motor M5 and dry heater relay C3. Dry heater R2 is de-energized when closed N.O. contacts on C3 open.

37. Program motor advances cycle one step. Switches 6 (line 26) and 16 (line 18) open de-energizing program motor M2 (line 26), turntable motor M3 (line 30) and Program Indicating Light (line 19).

E-5

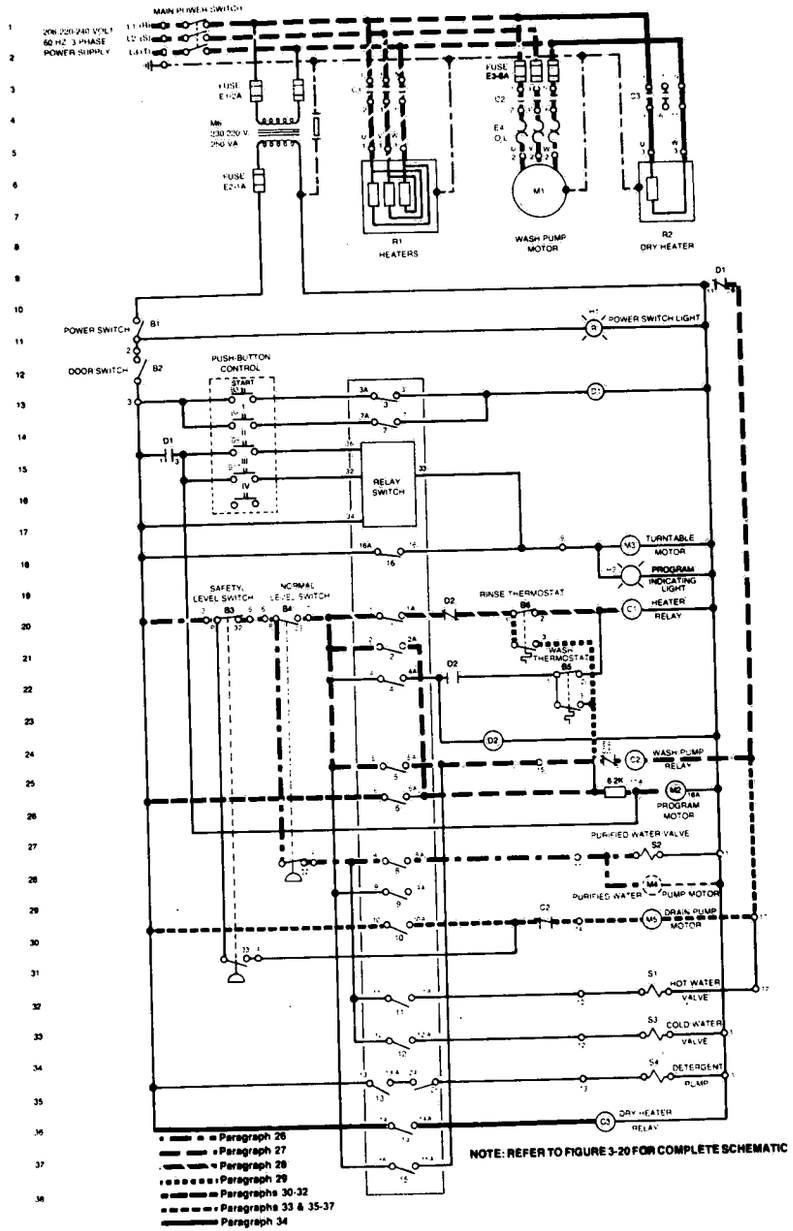
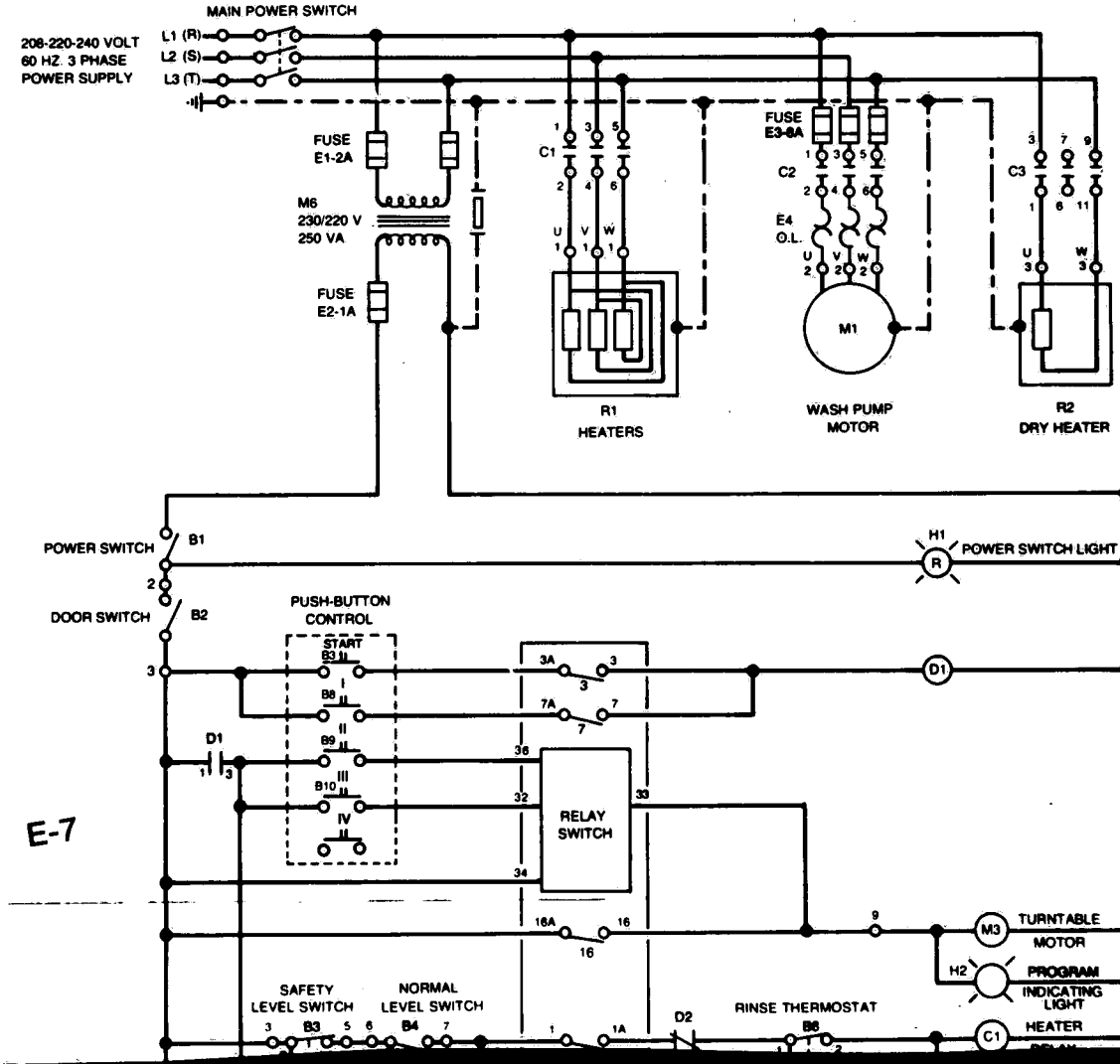


Figure 3-19. SECOND PURIFIED-WATER RINSE AND DRYING PHASE CIRCUITS FOR CYCLE IV.

E-6


MAIN POWER SWITCH
208-220-240 VOLT
60 HZ. 3 PHASE
POWER SUPPLY
L1 (R)
L2 (S)
L3 (T)
FUSE
E1-2A
M6
230/220 V
250 VA
FUSE
E2-1A
C1
R1
HEATERS
FUSE
E3-8A
C2
E4
O.L.
M1
WASH PUMP
MOTOR
C3
R2
DRY HEATER
D1
POWER SWITCH
B1
H1
POWER SWITCH LIGHT
DOOR SWITCH
B2
PUSH-BUTTON
CONTROL
START
B3
B8
B9
B10
RELAY
SWITCH
E-7
E-8
M3
TURNTABLE
MOTOR
H2
PROGRAM
INDICATING
LIGHT
SAFETY
LEVEL SWITCH
NORMAL
LEVEL SWITCH
B4
RINSE THERMOSTAT
B6
D2
C1
HEATER

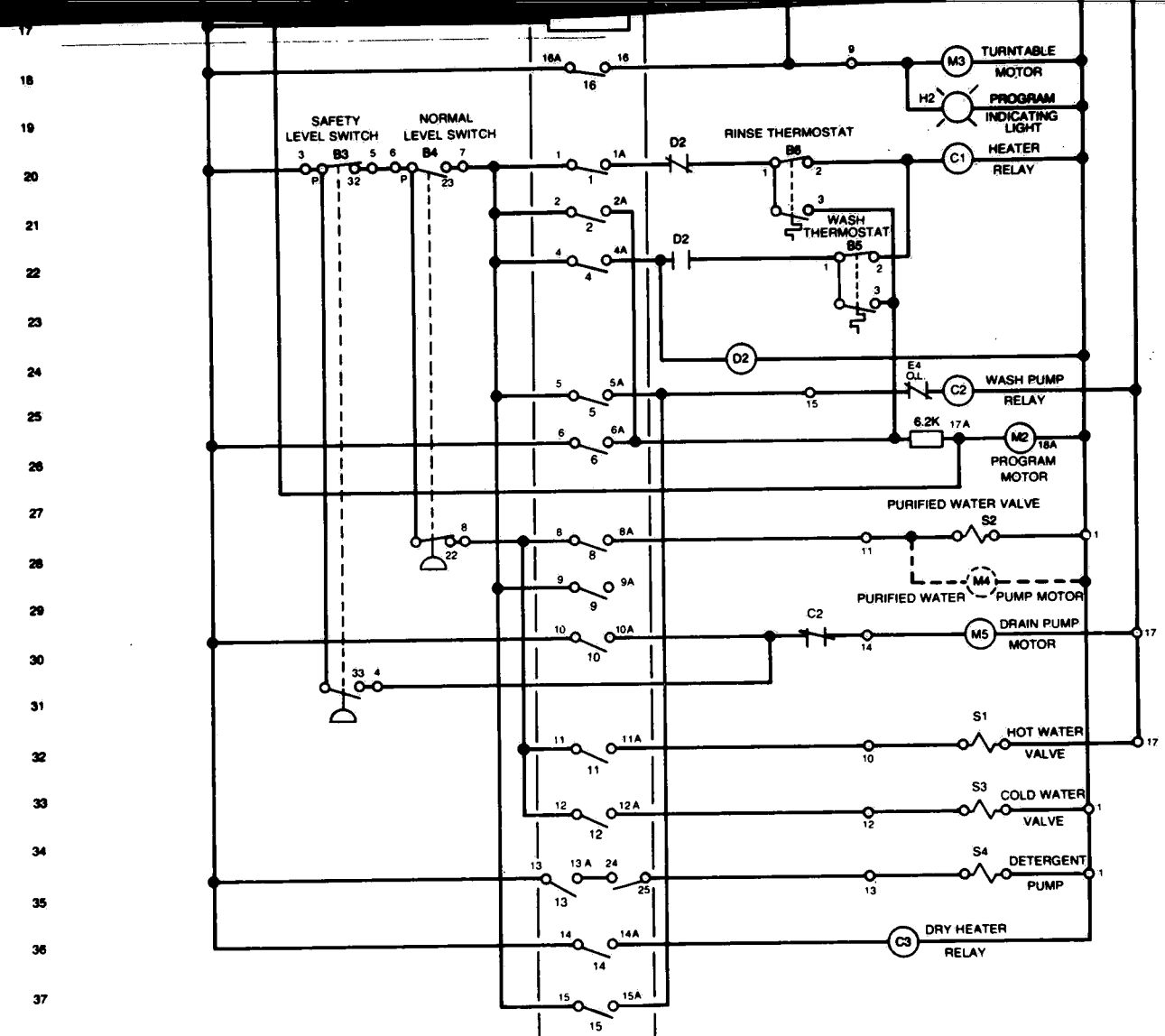


Figure 3-20. ELECTRICAL SCHEMATIC, NEWAMATIC F-570 WITH PUSH-BUTTON CONTROL.

3-9. YELLOW CODED PUNCH CARD CIRCUIT DESCRIPTION

NOTE: The following description is given in sequential paragraphs numerically identifiable to the referenced circuit diagram for the particular phase. Refer to the diagram and consult the legend for a circuit to description cross reference. Refer to Figure 3-32 for the schematic in its entirety.

While energized the program motor advances punch card one **step** approximately every 30 seconds.

Start (Fig. 3-21)

1. When chamber door is closed and black lever on punch-card control is lifted, Program Indicating Light (line 13) is energized through door switch B2 (line 12) and closed contact P (line 13). Contact 32 (line 17) on safety level switch B3 energizes program motor M2 (line 19) through contacts A (line 18) and B (line 19) and turntable motor M3 (line 20) through contacts A and C (line 20).

NOTE: If water level in tank is too high, contact 33 (line 16) on safety level switch B3 closes energizing the drain pump motor M5 (line 15) while contact 32 (line 17) opens de-energizing program motor, turntable motor and any other component energized through this contact. This circuit is not accented in Figure 3-21.

Pre-rinse Phase (Fig. 3-21)

2. Card is moved one step, then contact K (line 30) closes. Cold water valve S3 (line 31) is energized through contact 22 (line 28) on normal level switch B4 and contact K.

3. At start of next step, contact O (line 15) closes energizing pump motor M5 (line 15).

4. After card is advanced eight steps (approximately 4 minutes), contact K opens de-energizing the cold water valve S3.

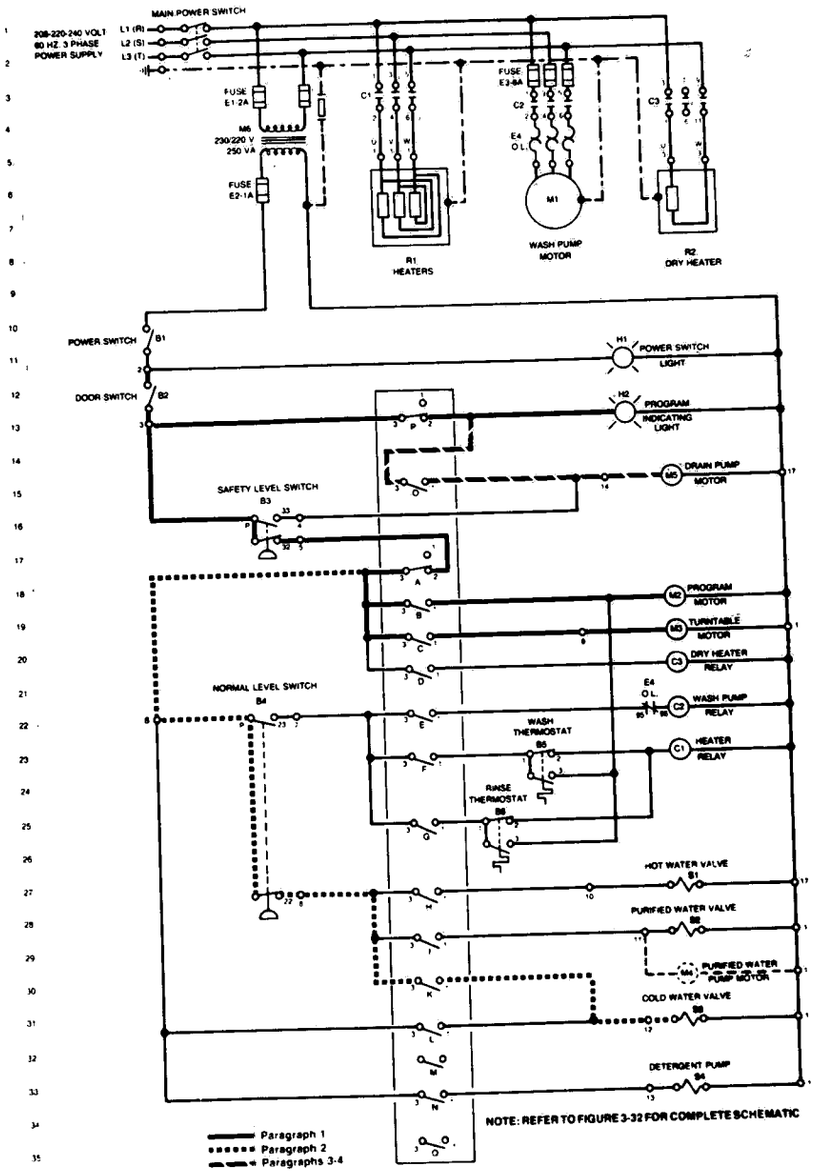


Figure 3-21. START AND PRE-RINSE PHASE CIRCUITS FOR YELLOW CODED PUNCH CARD.

First Wash Phase (Fig. 3-22)

5. Card is advanced one step. Contact O (line 15) opens de-energizing drain pump motor M5 (line 15). Contact H (line 28) closes. Hot water valve S1 (line 28) is energized through contact 22 (line 28) on normal level switch B4 and contact H.

6. After card is advanced to next step, contacts E (line 22) and F (line 23) close.

7. Card is advanced one step, then contact B (line 19) opens de-energizing program motor M2 (line 19).

8. When the water level in the tank reaches the operating level, contact 23 (line 22) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the hot water valve S1. Heater relay C1 (line 23) is energized through contact 23, contact 2 (line 23) on wash thermostat B5 and contact F. Wash pump relay C2 (line 22) is energized through contacts 23 and E and N.C. contacts (line 22) of overload E4. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1, and wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

9. When water in tank reaches selected temperature, contact 2 on B5 opens de-energizing heater relay C1 and contact 3 (line 24) on B5 closes energizing program motor M2. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

10. When card moves one step after program motor M2 was energized, contact B closes and contach H opens. Program motor M2 is now energized through contact B.

11. Card advances 9 steps (approximately 4½ minutes). Contact O closes energizing drain pump motor M5. Contact E opens de-energizing wash pump relay C2. Contact F opens de-energizing wash thermostat B5. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

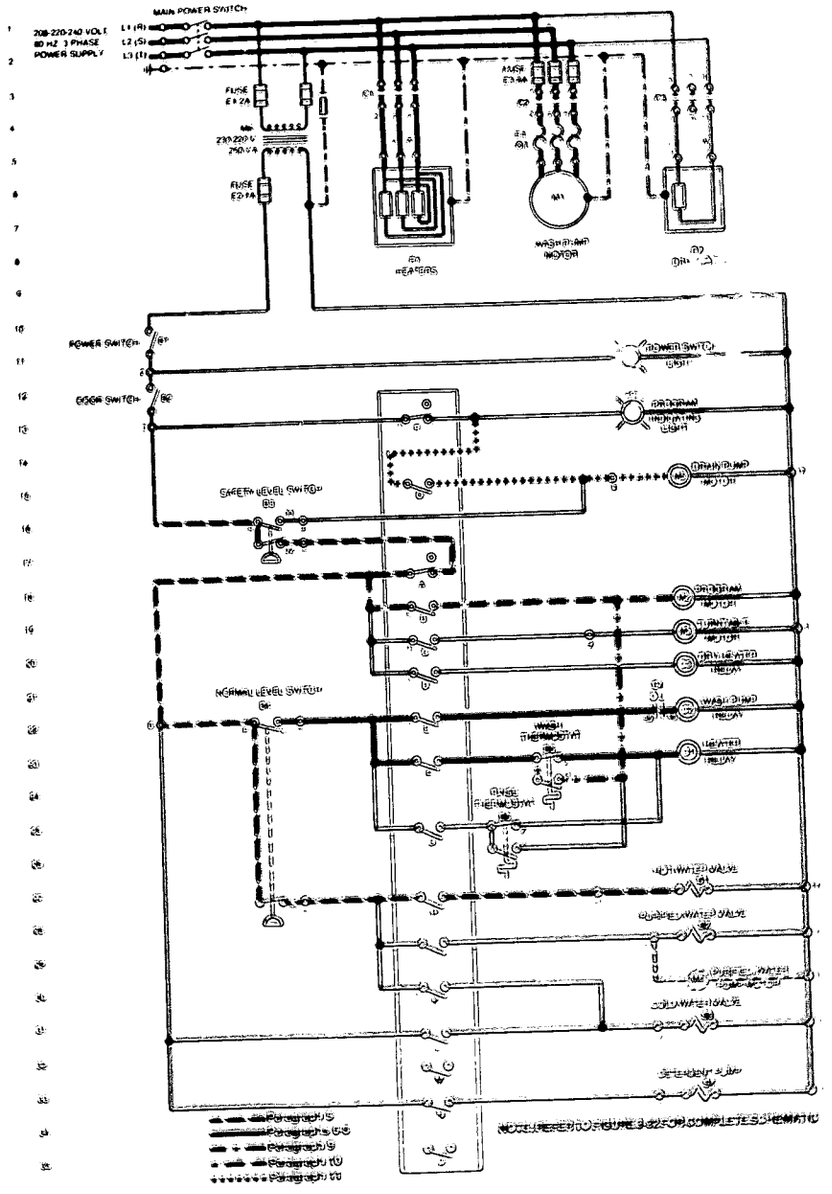


Figure 3-22. FIRST WASH PHASE CIRCUIT FOR YELLOW CODED PUNCH CARD.

Circulating Rinse Phase (Fig. 3-23)

12. Card advances two steps. Contact O opens de-energizing drain pump motor M5. Contact H (line 28) closes energizing hot water valve S1 (line 28).

13. After card advances to next step, contact E (line 22) closes. When water level in tank reaches operating level, contact 22 (line 28) on normal level switch B4 opens de-energizing hot water valve S1 and contact 23 (line 22) on B4 closes energizing wash pump relay C2 through contact E and N.C. overload contacts. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

14. Card advances three steps. Contacts H and E open de-energizing wash pump relay C2. Contact O closes energizing the drain pump motor M5. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

15. After card advances two steps, contact O opens de-energizing drain pump motor M5.

Second Wash Phase (Fig. 3-23)

16. Card advances one step. Contact H (line 28) closes energizing hot water valve S1 (line 28), contact N (line 34) closes energizing detergent pump S4 (line 34), and contact E (line 22) closes.

17. When the water level in the tank reaches the operating level, contact 22 on normal level switch B4 opens de-energizing the hot water valve S1, and contact 23 on B4 closes energizing wash pump relay C2 through contact E and N.C. contacts of overload E4. Wash pump motor M1 is energized through closed N.O. contacts on C2. As card advances the next 5 steps (approximately 2½ minutes); contact N opens at steps 1, 3 and 5 and closes at steps 2 and 4, and contact H opens at step 3. Detergent pump S4 is energized when contact N is closed and de-energized when N is open. Hot water valve S1 is de-energized when contact H opens.

18. Card advances to next step. Contact O closes energizing drain pump motor M5. Contact E opens de-energizing wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. When water level in tank falls below operating level, contact 23 opens and contact 22 closes on normal level switch B4.

Fresh Rinse Phase (Fig. 3-23)

19. Card advances two steps. Contact O opens de-energizing drain pump motor M5. Contact K (line 30) closes energizing cold water valve S3 (line 31).

20. When card is at the next step, contact O closes energizing drain pump motor M5.

21. Card advances two steps. Contact K opens de-energizing the cold water valve S3.

Purified-water Rinse Phase (Fig. 3-23)

22. After card advances one step, contact O opens de-energizing the drain pump motor M5. Contact I (line 29) closes energizing the purified-water valve S2 (line 29) and, if provided, the optional purified-water pump motor M4 (line 30).

23. When water level in tank reaches operating level, contact 22 on B4 opens de-energizing purified-water valve S2 and contact 23 on B4 closes.

24. After card advances two steps, contact E closes energizing the wash pump relay C2. Wash pump motor is energized through closed N.O. contacts on C2.

25. Card advances two steps and contact I opens. After card advances another two steps, contact E opens and contact O closes. The opening of contact E de-energizes wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Closing of contact O energizes drain pump motor M5.

26. After card advances two steps, contact O opens de-energizing drain pump motor M5, and contact P (line 13) opens de-energizing Program Indicating Light (line 13).

27. Card advances one step. Contacts A (line 18) and C (line 20) open de-energizing program motor M2 (line 19) and turntable motor M3 (line 20).

NOTE: Only cycle operation and cycle control circuit descriptions for standard punch cards are presented in this Manual. If cycle operation and cycle control circuit descriptions are required for special punch cards (including punch card for units with noncirculating purified-water rinse), contact your local AMSCO sales representative.

