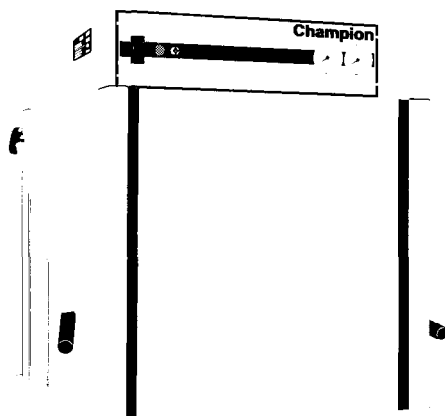


# Champion

**The Dishwashing Machine Specialists**

## Technical Manual

---



### **Door-Type Dishwasher**

**Model**  
**D-HB**  
**High Temperature**  
**with Built-in Booster**  
**D-H1**  
**High Temperature**  
**D-LF Low Temperature**

**Machine Serial No.**

---

**April, 1996**

**Manual P/N 111807**

---

P.O. Box 4149  
Winston-Salem, North Carolina 27115-4149  
336/661-1556 Fax: 336/661-1660  
Email: [champion@championindustries.com](mailto:champion@championindustries.com)

**Champion Industries, Inc.**

2674 N. Service Road  
Jordan Station, Ontario, Canada L0R 1S0  
905/562-4195 Fax: 905/562-4618

Complete the information below so it will be available for quick reference.

Model Number-\_\_\_\_\_ Serial Number- \_\_\_\_\_

Voltage and Phase \_\_\_\_\_

Champion Parts Distributor \_\_\_\_\_ Phone \_\_\_\_\_

Champion Service Agency- \_\_\_\_\_ Phone \_\_\_\_\_

Champion Industries Service: 1 (800) 858-4477 Champion Service Fax: 1 (336) 661-1660

In Canada:

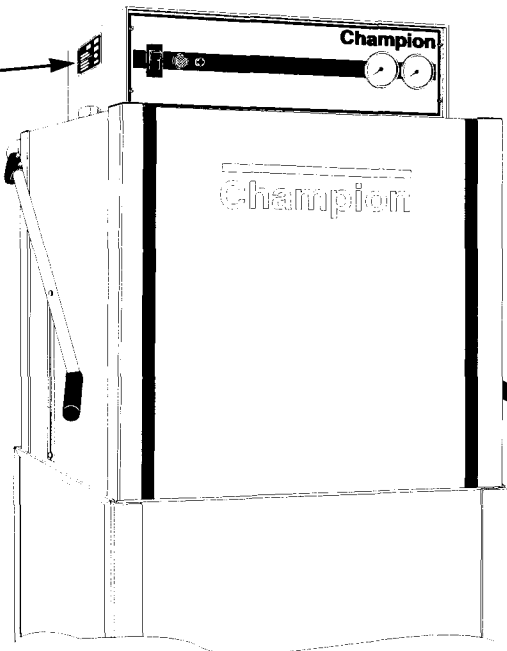
Champion Service: 1 (800) 263-5798 Canada

Service Fax: 1 (905) 562-4618

We strongly recommend that you fax your orders.

**NOTE:** When calling to order parts, be sure to have the model number, serial number, voltage, and phase of your machine.

**Machine Data Plate with  
Model & Serial number  
located on left side of  
control cabinet.**



## Revision History

Revision Effectivity	Revised	Serial Number	Comments Date	Pages
4/16/96	—	—	Reissue manual with new replacement parts lists	
9/16/96	11-12	—	Revised straight-through to comer conversion instructions	

## CONTENTS

	Page
The Dishwashing Formula	6
WARRANTY	7
INTRODUCTION	8
GENERAL	9
Model Numbers	9
Standard Equipment	9
Options	9
Accessories	9
Electrical Power Requirements	10
INSTALLATION	11
Unpacking	11
Changing from Straight-through to Corner Operation	11
Electrical Connections	12
Plumbing Connections	13
Water Connections	13
Drain Connections	14
Chemical Connections	14
Model D-HB, D-H1 and D-LF	15
Detergent	15
Rinse Aid/Sanitizer	16
INITIAL START-UP	18
Model D-HB, D-H1 and D-LF	
OPERATION	19
Model D-HB, D-H1 and D-LF	
MAINTENANCE	20
Maintenance Schedule	20
CLEANING	20
Every 2 Hours or After Each Meal Period	
Model D-HB, D-H1 and D-LF	20
Every 8 Hours or at the End of the Day	
Model D-HB, D-H1 and D-LF	20
DELIMING	21
Deliming process	
Model D-HB, D-H1 and D-LF	21
OPERATION CHECKS	22
Daily	22
Weekly	22

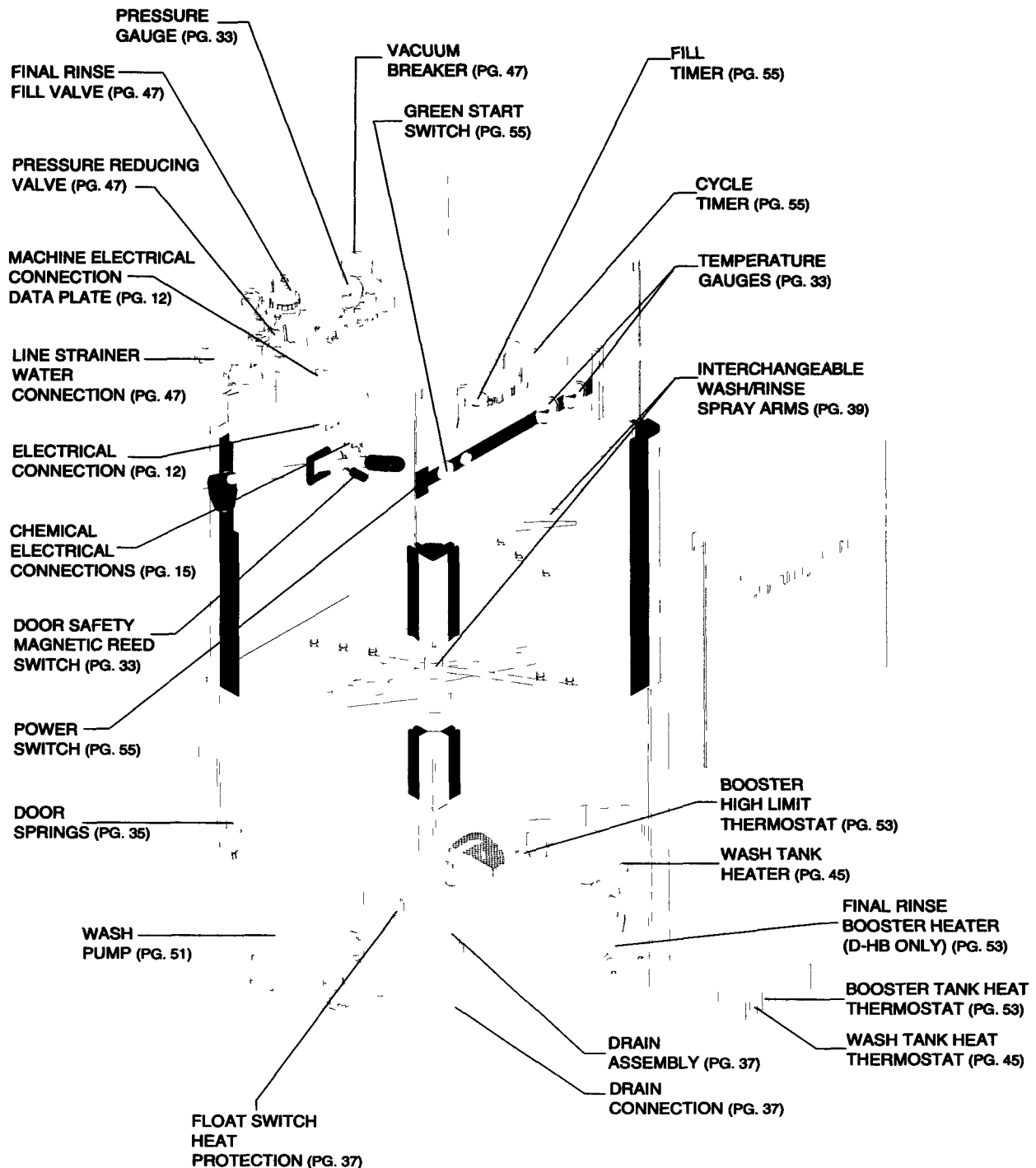
## CONTENTS

	Page
TROUBLESHOOTING	22
BASIC SERVICE	24
Electrical Service	24
Fuses	25
Motor Overloads	25
Timers	26
Timed Fill/Low Water Tank Heat Protection	27
Heater Element Wiring	28
Motor Connections	29
Mechanical Service	30
Pump Seal Replacement	30
REPLACEMENT PARTS LIST	31
ELECTRICAL SCHEMATICS & DIAGRAMS	67
LIST OF FIGURES	
Figure 1 — Placement for Corner Operation	11
Figure 2 — Changing the Track Assembly	12
a — Straight-Through Configuration	
b — Corner Configuration	
Figure 3 — Drain Connection	14
Figure 4 — Chemical Connection Points	15
Figure 5 — Detergent Probe Insertion Point	15
Figure 6 — Rinse Aid Insertion Point	16
Figure 7 — Rinse Aid/Sanitizer Injection Points	17
Figure 8 — Operator Controls	18
Figure 9 — Door Activated Drain Lever Assembly	18
Figure 10 — Fuses	25
Figure 11 — Motor Overload	25
Figure 12 — Cycle Timer	26
Figure 13 — Cycle Timer Chart	26
Figure 14 — Fill Timer	26
Figure 15 — Fill Timer Chart	26
Figure 16 — Float Switch	27
Figure 17 — Float Switch Troubleshooting Chart	27
Figure 18 — Pump Motor Wiring Diagrams	29
Figure 19 — Pump Seal Replacement	30
Figure 20 — Doors, Panels and Gauges	32
Figure 21 — Door Handle Assembly and Springs	34
Figure 22 — Door Linkage	35
Figure 23 — Track Assembly, Float Switch and Drain Assembly	36
Figure 24 — Wash/Rinse Spray System Assembly (Beginning with S/N 11599 and above)	38