F-1

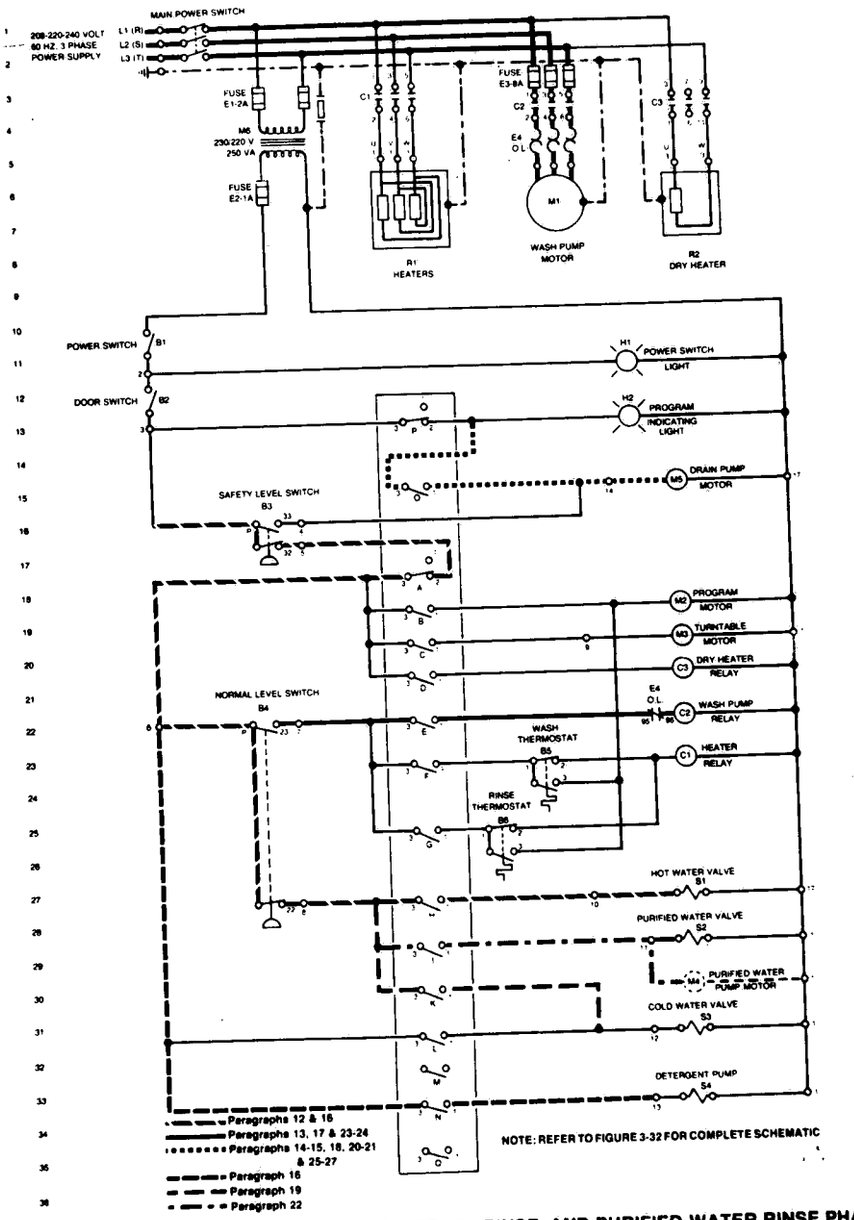


Figure 3-23. CIRCULATING RINSE, SECOND WASH, FRESH RINSE, AND PURIFIED-WATER RINSE PHASE CIRCUITS FOR YELLOW CODED PUNCH CARD.

F-2

3-10. BLUE CODED PUNCH CARD CIRCUIT DESCRIPTION

NOTE: The following description is given in sequential paragraphs numerically identifiable to the referenced circuit diagram for the particular phase. Refer to the diagram and consult the legend for a circuit to description cross reference. Refer to Figure 3-32 for the schematic in its entirety.

While energized the program motor advances punch card one **step** approximately every 30 seconds.

Start (Fig. 3-24)

1. When chamber door is closed and black lever on punch-card control is lifted, Program Indicating Light (line 13) is energized through door switch B2 (line 12) and closed contact P (line 13). Contact 32 (line 17) on safety level switch B3 energizes program motor M2 (line 20) through contacts A (line 18) and B (line 19) and turntable motor M3 (line 20) through contacts A and C (line 20).

NOTE: If water level in tank is too high, contact 33 (line 16) on safety level switch B3 closes energizing the drain pump motor M5 (line 15); while contact 32 (line 17) opens de-energizing program motor, turntable motor and any other component energized through this contact. This circuit is not accented on Figure 3-24.

Pre-rinse Phase (Fig. 3-24)

2. Card is moved one step, then contact K (line 30) closes. Cold water valve S3 (line 31) is energized through contact 22 (line 28) on normal level switch B4 and contact K.

3. At start of next step, contact O (line 15) closes energizing drain pump motor M5 (line 15).

4. After card is advanced eight steps (approximately 4 minutes), contact K opens de-energizing the cold water valve S3.

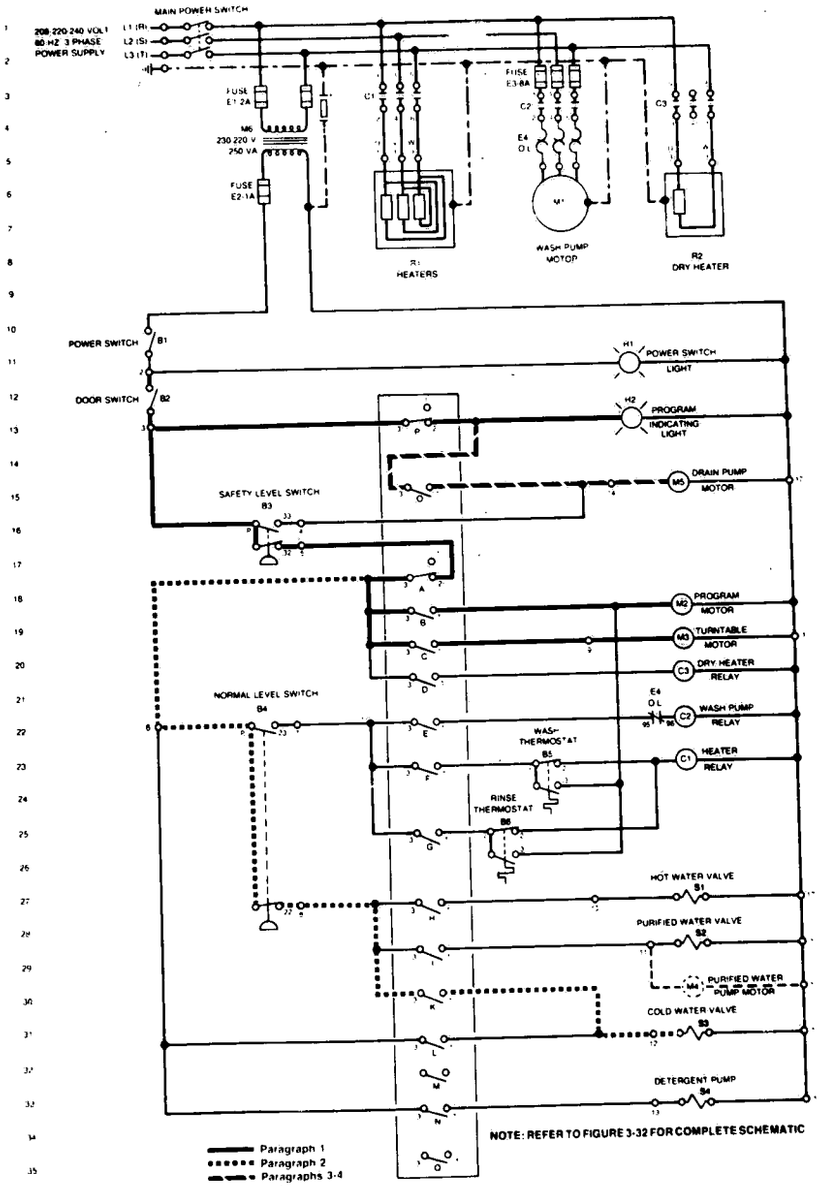


Figure 3-24. START AND PRERINSE PHASE CIRCUITS FOR BLUE CODED PUNCH CARD.

First Wash Phase (Fig. 3-25)

5. Card is advanced one step. Contact O (line 15) opens de-energizing drain pump motor M5 (line 15) and contact H (line 28) closes. Hot water valve S1 (line 28) is energized through contact 22 (line 28) on normal level switch B4 and contact H.

6. After card is advanced to next step, contacts E (line 22) and F (line 23) close.

7. Card is advanced one step, then contact B (line 19) opens de-energizing program motor M2 (line 19).

8. When the water level in the tank reaches the operating level, contact 23 (line 22) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the hot water valve S1. Heater relay C1 (line 23) is energized through contact 23, contact 2 (line 23) on wash thermostat B5 and contact F. Wash pump relay C2 (line 22) is energized through contacts 23 and E and N.C. contact (line 22) of overload E4. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1, and wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

9. When water in tank reaches selected temperature, contact 2 on B5 opens de-energizing heater relay C1 and contact 3 (line 24) on B5 closes energizing program motor M2. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

10. When card has moved one step after program motor M2 was re-energized, contact B closes and contact H opens. Program motor M2 is now energized through contact B.

11. Card advances 15 steps (approximately 7½ minutes). Contact O closes energizing drain pump motor M5. Contact E opens de-energizing wash pump relay C2. Contact F opens de-energizing wash thermostat B5. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

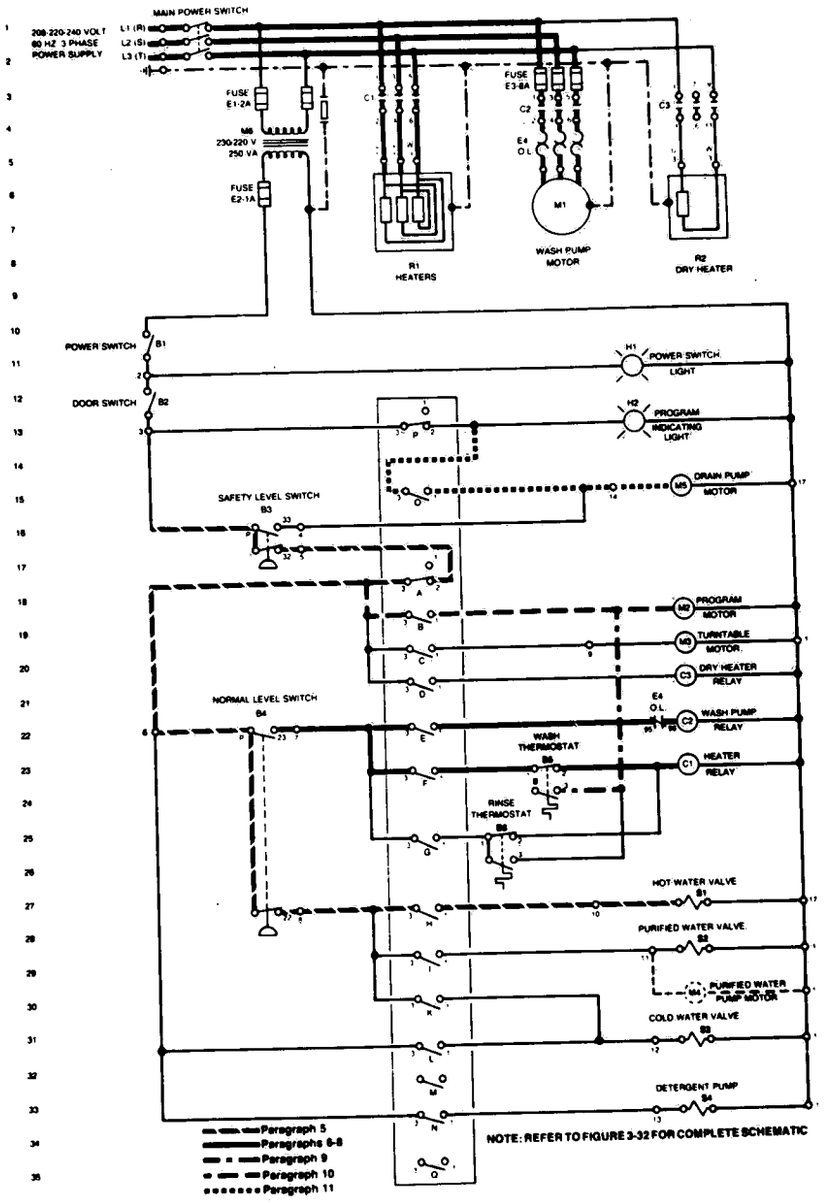


Figure 3-25. FIRST WASH PHASE CIRCUIT FOR BLUE CODED PUNCH CARD.

Circulating Rinse Phase (Fig. 3-26)

12. Card advances two steps. Contact O opens de-energizing drain pump motor M5. Contact H (line 28) closes energizing hot water valve S1 (line 28).

13. After card advances to next step, contact E (line 22) closes. When water level in tank reaches operating level, contact 22 (line 28) on normal level switch B4 opens de-energizing hot water valve S1 and contact 23 (line 22) on B4 closes energizing wash pump relay C2 through contact E and N.C. overload contacts. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

14. Card advances two steps and contact H opens.

15. After card advances to next step; contact E opens de-energizing wash pump relay C2. Contact O closes energizing drain pump motor M5. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

Second Wash Phase (Fig. 3-26)

16. Card advances two steps. Contact O opens de-energizing drain pump motor M5. Contact H (line 28) closes energizing hot water valve S1 (line 28).

17. When card advances to next step, contact E (line 22) closes, and contact N (line 34) closes energizing detergent pump S4 (line 34).

18. When the water level in the tank reaches the operating level, contact 22 on normal level switch B4 opens de-energizing the hot water valve S1, and contact 23 on B4 closes energizing wash pump relay C2 through contact E and N.C. contacts of overload E4. Wash pump motor M1 is energized through closed N.O. contacts on C2. As card advances the next 5 steps (approximately 2½ minutes); contact N opens at steps 1, 3 and 5 and closes at steps 2 and 4, and contact H opens at step 2. Detergent pump S4 is energized when contact N is closed and de-energized when N is open. Hot water valve S1 is de-energized when contact H opens.

19. Card advances to next step. Contact O closes energizing drain pump motor M5. Contact E opens de-energizing wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. When water level in tank falls below operating level, contact 23 opens and contact 22 closes on normal level switch B4.

Fresh Rinse Phase (Fig. 3-26)

20. Card advances two steps. Contact O opens de-energizing drain pump motor M5. Contact K (line 30) closes energizing cold water valve S3 (line 31).

21. When card is at next step, contact O closes energizing drain pump motor M5.

22. Card advances two steps. Contact K opens de-energizing the cold water valve S3.

First Purified-water Rinse Phase (Fig. 3-26)

23. Card advances to next step. Contact O opens de-energizing the drain pump motor M5. Contact I (line 29) closes energizing the purified-water valve S2 (line 29) and, if provided, the optional purified-water pump motor M4 (line 30).

24. When water level in tank reaches operating level, contact 22 on B4 opens de-energizing purified-water valve S2 and contact 23 on B4 closes.

25. After card advances two steps, contact E closes energizing the wash pump relay C2. Wash pump motor is energized through closed N.O. contacts on C2.

26. Card advances two steps and contact I opens. After card advances another two steps, contact E opens and contact O closes. The opening of contact E de-energizes wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Closing of contact O energizes drain pump motor M5.

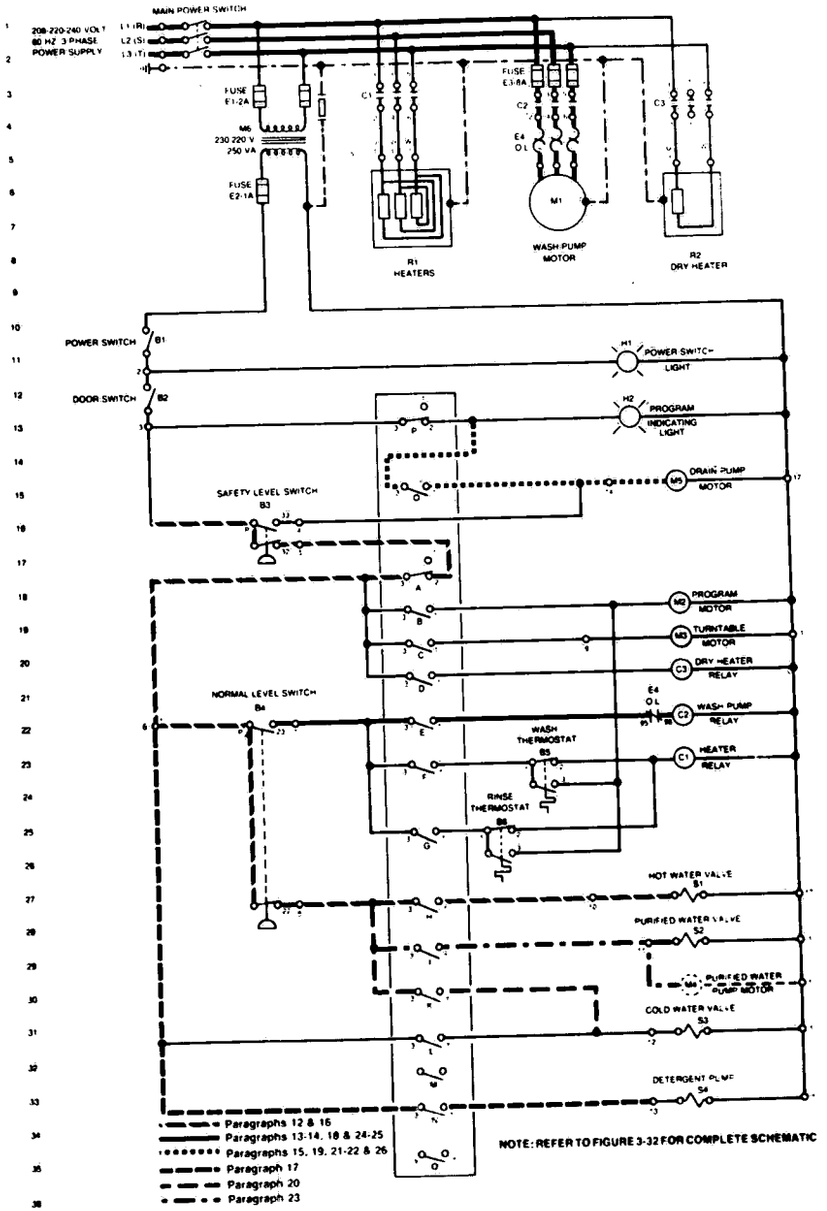


Figure 3-26. CIRCULATING RINSE, SECOND WASH, FRESH RINSE, AND FIRST PURIFIED-WATER RINSE PHASE CIRCUITS FOR BLUE CODED PUNCH CARD.

Second Purified-water Rinse Phase (Fig. 3-27)

27. Card advances two steps. Contact O opens de-energizing drain pump motor M5 (line 15). Contact I (line 29) closes energizing the purified-water valve S2 (line 29) and, if provided, the optional purified-water pump motor M4 (line 30).

28. When water level in tank reaches operating level, contact 22 on B4 opens de-energizing purified-water valve S2 and, if provided, purified-water pump motor M4. Contact 23 on B4 closes.

29. Card advances two steps. Contact E (line 22) closes energizing the wash pump relay C2 (line 22). Contact G (line 25) closes energizing heater relay C1 (line 23) through contact 2 (line 25) of rinse thermostat B6. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2, and heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1.

30. When card advances to the next step, contact B (line 19) opens de-energizing program motor M2 (line 19).

31. When water in tank reaches selected temperature, contact 2 on B6 opens de-energizing heater relay C1 and contact 3 (line 26) on B6 closes energizing program motor M2. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

32. When card has moved one step after program motor M2 was re-energized, contact B closes and contact I opens. Program motor M2 is now energized through contact B.

33. Card advances 4 steps (approximately 2 minutes). Contact O closes energizing drain pump motor M5. Contact E opens de-energizing wash pump relay C2. Contact G opens de-energizing rinse thermostat B6. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

34. Card advances 2 steps. Contact O opens de-energizing drain pump motor M5. Contact P (line 13) opens de-energizing Program Indicating Light (line 13).

35. After card advances one step, contacts A (line 18) and C (line 20) open de-energizing program motor M2 (line 19) and turntable motor M3 (line 20).

NOTE: Only cycle operation and cycle control circuit descriptions for standard punch cards are presented in this Manual. If cycle operation and cycle control circuit descriptions are required for special punch cards (including punch card for units with noncirculating purified-water rinse), contact your local AMSCO sales representative.

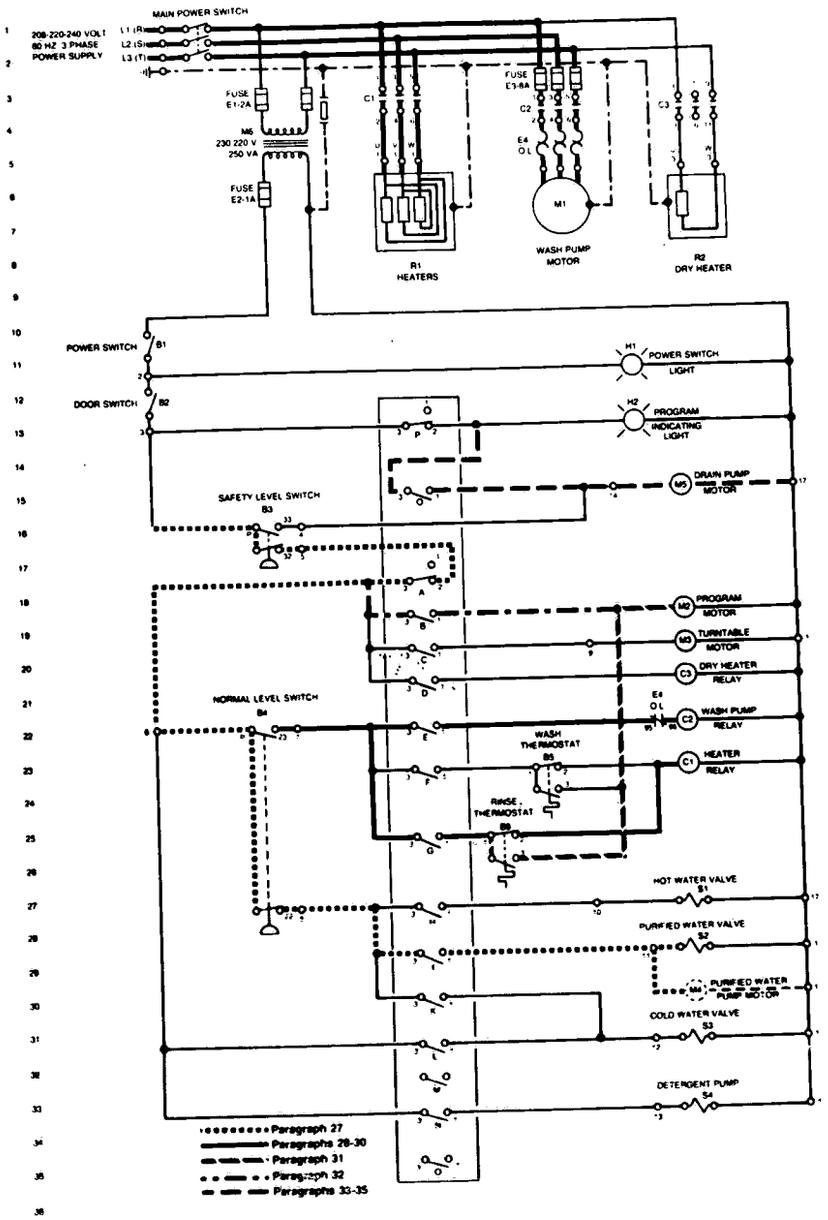


Figure 3-27. SECOND PURIFIED-WATER RINSE PHASE CIRCUIT FOR BLUE CODED PUNCH CARD.

3-11. BLACK CODED PUNCH CARD CIRCUIT DESCRIPTION

NOTE: The following description is given in sequential paragraphs numerically identifiable to the referenced circuit diagram for the particular phase. Refer to the diagram and consult the legend for a circuit to description cross reference. Refer to Figure 3-32 for the schematic in its entirety.

While energized the program motor advances punch card one **step** approximately every 30 seconds.

Start (Fig. 3-28)

1. When chamber door is closed and black lever on punch-card control is lifted, Program Indicating Light (line 13) is energized through door switch B2 (line 12) and closed contact P (line 13). Contact 32 (line 17) on safety level switch B3 energizes program motor M2 (line 20) through contacts A (line 18) and B (line 19) and turntable motor M3 (line 20) through contacts A and C (line 20).