## **LIST OF FIGURES (cont'd)**

Figure 25	Wash/Rinse Spray Arms (Beginning with S/N 77855 through S/N 11599)	40
Figure 26	Wash/Rinse Spray Arms (Prior to S/N 77854)	42
Figure 27	Tank Heater Element and Thermostat	44
Figure 28	Fill Piping Assembly	46
Figure 29	Fill Piping Assembly	48
Figure 30	Pump Assembly	50
Figure 31	Electric Booster Assembly and Thermostat	52
Figure 32	Control Cabinet	54
Figure 33	Dishracks	56
Figure 34	Steam Coil/Steam Injector Fill Piping	60
Figure 35	Steam Coil and Booster Assembly	62
Figure 36	Steam Injector and Booster Assembly	64
Figure 37	Electrical Schematic D-HB/D-H1, 3 Phase	68
Figure 38	Wiring Diagram D-HB, 3 Phase	69
Figure 39	Electrical Schematic D-HB/D-H1/D-LF, 1 Phase	70
Figure 40	Wiring Diagram D-HB, 1 Phase	71
Figure 41	Wiring Diagram D-H1/D-LF, 3 Phase	72

## D-HB COMPONENT DIAGRAM



# The Dishwasher Formula

## Five Elements for Cleaning Dishes

**A Perfect Score** means **Clean Ware** for your customers  
**Peak Dishwasher Performance** for you.

### Point Value

**1. Time ..... 20**

Wash and rinse times (set by NSF and Champion) allow everything to work.

**2. Temperature..... 20**

Heated water penetrates and loosens soil on dishes.

**3. Mechanical Action..... 20**

Pumps produce water pressure which flushes the soil off dishes.

**4. Chemical Action ..... 20**

Detergent breaks down grease and loosens soil particles.

**5. Procedure..... 20**

Pre-scraping and rinsing removes large food particles from the dishes. Proper washroom ventilation and humidity shortens dish drying time.

**SCORE 100**

# LIMITED WARRANTY

Champion Industries Inc. (herein referred to as Champion), P.O. Box 4149, Winston-Salem, North Carolina 27115, warrants machines, and parts, as set out below.

**Warranty of Machines:** Champion warrants all new machines of its manufacture bearing the name "Champion" and installed within the United States to be free from defects in material and workmanship for a period of one (1) year after the date of installation or fifteen (15) months after the date of shipment by Champion, whichever occurs first. [See below for special provisions relating to glasswashers.] The warranty registration card must be returned to Champion within ten (10) days after installation. If warranty card is not returned to Champion within such period, the warranty will expire after one year from the date of shipment.

Champion will not assume any responsibility for extra costs for installation in any area where there are jurisdictional problems with local trades or unions.

If a defect in workmanship or material is found to exist within the warranty period, Champion, at its election, will either repair or replace the defective machine or accept return of the machine for full credit; provided, however, as to glasswashers, Champion's obligation with respect to labor associated with any repairs shall end (a) 120 days after shipment, or (b) 90 days after installation, whichever occurs first. In the event that Champion elects to repair, the labor and work to be performed in connection with the warranty shall be done during regular working hours by a Champion authorized service technician. Defective parts become the property of Champion. Use of replacement parts not authorized by Champion will relieve Champion of all further liability in connection with its warranty. In no event will Champion's warranty obligation exceed Champion's charge for the machine. The following are not covered by Champion's warranty:

- a. Lighting of gas pilots or burners.
- b. Cleaning of gas lines.
- c. Replacement of fuses or resetting of overload breakers.
- d. Adjustment of thermostats.
- e. Adjustment of clutches.
- f. Opening or closing of utility supply valves or switching of electrical supply current.
- g. Cleaning of valves, strainers, screens, nozzles, or spray pipes.
- h. Performance of regular maintenance and cleaning as outlined in operator's guide.
- i. Damages resulting from water conditions, accidents, alterations, improper use, abuse, tampering, improper installation, or failure to follow maintenance and operation procedures.
- j. Wear on Pulper cutter blocks, pulse vanes, and auger brush.

*Examples of the defects not covered by warranty include, but are not limited to:* (1) Damage to the exterior or interior finish as a result of the above. (2) Use with utility service other than that designated on the rating plate. (3) Improper connection to utility service. (4) Inadequate or excessive water pressure. (5) Corrosion from chemicals dispensed in excess of recommended concentrations. (6) Failure of electrical components due to connection of chemical dispensing equipment installed by others. (7) Leaks or damage resulting from such leaks caused by the installer, including those at machine table connections or by connection of chemical dispensing equipment installed by others. (8) Failure to comply with local building codes. (9) Damage caused by labor dispute.

**Warranty of Parts:** Champion warrants all new machine parts produced or authorized by Champion to be free from defects in material and workmanship for a period of 90 days from date of invoice. If any defect in material and workmanship is found to exist within the warranty period Champion will replace the defective part without charge.

**DISCLAIMER OF WARRANTIES AND LIMITATIONS OF LIABILITY. CHAMPION'S WARRANTY IS ONLY TO THE EXTENT REFLECTED ABOVE. CHAMPION MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED, TO ANY WARRANTY OF MERCHANTABILITY, OR FITNESS OF PURPOSE. CHAMPION SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. THE REMEDIES SET OUT ABOVE ARE THE EXCLUSIVE REMEDIES FOR ANY DEFECTS FOUND TO EXIST IN CHAMPION DISHWASHING MACHINES AND CHAMPION PARTS, AND ALL OTHER REMEDIES ARE EXCLUDED, INCLUDING ANY LIABILITY FOR INCIDENTALS OR CONSEQUENTIAL DAMAGES.**

Champion does not authorize any other person, including persons who deal in Champion dishwashing machines to change this warranty or create any other obligation in connection with Champion Dishwashing Machines.

# INTRODUCTION

Welcome to **Champion ...**

and thank you for allowing us to take care of your dishwashing needs.

This manual covers the door-type series dishwasher models D-H1, D-HB, and D-LF.

Your machine was completely assembled, inspected, and thoroughly tested at our factory before it was shipped to your installation site.

This manual contains:

- Warranty Information
- Operation and Cleaning Instructions
- Maintenance Instructions
- Troubleshooting Guide
- Basic Service Information
- Replacement Parts Lists
- Electrical Schematics

Complete and return your warranty registration card within ten (10) days after the installation of your machine.

All information, illustrations and specifications contained in this manual are based upon the latest product information available at the time of publication. **Champion** constantly improves its products and reserves the right to make changes at any time or to change specifications or design without notice and without incurring obligation.

For your protection, factory authorized parts should always be used for repairs.

Replacement parts may be ordered from your **Champion** authorized parts distributor or from your **Champion** authorized service agency. When ordering parts, please supply the model number, serial number, voltage and phase of your machine, the part number, part description and quantity.

# GENERAL

This manual covers the Champion door type dishwashing machine. These machines are fully automatic and come equipped with a 1 -HP pump motor.

The D-series dishwasher is available in the following models:

## **Model Numbers**

D-H1,D-HB,D-LF

The D-H1 model is a high temperature (180°F/82°C rinse) sanitizing model without booster.

The D-HB model is a high temperature (180°F/82°C rinse) sanitizing model with booster.

The D-LF is a low temperature (Min. 120°F/49°C-140°F/60°C Optimum) sanitizing model for use with a sodium hypochlorite (Chlorine) based sanitizer at a minimum concentration of 50PPM in the final rinse.

## **Standard Equipment includes:**

D-H1, D-HB, D-LF

- Automatic tank fill
- Built-in electric or steam booster heater (D-HB only)
- Door activated drain
- Field convertible to comer model
- Electric tank heat
- Balanced three door lift system
- Low-water tank heat protection
- 1-hp drip-proof pump motor
- Door safety switches
- Common utility connections
- Two dish racks (peg and flat bottom)
- Detergent/chemical connection provisions
- Stainless steel front and side panels
- Top-mounted, splash-proof control console
- 60-second time cycle
- 1-1/2" O.D. gravity drain connection
- Water pressure regulating valve (mounted) (D-HB only)
- Interchangeable upper and lower spray arms

## **Options (D-HB only)**

- Electric booster (70°F/39°C temperature rise) heater for 110°F/43°C supply water
- Steam injector or steam coil tank heat (steam booster 40°F/23°C - 70°F/39°C rise)
- Single source gas booster system

## **Accessories**

Additional dishracks:

Dish rack (peg)

P/N101285

Silverware rack (flat bottom)