NOTE: If water level in tank becomes too high, contact 33 (line 16) on safety level switch B3 closes energizing the drain pump motor M5 (line 15) while contact 32 (line 17) opens de-energizing program motor, turntable motor and any other component energized through this contact. This circuit is not accented on Figure 3-28.

Pre-rinse Phase (Fig. 3-28)

2. Card is advanced one step, then contact K (line 30) closes. Cold water valve S3 (line 31) is energized through contact 22 (line 28) on normal level switch B4 and contact K.

3. After card moves to the next step contact O (line 15) closes energizing drain pump motor M5 (line 15).

4. After card advances 8 steps (approximately 4 minutes), contact K opens de-energizing the cold water valve S3.

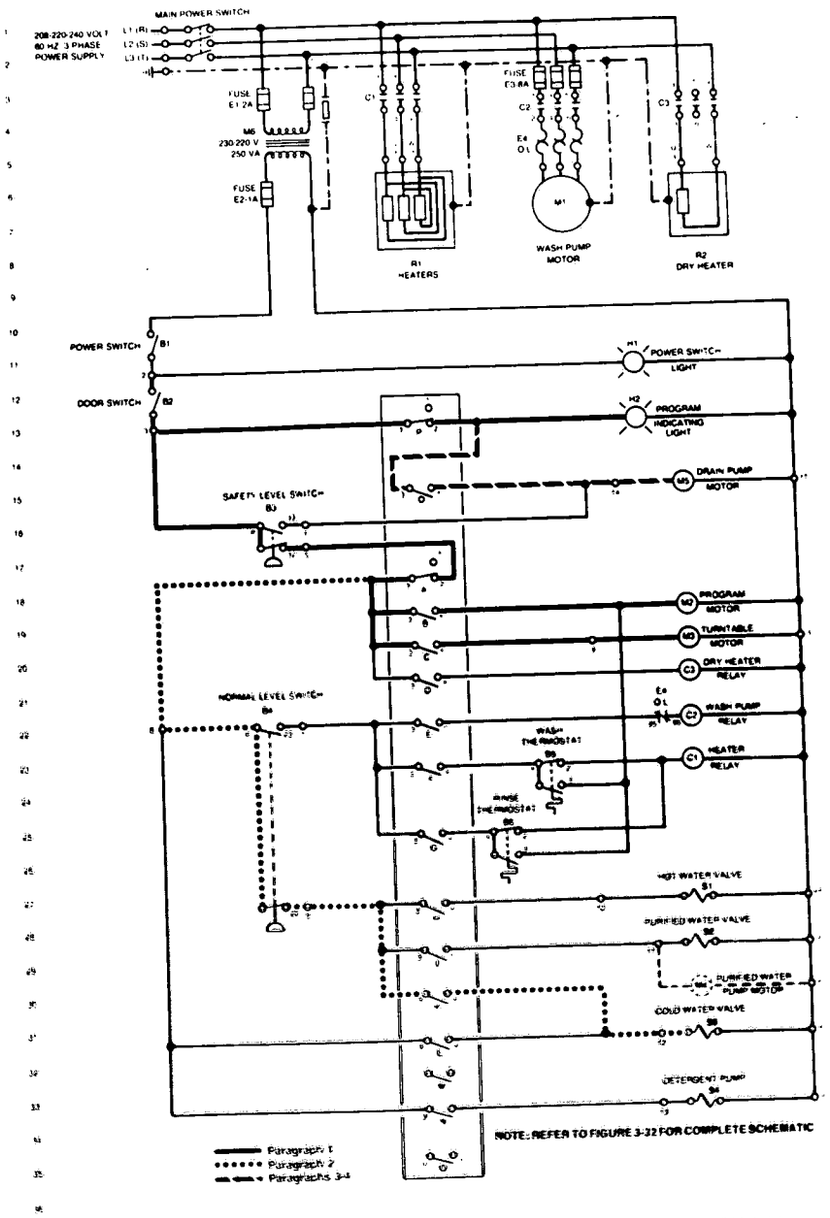


Figure 3-28. START AND PRE-RINSE PHASE CIRCUITS FOR BLACK CODED PUNCH CARD.

First Wash Phase (Fig. 3-29)

5. Card is advanced one step. Contact O (line 15) opens de-energizing drain pump motor M5 (line 15) and contact H (line 28) closes. Hot water valve S1 (line 28) is energized through contact 22 (line 28) on normal level switch B4 and contact H.

6. After card is advanced to next step, contacts E (line 22) and F (line 23) close.

7. Card is advanced one step, then contact B (line 19) opens de-energizing program motor M2 (line 19).

8. When the water level in the tank reaches the operating level, contact 23 (line 22) on normal level switch B4 closes and contact 22 on B4 opens de-energizing the hot water valve S1. Heater relay C1 (line 23) is energized through contact 23, contact 2 (line 23) on wash thermostat B5 and contact F. Wash pump relay C2 (line 22) is energized through contacts 23 and E and N.C. contact (line 22) of overload E4. Heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1, and wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

9. When water in tank reaches selected temperature, contact 2 on B5 opens de-energizing heater relay C1 and contact 3 (line 24) on B5 closes energizing program motor M2. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

10. When card has moved one step after program motor M2 was energized, contact B closes and contact H opens. Program motor M2 is now energized through contact B.

11. Card advances 21 steps (approximately 10½ minutes). Contact O closes energizing drain pump motor M5. Contact E opens de-energizing wash pump relay C2. Contact F opens de-energizing wash thermostat B5. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

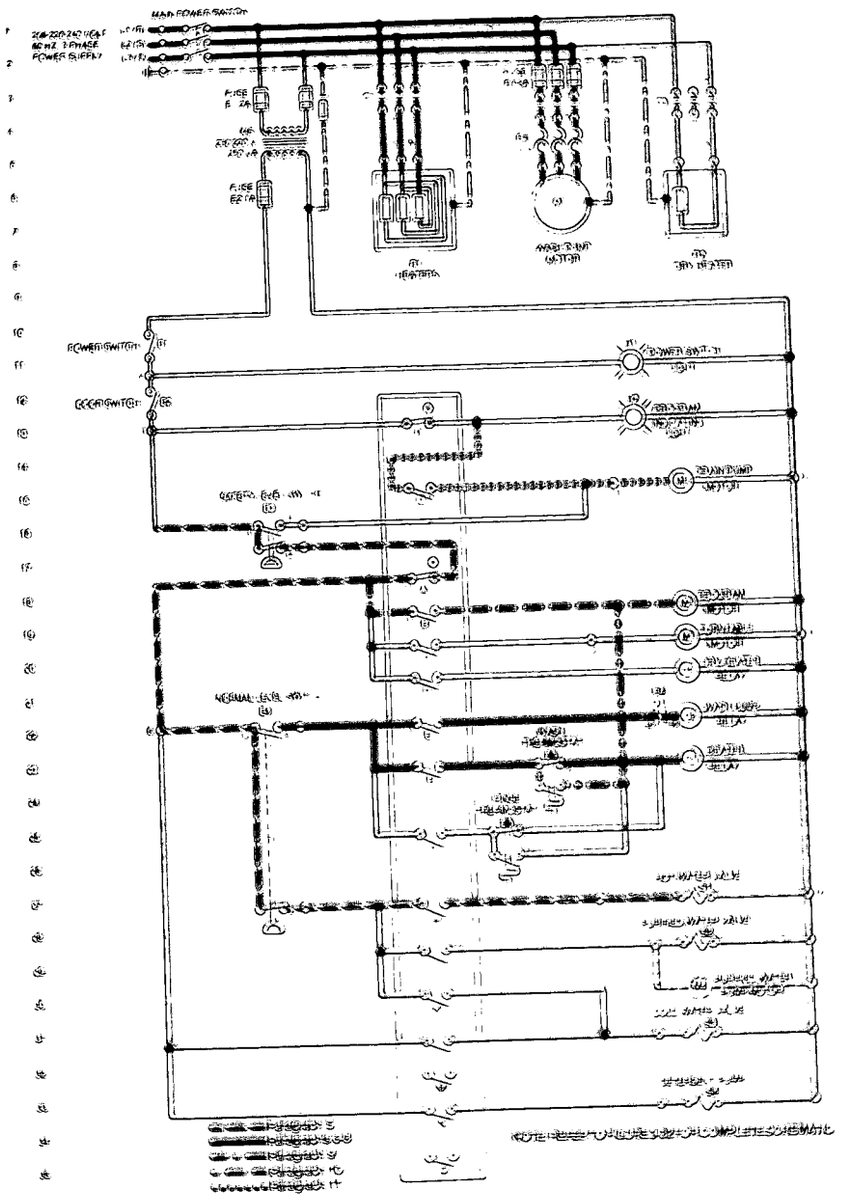


Figure 3-29. FIRST WASH PHASE CIRCUIT FOR BLACK CODED PUNCH CARD.

Circulating Rinse Phase (Fig. 3-30)

12. Card advances two steps. Contact O opens de-energizing drain pump motor M5. Contact H (line 28) closes energizing hot water valve S1 (line 28).

13. After card advances to next step, contact E (line 22) closes. When water level in tank reaches operating level, contact 22 (line 28) on normal level switch B4 opens de-energizing hot water valve S1 and contact 23 (line 22) on B4 closes energizing wash pump relay C2 through contact E and N.C. overload contacts. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2.

14. Card advances two steps and contact H opens.

15. After card advances to next step, contact E opens de-energizing wash pump relay C2. Contact O closes energizing drain pump motor M5. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

Second Wash Phase (Fig. 3-30)

16. Card advances two steps. Contact O opens de-energizing drain pump motor M5. Contact H (line 28) closes energizing hot water valve S1 (line 28).

17. When card advances to next step: contact E (line 22) closes, and contact N (line 34) closes energizing detergent pump S4 (line 34).

18. When the water level in the tank reaches the operating level, contact 22 on normal level switch B4 opens de-energizing the hot water valve S1 and contact 23 on B4 closes energizing wash pump relay C2 through contact E and N.C. contacts of overload E4. Wash pump motor M1 is energized through closed N.O. contacts on C2. As card advances the next 5 steps (approximately 2½ minutes); contact N opens at steps 1, 3 and 5 and closes at steps 2 and 4, and contact H opens at step 2. Detergent pump S4 is energized when contact N is closed and de-energized when N is open. Hot water valve S1 is de-energized when contact H opens.

19. Card advances to next step. Contact O closes energizing drain pump motor M5. Contact E opens de-energizing wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. When water level in tank falls below operating level contact 23 opens and contact 22 closes on normal level switch B4.

Fresh Rinse Phase (Fig. 3-30)

20. Card advances two steps. Contact O opens de-energizing drain pump motor M5. Contact K (line 30) closes energizing cold water valve S3 (line 31).

21. When card is at next step, contact O closes energizing drain pump motor M5.

22. Card advances two steps. Contact K opens de-energizing the cold water valve S3.

First Purified-water Rinse Phase (Fig. 3-30)

23. Card advances to next step. Contact O opens de-energizing the drain pump motor M5. Contact I (line 29) closes energizing the purified-water valve S2 (line 29) and, if provided, the optional purified-water pump motor M4 (line 30).

24. When water level in tank reaches operating level, contact 22 on B4 opens de-energizing purified-water valve S2 and contact 23 on B4 closes.

25. After card advances two steps, contact E closes energizing the wash pump relay C2. Wash pump motor is energized through closed N.O. contacts on C2.

26. Card advances two steps and contact I opens. After card advances another two steps, contact E opens and contact O closes. The opening of contact E de-energizes wash pump relay C2. Wash pump motor M1 is de-energized when closed N.O. contacts on C2 open. Closing of contact O energizes drain pump motor M5.

G-1

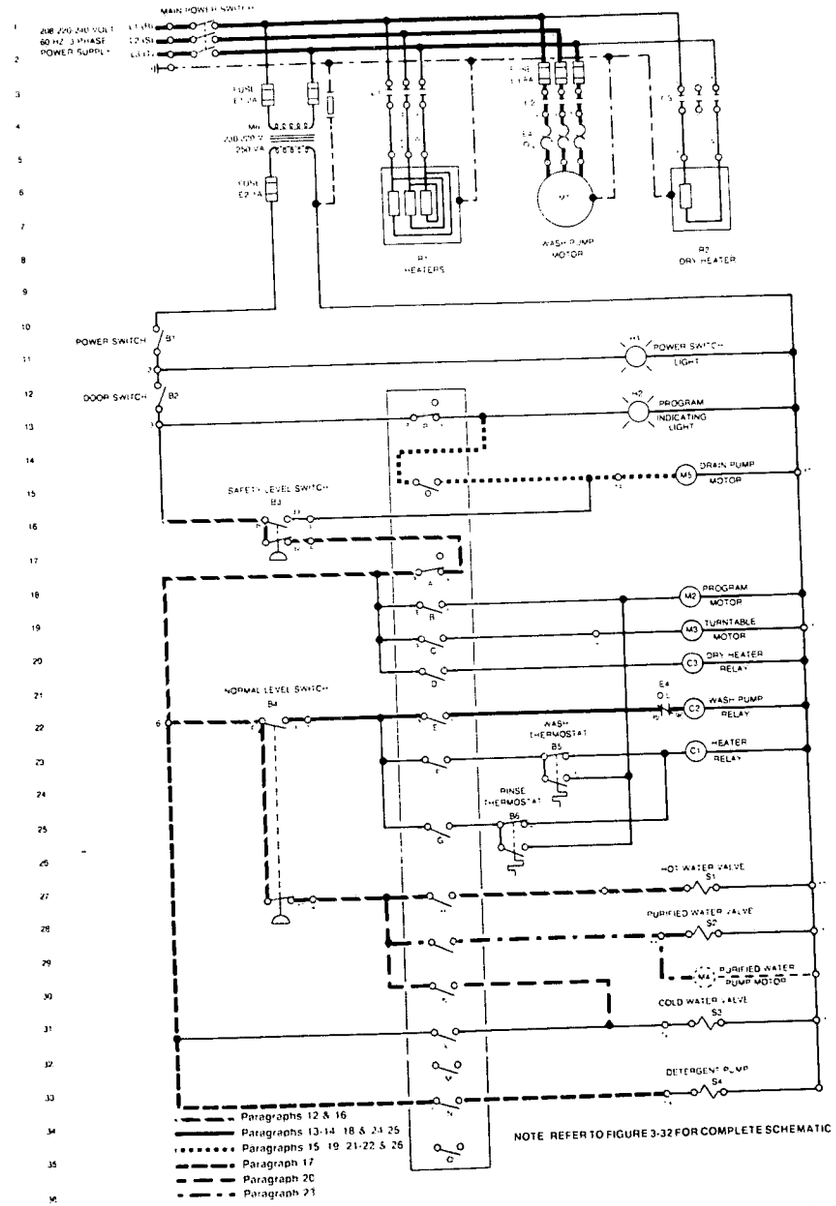


Figure 3-30. CIRCULATING RINSE, SECOND WASH, FRESH RINSE, AND FIRST PURIFIED-WATER RINSE PHASE CIRCUITS FOR BLACK CODED PUNCH CARD.

G-2

Second Purified-water Rinse Phase (Fig. 3-31)

27. Card advances two steps. Contact O opens, de-energizing drain pump motor M5 (line 15). Contact I (line 29) closes energizing the purified-water valve S2 (line 29) and, if provided, the optional purified-water pump motor M4 (line 30).

28. When water level in tank reaches operating level, contact 22 on B4 opens de-energizing purified-water valve S2 and, if provided, purified-water pump motor M4. Contact 23 on B4 closes.

29. Card advances two steps. Contact E (line 22) closes energizing the wash pump relay C2 (line 22). Contact G (line 25) closes energizing heater relay C1 (line 23) through contact 2 (line 25) of rinse thermostat B6. Wash pump motor M1 (line 7) is energized through closed N.O. contacts (line 3) on C2, and heaters R1 (line 7) are energized through closed N.O. contacts (line 3) on C1.

30. When card advances to the next step, contact B (line 19) opens de-energizing program motor M2 (line 19).

31. When water in tank reaches selected temperature, contact 2 on B6 opens de-energizing heater relay C1 and contact 3 (line 26) on B6 closes energizing program motor M2. Heaters R1 are de-energized when closed N.O. contacts on C1 open.

32. When card has moved one step after program motor M2 was re-energized, contact B closes and contact I opens. Program motor M2 is now energized through contact B.

33. Card advances 4 steps (approximately 2 minutes). Contact O closes energizing drain pump motor M5. Contact E opens de-energizing wash pump relay C2. Contact G opens de-energizing rinse thermostat B6. Closed N.O. contacts on C2 open de-energizing wash pump motor M1. When water level in tank falls below operating level, contact 22 closes and contact 23 opens on normal level switch B4.

Drying Phase (Fig. 3-31)

34. Card advances 2 steps. Contact O opens de-energizing drain pump motor M5; and contact D (line 21) closes energizing dry heater relay C3 (line 21). Normally opened contacts (line 3) of C3 close energizing dry heater R2 (line 7).

35. Card advances 15 steps (approximately 7½ minutes). Contact P (line 13) opens de-energizing the Program Indicating Light (line 13).

36. After card advances to the next step, contacts A (line 18), B (line 19), C (line 20) and D (line 21) open de-energizing program motor M2 (line 19), turntable motor M3 (line 20), and dry heater relay C3. Dry heater R2 is de-energized when N.O. contacts of C3 open.

NOTE: Only cycle operation and cycle control circuit descriptions for standard punch cards are presented in this Manual. If cycle operation and cycle control circuit descriptions are required for special punch cards (including punch card for units with noncirculating purified-water rinse), contact your local AMSCO sales representative.

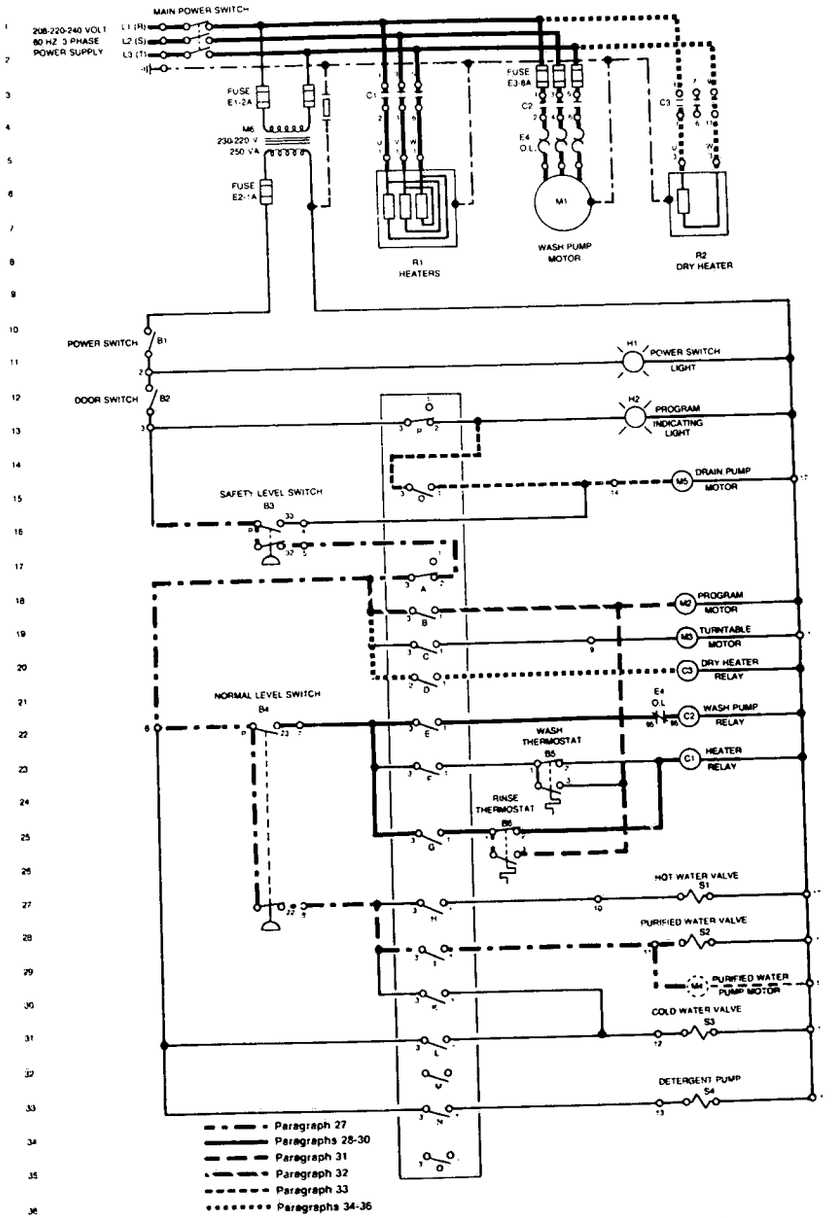
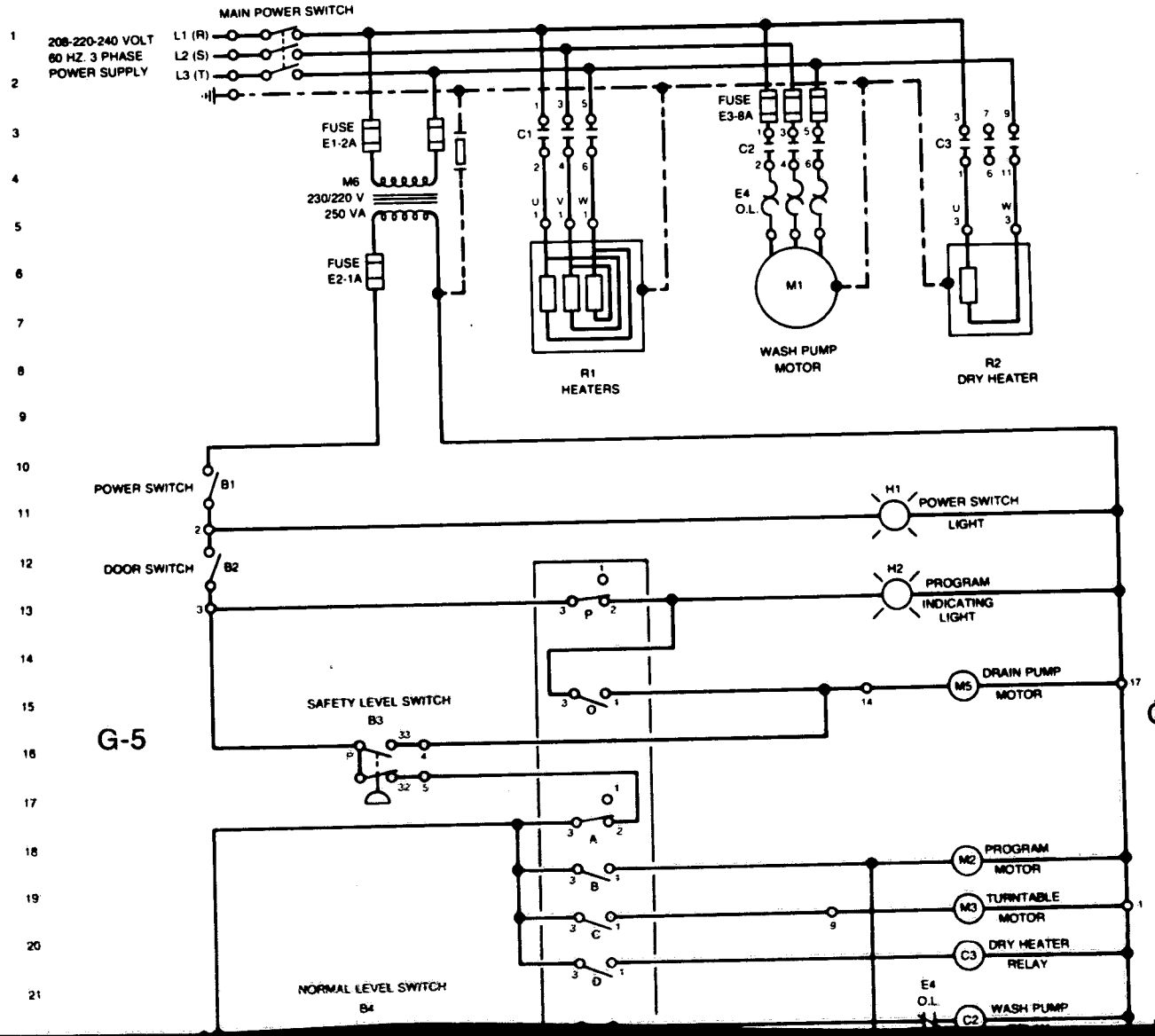


Figure 3-31. SECOND PURIFIED-WATER RINSE AND DRY PHASE CIRCUITS FOR BLACK CODED PUNCH CARD.