P/N101273

## Electrical Power Requirements

Model	Voltage	Booster Rise (D-HB Only)	Machine Full Load Amps	Power Requirement (125% Service Factor)
D-H1/LF	115/60/1	—	48 Amps	60 Amps
D-H1/LF	208/60/1	—	23 Amps	29 Amps
D-H1/LF	220/60/1	—	23 Amps	29 Amps
D-H1/LF	230/60/1	—	23 Amps	29 Amps
D-H1/LF	240/60/1	—	24 Amps	30 Amps
D-H1/LF	208/60/3	—	12 Amps	15 Amps
D-H1/LF	220/60/3	—	13 Amps	16 Amps
D-H1/LF	230/60/3	—	13 Amps	16 Amps
D-H1/LF	240/60/3	—	13 Amps	16 Amps
D-H1/LF	380/60/3	—	7 Amps	9 Amps
D-H1/LF	415/60/3	—	8 Amps	10 Amps
D-H1/LF	480/60/3	—	6 Amps	8 Amps
D-H1/LF	575/60/3	—	5 Amps	6 Amps
D-HB	115/60/1			
D-HB	208/60/1	40°F/23°C	59 Amps	74 Amps
D-HB	220/60/1	40°F/23°C	61 Amps	76 Amps
D-HB	230/60/1	40°F/23°C	63 Amps	79 Amps
D-HB	240/60/1	40°F/23°C	65 Amps	81 Amps
D-HB	208/60/3	40°F/23°C	33 Amps	41 Amps
D-HB	220/60/3	40°F/23°C	35 Amps	44 Amps
D-HB	230/60/3	40°F/23°C	36 Amps	45 Amps
D-HB	240/60/3	40°F/23°C	37 Amps	46 Amps
D-HB	380/60/3	40°F/23°C	20 Amps	25 Amps
D-HB	415/60/3	40°F/23°C	20 Amps	25 Amps
D-HB	480/60/3	40°F/23°C	17 Amps	21 Amps
D-HB	575/60/3	40°F/23°C	14 Amps	18 Amps
D-HB	115/60/1			
D-HB	208/60/1	—	—	—
D-HB	220/60/1	—	—	—
D-HB	230/60/1	—	—	—
D-HB	240/60/1	—	—	—
D-HB	208/60/3	70°F/39°C	50 Amps	63 Amps
D-HB	220/60/3	70°F/39°C	52 Amps	65 Amps
D-HB	230/60/3	70°F/39°C	54 Amps	68 Amps
D-HB	240/60/3	70°F/39°C	56 Amps	70 Amps
D-HB	380/60/3	70°F/39°C	30 Amps	38 Amps
D-HB	415/60/3	70°F/39°C	33 Amps	41 Amps
D-HB	480/60/3	70°F/39°C	28 Amps	35 Amps
D-HB	575/60/3	70°F/39°C	23 Amps	29 Amps

# INSTALLATION

## Unpacking



### CAUTION:

*Care should be taken when lifting the machine to prevent damage.*

1. Immediately after unpacking the machine, inspect for any shipping damage. If damage is found, save the packing material and contact the carrier immediately.
2. Remove the dishwasher from the skid. Adjust the feet if required, then move the machine to its permanent location.
3. Level the machine (if required) by placing a level on the top of machine and adjusting the feet. Level the machine front-to-back and side-to-side.
4. Remove the two dishracks from the interior of the machine.



### NOTE:

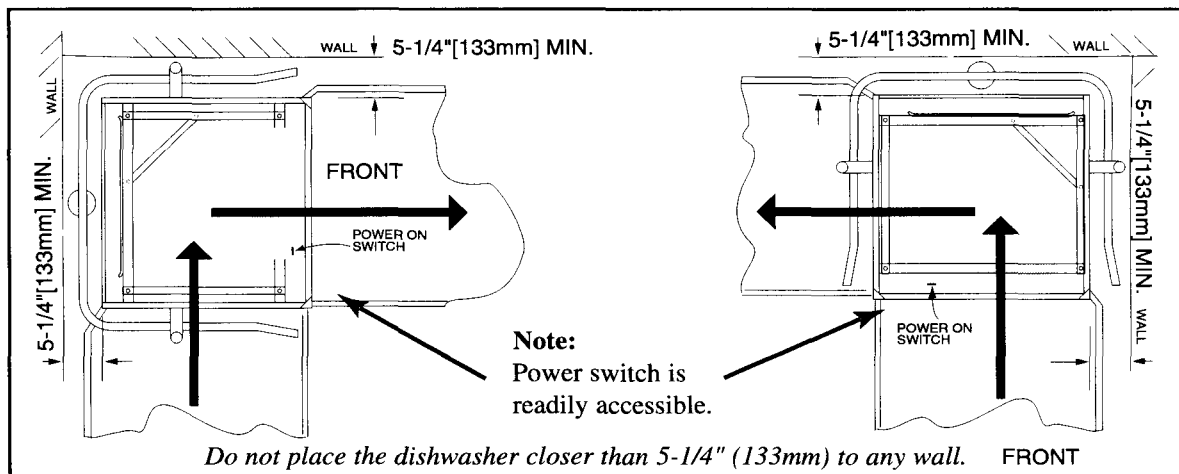
*The installation of your machine must meet local health codes.*

## Changing from Straight-through to Corner Operation

Your door-type dishwasher is shipped from the factory in a straight-through configuration. The following instructions explain how to convert your machine for corner operation.

Refer to Fig. 1 below.

1. Place the dishwasher so the operator controls are readily accessible.
2. Minimum clearance from any corner wall is 5-1/4" (133mm).



**Figure 1 Placement for Corner Operation**

## Changing from Straight-through to Corner Operation (cont'd)

Refer to Fig. 2 and perform the steps below.

1. Remove the front rack guide (A). Discard the square spacers.
2. Move front rack guide (A) to the left side of the rack tracks. (See Fig. 2b) Use existing hardware.
3. Unbolt the track (B) and rack support rod (C).
4. Remove and save the two remaining fasteners from rear track.
5. Bolt (B) and (C) as shown in Fig. 2b.

Figure 2 Changing the Track Assembly

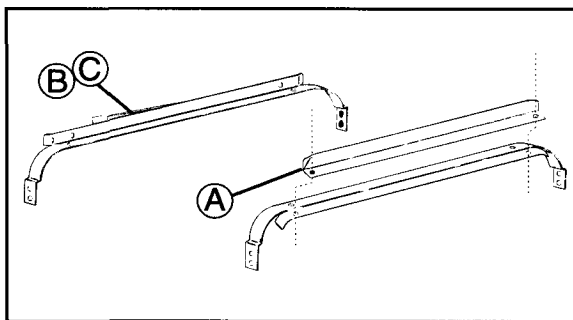


Figure 2a Straight-Through Configuration

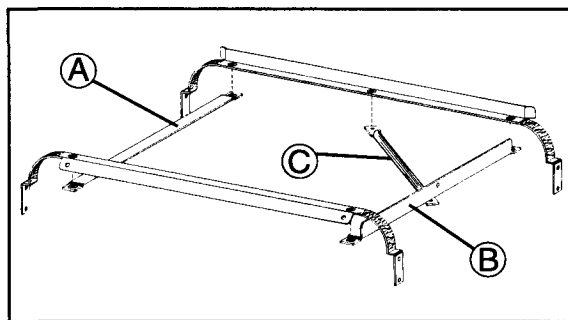


Figure 2b Corner Configuration

## Electrical Connections



### WARNING:

*Electrical and grounding connections must comply with the National Electrical Code and/or Local Electrical Codes.*



### WARNING:

*When working on the dishwasher, disconnect the electric service and place a tag at the disconnect switch to indicate work is being done on that circuit.*

1. A qualified electrician must compare the electrical power supply with the machine electrical specifications stamped on the MACHINE ELECTRICAL CONNECTION PLATE located inside the top mounted control cabinet before connecting to the incoming service at a fused disconnect switch.
2. Motor rotation was set at the factory. Check the rotation of the motor shaft (CW when viewed from rear of motor). For three phase machines, reversing the motor direction is done in the control cabinet by reversing the wires LI and L2 on the disconnect side of the main electrical connection block. For single phase machines, motor rotation is changed at the motor connection plate on the rear of the single phase motor.

## Electrical Connections (cont'd)

3. A knock-out is provided at the rear of the top mounted control cabinet for the electrical service connection. A single source electrical connection has been provided. A fused disconnect switch or circuit breaker (supplied by others) is required to protect each power supply circuit.

## Plumbing Connections



### CAUTION:

*Plumbing connections must comply with local sanitary and plumbing codes.*

## Water Connections

1. Connect the hot water supply to the "Y" strainer or pressure reducing valve (PRV) at the final rinse piping (located behind the control cabinet at the top of the machine).
2. Minimum incoming water supply temperature requirements are listed below:
  - D-HB with built-in 40°F/23°C rise electric booster (Minimum 140°F/60°C) (Min./Max. flow pressure 20-22 psi/138 Kpa)
  - D-HB with built-in 70°F/39°C rise electric booster (Minimum 110°F/43°C) (Min./Max. flow pressure 20-22 psi/138 Kpa)
  - D-H1 without built-in booster (Minimum 180°F/70°C) (Min./Max. flow pressure 20-22 psi/138 Kpa)
  - D-LF (Minimum 120°F/49°C - 140°F/60°C Optimum) (Min./Max. flow pressure 20-22 psi/138 Kpa)
3. A manual shut-off valve for steam and water (supplied by others) should be installed in supply line to allow for servicing of the machine. The shut-off valve should be the same size or larger than the supply line.
4. A 3/4" Pressure Regulating Valve (PRV), should be installed on the incoming water supply line if water flow pressure exceeds 20-22 psi/138 Kpa.

A PRV is standard equipment on Model D-HB.

A PRV is not standard equipment on Models D-H1 and D-LF. The PRV may be obtained locally or direct from Champion.

## Drain Connections

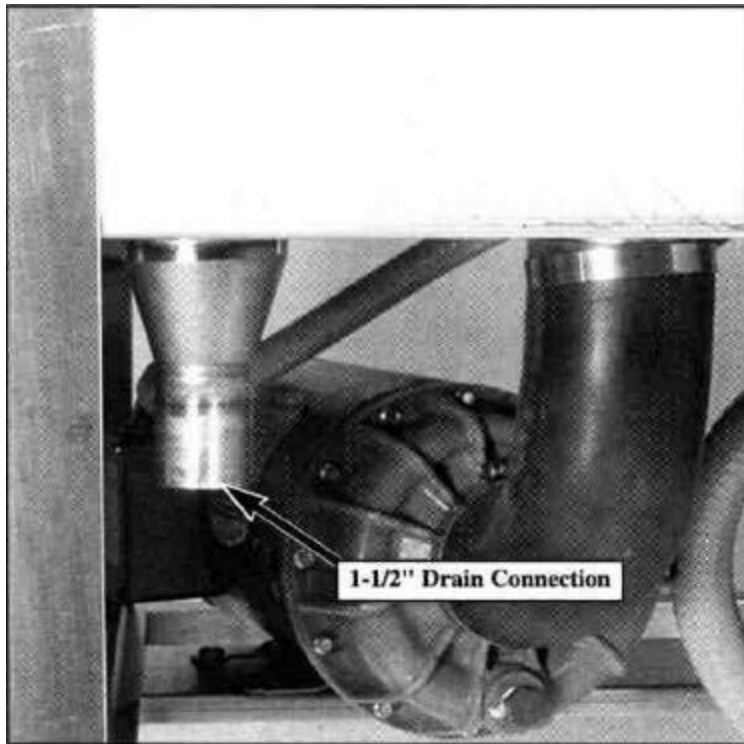
Refer to Fig. 3 for the location of the machine drain.

1. Models D-HB, D-H1, and D-LF are GRAVITY DRAIN machines equipped with a 1-1/2" hose connection point. • Drain height for ALL MODELS must not exceed 15" above floor level.



### **WARNING:**

*Connection of the machine to a drain line higher than the machine drain height will prevent the machine from draining properly.*



**Figure 3 D-HB, D-H1, D-LF 1-1/2"  
Drain Connection Front Left Side of  
Machine**

## Ventilation



### **NOTE:**

*Ventilation must comply with local sanitary and plumbing codes.*



### **CAUTION:**

*Exhaust air should not be vented into a wall, ceiling, or concealed space of a building. Condensation can cause damage.*

## Chemical Connections



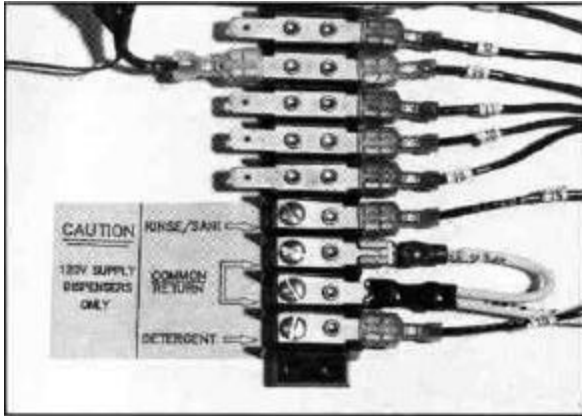
### NOTE:

*Consult a qualified chemical supplier for your chemical needs.*

#### Models D-HB, D-H1 and D-LF

1. Refer to Fig. 4

Labeled chemical signal connection points are provided inside the control cabinet for chemical dispensing equipment (supplied by others).



#### Signal connection points include:

- Detergent signal 120 VAC between Wire #10 and Wire #2 (1 AMP MAX AMP LOAD)
- Rinse Aid/Sanitizier signal 120 VAC between Wire #15 and Wire #2 (1 AMP MAX AMP LOAD)

**Figure 4 D-HB, D-H1, D-LF Chemical Connection Points Left Side Interior of Control Cabinet**

## Detergent

1. Refer to Fig. 5

A removable black plug, located on the rear of the wash tank is provided as a detergent probe insertion point.



**Figure 5 D-HB, D-H1, D-LF Detergent Probe Insertion Point Wash Tank (Rear)**

## Chemical Connections (cont'd)

### Detergent (cont'd)

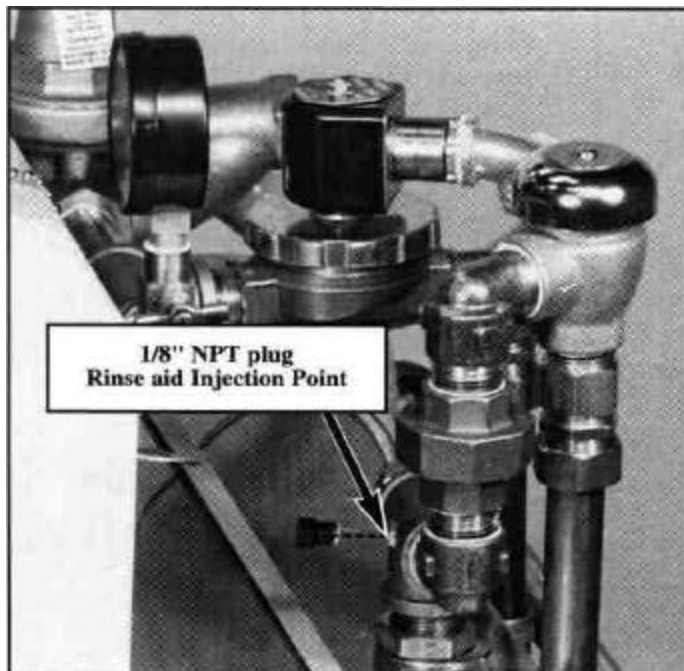
2. Detergent may be added manually if dishwasher is not equipped with dispensing equipment. Consult your chemical supplier for recommended amounts.

### Rinse Aid/Sanitizer

#### Model D-HB and D-H1

Refer to Fig. 6

1. A rinse aid injection point is provided via a 1/8" NPT plug located in the final rinse piping. The plug is located in a Tee fitting on the outlet side of the vacuum breaker. The vacuum breaker is located behind the control cabinet at the top of the machine.
2. Use a liquid rinse aid.



**Figure 6 Rinse aid Insertion  
Point D-HB, D-H1 Only**

**NOTE:**  
 *Models D-HB and D-H1 do not require sanitizer.*

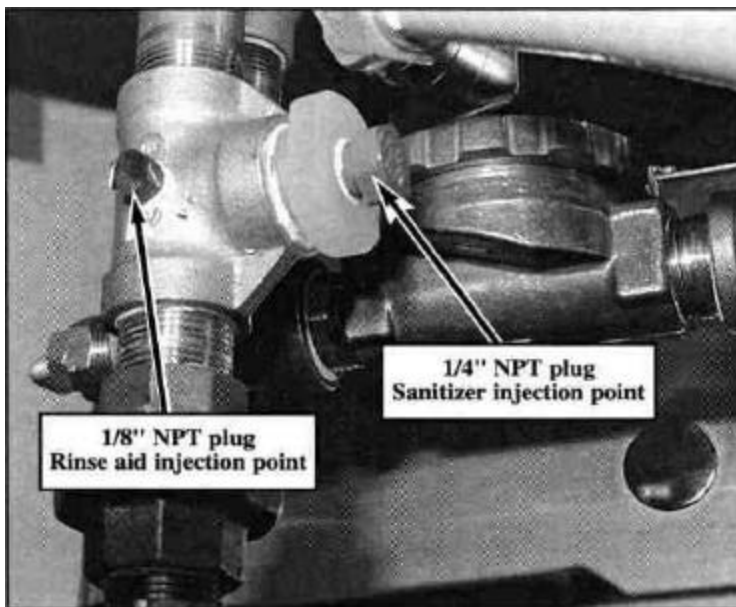
## Chemical Connections (cont'd)

### Rinse Aid/Sanitizer (cont'd)

Model D-LF Refer

to Fig. 7

1. A Rinse aid injection point is provided via a 1/8" NPT plug located in the final rinse piping. The plug is located in a Tee fitting on the outlet side of the vacuum breaker. The vacuum breaker is located behind the control cabinet at the top of the machine.
2. Use a liquid rinse aid.
3. A Sanitizer injection point is provided via a 1/4" NPT plug located in the final rinse piping. The plug is located in a Tee fitting on the outlet side of the vacuum breaker. The vacuum breaker is located behind the control cabinet at the top of the machine.
4. Use a sodium hypochlorite (Chlorine) based sanitizer at a minimum concentration of 50PPM in the final rinse. Use chlorine test papers to verify and monitor the 50PPM chlorine level.



**Figure 7 D-LF Rinse Aid/Sanitizer Injection Points**



**WARNING:**

*Never premix rinse aid with the sanitizing agent. Mixing may cause hazardous gases to form.*



**CAUTION:**

*Some metal, including silver, aluminum, and pewter are attacked by sodium hypochlorite (chlorine sanitizer). Avoid cleaning these metals in a D-LF dishwasher.*

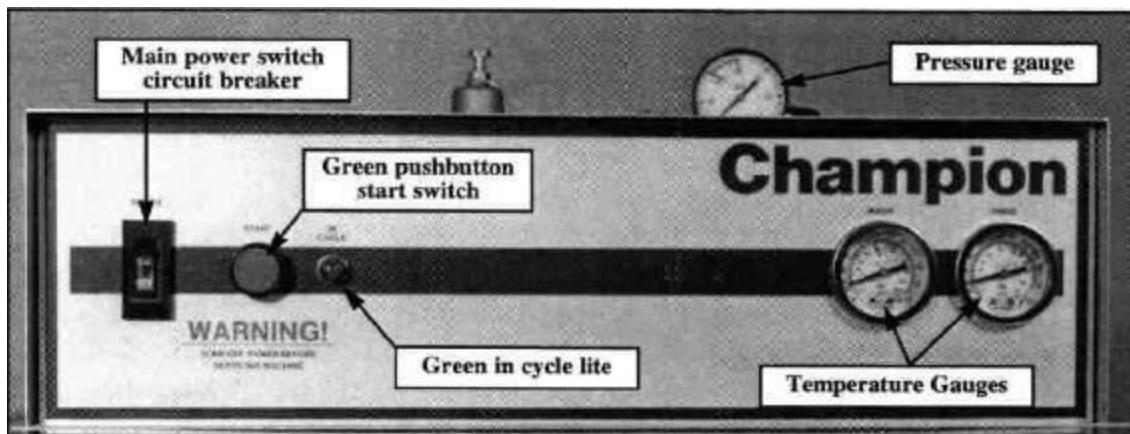
## INITIAL START-UP

After plumbing and electrical connections are completed, follow the steps below to place your machine in service.