MAIN POWER SWITCH
208-220-240 VOLT
60 HZ. 3 PHASE
POWER SUPPLY
L1 (R)
L2 (S)
L3 (T)
FUSE
E1-2A
M6
230/220 V
250 VA
FUSE
E2-1A
C1
R1
HEATERS
FUSE
E3-8A
C2
E4
O.L.
M1
WASH PUMP
MOTOR
C3
R2
DRY HEATER
POWER SWITCH
B1
DOOR SWITCH
B2
H1
POWER SWITCH
LIGHT
H2
PROGRAM
INDICATING
LIGHT
DRAIN PUMP
MOTOR
M5
SAFETY LEVEL SWITCH
B3
PROGRAM
MOTOR
M2
TURNTABLE
MOTOR
M3
DRY HEATER
RELAY
C3
NORMAL LEVEL SWITCH
B4
E4
O.L.
WASH PUMP
C2

G-5

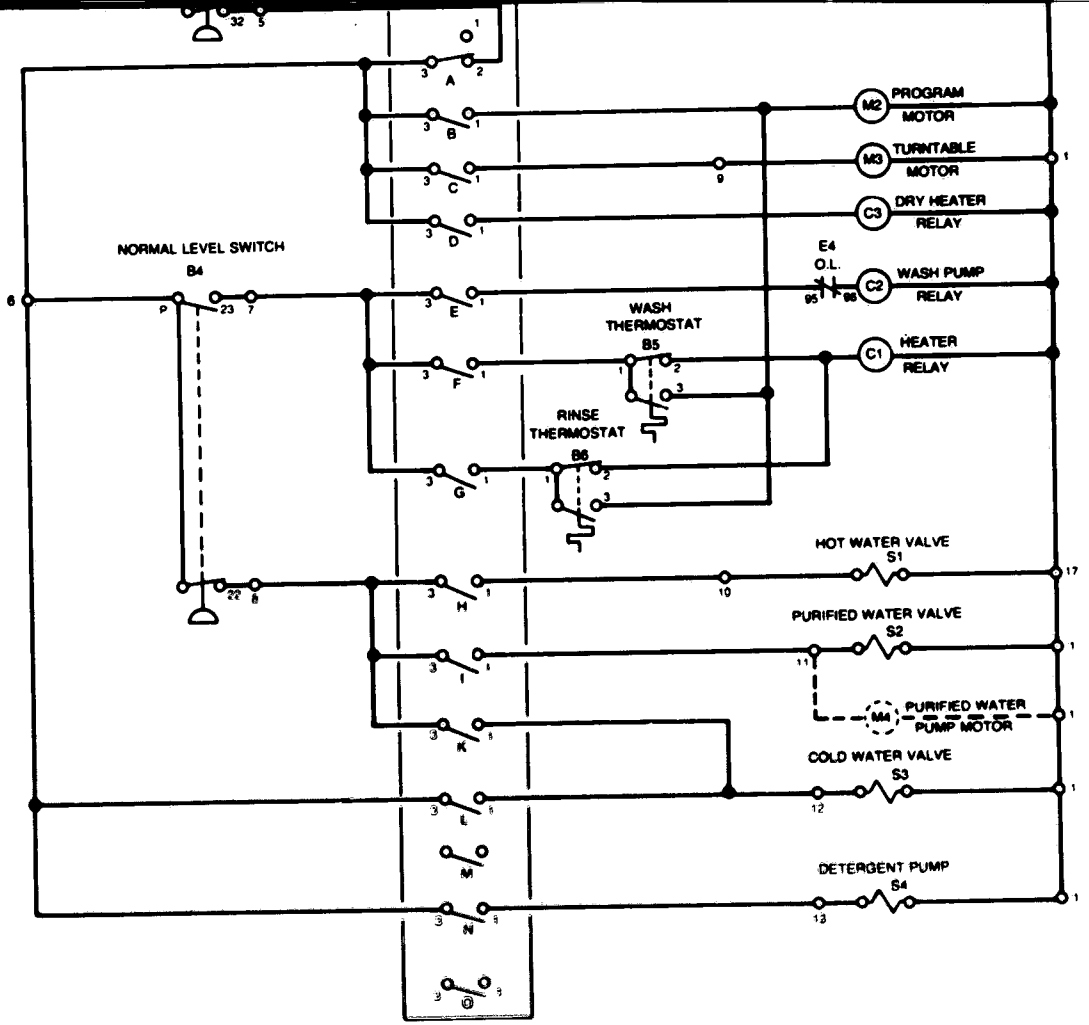


Figure 3-32. ELECTRICAL SCHEMATIC, NEWAMATIC F-570 WITH PUNCH-CARD CONTROL.

SECTION 4

PREVENTIVE MAINTENANCE

4-1. GENERAL

The following operations (Paragraphs 4-2 through 4-17) should be performed at intervals designated in Table 4-1. Preventive Maintenance should be conducted biomonthly or quarterly (depending on usage) by a qualified mechanic. Should a problem occur, refer to Section 5, TROUBLESHOOTING.

TABLE 4-1.

FREQUENCY OF PREVENTIVE MAINTENANCE

PARAGRAPH	FIRST BIMONTHLY OR QUARTERLY	SECOND BIMONTHLY OR QUARTERLY	THIRD BIMONTHLY OR QUARTERLY	FOURTH BIMONTHLY OR QUARTERLY	FIFTH BIMONTHLY	SIXTH BIMONTHLY
4-2	Yes	Yes	Yes	Yes	Yes	Yes
4-3	Yes	Yes	Yes	Yes	Yes	Yes
4-4	Yes	Yes	Yes	Yes	Yes	Yes
4-5	Yes	No	No	Yes	No	No
4-6	Yes	No	No	Yes	No	No
4-7	Yes	Yes	Yes	Yes	Yes	Yes
4-8	Yes	No	No	Yes	No	No
4-9	Yes	Yes	Yes	Yes	Yes	Yes
4-10	Yes	No	Yes	No	Yes	No
4-11	Yes	Yes	Yes	Yes	Yes	Yes
4-12	Yes	Yes	Yes	Yes	Yes	Yes
4-13	Yes	No	No	Yes	No	No
4-14	Yes	No	No	No	No	No
4-15	Yes	Yes	Yes	Yes	Yes	Yes
4-16	Yes	No	Yes	No	Yes	No
4-17	Yes	No	No	No	No	No

4-2. TANK FILTER (Fig. 4-1)

Open chamber door and remove turntable from chamber. Remove lid that is on top of tank filter. Remove and inspect filter. If necessary, clean filter using a brush and water. Replace filter, lid, then turntable.

4-3. SPRAY PIPES (Fig. 7-2)

Open chamber door and remove turntable from chamber. Inspect and clean spray pipes as follows:

1. Remove top wash spray pipe by lifting stop levers and pushing down on pipe.

2. Remove bottom wash spray pipe by lifting up on pipe.

3. Check packing collars (7) on wash spray pipes. If defective, replace packing collars and O-rings (6).

4. Remove plugs (3) from the two wash spray and the two rinse spray pipes.

5. Inspect O-rings (4) on the four pipes. If defective, replace O-rings (4).

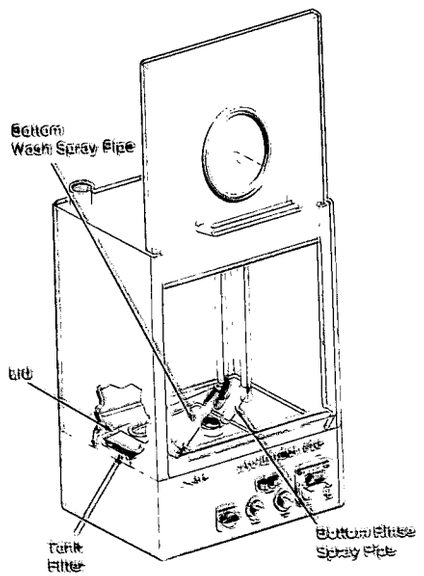


Figure 4-1. CHAMBER (COUNTER-TOP MODEL WITH PUNCH-CARD CONTROL SYSTEM SHOWN)

6. Clean the four pipes using wire brush provided.

7. Rinse wash spray pipes with water.

8. Install O-rings (4) and plugs (3).

9. Insert top wash spray pipe into manifold while holding up stop levers then push pipe up and into manifold.

10. Insert bottom wash spray pipe into manifold then push pipe down and into manifold.

11. Install turntable inside chamber.

4-4. CHAMBER DOOR (Fig. 7-1 and 7-7 or 7-8)

Open and close chamber door. If door does not move freely, adjust hinges on under-counter model or wire ropes on counter-top or freestanding model. Be sure shipping setscrew has been removed from door weight shield on counter-top or freestanding model.

For counter-top or freestanding model — Gain access to back of Washer. While opening and closing door several times, check wire rope as it comes out of grommets at back of Washer. If wire rope is frayed, replace it (see Paragraph 6-2).

4-5. STRAINERS ON WATER INLET FITTINGS (Fig. 7-4)

Gain access to back of Washer. Disconnect input lines to hot water and purified-water fittings. Using a needle nose pliers, remove the strainers (13 and 14). Clean then install strainers. Reconnect input lines to fittings.

Remove strainer in trap (5) at prerinse water input. Clean then replace strainer.

4-6. DRAIN HOSE

Be sure outlet of Washer drain hose (at building waste line) is less than 12 inches above the bottom of the Washer.

4-7. THERMOSTAT BULBS (Fig. 7-2)

Open chamber door and remove turntable. Inspect gaskets (M2) around the thermostat bulbs. If deformed, brittle or cracked, replace gasket.

WARNING: BE SURE TO DISCONNECT ELECTRIC POWER TO WASHER BEFORE DOING ANY WORK IN CONTROL DRAWER OR COMPARTMENT BELOW CHAMBER. WHEN ELECTRIC POWER IS SUPPLIED TO WASHER, SEVERAL TERMINALS IN CONTROL DRAWER ARE ENERGIZED.

4-8. WIRES AND HOSES

Inspect wires and hoses as follows:

1. Disconnect electric cable from source and water lines from Washer.

2. Open chamber door and remove turntable.

3. Close chamber door, and remove both side panels and screws from control panel.

NOTE: At least two people are required when positioning unit on its side or moving it to the upright position.

4. Position Washer on either side. Only use frame as handholds.

5. Pull open control drawer.

6. Disassemble bottom plate by removing four leveling feet and washers. Freestanding model will have four bolts instead of feet.

7. Inspect all wires and terminals. If plug-in type connectors are not tightly secured to terminals, adjust or replace connectors. If wiring is deteriorating, replace defective wires.

8. Check all hoses and clamps. Be sure all hose clamps are tight. Replace any defective hoses.

9. Install bottom plate and bolt in control drawer.

10. Return Washer to upright position. Only use frame as handholds.

11. Replace side panels being sure slots or edges of side panels are facing top and front of unit.

12. Set the control drawer being sure that it is properly positioned between drawer guides that are bolted to both sides of frame.

13. Connect electric cable to source and water lines to Washer.

4-9. TURNTABLE (Fig. 7-2)

Open chamber door and manually spin turntable. Remove any obstructions. If turntable does not turn freely, see paragraph 4-17 for drive shaft bearing inspection.

4-10. SOLENOID VALVES

Be sure water is supplied to each fitting at required pressure (see Section 1). Open chamber door, and check the rinse spray pipes, hot water inlet and purified-water inlet for water leaks (see Figure 4-2). If necessary, replace the defective solenoid valve (Paragraph 6-4, 6-5, 6-6, 6-12 or 6-13).

CAUTION: Do not operate Washer without tank filter in wash tank. Wash pump and drain pump will be damaged if broken glass, etc. are not prevented from leaving the wash tank.

4-11. SWITCHES AND DRAIN PUMP (Fig. 4-2)

Check with operator to determine if Washer is cleaning and operating properly (see Sections 2 and 3). Then check switches and drain pump as follows:

1. Turn main power switch to "I" and push power switch to "on". If the Power Switch Light does not come on, replace defective component(s).

2. Open chamber door and fill tank with water until it begins to overflow.

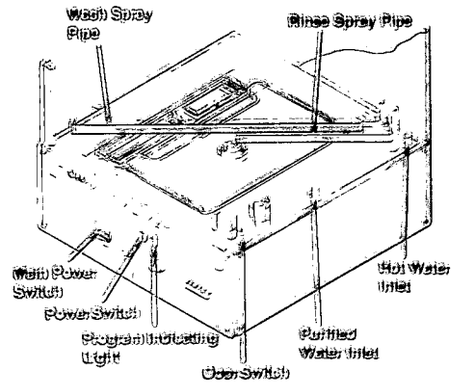


Figure 4-2. CHAMBER WATER INPUTS.

3. Close chamber door and start Washer as follows:

- **Unit with Push-button Control** — Push program cycle buttons 1 then 5.

- **Unit with Punch-card Control** — Push down black lever while lifting its forward edge. Insert Yellow Coded Punch Card into the slot in the punch-card control. Lift forward edge of black lever while gently pulling up on it.

4. Program Indicating Light should come on. Open chamber door: light should go off. Close door and light should come on. If door switch does not work, adjust or replace it.

5. Premise phase (water entering chamber through rinse spray pipes) should not start until drain pump has removed most of the water from the tank.

6. If tank does not empty before premise phase starts, replace defective level switch (paragraph 6-9).

7. If premise phase does not start and drain pump does not empty tank, replace defective drain pump (paragraph 6-7).

8. After tank has drained but before premise phase starts, press power switch to "off" and turn main power switch to "O".

4-12. OPERATIONAL CHECK

1. Be sure second-wash detergent dispenser is filled to the top.

2. Following applicable instructions in Section 2, run Washer through all available cycles.

3. As Washer proceeds through the various cycles, compare actual operation to description of operation in paragraph 2-2 or 2-3.

4. When load is being spun-dried, check door for water leaks.

5. At completion of each cycle, measure amount of detergent needed to completely fill second-wash detergent dispenser. If this amount is not correct, refer to cycle adjust or replace detergent cup. (See paragraph 6-5.)

4-13. HEATERS AND THERMOSTATS

1. [illegible] Wash-temperature heater and the thermostat does not cool water, and the thermostat can be tested through chamber door.

2. Following applicable instructions in Section 2 and using Section 3 as guide for proper operation, run Washer through cycle with drying phase.

3. During first wash phase, check temperature of tank water. Temperature should be within ± 5 degrees of temperature set on Wash-water Thermostat for last 10½ minutes of phase.

4. During second purified water rinse phase, check temperature of tank water. Temperature should be within ±5 degrees of temperature set on Purified Rinse-water Thermostat for last two minutes of phase.

5. During drying phase, check temperature in chamber. Temperature should increase until cycle is completed.

4-14. ROTATION OF WASH PUMP

1. Remove panel from side of Washer where detergent dispensers are located.

2. Following applicable instructions in Section 2, run Washer through one cycle.

3. When cycle is in first wash phase, be sure wash pump motor is rotating in the same direction as arrow on motor housing (shifting it if it is not reverse two of the three-phase wires (L1, L2 and L3) at supply connection box.

4. Allow Washer to complete cycle, then replace side panel.

4-15. WATER LEAK CHECKS

After completing operation checks in paragraphs 4-11 and 4-12, check for water leaks as follows:

1. Disconnect Washer from electric power source.

2. Remove side panels and pull out control drawer.

3. Check wash pump for leaks. If pump is leaking at seals or pump cover, entire wash pump (see paragraph 6-6).

4. Inspect drive shaft gasket for evidence of water leaks (Fig. 7-3). If necessary, replace gasket.

5. Check thermostat bulb gasket for evidence of water leaks (Fig. 7-3). If necessary, replace gasket.

6. Inspect door switch gasket for evidence of water leaks (Fig. 7-3). If necessary, replace gasket.

7. Inspect heater mounting flanges for indication of water leaks (Fig. 7-3). If necessary, tighten or replace leaky flanges.

8. Reassemble side panels and control drawer.

9. Restore electric power to unit.

4-16. CHECK VALVE (Fig. 7-6)

Inspect hose that connects drain pump to check valve as follows:

1. Disconnect Washer from electric power source and water lines from Washer.

2. Remove side panel at tank side of Washer.

3. Disconnect hoses from drainage panel and remove premise solenoid shield and mounting plate.

4. Position premise solenoid valve assembly as far from back of Washer as wires will allow.

5. If freestanding or counter-top model, remove back cover by pulling it down to clear counter weight shield. On all models, bring cover up over premise solenoid valve assembly to clear Washer.

6. Check for water leaks at pump and check valve connections of hose.

7. If hose is not defective, repair or replace check valve (see paragraph 6-4).

8. Install back cover on frame. Be sure hose from check valve is positioned through slot in back cover. On freestanding or counter-top model, position hose so that it will not be pinched when back cover is installed. On all models, be sure hose from premise solenoid valve with bottom edge of cover, several inches above bottom frame of Washer. Then guide back cover behind counter-weight shield.

9. Secure premise solenoid mounting plate and shield to Washer. Be sure premise solenoid wires do not get pinched.

10. Reconnect hoses to drainage panel.

11. Install side panel. Be sure slots on edges of side panel are facing top and front of unit.

12. Connect electric cable to source and water lines to Washer.

4-17. DRIVE SHAFT

1. Follow paragraph 4-11 and remove drive shaft.

2. Inspect gasket and bearings.

3. Replace defective parts.

4. Lubricate drive shaft bearings with petroleum jelly.

5. Reassemble drive shaft (paragraph 6-6).

AMSCO SERVICE

NEWAMATIC GLASSWARE WASHER P-763626-002

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1 of 2

SECTION 5

TROUBLESHOOTING

This section contains detailed information for locating and correcting the cause of Washer malfunctions.

5-1. HELPFUL HINTS

1. Use operating procedures presented in Section 2 and operating description in Section 3 to determine the trouble symptom.

2. If necessary, operate Washer more than once in case reported problem is caused by periodic component malfunction.

3. Refer to paragraph 5-2 and the TROUBLE-SHOOTING CHART (Table 5-1) after symptom has been verified.

4. Use the control system descriptions (Section 3) and applicable electrical schematic (Fig. 3-20 or 3-32) as aids in understanding system operation and how the malfunction of a specific component would affect it.

5. Refer to the following guide for examples of what to look for and what to do when you are doing the actual troubleshooting.

Water Supplies

a. Be sure the building-supply valves are fully open.

b. Be sure the supply pressure is the proper value and that it does not fluctuate. Be sure that gauge readings are correct.

c. Check all valves, replace if necessary.

d. Clean the supply line strainers.

e. Inspect the entire system; correct all leaks.

WARNING: BE SURE TO DISCONNECT ELECTRIC POWER TO WASHER BEFORE DOING ANY WORK IN CONTROL DRAWER OR COMPARTMENT BELOW CHAMBER. WHEN ELECTRIC POWER IS SUPPLIED TO WASHER, SEVERAL TERMINALS IN CONTROL DRAWER ARE ENERGIZED.

Electrical System

a. Using the electrical schematics and circuit descriptions, determine the circuit and component function. Correct all loose wires or improper connections.

b. Inspect the individual components and adjust, repair or replace as necessary.

Drain System

a. Clean the drain pump filter.

b. Check valve; replace if necessary.

A-2

5-2. THE TROUBLESHOOTING CHART — EXPLANATION OF ITS CONTENTS

COLUMN HEADING	EXPLANATION
WASHER OPERATION STATUS	Select a symptom from this column that most nearly corresponds with the position to which the Washer cycle progressed before the trouble occurred.
TROUBLE	Select the problem you think is most appropriate to the particular trouble symptom. The examples are presented in cycle sequence.
ARE CONDITIONS AS FOLLOWS?	This column lists the specific conditions that should be checked to isolate and correct the malfunction. The conditions are presented in the order in which they would most likely have caused the malfunction. Check them in the order given. When troubleshooting these items, check for circuit and component continuity, loose or improper electrical connections, maladjustments, and worn or defective parts. Such verification will help determine the corrective action required. **NOTE:** If the symptom for a malfunction is established as mechanical, the electrical components may be omitted and vice versa. Refer to Paragraph 5-1 for what to do if the conditions are not as described.
WHERE TO FIND ITEMS IN MANUAL	Where applicable, the particular paragraph (P) correcting the trouble and illustration (F) on which a given component may be found are provided in this area. The index number after a figure number denotes the specific component.

A-3

TABLE 5-1.

WASHER TROUBLESHOOTING CHART

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
1. Washer in ON position, door open	Power switch light is not on	(1) Power input hot (2) Main Power Switch on (3) 2-amp fuses E1 not burned out (4) 1-amp fuse E2 not burned out (5) Power Switch on	(F) 2-1 (F) 7-11, 11 or (F) 7-12, 9 (F) 7-11, 11 or (F) 7-12, 9 (F) 2-1
2. **Push-button Unit only:** Door closed, cycle selected and cycle start button pushed	A. Cycle button does not lock in position when pushed	(1) Push-button control operating properly	(F) 7-9, 1: (F) 7-11, 1; (P) 4-12
	B. Control does not start when cycle start button is pushed	(1) Door Switch closed (2) Door Switch in proper slot (3) Relay D1 energized (4) Program motor operating	(P) 4-11: (F) 7-13, 7 (P) 4-11: (F) 7-13, 7 (P) 4-12: (P) 6-8; (F) 7-11, 9 (P) 4-12, (P) 6-8: (F) 7-11, 1
	C. Control starts, but turntable does not and Program Indicating Light does not come on	Program motor and switch gear operating	(P) 4-12: (P) 6-8; (F) 7-11, 1
	D. Control and turntable start, but Program Indicating Light does not come on	(1) Light not burned out (2) Light energized	(F) 7-9, 3 (P) 6-8: (F) 7-9, 3
	E. Control starts and Program Indicating Light on, but turntable does not come on	(1) Turntable motor operating (2) Bearings and sleeves not damaged	(F) 7-15: (P) 4-12 (P) 6-11: (F) 7-15
3. **Punch-card Unit only:** Door closed, cycle inserted and cycle start lever engaged	A. Cycle start lever does not lock in position	(1) Punch card reader operating	(F) 7-10, 3: (P) 6-8 (P) 4-12
	B. Control does not start when start lever is engaged	(1) Door switch closed (2) Door switch in proper slot (3) Safety level switch B3 contact 32 closed and contact 33 open (4) Punch card properly punched and inserted correctly (5) Program motor and punch card reader operating	(P) 4-11: (F) 7-13, 7 (P) 4-11: (F) 7-13, 7 (P) 4-11: (P) 6-9; (F) 7-13, 2 (P) 2-4 (P) 6-8; (F) 7-10, 3; (P) 4-12
	C. Control starts and Program Indicating Light on, but turntable does not start	(1) Punch card properly punched (2) Turntable motor operating (3) Bearings and sleeves not damaged	(F) 7-15: (P) 4-12 (P) 6-11: (F) 7-15
	D. Control and turntable start, but Program Indicating Light does not come on	(1) Light not burned out (2) Light energized	(F) 7-10, 4 (P) 6-8: (F) 7-10, 4

A-4

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
4. Washer in "prerinse" phase	A. Water not spraying properly on load from rinse spray pipes	(1) Water supply pressure as recommended (2) Spray pipes clean (3) Prerinse strainer clean (4) Prerinse solenoid valve S3 energized (5) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (6) **For punch-card unit:** punch card properly punched (7) Safety level switch B3 contact 32 closed (8) Normal level switch B4 contact 22 closed	See Applicable Tech Data in Section 1 (P) 4-3; (F) 7-2 (P) 4-5; (F) 7-4, 5 (P) 4-10; (P) 6-4; (F) 7-4 (P) 6-8; (F) 7-11, 1; (P) 4-12 (P) 6-8; (F) 7-10, 3; (P) 4-12 (P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 4-11; (P) 6-9; (F) 7-13, 2
	B. Water sprayed on load, but tank does not empty	(1) Drain line hose straight (2) Drain line outlet not too high (3) Tank filter clean (4) Drain pump operating (5) Check valve operating (6) **For push-button unit:** relay C2 de-energized (7) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (8) **For punch-card unit:** punch card properly punched	(P) 2-2 (P) 4-2 (P) 6-7; (F) 7-6, 5 (P) 6-7; (F) 7-6, 1 (P) 6-8; (F) 7-11, 7; (P) 4-12 (P) 6-8; (F) 7-11, 1; (P) 4-12 (P) 6-8; (F) 7-10, 3; (P) 4-12
	C. Water sprayed on load, but tank overflows	(1) Normal level switch B4 contact 23 closed and contact 22 open (2) Safety level switch B3 contact 32 open and contact 33 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 4-12; (P) 6-9; (F) 7-13, 2
	D. Washer does not advance to "first wash" phase	(1) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (2) **For punch-card unit:** punch card properly punched	(P) 6-8; (F) 7-11, 1; (P) 4-12 (P) 6-8; (F) 7-10, 3; (P) 4-12
5 Washer in "first wash" phase	A. Tank does not fill with hot water	(1) Water supply pressure as recommended (2) Strainer inside hot water fitting is clean (3) Hot water solenoid valve S1 energized	See Applicable Tech Data in Section 1 (P) 4-5; (F) 7-4, 13 (P) 6-5; (F) 7-5, 6; (P) 4-10