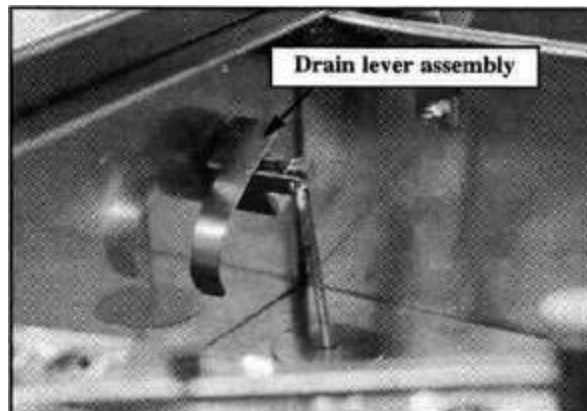
Model D-HB, D-H1 and D-LF Refer to

Figs. 8 and 9 below.

1. Remove any foreign material from inside the machine. Make sure scrap screens are in place.
2. Make sure drain lever assembly is closed.
3. Close the Door.
4. Turn the water and main power sources to the dishwasher **ON**.
5. Flip the Power switch to the ON position. The "power on" light will illuminate and the machine will automatically fill with water.
6. Check the machine for leaks.
7. Push the Green Start Button to check automatic cycle.
8. Check pump motor rotation. Rotation is CW when viewed from rear of motor.
9. If machine checks okay, lift the drain lever assembly to drain machine. 10. Flip the power switch to OFF.



**Figure 8 Operator Controls Top Mounted Control Cabinet**



**Figure 9 Door Activated Drain Lever Assembly**

# OPERATION

## Model D-HB, D-H1 and D-LF

- |  |   |
|--|---|
| 1. Close the door and flip power switch ON                                     | Power light illuminates. Tank fills automatically and tank heat comes on.   |
| 2. Monitor wash tank temperature gauge   | Wait for temperature reading to reach Min. 150°F/66°C (D-HB, D-H1 Only) Temperature reading must be Min. 120°F-140°F/49°C-60°C Optimum (For D-LF Only)  |
| 3. Prescrap and load ware into rack  | Place dishes edgewise in peg rack, cups and bowls upside down in flat rack, and silverware spread evenly in single layer in flat rack.  |
| 4. Open door, insert rack  |   |
| 5. Close door, Push Green start button   | Green cycle light will illuminate. Automatic cycle begins.<br>Machine washes for 45 sec., then pauses for 1 sec.  |
| 6. During Final Rinse monitor pressure gauge and final rinse temperature gauge | Machine final rinses for 14 sec. Pressure gauge reading must read between 20-22 PSI. Temperature gauge must read 180-195 °F/82-91°C (D-HB, D-H1 Only) Min. 120°-140°F/49°C-60°C Optimum (D-LF Only) |
| 7. 60-second cycle complete  | Green cycle light goes out.   |
| 8. Open door, remove clean rack  | Insert another rack of soiled ware.   |
| 9. After each meal period or every two hours operation                         | Lift drain lever assembly to drain machine. Flush interior and clean scrap screens and pump intake strainer. Check spray arms and clean if necessary.   |



### NOTE:

*Opening the door at any time during the cycle will stop the machine. Closing the door and pushing the Green start button will resume the cycle where it left off.*

# MAINTENANCE

Cleaning your machine is the best maintenance that you can provide. Components that are not regularly flushed and cleaned do not perform well.

The Maintenance intervals shown in the following schedules are the minimum requirements necessary for the proper performance of your machine. Maintenance intervals should be shortened whenever your machine is faced with abnormal working conditions, hard water, or multiple shift operations.

## Maintenance Schedule

### CLEANING

#### • Every 2 Hours or After Each Meal Period

##### Model D-HB, D-HI, and D-LF

1. Flip the power switch OFF.
2. Lift drain lever, drain the machine.
3. Flush tank interior with fresh water.
4. Remove and clean the scrap screens. Clean the pump intake screen.
5. Inspect the spray arm nozzles and rinse nozzles. Clean if necessary.
6. Close door, flip power switch **ON** to refill machine.

#### • Every 8 Hours or at the End of the Day

##### Model D-HB, D-HI, and D-LF

1. Flip the power switch OFF.
2. Lift drain lever, drain the machine.
3. Flush tank interior with fresh water.
4. Remove and clean the scrap screens. Clean the pump intake screen.
5. Remove the spray arms.
6. Clean and inspect the spray arm bearings.
7. Flush the wash arm and rinse arm assemblies and nozzles.
8. Back flush the scrap screens and pump intake strainer.
9. Thoroughly clean the exterior of the machine. **DO NOT HOSE DOWN WITH WATER.**
10. Reassemble the machine. Leave the door open to aid overnight drying.



#### **CAUTION:**

***DO NOT LEAVE WATER IN WASH TANK OVERNIGHT***

## DELIMING

Your dishwasher should be delimed regularly depending on the mineral content of your water. Inspect the machine interior for mineral deposits and use a deliming solution for the best cleaning results.



### NOTE:

*Consult your chemical supplier/or an appropriate deliming solution.*

---



### WARNING:

*Deliming solutions or other acids must not come in contact with household bleach (sodium hypochlorite) or any chemicals containing chlorine, iodine, bromine, or fluorine. Mixing will cause hazardous gases to form. Skin contact with deliming solutions can cause severe irritation and possible chemical burns. Consult your chemical supplier for specific safety precautions.*

---

## DELIMING PROCESS

Model D-HB, D-H1, and D-LF

1. Remove all dishes from machine.
2. Remove any chemical pick-up tubes from their containers.
3. Place each tube in a container of fresh water and prime the chemical lines for several minutes to thoroughly flush chemical from the lines. Leave pick-up tubes out of their containers.
4. Drain the machine and refill with fresh water.
5. Spray interior walls with deliming solution and let sit for 5 or 10 minutes depending on amount of build-up. Add deliming solution to wash tank. Do not let chemicals sit for longer than 15 minutes.
6. Push the Green start button and run an automatic cycle.
7. Repeat Steps 3-4 if necessary.
8. Lift the drain lever assembly and drain the machine.
9. Refill the machine and run a complete cycle two additional times. Drain and refill the machine after each cycle to thoroughly flush any deliming solution from the interior of the machine.
10. Flip the power switch to OFF.
11. Drain machine.
12. Deliming is complete.

## OPERATION CHECKS

### • Daily

1. Check temperature gauges for proper readings.
2. Check pressure gauge for proper reading (D-H1, D-HB ONLY).
3. Check for leaks.
4. Check chemical supplies and refill as necessary.

### • Weekly

1. Inspect all water lines for leaks.
2. Clean all detergent residue from the exterior of the machine.
3. Check the drains for leaks.
4. Clean accumulated mineral deposits from the tank heating elements
5. Check that float switch moves freely.

## TROUBLESHOOTING

Before determining any specific cause of a breakdown or abnormal operation on your dishwasher, check that:

### Checklist

1. Main power and water supply are turned on to the machine
2. All switches are **ON**
3. Drain and overflow tube are in place and seated
4. Wash pipe and rinse nozzles are clean
5. Scrap screen(s) are properly positioned
6. Spray pipes are in their proper positions
7. Doors are fully closed
8. Thermostat(s) are at their correct setting
9. Sanitizer, detergent, and rinse additive dispensers are adequately filled.

If a problem still exists, use the following for troubleshooting.

CONDITION	CAUSE	SOLUTION
Machine will not start	Door not closed	Make sure doors are fully closed
	Door safety switch faulty	Contact your service agency
	Start switch faulty	Contact your service agency
	Main switch OFF	Check disconnect
	Overload protector tripped	Reset overload in Control Box
Low or no water	Main water supply is turned off	Turn on house water supply
	Drain/overflow tube is not in place and seated	Place and seat drain tube
	Defective drain/overflow O'ring	Replace O'ring
	Machine doors not fully closed	Close doors securely
	Faulty fill valve	Contact your service agency
	Defective fill timer	Replace fill timer
	Stuck or defective float	Check floats and clean
	Clogged "Y" strainer	Clean or replace
Continuous water filling	Stuck or defective float	Check floats and clean
	Defective drain/overflow O'ring	Replace O'ring
	Fill valve will not close	Clean or replace
	Defective fill timer	Replace fill timer
	Drain tube not in place	Look for drain tube in tank

CONDITION	CAUSE	SOLUTION
Any motor not running	Overload protector tripped	Reset overload in Control Box
	Defective motor	Contact your service agency
Wash tank water temperature is low when in use	Incoming water temperature at machine too low	Raise temperature to:
		140°F/60°C for D-HB and D-LF, 180°F/82°C for D-HI
	Defective thermometer	Check or replace
	Defective thermostat	Check for proper setting or replace
	Lime scale buildup on heating elements	Delime element
	Defective heater element	Check or replace
	Low steam pressure	Check steam supply pressure (15-30 psi)
	Defective steam trap	Check or replace
	Defective solenoid valve	Check or replace
Insufficient pumped spray pressure	Clogged pump intake screen	Clean
	Clogged spray pipe	Clean
	Scrap screen full	Must be kept clean and in place
	Low water level in tank	Check drain and overflow tube
	Pump motor rotation incorrect	Reverse connection between L1 and L2 in Control Cabinet (3PH machines only)
	Defective pump seal	Contact Service Agent
Insufficient final rinse or no final rinse	Faulty pressure reducing valve	Clean or replace
	Improper setting on pressure reducing valve	Set psi flow pressure at 20-22 psi/138 Kpa
	Clogged rinse nozzle and/or pipe	Clean
	Improper water line size	Have installer change to proper size (3/4" min)
Low final rinse temperature	Clogged "Y" strainer	Clean or replace Check house supply water temperature
	Low incoming water temperature	
	Thermostat	Be sure booster thermostat is set to maintain 180°F/82°C temperature
Poor washing results	Defective booster thermostat	Replace thermostat
	Defective thermometer	Check for proper setting or replace
	Detergent dispenser not operating	Contact detergent supplier
	Insufficient detergents	Contact detergent supplier
	Wash water temperature too low	See condition "Wash Tank Water Temperature" above
	Wash arm clogged	Clean
	Improperly scraped dishes	Check scraping procedures
	Ware being improperly placed in rack	Use proper racks Do not overload racks
Poor drying results	Improperly cleaned equipment	Unclog wash sprays and rinse nozzles to maintain proper pressure and flow conditions Overflows must
	Electric Elements or steam coils has soil/lime buildup	Clean and/or delime Contact chemical supplier
	Insufficient rinse-aid	
	Low final rinse temp	See condition "Low final rinse temperature"

## BASIC SERVICE

This Basic Service section does not cover all possible repair procedures. If you require additional service support, you may call your local service company or:

**Champion National Service**  
**1-800-858-4477**  
**In Canada**  
**1-800-263-5798**

**Please have the Model and Serial Number of the machine ready when you call.**

## ELECTRICAL SERVICE



### NOTE:

**DO NOT USE CHASSIS GROUND WHEN PERFORMING VOLTAGE CHECKS.**

*Doing so will result in false and inaccurate readings.*

**PERFORM VOLTAGE CHECKS BY READING FROM THE HOT SIDE OF THE LINE AND NEUTRAL (any #2 or white wire).**



### WARNING:

**USE EXTREME CAUTION** when performing tests on energized circuits.



### WARNING:

*When repairing a circuit, disconnect the power at the main service disconnect switch and place a tag at the disconnect switch to indicate that work is being performed on the circuit.*

## Troubleshooting

### Schematics

Champion places an electrical schematic in the control cabinet of every machine before it is shipped. Schematics are included at the back of this manual as well. Be aware that these schematics include options that may not apply to your machine. Options are enclosed in dashed lines with the words (IF USED) next to them on the schematic. Disregard any options that appear on the schematics which are not a part of your machine.

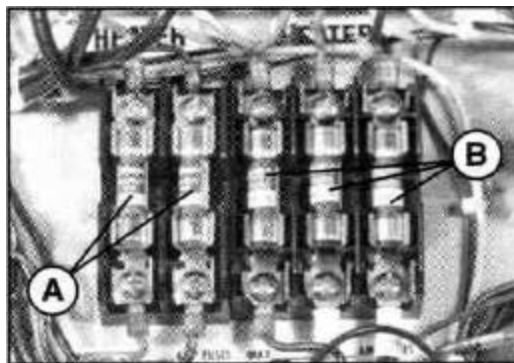
### Tools

All electrical repairs can be made with: Standard set of hand tools Volt/Ohm  
Meter (VOM) Clip-on AC current  
tester

### Circuit Tests

Use a clip-on AC current tester to check the motors and electric heaters. Use a VOM to test line voltages and the 120VAC and the 24 VAC control circuits.

## ELECTRICAL SERVICE (cont'd)



**Figure 10 Fuses**  
(Three phase shown)

### Fuses —

Refer to Fig. 10.

There are two fuse blocks, located in the center of the main control cabinet. The (A) fuses protect the main control transformer. The (B) fuses protect the wash tank heater circuit.

Fuses are marked FU on the electrical schematic. Booster heater circuits (D-HB only) are not fused.

### To Replace a fuse:

Turn the dishwasher main power switch off.  
Disconnect power to the machine at the main service disconnect switch.  
Replace the fuse. If the fuse blows again,  
DO NOT INCREASE THE FUSE SIZE.  
DETERMINE THE CAUSE OF THE OVERLOAD.

### Motor Overloads —

The wash pump motor has an overload to protect it from line voltage electrical overloads. The overload disconnects 120 VAC power to the motor contactor coil.

Refer to Fig. 11.

### Note the Switch Lever on the Overload.

If the switch lever is off with the "0" showing then the overload has tripped.

### To Reset the Motor Overload:

Flip the overload switch to the On position. A "1" should be visible on the switch lever.

### To Replace a Motor Overload:

Disconnect the wires to the overload. Release the mounting catch on the front side of the overload. Push forward and lift out. Snap the new overload into place and reconnect the wires.

### To adjust the overload setting:

The screwdriver in Fig. 11 is positioned to adjust the motor overload AMP setting. Read the full load amps (FLA) motor amps on the motor nameplate. Adjust the overload dial to 125% of the nameplate FLA or the maximum setting.



**Figure 11 Motor Overload**

ELECTRICAL SERVICE (cont'd) Timers

D-HB, D-H1, and D-LF models have two timers located in the top mounted main control cabinet.

These timers are not adjustable. The timer chart is shown in Fig. 13.

Cycle Timer —

Refer to Fig. 12.

The cycle timer controls the dishwasher's 60-second operation. The timer consists of a timer motor, four micro-switches, and four non-adjustable metal cams. Cam A controls power to the timer motor. Cam B controls power to the wash motor. Cam C controls power to the final rinse valve. Cam D controls the dishwasher instant start.

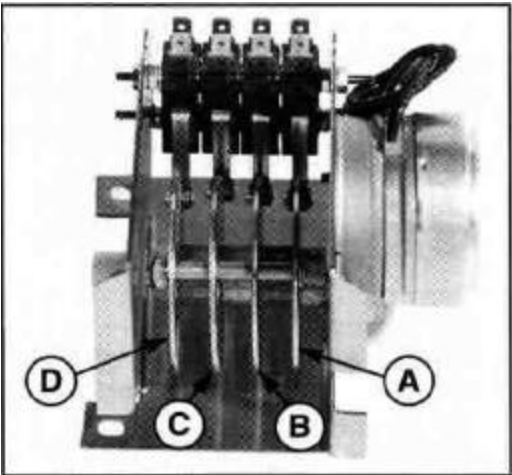


Figure 12 Cycle Timer

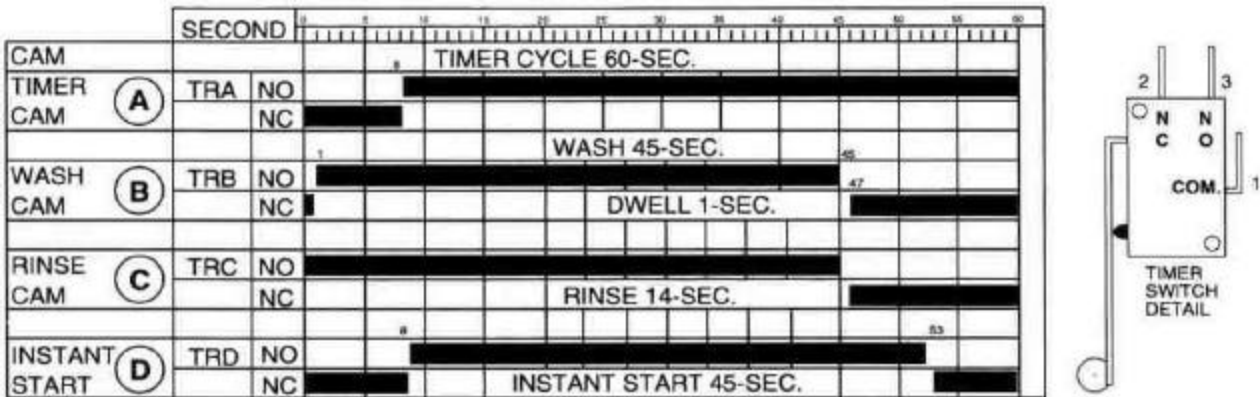


Figure 13 Cycle Timer Chart

Fill Timer —

Refer to Fig. 14.

The fill timer controls the dishwasher's 90-second fill operation. The timer consists of a timer motor, one micro-switch, and one non-adjustable plastic cam. The fill timer operates during initial fill and any time the low water tank heat protection circuit calls for make-up water. Refer to Timed Fill/Low Water Tank Heat Protection on the next page for an explanation of the fill timer operation.



Figure 14 Fill Timer



Figure 15 Fill Timer Chart

## ELECTRICAL SERVICE (cont'd)

### Timed Fill/Low Water Tank Heat Protection —

Models D-HB, D-H1, and D-LF use a float switch and fill timer to control tank fill and tank heat.