A-5

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
5. Continued		(4) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (5) **For punch-card unit:** punch card properly punched (6) Safety level switch B3 contact 32 closed (7) Normal level switch B4 contact 22 closed (8) There are no leaks	(P) 6-8; (F) 7-11, 1; (P) 4-12 (P) 6-8; (F) 7-10, 3; (P) 4-12 (P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 4-15
	B. Tank overflows	(1) Normal level switch B4 contact 23 closed and contact 22 open (2) Safety level switch B3 contact 32 open and contact 33 closed	(P) 4-11, (P) 6-9; (F) 7-13, 2 (P) 4-11, (P) 6-9; (F) 7-13, 2
	C. Tank is filled, but water is not heated	(1) Normal level switch B4 contact 23 closed (2) Wash water thermostat at correct setting (3) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (4) **For punch-card unit:** punch card properly punched (5) **For push-button unit:** relay D2 energized (6) Wash water thermostat B5 contact 2 closed (7) Heater relay C1 energized (8) Heaters R1 energized and at correct temperature	(P) 4-11, (P) 6-9; (F) 7-13, 2 (P) 4-13; (F) 7-9, 7 or (F) 7-10, 8 (P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3 (P) 6-8; (P) 4-12; (F) 7-11, 9 (P) 6-8; (P) 4-12; (F) 7-9, 7 or (F) 7-10, 8 (P) 4-12; (P) 6-8; (F) 7-11, 1 or (F) 7-12, 5 (P) 4-13; (P) 6-3; (F) 7-3
	D. Tank is filled, but water is not pumped to wash spray pipes	(1) Wash pump motor operating (a) Overload E4 is reset (b) 8-amp fuses E3 not burned out (c) Motor energized (2) Tank filter is clean (3) Wash pump relay C2 energized (4) Normal level switch B4 contact 23 closed (5) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (6) **For punch-card unit:** punch-card properly punched (7) Wash water thermostat B5 contact 3 closed	(P) 6-8; (P) 4-12 (F) 7-11, 8 or (F) 7-12, 6 (F) 7-11, 11 or (F) 7-12, 9 (P) 4-2 (P) 6-8; (P) 4-12; (F) 7-11, 7 or (F) 7-12, 5 (P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3 (P) 4-12; (F) 7-9, 7 or (F) 7-10, 8

A-6

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
5. Continued	E. Bottom wash spray pressure too high	(1) Control in bottom wash spray pipe properly set	(F) 7-2, 8
	F. Wash spray sporadic	(1) Motor turning in direction of arrow on housing	(F) 7-5, 5; (P) 4-14
		(2) Wash spray pipes are clean	(P) 4-3; (F) 7-2
		(3) Tank filter is clean	(P) 4-2
	G. Tank does not empty at end of phase	(1) Drain line hose straight	
		(2) Drain line outlet not too high	(P) 2-2
		(3) Tank filter is clean	(P) 4-2
		(4) Drain pump operating	(P) 6-7; (F) 7-6, 5
		(5) Check valve operating	(P) 6-7; (F) 7-6, 1
		(6) **For push-button unit:** relay C2 de-energized	(P) 6-8; (F) 7-11, 7; (P) 4-12
		(7) **For push-button unit:** switch gear operating	(P) 6-8; (F) 7-11, 1; (P) 4-12
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(8) **For punch-card unit:** punch-card properly punched	
	H. Washer does not advance to "circulating rinse" phase	(1) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(2) **For punch-card unit:** punch-card properly punched	
6. Washer in "circulating rinse" phase	A. Tank does not fill with hot water	(1) Water supply pressure as recommended	See Applicable Tech Data in Section 1
		(2) Strainer inside hot water fitting is clean	(P) 4-5; (F) 7-14, 13
		(3) Hot water solenoid valve S1 energized	(P) 6-5; (F) 7-5, 6; (P) 4-10
		(4) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(5) **For punch-card unit:** punch card properly punched	
		(6) Safety level switch B3 contact 32 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(7) Normal level switch B4 contact 22 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(8) There are no leaks	(P) 4-15
	B. Tank overflows	(1) Normal level switch B4 contact 23 closed and contact 22 open	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(2) Safety level switch B3 contact 32 open and contact 33 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2

A-7

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
6. Continued	C. Tank is filled, but water is not pumped to wash spray pipes	(1) Wash pump motor operating	(P) 6-8; (P) 4-12
		(a) Overload E4 is reset	(F) 7-11, 8 or (F) 7-12, 6
		(b) 8-amp fuses E3 not burned out	(F) 7-11, 11 or (F) 7-12, 9
		(c) Motor energized	
		(2) Tank filter is clean	(P) 4-2
		(3) Wash pump relay C2 energized	(P) 6-8; (P) 4-12; (F) 7-11, 7 or (F) 7-12, 5
		(4) Normal level switch B4 contact 23 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(5) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(6) **For punch-card unit:** punch-card properly punched	
	D. Water spray sporadic	(1) Wash spray pipes are clean	(P) 4-3; (F) 7-2
		(2) Tank filter is clean	(P) 4-2
	E. Tank does not empty at end of phase	(1) Drain line hose straight	
		(2) Drain line outlet too high	(P) 2-2
		(3) Tank filter is clean	(P) 4-2
		(4) Drain pump operating	(P) 6-7; (F) 7-6, 5
		(5) Check valve operating	(P) 6-7; (F) 7-6, 1
		(6) **For push-button unit:** relay C2 de-energized	(P) 6-8; (P) 4-12; (F) 7-11, 7
		(7) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(8) **For punch-card unit:** punch card properly punched	
	F. Washer does not advance to "second wash" phase	(1) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(2) **For punch-card unit:** punch-card properly punched	
7. Washer in "second wash" phase	A. Tank does not fill with hot water	(1) Water supply pressure as recommended	See Applicable Tech in Section 1
		(2) Strainer inside hot water fitting is clean	(P) 4-5, (F) 7-14, 13
		(3) Hot water solenoid valve S1 energized	(P) 6-5; (F) 7-5, 6 (P) 4-10
		(4) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3

A-8

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
7. Continued		(5) **For punch-card unit:** punch-card properly punched	
		(6) Safety level switch B3 contact 32 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(7) Normal level switch B4 contact 22 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(8) There are no leaks	(P) 4-15
	B. Tank fills with hot water but detergent pump does not operate	(1) Detergent container filled	(F) 2-1; (P) 2-2
		(2) Detergent container filter is clean	(F) 7-3, 17
		(3) Detergent pump delivering proper dosage	(F) 7-13, 1; (P) 6-9
		(4) Detergent pump S4 operating	(P) 4-12; (F) 7-13, 1
		(5) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(6) **For punch-card unit:** punch-card properly punched	
	C. Tank overflows	(1) Normal level switch B4 contact 23 closed and contact 22 open	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(2) Safety level switch B3 contact 32 open and contact 33 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
	D. Tank is filled, but water is not pumped to wash spray pipes	(1) Wash pump motor operating	(P) 6-8; (P) 4-12
		(a) Overload E4 is reset	(F) 7-11, 8 or (F) 7-12, 6
		(b) 8-amp fuses E3 not burned out	(F) 7-11, 11 or (F) 7-12, 9
		(c) Motor energized	
		(2) Tank filter is clean	(P) 4-2
		(3) Wash pump relay C2 energized	(P) 6-8; (P) 4-12; (F) 7-11, 7 or (F) 7-12, 5
		(4) Normal level switch B4 contact 23 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(5) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(6) **For punch-card unit:** punch-card properly punched	
	E. Wash spray sporadic	(1) Wash spray pipes are clean	(P) 4-3; (F) 7-2
		(2) Tank filter is clean	(P) 4-2
	F. Tank does not empty at end of phase	(1) Drain line hose straight	(P) 2-2
		(2) Drain line outlet not too high	(P) 4-2
		(3) Tank filter is clean	(P) 6-7; (F) 7-6, 5
		(4) Drain pump operating	(P) 6-7; (F) 7-6, 1
		(5) Check valve operating	(P) 6-8; (P) 4-12; (F) 7-11, 7
		(6) **For push-button unit:** relay C2 de-energized	

A-9

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
7. Continued		(7) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(8) **For punch-card unit:** punch-card properly punched	
	G. Washer does not advance to "noncirculating rinse" phase	(1) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(2) **For punch-card unit:** punch-card properly punched	
8. Washer in "noncirculating rinse" phase	A. Water not spraying properly on load from rinse spray pipes	(1) Water supply pressure as recommended	See Applicable Tech Data in Section 1
		(2) Spray pipes clean	(P) 4-3; (F) 7-2
		(3) Prerinse strainer clean	(P) 4-5; (F) 7-4, 5
		(4) Prerinse solenoid S3 energized	(P) 4-10; (P) 6-4; (F) 7-4
		(5) **For push-button unit:** switch gear operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(6) **For punch-card unit:** punch-card properly punched	
		(7) Safety level switch B3 contact 32 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(8) Normal level switch B4 contact 22 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
	B. Water sprayed on load, but tank does not empty	(1) Drain line hose straight	(P) 2-2
		(2) Drain line outlet not too high	(P) 4-2
		(3) Tank filter is clean	(P) 6-7; (F) 7-6, 5
		(4) Drain pump operating	(P) 6-7; (F) 7-6, 1
		(5) Check valve operating	(P) 6-8; (P) 4-12; (F) 7-11, 7
		(6) **For push-button unit:** relay C2 de-energized	(P) 6-8; (P) 4-12; (F) 7-11, 1
		(7) **For push-button unit:** switch gear operating	
		or	
		For punch-card unit: punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(8) **For punch-card unit:** punch-card properly punched	
	C. Water sprayed on load, but tank overflows	(1) Normal level switch B4 contact 23 closed and contact 22 open	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(2) Safety level switch B4 contact 32 open and contact 33 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2

A-10

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
8. Continued	D. Washer does not advance to "purified-water rinse" phase	(1) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (2) **For punch-card unit:** punch-card properly punched	(P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3
9. Washer in "first purified-water rinse" phase (circulated) **NOTE:** This phase is not included in cycle for punch-card unit with noncirculating purified water rinse. See item 10 for noncirculating purified-water rinse phase.	A. Tank does not fill with purified water	(1) Purified water supply pressure as recommended (2) Strainer before solenoid valve is clean (3) Purified water solenoid valve S2 energized (4) **For unit with purified-water pump:** purified-water pump M4 operating (5) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (6) **For punch-card unit:** punch-card properly punched (7) Safety level switch B3 contact 32 closed (8) Normal level switch B4 contact 22 closed (9) There are no leaks	See Applicable Tech Data in Section 1 (P) 4-5; (F) 7-4, 15 (P) 4-10; (P) 6-6; (F) 7-5, 7 (P) 4-12; (P) 6-12; (F) 7-16 (P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3 (P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 4-15
	B. Tank overflows	(1) Normal level switch B4 contact 23 closed and contact 22 open (2) Safety level switch B3 contact 32 open and contact 33 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 4-11; (P) 6-9; (F) 7-13, 2
	C. Tank is filled, but water is not pumped to wash spray pipes	(1) Wash pump motor operating (a) Overload E4 is reset (b) 8-amp fuses E3 not burned out (c) Motor energized (2) Tank filter is clean (3) Wash pump relay C2 energized (4) Normal level switch B4 contact 23 closed (5) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (6) **For punch-card unit:** punch-card properly punched	(P) 6-8; (P) 4-12 (F) 7-11, 8 or (F) 7-12, 6 (F) 7-11, 11 or (F) 7-12, 9 (P) 4-2 (P) 6-8; (P) 4-12; (F) 7-11, 7 or (F) 7-12, 5 (P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3
	D. Water spray sporadic	(1) Wash spray pipes are clean (2) Tank filter is clean	(P) 4-3; (F) 7-2 (P) 4-2

A-11

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
9. Continued	E. Tank does not empty at end of phase	(1) Drain line hose straight (2) Drain line outlet too high (3) Tank filter is clean (4) Drain pump operating (5) Check valve operating (6) **For push-button unit:** relay C2 de-energized (7) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (8) **For punch-card unit:** punch-card properly punched	(P) 2-2 (P) 4-2 (P) 6-7; (F) 7-6, 5 (P) 6-7; (F) 7-6, 1 (P) 6-8; (P) 4-12; (F) 7-11, 7 (P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3
	F. Washer does not advance to next phase if selected	(1) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating (2) **For punch-card unit:** punch-card properly punched	(P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3
10. **Only for punch-card unit with noncirculating purified-water rinse:** Washer in "noncirculating purified-water" rinse **Note:** This is the only purified-water rinse available on this model. It is substituted for the "first purified-water rinse" phase.	A. Water not spraying properly on load from rinse spray pipes	(1) Purified water supply pressure as recommended (2) Spray pipes clean (3) Purified water strainer clean (4) Purified water solenoid valve S2 energized (5) Punch-card reader operating (6) Punch card properly punched (7) Safety level switch B3 contact 32 closed (8) Normal level switch B4 contact 22 closed	See Applicable Tech Data in Section 1 (P) 4-3; (F) 7-2 (F) 7-17, 1 (P) 6-13; (F) 7-17, 2 (P) 6-8; (P) 4-12; (F) 7-10, 3 (P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 4-11; (P) 6-9; (F) 7-13, 2
	B. Water sprayed on load, but tank does not empty	(1) Drain line hose straight (2) Drain line outlet not too high (3) Tank filter is clean (4) Drain pump operating (5) Check valve operating (6) Punch-card reader operating (7) Punch card properly punched	(P) 2-2 (P) 4-2 (P) 6-7; (F) 7-6, 5 (P) 6-7; (F) 7-6, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3
	C. Water sprayed on load, but tank overflows	(1) Normal level switch B4 contact 23 closed and contact 22 open (2) Safety level switch B3 contact 32 open and contact 33 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2 (P) 4-11; (P) 6-9; (F) 7-13, 2
	D. Washer does not advance to next phase if selected	(1) Punch-card reader operating (2) Punch-card properly punched	(P) 6-8; (P) 4-12; (F) 7-10, 3

A-12

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
11. Washer in "second purified-water rinse" phase (heated and circulated)	A. Tank does not fill with purified water	(1) Purified water supply pressure as recommended	See Applicable Tech Data in Section 1 (P) 4-5; (F) 7-4, 15
		(2) Strainer before solenoid valve is clean	(P) 4-10; (P) 6-6; (F) 7-5, 7
		(3) Purified water solenoid valve S2 energized	(P) 4-10; (P) 6-12; (F) 7-16
		(4) **For unit with purified-water pump:** purified-water pump M4 operates	(P) 6-8; (P) 4-12; (F) 7-11, 1
		(5) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(6) **For punch-card unit:** punch-card properly punched	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(7) Safety level switch B3 contact 32 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(8) Normal level switch B4 contact 22 closed	
		(9) There are no leaks	
	B. Tank overflows	(1) Normal level switch B4 contact 23 closed and contact 22 open	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(2) Safety level switch B3 contact 32 open and contact 33 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
	C. Tank is filled, but water is not heated	(1) Normal level switch B4 contact 23 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(2) Rinse water thermostat at correct setting	(P) 4-13; (F) 7-9, 7 or (F) 7-10, 8
		(3) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3
		(4) **For punch-card unit:** punch-card properly punched	(P) 6-8; (P) 4-12; (F) 7-11, 9
		(5) **For push-button unit:** relay D2 energized	(P) 6-8; (P) 4-12; (F) 7-9, 7 or (F) 7-10, 8
		(6) Rinse water thermostat B6 contact 2 closed	(P) 4-12; (P) 6-8; (F) 7-11, 1 or (F) 7-12, 3
		(7) Heater relay C1 energized	(P) 4-13; (P) 6-3; (F) 7-3
		(8) Heaters R1 energized and at correct temperature	
	D. Tank is filled, but water is not pumped to wash spray pipes	(1) Wash pump motor operating (a) overload E4 is reset (b) 8-amp fuses E3 not burned out (c) Motor energized	(P) 6-8; (P) 4-12 (F) 7-11, 8 or (F) 7-12, 6 (F) 7-11, 11 or (F) 7-12, 9
		(2) Tank filter is clean	(P) 4-2
		(3) Rinse water thermostat B6 contact 3 closed	(P) 4-13; (F) 7-9, 7 or (F) 7-10, 8

A-13

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
11. Continued		(4) Wash pump relay C2 energized	(P) 6-8; (P) 4-12; (F) 7-11, 7 or (F) 7-12, 5
		(5) Normal level switch B4 contact 23 closed	(P) 4-11; (P) 6-9; (F) 7-13, 2
		(6) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3
		(7) **For punch-card unit:** punch-card properly punched	
	E. Spray sporadic	(1) Wash spray pipes are clean	(P) 4-3; (F) 7-2
		(2) Tank filter is clean	(P) 4-2
	F. Tank does not empty at end of phase	(1) Drain line hose straight	(P) 2-2
		(2) Drain line outlet not too high	(P) 4-2
		(3) Tank filter is clean	(P) 6-7; (F) 7-6, 5
		(4) Drain pump operating	(P) 6-7; (F) 7-6, 1
		(5) Check valve operating	(P) 6-8; (P) 4-12; (F) 7-11, 7
		(6) **For push-button unit:** relay C2 de-energized	(P) 6-8; (P) 4-12; (F) 7-11, 1
		(7) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-10, 3
		(8) **For punch-card unit:** punch-card properly punched	
	G. Washer does not advance to next phase if selected	(1) **For push-button unit:** switch gear operating or **For punch-card unit:** punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3
		(2) **For punch-card unit:** punch-card properly punched	
12. Washer in "drying" phase	A. Dry heater does not come on	(1) Dry heater relay C3 energized	(P) 6-8; (P) 4-12; (F) 7-11, 9 or (F) 7-12, 7
		(2) Dry heater R2 energized and at correct temperature	(P) 4-13; (P) 6-3; (F) 7-3
		(3) **For push-button unit:** gear switch operating or **For punch-card unit:** punch-card reader operating	(P) 6-8; (P) 4-12; (F) 7-11, 1 (P) 6-8; (P) 4-12; (F) 7-10, 3
		(4) **For punch-card unit:** punch-card properly punched	
13. Cycle completed and load removed from chamber	A. Load is not clean	(1) Correct program cycle used	Table 2-1 or 2-2
		(2) Turntable rotated throughout cycle	(F) 7-2, 1; (P) 4-9
		(3) Wash spray pipes clean	(P) 4-3; (F) 7-2
		(4) Tank filter is clean	(P) 4-2

A-14

Table 5-1. (Continued)

WASHER OPERATIONAL STATUS	TROUBLE	ARE CONDITIONS AS FOLLOWS?	WHERE TO FIND ITEMS IN MANUAL
13. Continued		(5) Correct water temperature selected for "prerinse" phase (hot for greasy or nonprotein soil or cold for protein soil)	
		(6) Correct detergent used in both first and second wash phases	(P) 2-2
		(7) Second wash detergent container is filled	(P) 2-2; (F) 2-1
		(8) Rinse spray pipes clean	(P) 4-3; (F) 7-2
14. Miscellaneous	A. Cycle runs too fast (phases not running for proper length time)	(1) **For push-button unit:** (a) push button cycle selector operating	(P) 6-8; (P) 4-12; (F) 7-9, 1
		(b) relay switch in gear switch operating	(P) 6-8; (P) 4-12; (F) 7-11, 1
		(2) **For punch-card unit:** punch-card reader motor operating at proper speed	(P) 6-8; (P) 4-12: (F) 7-10, 3
	B. Wash pump leaks	(1) Seal not leaking	(P) 6-10; (F) 7-14
		(2) O-ring not leaking	(P) 6-10; (P) 7-14
	C. Door does not open or or close properly	(1) Guide rollers operate smoothly	(P) 4-4; (F) 7-1
		(2) Cable is not worn or broken	(P) 4-4; (P) 6-2; (F) 7-1

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SECTION 6

COMPONENT ADJUSTMENT, REPAIR AND REPLACEMENT

6-1. GENERAL

This section includes instructions for the adjustment, disassembly, repair and replacement of selected Washer components. Exploded views and assembly drawings showing the various parts and assemblies referred to in this section are included in Section 7.

WARNING: BE SURE TO DISCONNECT ELECTRIC POWER TO WASHER BEFORE DOING ANY WORK IN CONTROL DRAWER OR COMPARTMENT BELOW CHAMBER. WHEN ELECTRIC POWER IS SUPPLIED TO WASHER, SEVERAL TERMINALS IN CONTROL DRAWER ARE ENERGIZED.

NOTE: When reassembling components, panels, etc; do not tighten bolts or screws until all screws or bolts have been started.

After conducting repairs in chamber be sure all iron particles are removed from chamber and tank. Then wash out chamber using a mild acidic detergent.

6-2. DOOR CABLE REPLACEMENT (Freestanding or Counter-top Model)

1. Open chamber door and remove eight bolts (9, Fig. 7-1) and washers (10, Fig. 7-1) from top of chamber.

2. Using a thin knife, cut cover (1, Fig. 7-1) free of Washer. Sealant is used on both sides and back.

3. Lift up cover to gain access to door wire rope (6, Fig. 7-1).

4. Remove torn or broken wire rope.

5. Replace guide pulleys (5, Fig. 7-1) if necessary.

6. String and secure wire rope as shown in Figure 7-1.

7. Clean old sealant from top edges of Washer.

8. Apply sealant (silicon rubber, RTV or equivalent) to back and side edges of Washer top.

9. Replace cover on top of Washer and secure it from inside with eight bolts and washers. Clean off excess sealant.

6.3 HEATERS

Testing, Removal and Replacement

1. Be sure electric power to Washer is disconnected.

2. Remove both side panels and pull out control drawer.

3. Identify and disconnect wires to all heaters.

4. Check continuity of each heater; remove defective heater(s).

5. Install new heater(s) as shown in Figure 7-3. Spacer (9) shown in view B is used with heaters (2 and 3). Heaters (6 and 8) have a spacer (not shown) with holes instead of slots.

6. Bend terminals on heater and connect wires to terminals.

7. Reassemble side panels. Be sure slots on edges of side panels are facing top and front of unit.

8. Push in and secure control drawer being sure drawer is properly positioned between drawer guides that are bolted to both sides of frame.

9. Reestablish electric power to Washer.

6-4. PRERINSE SOLENOID VALVE (Fig. 7-4)

NOTE: When removing back cover from a freestanding or counter-top model, position Washer so that back is extended approximately four inches over base or counter.

Removal and Replacement

1. Disconnect electric cable from source and water lines from Washer.

2. Disconnect hoses from drainage bend (4).

3. Disassemble solenoid shield (12) and mounting plate (7).

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4. Position pre-rinse solenoid valve assembly away from back of Washer as far as wires will allow.

5. If freestanding or counter-top model, slide back cover down to clear counter-weight shield. On all models, bring cover up and over solenoid valve assembly to clear Washer.

6. Loosen hose clamp and remove hose from solenoid valve.

7. Cut solenoid wires at point of splicing (approximately 11 inches from solenoid).

8. Remove defective solenoid valve and install new one.

9. Install hose on solenoid valve.

10. Splice wires of new solenoid valve and cover wires with flexible conduit.

11. Install back cover on frame. (On freestanding or counter-top model; position applicable opening in cover over hose leading from solenoid valve with bottom edge of cover several inches below bottom frame of Washer, then guide back cover up behind counter-weight shield.)

12. Reassemble solenoid mounting plate and shield. Be careful not to pinch solenoid wires.

13. Reconnect electric lines to source and water lines to fittings on Washer.

6-5. HOT-WATER SOLENOID VALVE

Removal and Replacement

1. Disconnect electric cable from source and water lines from Washer.

2. Loosen screws securing control drawer to frame.

3. Remove side panel on power cable side of Washer.

4. Disconnect wires from hot-water solenoid valve (6, Fig. 7-5).

5. Loosen hose clamp and remove hose from solenoid valve.

6. Remove solenoid valve from mounting plate.

7. Install new valve and connect wires and hose.

8. Reassemble side panel, then tighten screws on control drawer. Be sure slots on edges of side panel are facing top and front of unit.