**For Model D-HB only**, the built-in booster heat circuit is also controlled by the float switch.

#### Operation:

1. When dishwasher main power switch is turned on, fill timer runs for a minimum of 90 seconds to fill the tank.
2. The float switch ball rises; its normally open contacts close. The fill circuit times out; the fill solenoid de-energizes, and the tank heat and booster heat energize.
3. If water level drops below the float level, the float switch ball moves down; heat de-energizes. The fill solenoid energizes and the fill timer runs for a minimum of 90 seconds to refill the tank.
4. If the tank is not full of water at the end of the 90-second fill timer cycle, then the fill timer will cycle again. When the float switch is satisfied, the fill timer stops after completing its 90-sec. cycle.
5. Refer to the float switch troubleshooting chart below (Fig. 17) for a quick guide to evaluating float switch problems.



Figure 16 Float Switch

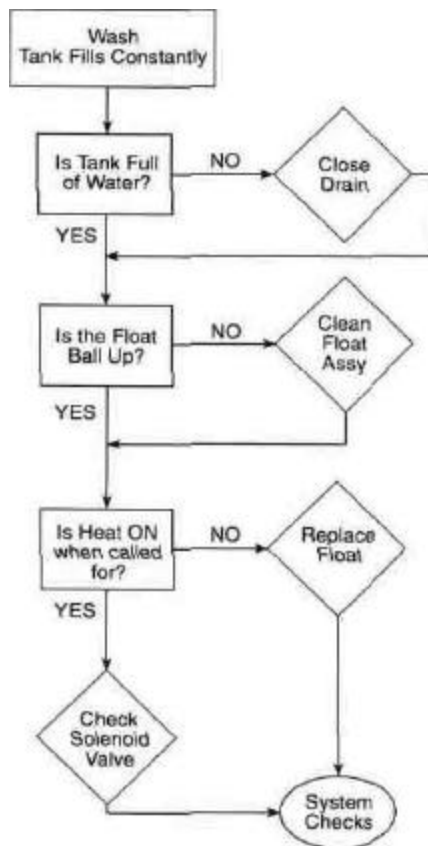


Figure 17 Float Switch Troubleshooting Chart

## ELECTRICAL SERVICE (cont'd)

### Heater Element Wiring - Booster Tank and Wash Tank Heater Elements

Refer to the illustrations and follow the steps below to properly install terminal jumpers and to make line power connections to a replacement element.

**Step 1.** Hold the element assembly with the calrod coils facing toward you.

**Step 2.** Match your element coil to Configuration A, B, C, or D.

**Step 3.** Rotate your element coils to match the correct configuration.

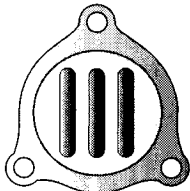
**Step 4.** Turn the element over and match your element to the correct terminal configuration.

**Step 5.** Install terminal jumpers according to the illustration for your voltage requirement.

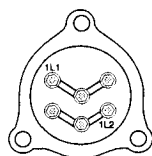
**Step 6.** Install the element and make your line connections 1L1, 1L2, or 1L3 per the illustration.

#### Configuration A

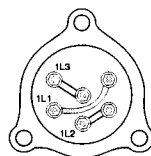
Booster tank element  
View of calrod coils



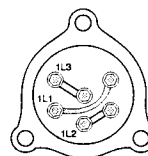
#### Terminal Connections view of element



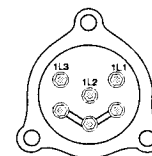
208V/1 Phase



208-240V/3 Phase  
Delta Connection



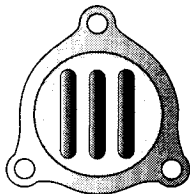
480V/3 Phase  
575V/3 Phase  
Delta Connection



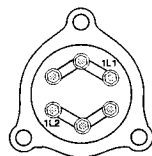
208-240V/3 Phase  
Wye Connection for  
380-415V/3 Phase

#### Configuration B

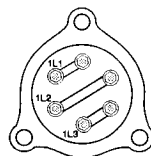
Booster tank element  
View of calrod coils



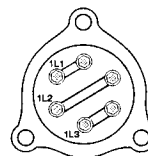
#### Terminal Connections view of element



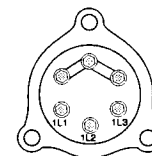
208V/1 Phase



208-240V/3 Phase  
Delta Connection



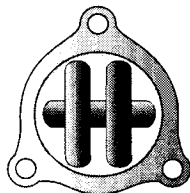
480V/3 Phase  
575V/3 Phase  
Delta Connection



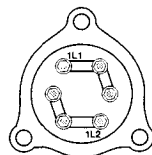
208-240V/3 Phase  
Wye Connection for  
380-415V/3 Phase

#### Configuration C

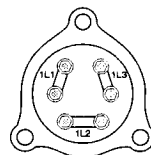
Booster tank element  
View of calrod coils



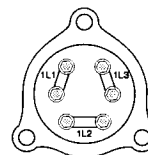
#### Terminal Connections view of element



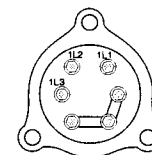
208V/1 Phase



208-240V/3 Phase  
Delta Connection



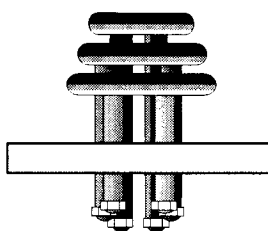
480V/3 Phase  
575V/3 Phase  
Delta Connection



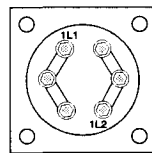
208-240V/3 Phase  
Wye Connection for  
380-415V/3 Phase

#### Configuration D

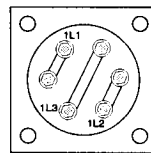
Wash tank element  
View of calrod coils



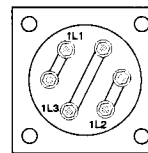
#### Terminal Connections view of element



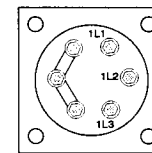
208V/1 Phase



208-240V/3 Phase  
Delta Connection



480V/3 Phase  
575V/3 Phase  
Delta Connection



208-240V/3 Phase  
Wye Connection for  
380-415V/3 Phase

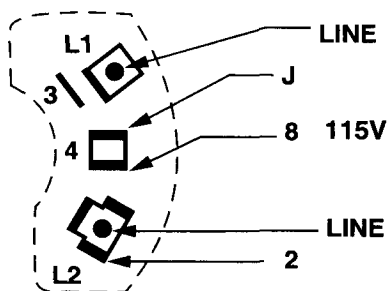
## ELECTRICAL SERVICE (cont'd) Motor

### Connections —

1. Models D-HB, D-H1, and D-LF are available in either single phase or 3 phase voltages.
2. Motor rotation was set at the factory. For three phase machines, reversing the motor direction is done in the control cabinet by reversing the wires L1 and L2 on the disconnect side of the main electrical connection block. For single phase machines, motor rotation is changed at the motor connection plate on the rear of the single phase motor (If necessary).

Refer to Fig. 18 for the proper wiring of the pump motor for single and three phase voltages.

#### Single Phase - Low Voltage



#### Single Phase - High Voltage

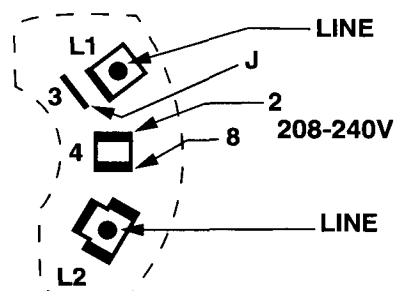
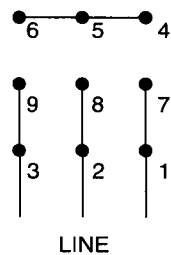
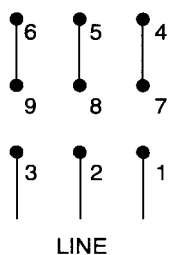


Figure 18 Pump Motor Wiring Diagrams

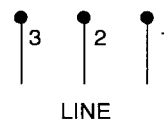
#### 208-240V Three Phase - Low Voltage



#### 480V Three Phase - High Voltage



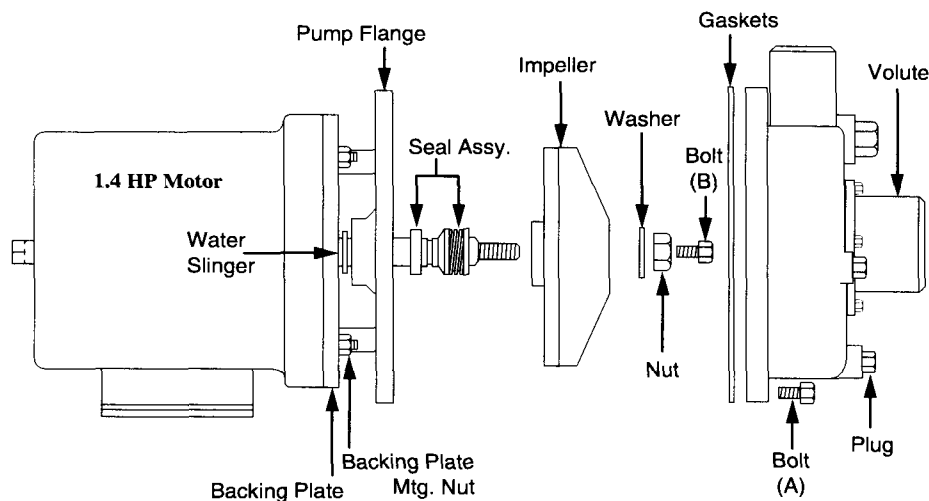
#### 575V Only Three Phase



# MECHANICAL SERVICE

## Pump Seal Replacement

1. Disconnect the power to the machine at the main breaker panel or fuse box.
2. Drain the machine.
3. Remove the front and side panels.
4. Remove drain plug on the pump volute and drain the pump.
5. Remove the pump hoses.
6. Disconnect the wires to the motor at the motor junction box.
7. Unbolt motor from machine base and remove the pump/motor assembly.
8. Remove bolts on volute and carefully remove from the pump flange.
9. Lock the motor shaft with a wrench or pliers. The back of motor shaft is square.
10. Turn the impeller counter-clockwise to remove from shaft (right hand threads).
11. Remove any shims or spacers and save for reassembly.
12. Remove the old seal and discard.
13. Check seal seat in the pump flange and clean thoroughly.
14. Press rubber seal/ceramic portion of seal assembly into the pump flange. Use a water soluble lubricant. Be careful to keep the ceramic clean.
15. Install the rotating part of the seal on the shaft with the graphite surface toward the ceramic. Use a water soluble lubricant on the rubber seal part only (not the graphite).
16. Reinstall spacers, impeller, and new flange gasket. Reinstall bolts.
17. Reinstall the pump/motor assembly and reconnect the pump hoses.
18. Fill the dishwasher with water.
19. Check motor rotation by bump starting motor.  
Correct motor shaft rotation is clockwise when viewing motor from the rear.
20. Test run and check for leaks.