9. Reconnect electric cable and water lines.

6-6. PURIFIED-WATER SOLENOID VALVE WITHOUT PUMP FOR CIRCULATING RINSE

Removal and Replacement

1. Disconnect electric cable from source and water lines from Washer.

2. Loosen screws securing control drawer to frame.

3. Remove side panel on power cable side of Washer.

4. Disconnect wires from purified-water solenoid valve (7, Fig. 7-5).

5. Loosen hose clamp and remove hose from solenoid valve.

6. Remove solenoid valve from mounting plate.

7. Install new valve, and connect wires and hose.

8. Reassemble side panel, then tighten screws on control drawers. Be sure slots on edges of side panel are facing top and front of unit.

9. Reconnect electric cable and water lines.

6-7. DRAIN PUMP AND CHECK VALVE

NOTE: When removing back cover from a freestanding or counter-top model, position Washer so that back is extended approximately four inches over base or counter.

Removing Check Valve and Drain Pump

1. Disconnect electric cable from source and water lines from Washer.

2. Loosen eight screws securing control drawer.

3. Remove side panel at tank side of Washer.

4. Disconnect hoses from drainage bend (4, Fig. 7-4).

5. Remove pre-rinse solenoid shield (12, Fig. 7-4) and mounting plate (7, Fig. 7-4).

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6. Position pre-rinse solenoid valve assembly away from back of Washer as far as wires will allow.

7. If freestanding or counter-top model, slide back cover down to clear counter-weight shield. On all models, bring cover up over pre-rinse solenoid valve assembly to clear Washer.

8. Disconnect wires from drain pump and hoses from pump and check valve.

9. Disassemble drain pump (5, Fig. 7-6) from mounting bracket.

10. Being careful not to damage wires, remove drain pump and check valve using opening in back of Washer.

Repairing Check Valve

1. Pull spring (2, Fig. 7-6) out of check valve side (view A on Figure 7-6).

2. Replace O-ring (4, Fig. 7-6) and seat (3, Fig. 7-6).

3. Reassemble check valve.

Replacing Check Valve

1. Be sure hoses are disconnected from check valve (1, Fig. 7-6).

2. Replace defective check valve with new one.

3. Connect hoses to new check valve.

Replacing Drain Pump (Fig. 7-6)

1. Be sure hoses are disconnected from drain pump.

2. Replace defective pump with new one.

3. Connect hoses to new pump.

Reassembling Check Valve and Drain Pump

1. Insert check valve (1, Fig. 7-6) and drain pump (5, Fig. 7-6) into Washer through opening in back.

2. Secure pump to mounting bracket.

3. Connect hoses to drain pump and check valves.

4. Be sure hose that was connected to drainage bend (12, Fig. 7-4) is connected to outlet of check valve.

5. Reconnect wires to drain pump.

6. Install back cover on frame. Be sure hose from check valve is inserted through proper opening in back cover. On freestanding or counter-top model, position applicable opening in cover over hose leading from pre-rinse solenoid valve with bottom edge of cover several inches below bottom frame of Washer. Then slide back cover up behind counter-weight shield.

7. Reassemble pre-rinse solenoid mounting plate and shield. Be sure pre-rinse solenoid wires do not get pinched between back cover and solenoid mounting plate.

8. Connect hoses to drainage bend.

9. Install side panel, then tighten screws on control drawer. Be sure slots on edges of side panel are facing top and front of unit.

10. Connect electric cable to source and water lines to Washer.

6-8. CONTROL COMPONENTS

CAUTION: Do not remove plastic sheet when servicing control components. Remove clip at rear of drawer and move plastic sheet aside. Be sure to secure plastic sheet with clip prior to pushing in control drawer.

Removal and Replacement

1. Identify wires before disconnecting them.

2. **For Push-button Control Unit,** refer to Figures 7-9 and 7-11.

or

For Punch-card Control Unit, refer to Figures 7-10 and 7-12.

3. When pushing in control drawer, be sure drawer is properly positioned between drawer guides that are bolted to both sides of frame.

6-9. LEVEL SWITCH AND DETERGENT PUMP (Fig. 7-13)

Adjusting Detergent Pump

The dose of detergent delivered can be set at approximately 8 cc as follows (refer to Figure 6-1):

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1. Loosen counter nut.

2. Turn adjusting screw until gap is 5mm (approximately 3/16 inch).

3. Tighten counter nut.

Removing Level Switch and Detergent Pump

1. Be sure electric power to Washer is disconnected.

2. Pull out control drawer.

3. Remove side panel at detergent dispenser side of Washer.

4. Identify wires to level switch (2) and detergent pump (1).

5. Disconnect six wires to level switch and two ground wires to detergent pump.

6. Cut two detergent pump wires at point of splicing (approximately 6 inches from pump).

7. Identify hoses and disconnect them. Have container available to catch detergent leaking from hose connected to detergent dispenser in chamber.

8. Remove bracket with detergent pump and level switch.

Replacing Detergent Pump

1. Disassemble defective detergent pump from bracket.

2. Install new detergent pump.

Replacing Level Switch

1. Disassemble defective level switch from bracket.

2. Install new level switch.

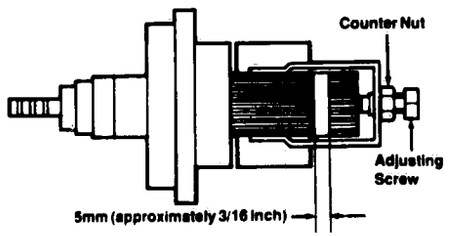


Figure 6-1. DETERGENT PUMP ADJUSTMENT.

Reassembling Level Switch and Detergent Pump

1. Insert bracket with level switch and detergent pump into Washer through opening in side.

2. Secure bracket to frame, and connect six red wires to level switch and two ground wires to detergent pump.

3. Splice two wires to detergent pump, and cover wires with insulation and flexible conduit.

4. Connect hoses to detergent pump and level switch.

5. Install side panel and control drawer. Be sure slots on edges of side panel are facing top and front of unit. Control drawer should be properly between drawer guides that are bolted to both sides of frame.

6. Reestablish electric power to Washer.

6-10. WASH PUMP (Fig. 7-14)

Removal

1. Disconnect electric cable from source and water lines from Washer.

2. Open chamber door and remove turntable. Close door.

3. Remove both side panels and screws from control panel.

NOTE: At least two people are required when positioning unit on its side or moving it to the upright position.

4. Position Washer on its right side (as viewed facing back of unit). Only use frame as handholds.

5. Pull open control drawer, and disconnect hose from drainage bend.

6. Disassemble pre-rinse solenoid shield and mounting plate.

7. Remove back cover. If freestanding or counter-top model, be sure cover clears counter-weight shield.

8. Disassemble bottom plate by removing four leveling feet (2, Fig. 7-14) and washers (3, Fig. 7-14). Freestanding model will have four bolts instead of leveling feet.

9. Remove cover to pump motor junction box, identify four wires going into junction box, then disconnect them.

10. While holding locknut (12, Fig. 7-14) unscrew grommet (11, Fig. 7-14) from junction box, then pull four wires out of junction box.

11. Loosen both clamps on hose connecting wash pump outlet to spray pipe inlet.

12. Move hose up on spray pipe inlet.

13. Loosen clamp connecting hose to wash pump inlet.

14. Remove four nuts (5, Fig. 7-14) and lockwashers (6, Fig. 7-14) securing wash pump to mounting brackets.

15. Pull out two bolts (7, Fig. 7-14) and washers (8, Fig. 7-14) holding wash pump to bottom of bracket (as viewed with pump motor facing up).

16. Close control drawer and return Washer to upright position. Only use frame as handholds.

17. Remove two remaining bolts and washers holding wash pump to bracket.

18. Remove wash pump through opening on left side of washer (as viewed facing back of unit).

Replacement

1. With Washer in upright position and control drawer pulled out, install wash pump through left side (as viewed facing back of unit). Be sure hose from tank is connected to wash pump inlet.

2. Assemble as many of the bolts, washers, lockwashers and nuts that secure wash pump to mounting brackets. Do not tighten.

3. Push in control drawer and position Washer on its right side (as viewed facing back of unit). Only use frame as handholds.

4. Pull control drawer out.

5. Be sure hose that connects wash pump inlet to tank outlet is properly positioned.

6. Replace remaining wash pump mounting hardware, and tighten the four bolts.

7. Connect hose between wash pump outlet and spray pipe inlet.

8. Tighten hose clamps at wash pump inlet and outlet.

9. Insert wires into grommet, and use nut to secure grommet to pump motor junction box.

10. Connect four wires to applicable terminals in junction box. (**Note:** If unit had pump motor with 9 terminals, refer to Figure 6-2 for correcting wiring of motor with 6 terminals.)

11. Replace junction box cover. (**Note:** Longer screw (10, Fig. 7-14) should be screwed into lower hole.)

12. Install back cover and bottom plate. If freestanding or counter-top model, be sure back cover is inserted behind counter-weight shield before securing it.

13. Install pre-rinse solenoid mounting plate and shield. Be careful not to pinch solenoid wires.

14. Push in control drawer and return Washer to upright position. Only use frame as handholds. Be sure control drawer is properly positioned between drawer guides that are bolted to both sides of frame.

15. Replace side panels being sure slots on edges of side panels are facing top and front of unit.

16. Connect electric cable to source and water lines to Washer.

6-11. DRIVE SHAFT AND MOTOR (Fig. 7-15).

Removing Angle Iron and Drive Motor

1. Disconnect electric cable from source and water lines from Washer.

2. Open chamber door and remove turntable. Close door.

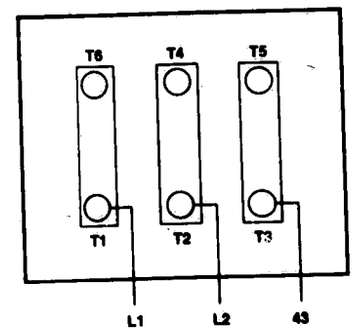


Figure 6-2. WIRING OF SIX TERMINAL MOTOR.

3. Remove both side panels and screws from control panel.

NOTE: At least two people are required when positioning unit on its side or moving it to the upright position.

4. Position Washer on its right side (as viewed facing back of unit.) Only use frame as handholds.

5. Pull open control drawer, and remove bottom plate.

6. Remove three hex head bolts (11) and lockwasher (10).

7. Carefully remove angle iron (9) with motor (12). Rest angle iron with motor on frame so there is no strain on wires attached to motor.

Removing Drive Shaft

1. Drive pin (7) from bevel wheel (8) on drive shaft.

2. Pry bevel wheel off of drive shaft (1).

3. Remove keeper (6) and washer (5).

4. Open chamber door and remove bottom wash spray pipe.

5. Remove three bolts (3) securing bearing housing (4) to inside of chamber.

6. From inside of chamber, pull drive shaft out of bearing housing.

7. Remove radial gasket (2) from bearing housing.

NOTE: To repair or replace bearings or bearing housing, the Washer must be returned to factory because bearing housing cannot be moved past rinse spray pipe. Rinse spray pipe is welded.

Removing Drive Motor

1. Cut two wires to drive motor at point of splicing (approximately 7 inches from motor).

2. Disassemble motor from bracket.

Replacing Drive Motor

1. Install motor to bracket; do not tighten screws.

2. Splice drive motor wires, and cover wires with insulation and flexible conduit.

Replacing Drive Shaft

1. Install radial gasket (2) on drive shaft (1).

2. Apply silicon grease to drive shaft as shown in Figure 6-3.

3. Insert shaft and shaft seal into bearing housing (4) from inside of chamber.

4. Secure bearing housing to chamber with three bolts (3).

5. From bottom of chamber, install washer (5) and keeper (6) on shaft.

6. Install bevel wheel (8) to shaft with pin (7) then close chamber door.

Replacing Angle Iron and Drive Motor

1. Install angle iron with attached drive motor to bottom of chamber.

2. Loosen socket head screws that mount motor to angle iron, and so position motor that bevel wheels are properly meshed. This is when meshing part of the two bevel wheels is smooth to the touch.

3. Tighten the four socket head screws (15).

4. Install bottom plate and control drawer. Be sure control drawer is properly positioned between drawer guides that are bolted to both sides of frame.

5. Return Washer to upright position. Only use frame as handholds.

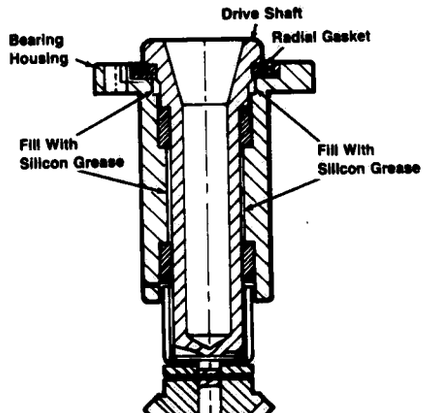


Figure 6-3. REPLACING DRIVE SHAFT.

B-7

6. Replace side panels being sure slots on edges of side panels are facing top and front of unit.

7. Open chamber door and replace turntable.

8. Connect electric cable to source and water lines to Washer.

6-12. OPTIONAL PURIFIED-WATER PUMP WITH SOLENOID VALVE (Fig. 7-16)

Gaining Access to Pump and Solenoid Valve

1. Disconnect electric cable from source and water lines from Washer.

2. Loosen screws securing control drawer to frame.

3. Remove side panel on power cable side of Washer.

Removing and Replacing Solenoid Valve

1. Disconnect wires from pump (1).

2. Unsolder solenoid valve wires from bayonet terminals.

3. Loosen hose clamps and remove defective solenoid valve (2).

4. Install new solenoid valve and tighten hose clamps.

5. Insulate wires of solenoid valve.

6. Solder solenoid valve wires to bayonet terminals.

7. Connect wires to pump.

Removing and Replacing Pump

1. Disconnect hoses from pump (1).

2. Identify wires, then disconnect them from pump.

3. Disassemble defective pump from frame, then remove pump from mounting bracket.

4. Install pump on mounting bracket, then install bracket on frame.

5. Connect hoses to pump inlet and outlet.

6. Connect wires to pump.

Securing Washer

1. Install side panel being sure slots on edges of side panel are facing top and front of unit.

2. Secure control drawer.

3. Connect electric cable to source and water lines to Washer.

6-13. OPTIONAL NONCIRCULATING PURIFIED-WATER RINSE AND PRE-RINSE SOLENOID VALVES (Fig. 7-17)

Removal and Replacement

NOTE: The following instructions apply to either or both solenoid valves (2).

1. Disconnect electric cable from source and water lines from Washer.

2. Remove cap on solenoid valve, and disconnect wires.

3. Disconnect strainer (1) from solenoid valve.

4. Remove defective solenoid valve.

5. Install new valve and connect wires.

6. Reassemble valve cover and strainer.

7. Connect electric cable to source and water lines to Washer.

6-14. GASKETS (Fig. 7-3)

Removing and Replacing Thermostat Gaskets

1. Be sure electric power to Washer is disconnected.

2. Pull out control drawer and open chamber door to remove turntable.

3. Push thermostat bulb out of defective gasket (13), and remove gasket.

4. Install new gasket (13) and push thermostat bulb into gasket.

5. Push in control drawer being sure drawer is properly positioned between drawer guides that are bolted to both sides of frame, then secure drawer.

6. Insert turntable and close chamber door.

7. Restore electric power to Washer.

B-8

Removing and Replacing Door Switch Actuator Gasket

1. Be sure electric power to Washer is disconnected.

2. Pull out control drawer and open chamber door to remove turntable.

3. Push down on door switch actuator (14) and remove cotter pin and washer.

4. Pull out actuator and remove defective gasket (16).

5. Install new gasket and insert actuator.

6. Push down on actuator, and install washer and cotter pin.

7. Push in control drawer being sure drawer is properly positioned between drawer guides that are bolted to both sides of frame, then secure drawer.

8. Insert turntable and close chamber door.

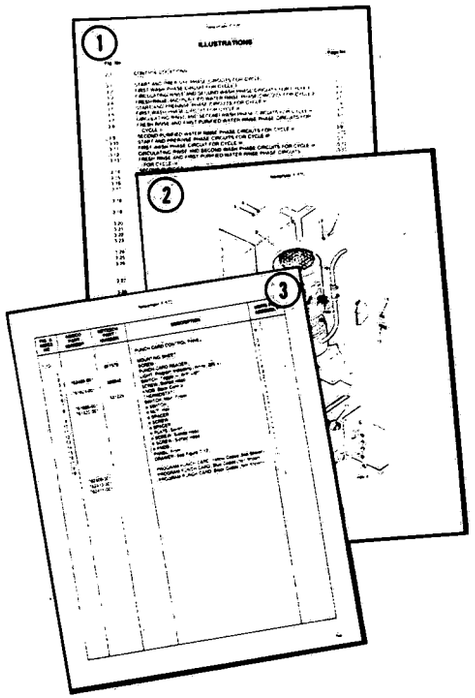
9. Restore electric power to Washer.

B-9

SECTION 7

EXPLODED VIEWS AND PARTS LISTS

Assemblies and components of Newamatic F-570 Washers are illustrated and identified on the following pages. The part number, the description and the quantity required for each usage is given. Each indentation in the description represents the assembly level. The UNITS PER ASSEMBLY column is specific for the given assembly or subassembly level.



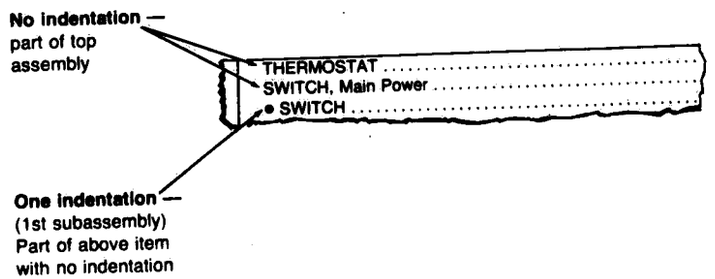
HOW TO USE THE ILLUSTRATED PARTS BREAKDOWN

(1) Determine the function and application of the part required. Turn to the List of Illustrations and select the most appropriate title. Note the illustration page number.

(2) Turn to the page indicated and locate the desired part on the illustration.

(3) From the illustration, obtain the index number assigned to the part desired. Refer to the accompanying description for specific information regarding the part.

TYPICAL INDENTATION EXAMPLE



B-10

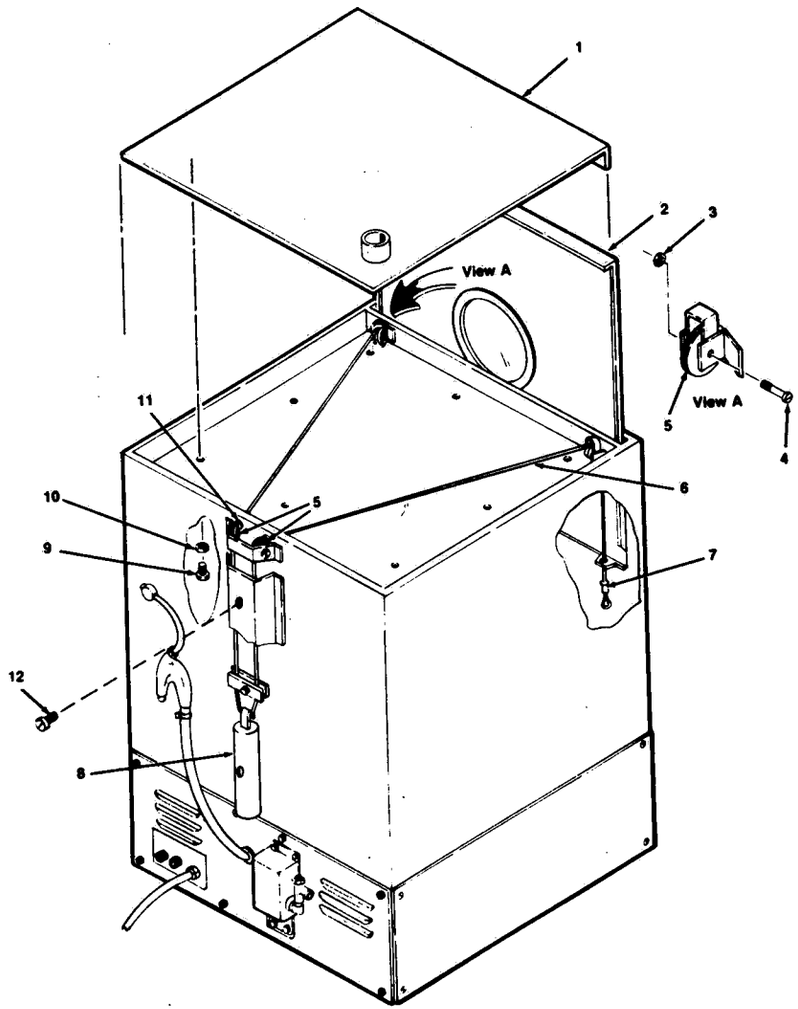


Figure 7-1. FREESTANDING AND COUNTER-TOP MODELS.

B-11

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-1-			FREESTANDING AND COUNTER-TOP MODELS	*
				1
			COVER	1
1		858673	DOOR (See Figure 7-2)	4
2			NUT, Hex	4
3			SCREW, Flat Slotted Head	4
4			PULLEY, Guide	1
5			ROPE, Wire	2
6	761802-001		RIVET	1
7	761801-001		COUNTER WEIGHT, Door	8
8			BOLT	8
9			WASHER	2
10			GROMMET, Wire Rope	A/R
11			SETSCREW, Red Shipping	
12	762227-001			

B-12

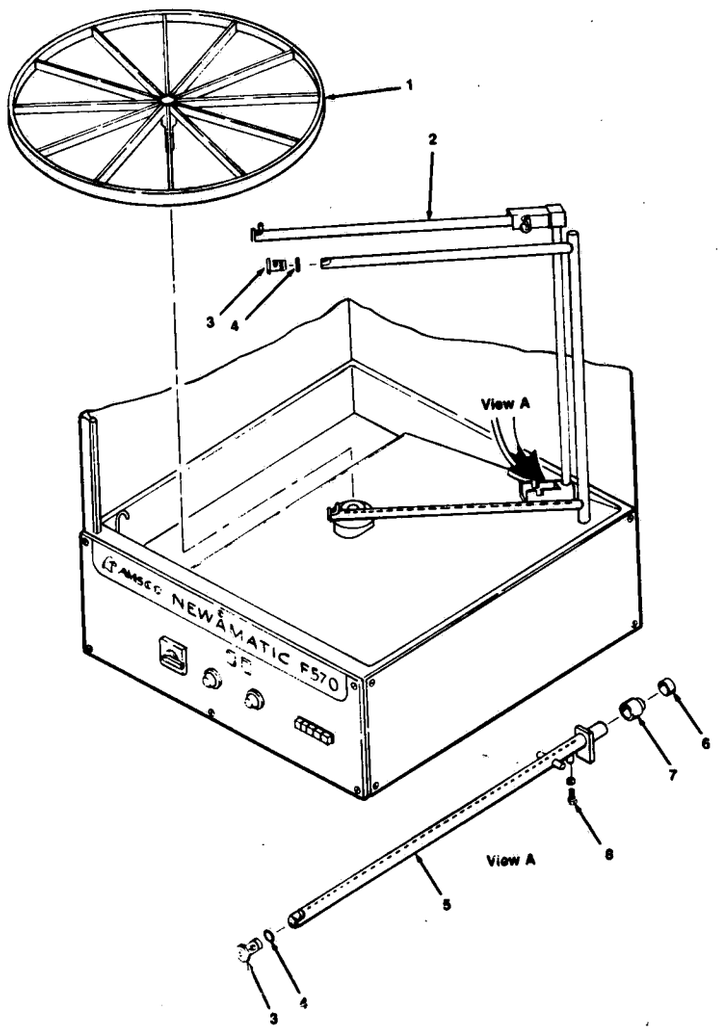


Figure 7-2. TURNTABLE AND SPRAY PIPES.

B-13

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-2-			TURNTABLE AND SPRAY PIPES	*
1			TURNTABLE	1
2		858189	PIPE, Top Wash Spray	1
3		859558	PLUG	4
4	761810-001		O-RING	4
5		858188	PIPE, Bottom Wash Spray	1
6		517066	O-RING	2
7	761809-001		PACKING COLLAR ASSEMBLY	2
		460581	• PACKING COLLAR (Not Shown)	2
		857427	• TUBE (Not Shown)	2
8			SCREW, Bottom Wash Spray Adjusting	1
9	762225-001		SCREW, Flat Head	6

B-14

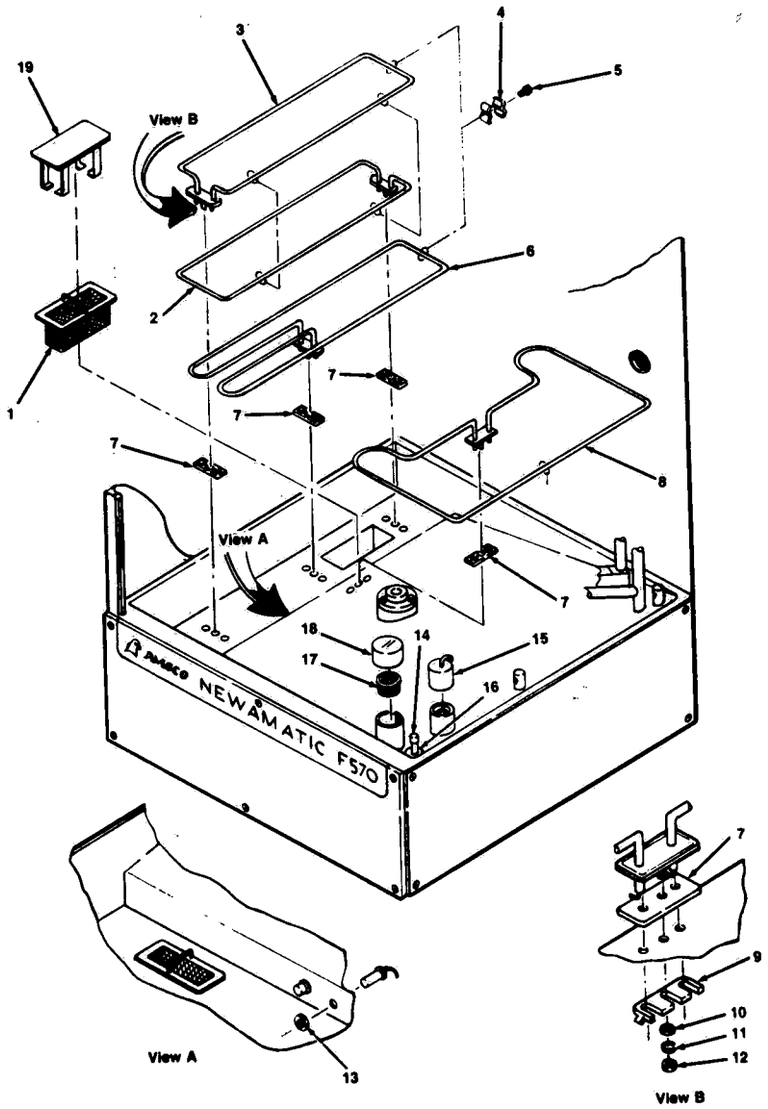


Figure 7-3. HEATERS AND CHAMBER GASKETS.

C-1

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-3-			HEATERS AND CHAMBER GASKETS	*
1			FILTER, Tank	1
2	761800-001		HEATER — 5-3/8 x 18-3/4, 2000 W, 220 V	1
3	761799-001		HEATER — 4-1/8 x 17-1/2, 2000 W, 220 V	1
4			BRACKET, Heater Holding	3
5			SCREW	4
6	761798-001		HEATER, 4-3/6 x 16-3/8, 2800 W, 220 V	1
7			INSULATOR, Heater	4
8	761797-001		HEATER, Dry — 18-15/16 x 10-5/8, 500 W, 200 V	1
9			SPACER, Heater	2
10			SPACER, Heater (Not Shown)	2
11			WASHER	4
12			LOCKWASHER	4
13			NUT, Hex	4
14			GASKET, Thermostat Bulb	2
			ACTUATOR, Door Switch	1
			• WASHER (Not Shown)	1
			• COTTER PIN (Now Shown)	1
15			COVER, Detergent Container	1
16			GASKET, Door Switch Actuator	1
17			FILTER	1
18			COVER, Detergent Container	1
19	762427-001		LID, Tank Filter	1

C-2

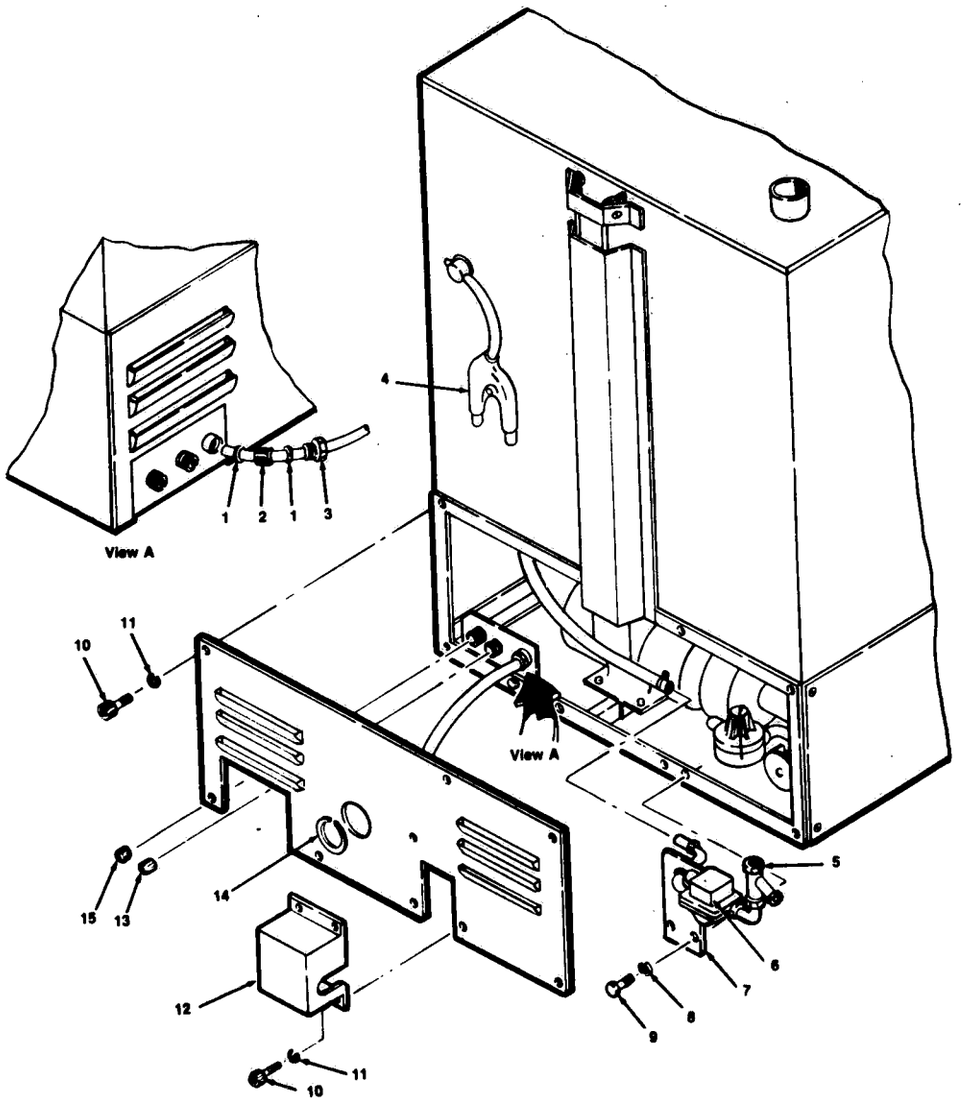


Figure 7-4. BACK COVER AND PRE-RINSE FITTING.

C-3

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-4-			BACK COVER AND PRE-RINSE FITTING	*
			WASHER	2
1			SEAL, Rubber	1
2			NUT	1
3			BEND, Drainage	1
4	761818-001		STRAINER	1
5			VALVE, Solenoid	1
6		590693	PLATE, Solenoid Mounting	1
7			LOCKWASHER	2
8			BOLT, Hex Head	2
9			SCREW, Socket Head	9
10	762224-001		LOCKWASHER	9
11			SHIELD, Solenoid Valve	1
12			STRAINER, Hot Water Fitting	
13			GROMMET	1
14			STRAINER, Purified-water Rinse Fitting	1
15				

C-4

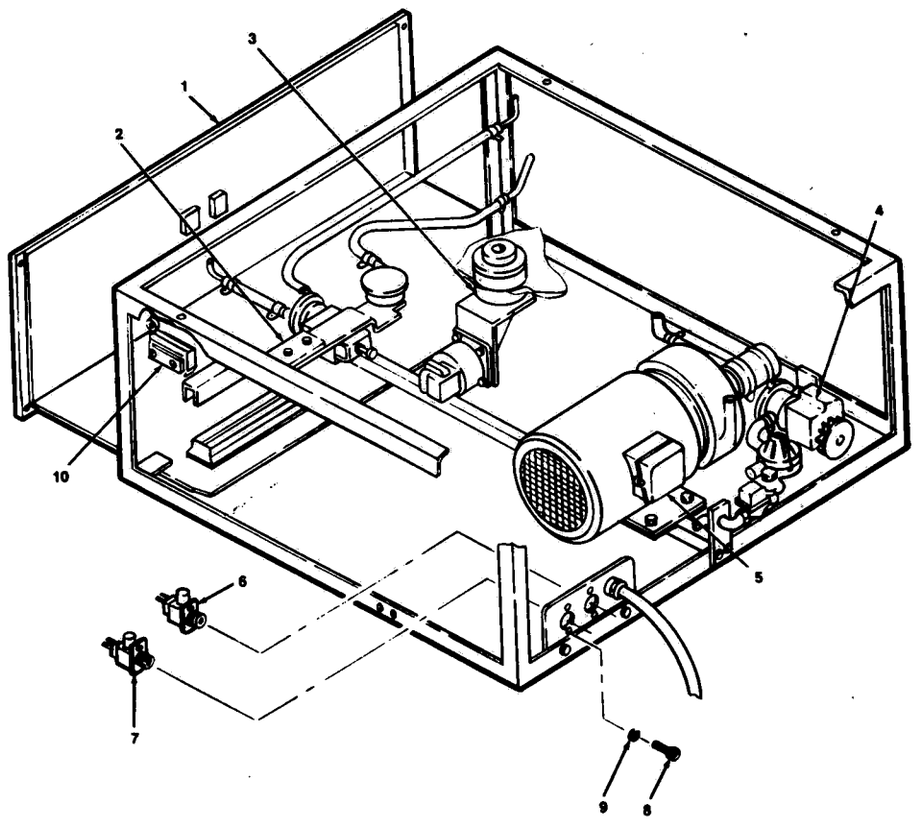


Figure 7-5. MAJOR COMPONENTS.

C-5

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-5-			MAJOR COMPONENTS	*
1			DRAWER AND PANEL, Push-button Control (See Figures 7-9 and 7-11)	1
			DRAWER AND PANEL, Punch-card Control (See Figures 7-10 and 7-12)	1
2		858698	LEVEL SWITCH AND DETERGENT PUMP (See Figure 7-13)	1
			DRIVE ASSEMBLY (See Figure 7-15)	1
3		858675	DRAINAGE ASSEMBLY (See Figure 7-6)	1
4		858689	WASH PUMP AND MOTOR (See Figure 7-14)	1
5		858700	VALVE, Hot Water Solenoid	1
6	761814-001		VALVE, Purified-water Solenoid	1
7	761814-001		SCREW, Socket Head	4
8	762224-001		LOCKWASHER	4
9			SWITCH, Door (See Figure 7-13)	1
10				

C-6

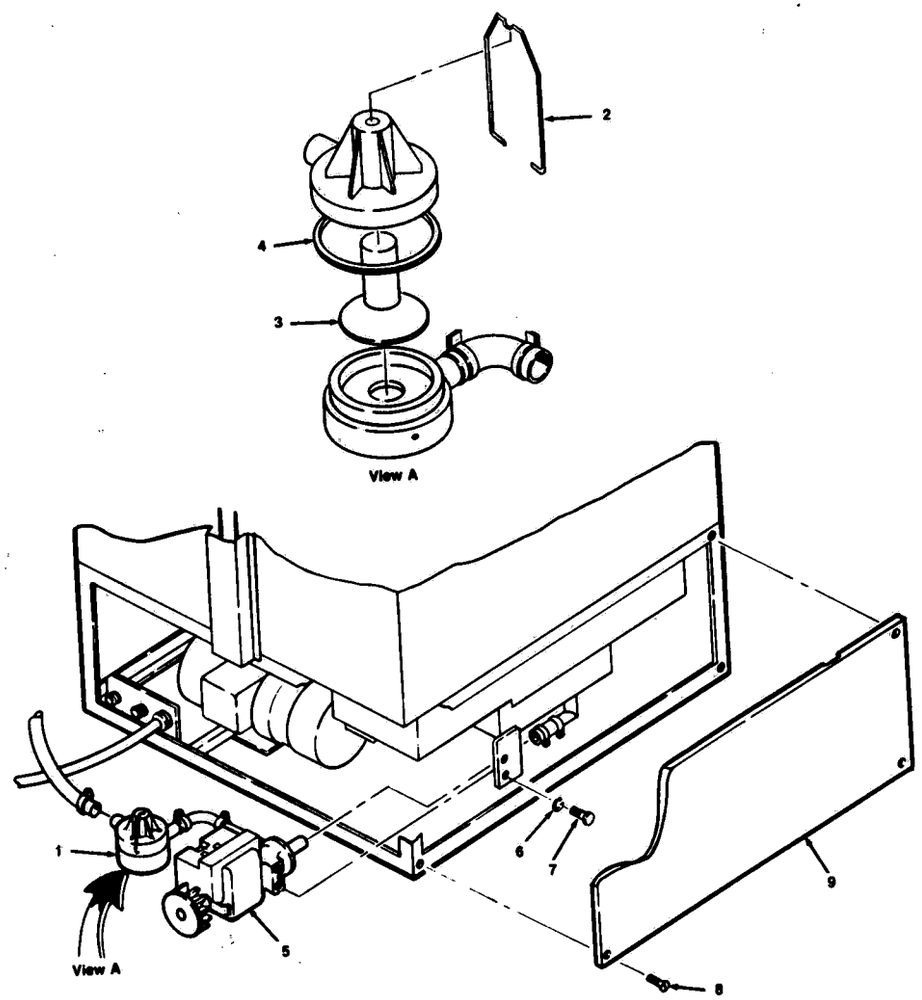


Figure 7-6. DRAINAGE SYSTEM.

C-7

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-6-			DRAINAGE SYSTEM	*
				1
1	761817-001		VALVE, Check	1
2			• SPRING	1
3			• SEAT	1
4			• O-RING	1
5	761811-001		PUMP, Drain	2
6			LOCKWASHER	2
7			BOLT, Hex Head	4
8	762226-001		SCREW, Oval Head	1
9		857076	PANEL, Side	

C-8

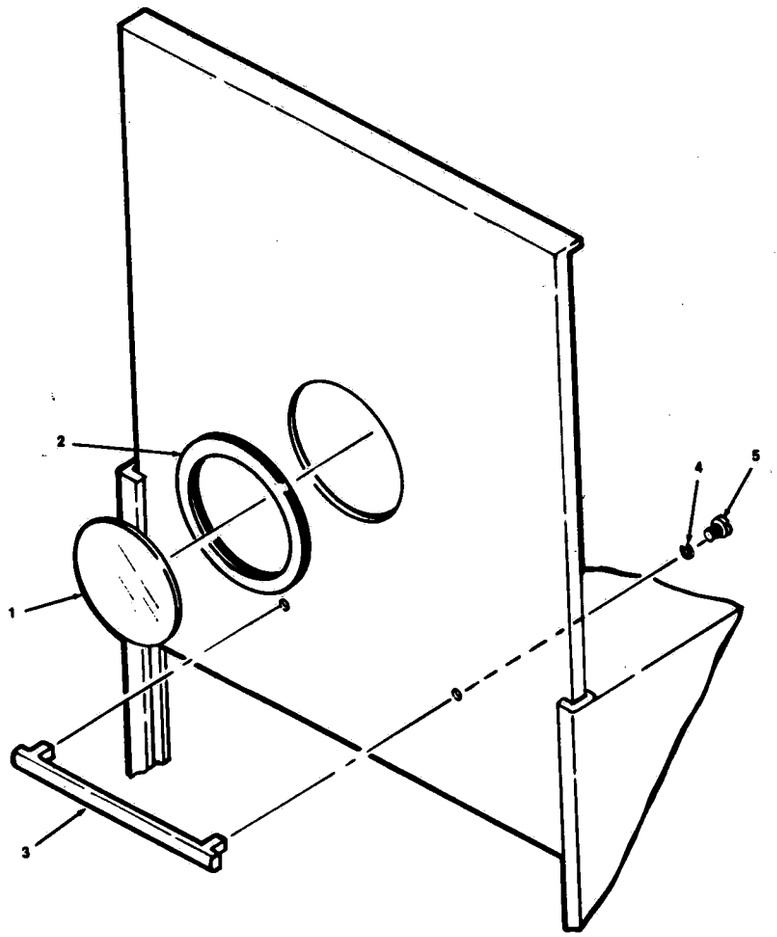


Figure 7-7. DOOR ASSEMBLY (FREESTANDING OR COUNTER-TOP MODEL).

C-9

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-7-			DOOR ASSEMBLY (Freestanding or Counter-top Model)	*
1			WINDOW, Glass	1
2			GASKET, Window	1
3			HANDLE	1
4			LOCKWASHER	2
5			SCREW, Pan Head Slotted	2

C-10

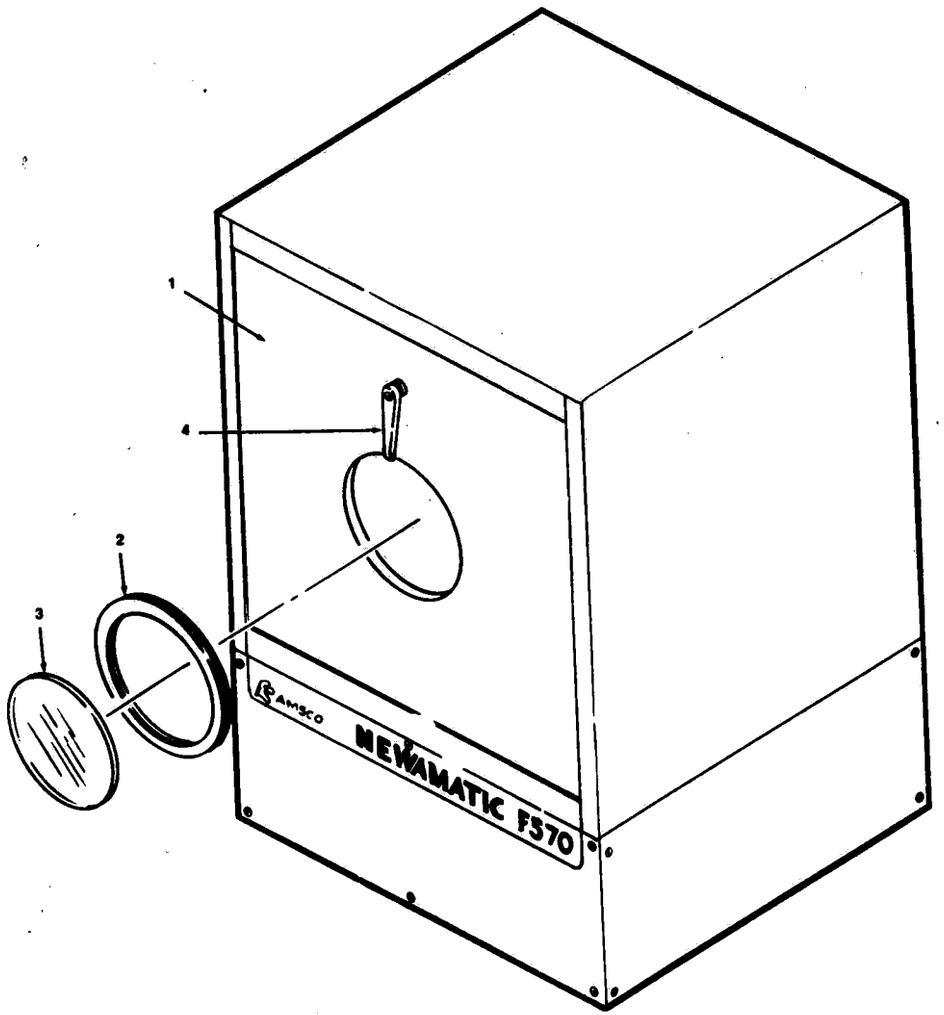


Figure 7-8. DOOR ASSEMBLY (UNDER-COUNTER MODEL).

C-11

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-8-			DOOR ASSEMBLY (Under-counter Model)	*
				1
1			DOOR	1
2			GASKET, Window	1
3			WINDOW, Glass	1
4			HANDLE, Door	

C-12

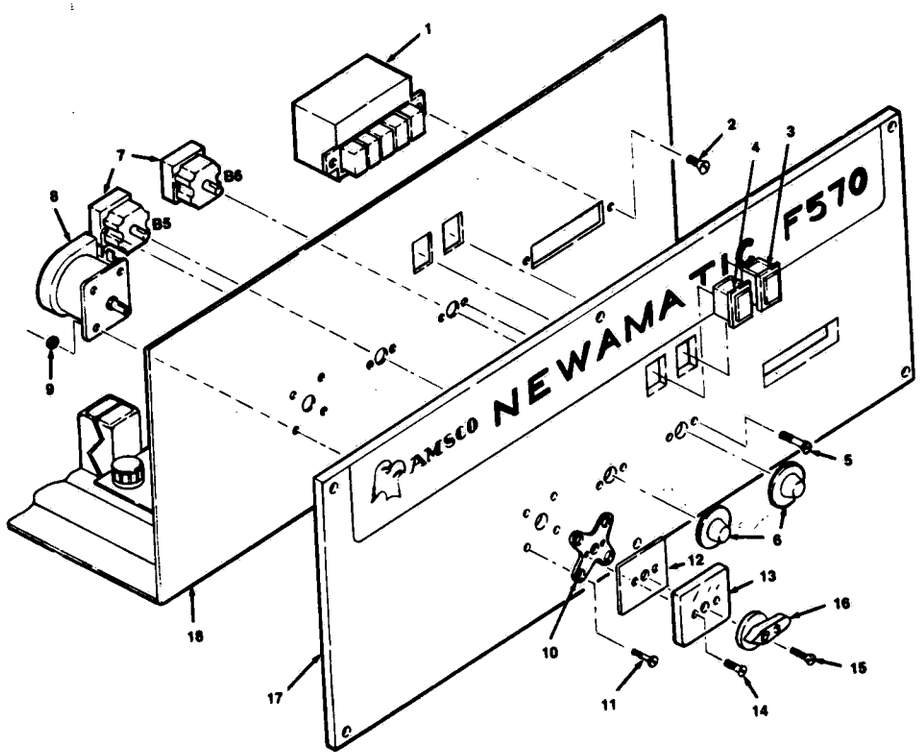


Figure 7-9. PUSH-BUTTON CONTROL PANEL.

C-13

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-9-			PUSH-BUTTON CONTROL PANEL.	*
			PUSH-BUTTON CYCLE SELECTOR	1
1	761825-001		SCREW, Machine Oval Head	2
2			LIGHT, Program Indicating (White, 220 V)	1
3		592940	SWITCH, Toggle — With Light	1
4	761823-001		SCREW, Slotted Head	4
5			KNOB, Black Control	2
6		531229	THERMOSTAT	2
7	761826-001		SWITCH, Main Power	1
	761822-001		• SWITCH	1
8			• NUT, Hex	4
9			• SPACER	1
10			• SCREW	4
11			• SPACER	1
12			• PLATE, Switch	1
13			• SCREW, Slotted Head	1
14			• SCREW, Slotted Head	1
15			• KNOB	1
16			PANEL, Front	1
17			DRAWER (See Figure 7-11)	
18				

C-14

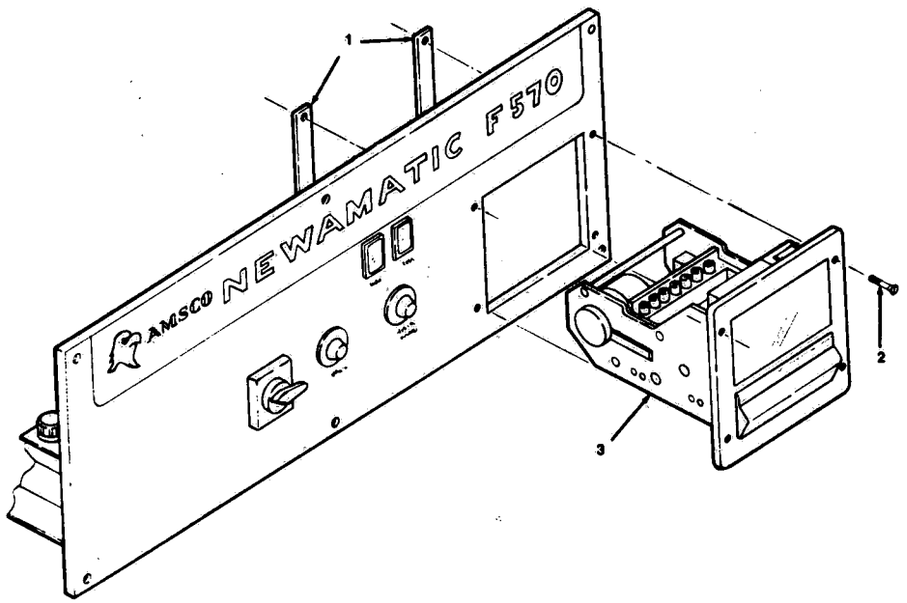


Figure 7-10. PUNCH-CARD CONTROL PANEL (Sheet 1 of 2).

D-1

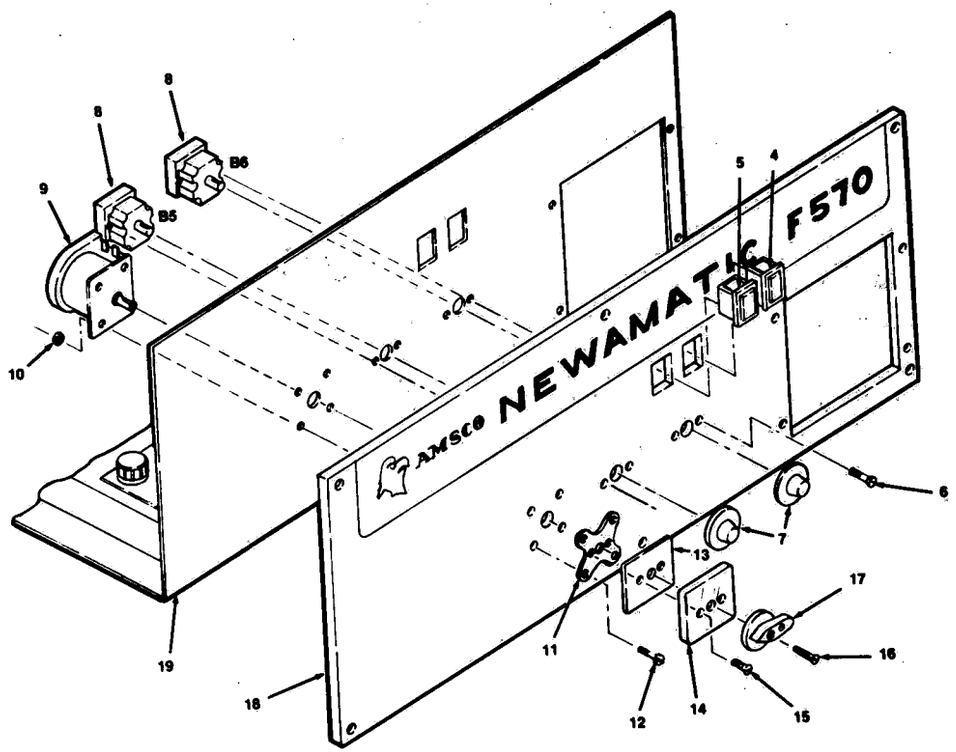


Figure 7-10. PUNCH-CARD CONTROL PANEL (Sheet 2 of 2).

D-2

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-10-			PUNCH-CARD CONTROL PANEL	*
1		857578	MOUNTING SHEET	2
2			SCREW	4
3	762408-001		PUNCH CARD READER	1
4		592940	LIGHT, Program Indicating (White, 220 V)	1
5	761823-001		SWITCH, Toggle — With Light	1
6			SCREW, Slotted Head	4
7		531229	KNOB, Black Control	2
8	761826-001		THERMOSTAT	2
	761822-001		SWITCH, Main Power	1
9			• SWITCH	1
10			• NUT, Hex	4
11			• SPACER	1
12			• SCREW	4
13			• SPACER	1
14			• PLATE, Switch	1
15			• SCREW, Slotted Head	1
16			• SCREW, Slotted Head	1
17			• KNOB	1
18			PANEL, Front	1
19			DRAWER (See Figure 7-12)	1
	762409-001		PROGRAM PUNCH CARD, Yellow Coded (Not Shown)	1
	762410-001		PROGRAM PUNCH CARD, Blue Coded (Not Shown)	1
	762411-001		PROGRAM PUNCH CARD, Black Coded (Not Shown)	1

D-3

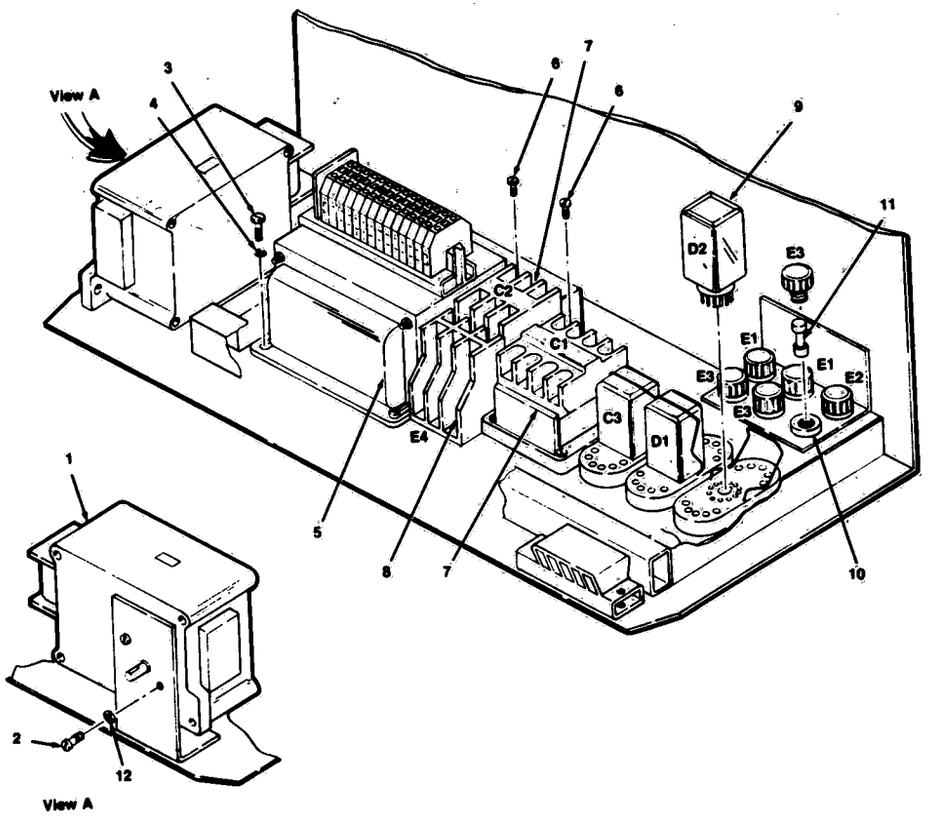


Figure 7-11. PUSH-BUTTON CONTROL DRAWER.

D-4

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-11-			PUSH-BUTTON CONTROL DRAWER	*
				1
1	761827-001		SWITCH GEAR	2
2			SCREW, Slotted Head	4
3			SCREW, Slotted Head	4
4			LOCKWASHER	1
5	761832-001		TRANSFORMER, Control (200-550 V/220 V, 250 VA)	6
6			SCREW, Slotted Head	1
7	761828-001		STARTER, Air Cooled — 220 V, 50/60 Hz	1
8	761831-001		OVERLOAD PROTECTOR, Motor — 2.5 to 4 Amp	3
9	761830-001		RELAY, Plug-in (220 V, 60 Hz)	6
10			HOLDER, Fuse	2
11			FUSE, 2 Amp, E1	1
			FUSE, 1 Amp, E2	3
			FUSE, 8 Amp, E3	2
			LOCKWASHER	1
12	761829-001		BLOCK, Attachment (Not Shown)	

D-5

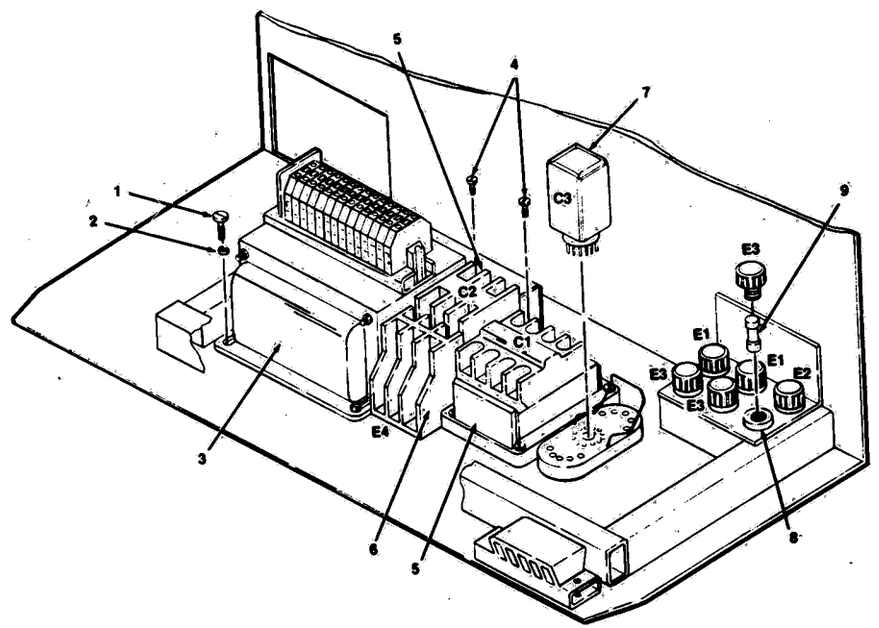


Figure 7-12. PUNCH-CARD CONTROL DRAWER.

D-6

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-12-			PUNCH-CARD CONTROL DRAWER	*
			SCREW, Slotted Head	4
1			LOCKWASHER	4
2			TRANSFORMER, Control (200-550 V/220 V, 250 VA)	1
3	761832-001		SCREW, Slotted Head	6
4			STARTER, Air Cooled — 220 V, 50/60 Hz	1
5	761828-001		OVERLOAD PROTECTOR, Motor — 2.5 to 4 Amp	1
6	761831-001		RELAY, Plug-in (220 V, 60 Hz)	1
7	761830-001		HOLDER, Fuse	6
8			FUSE, 2 Amp, E1	2
9			FUSE, 1 Amp, E2	1
			FUSE, 8 Amp, E3	3

D-7

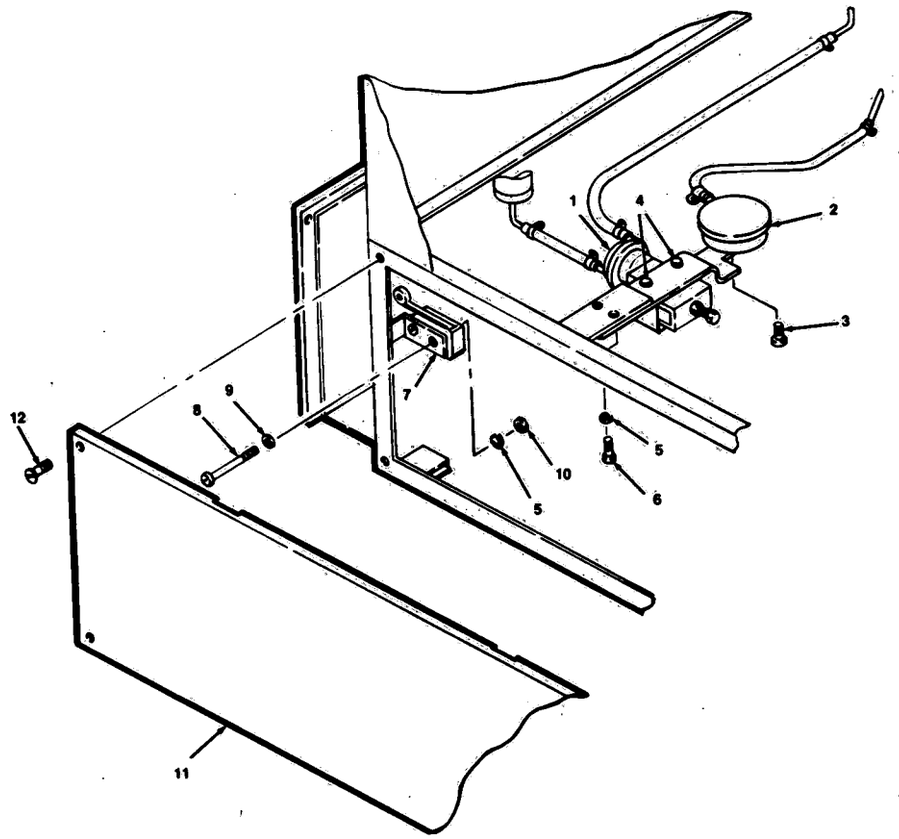


Figure 7-13. LEVEL SWITCH, DETERGENT PUMP AND DOOR SWITCH.

D-8

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-13-			LEVEL SWITCH, DETERGENT PUMP AND DOOR SWITCH	*
1	761816-001		PUMP, Magnetic Diaphragm, 220 V, 50 Hz, Winterhalter Type ELT 10	1
2	761815-001		SWITCH, Triple Pressure	1
3			SCREW, Slotted Head	1
4			SCREW, Hex Head	2
5			LOCKWASHER	2
6			SCREW, Hex Head	2
7	761824-001		SWITCH, Micro	1
8			SCREW, Slotted Head	2
9			LOCKWASHER	4
10			NUT	2
11		857076	PANEL, Side	1
12	762226-001		SCREW, Oval Head	4

D-9

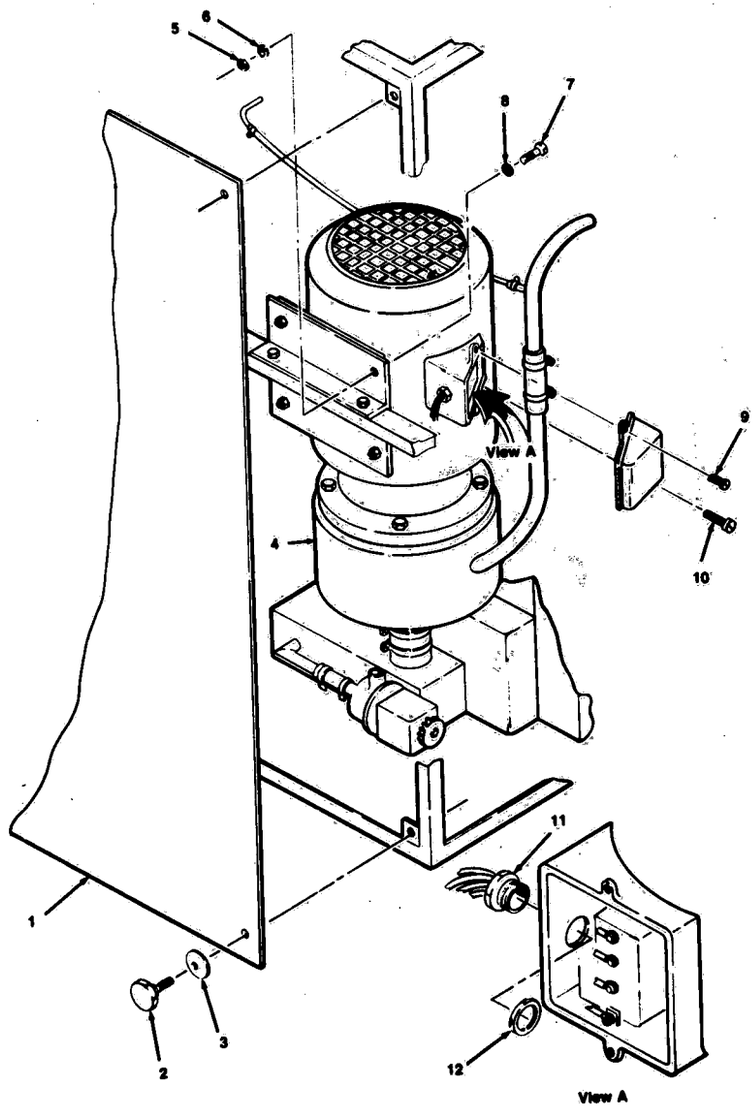


Figure 7-14. WASH PUMP.

D-10

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-14-			WASH PUMP	*
1			PLATE, Bottom	1
2	762228-001		FOOT, Leveling	4
3			WASHER	4
4	762479-001		WASH PUMP ASSEMBLY	1
5			NUT, Hex	4
6			LOCKWASHER	4
7			BOLT, Hex Head	4
8			WASHER	4
9			SCREW, Slotted Head (Shorter than item 10)	1
10			SCREW, Slotted Head (Longer than item 9)	1
11			GROMMET	1
12			LOCKNUT	1

D-11

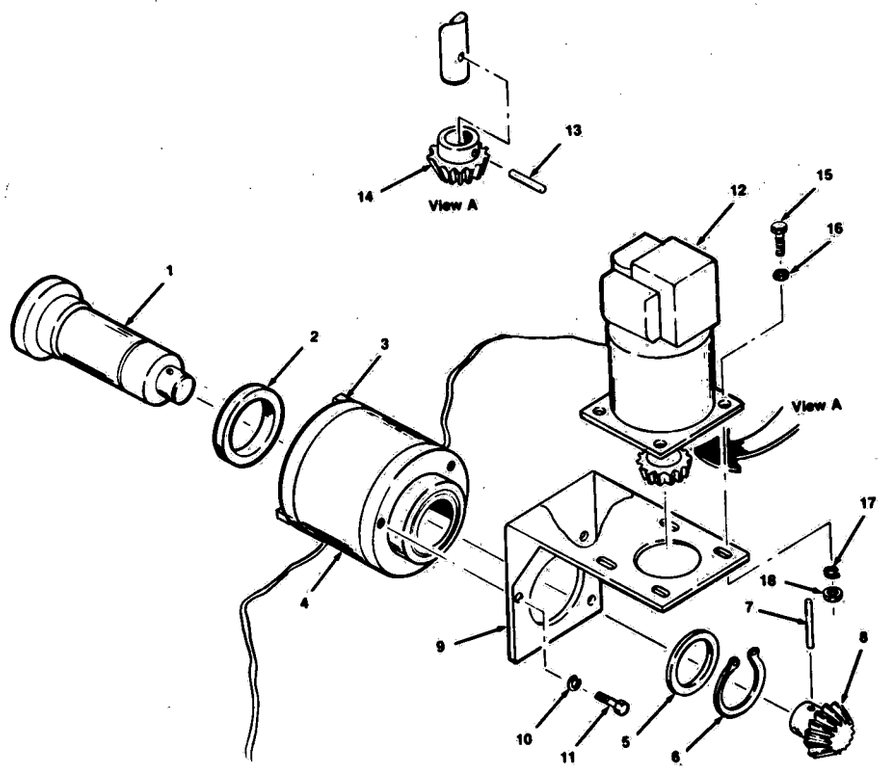


Figure 7-15. DRIVE SHAFT AND MOTOR.

D-12

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-15-		858675	DRIVE SHAFT AND MOTOR	*
			DRIVE SHAFT ASSEMBLY	1
		858676	• SHAFT, Drive	1
1		857012	• GASKET, Radial	1
2	762412-001		• BOLT, Hex Head	3
3			• HOUSING, Bearing	1
4			• WASHER	1
5			• KEEPER	1
6			• PIN, Locking	1
7	761804-001		• WHEEL, Bevel	1
8	761805-001		ANGLE IRON	1
9			LOCKWASHER	3
10			BOLT, Hex Head	3
11		858677	DRIVE MOTOR ASSEMBLY	1
			• MOTOR, Gear — Split Pole, 220 V, 50 Hz, 1.7 rpm	1
12	761806-001		• PIN, Locking	1
13	761808-001		• WHEEL, Bevel	1
14	761807-001		• SCREW, Socket Head	4
15			• WASHER	4
16			• LOCKWASHER	4
17			• NUT, Hex	4
18				

D-13

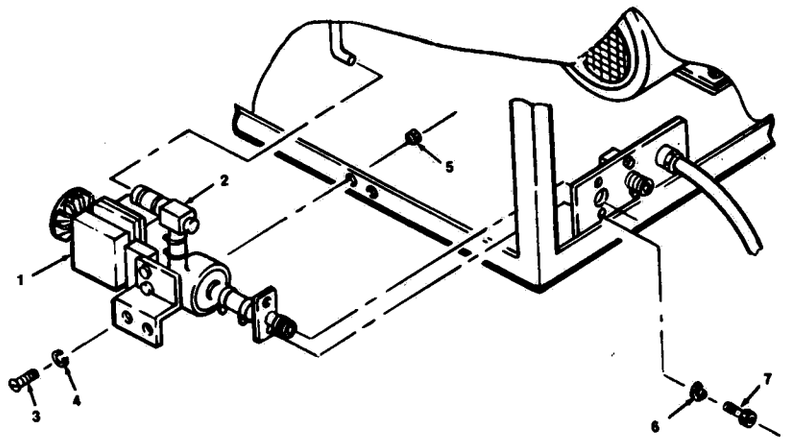


Figure 7-16. OPTIONAL PURIFIED-WATER PUMP WITH SOLENOID VALVE.

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FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-16-		364764	OPTIONAL PURIFIED-WATER PUMP WITH SOLENOID VALVE	X
1	761811-001		PUMP	1
2.	761812-001		VALVE, Solenoid — 220 V, 60 Hz, 3 psig	1
3			SCREW, Slotted Flat Head	2
4			LOCKWASHER	2
5			NUT, Hex	2
6			LOCKWASHER	2
7			SCREW, Socket Head	2

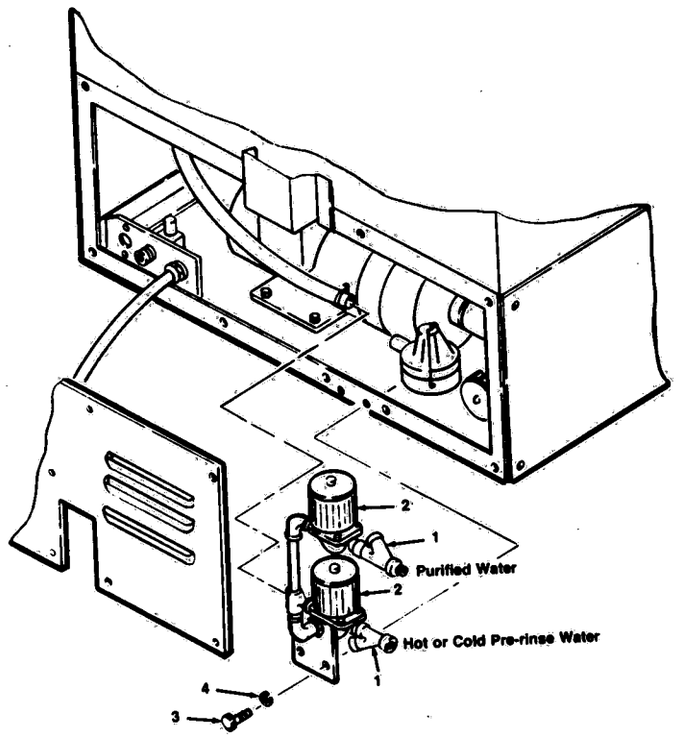

Figure 7-17. OPTIONAL NONCIRCULATING PURIFIED-WATER RINSE SOLENOID VALVE WITH PRE-RINSE SOLENOID VALVE.

FIG. & INDEX NO.	AMSCO PART NUMBER	NETZSCH PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
7-17-	337525-091		OPTIONAL NONCIRCULATING PURIFIED-WATER RINSE SOLENOID VALVE WITH PRE-RINSE SOLENOID VALVE	*
1			STRAINER	2
2	761813-001		VALVE, Solenoid	2
3			BOLT, Hex Head	2
4			LOCKWASHER	2

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NEWAMATIC GLASSWARE WASHER P-763626-002

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