**Figure 19 Pump Seal Replacement**

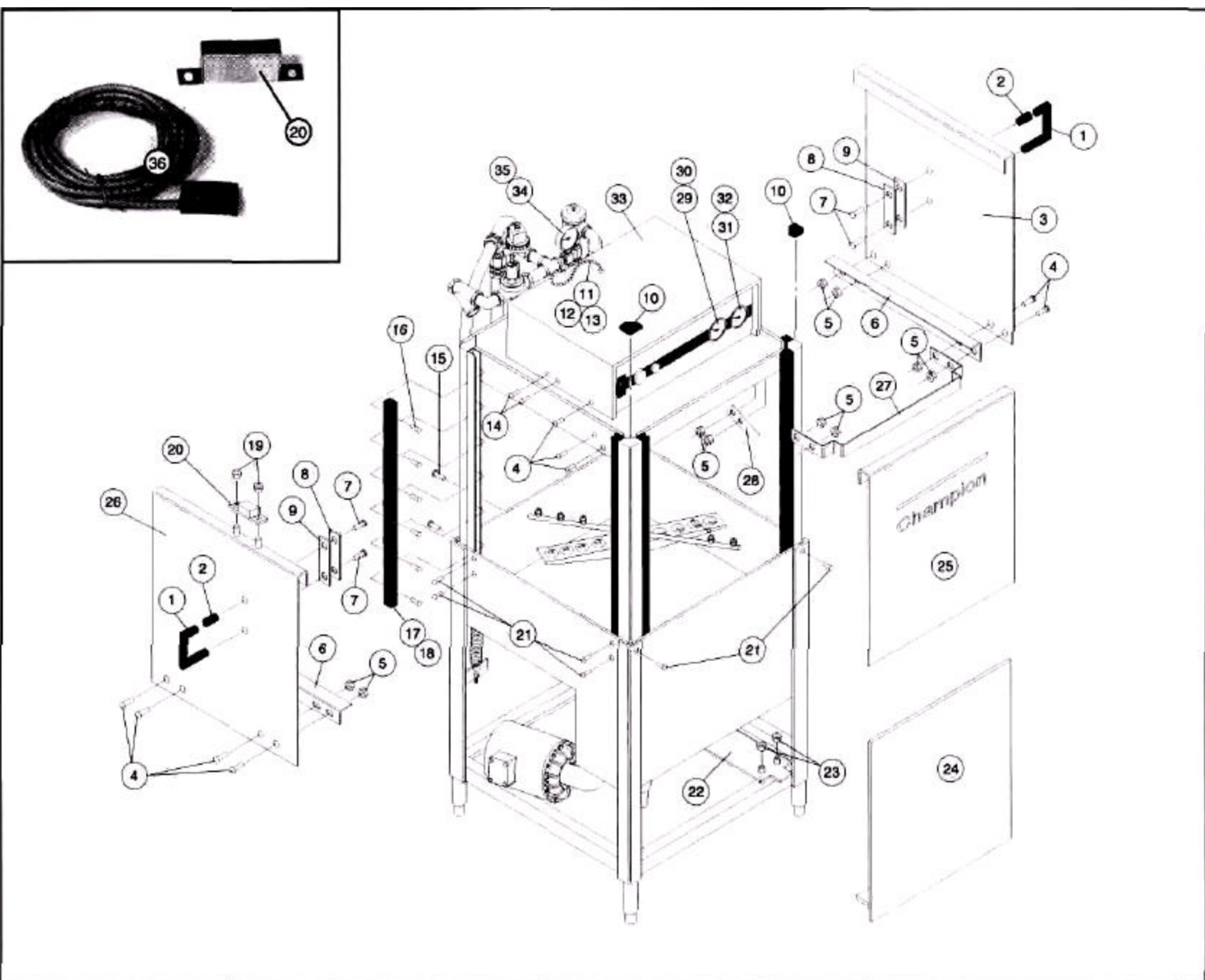
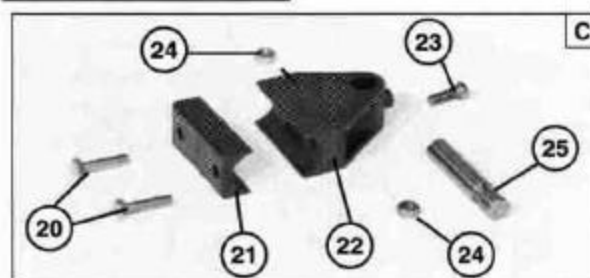
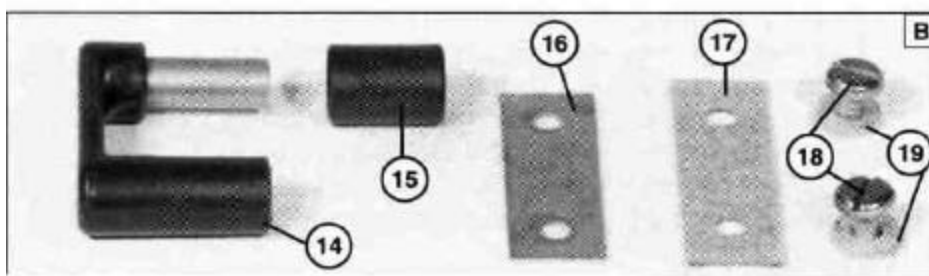
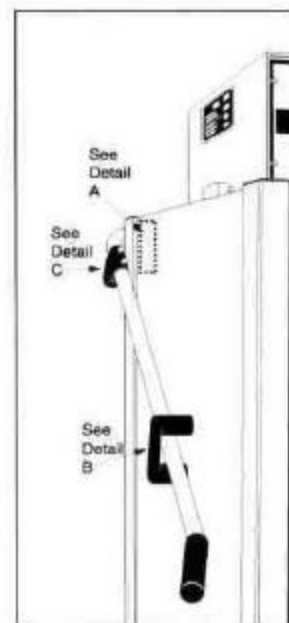
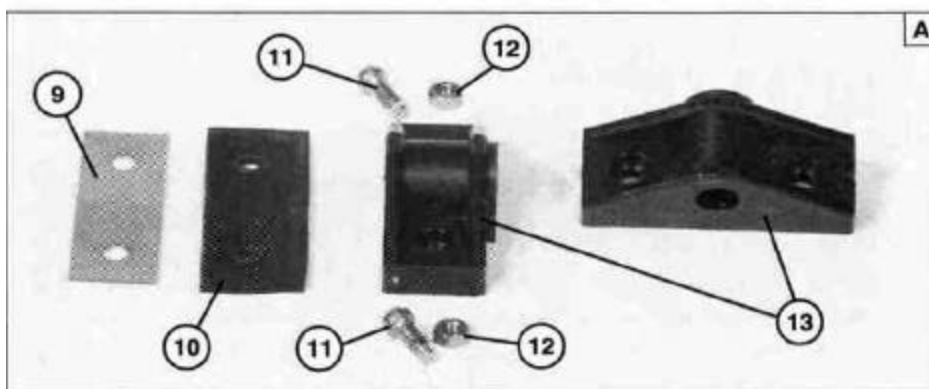
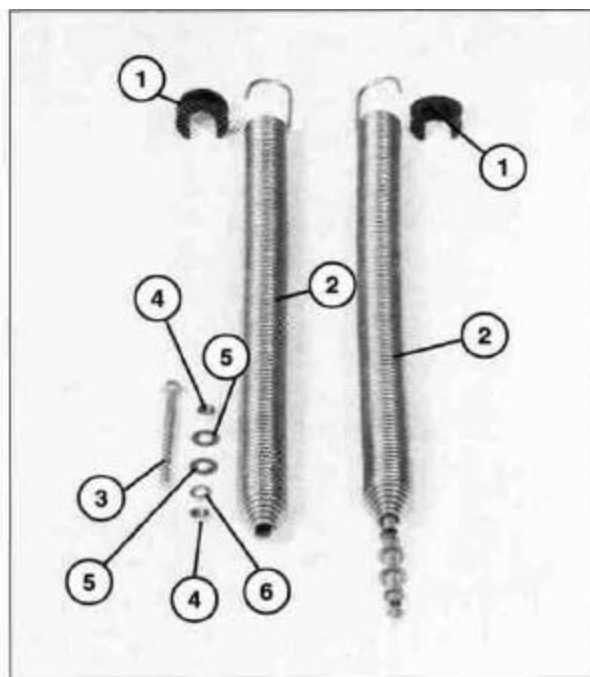
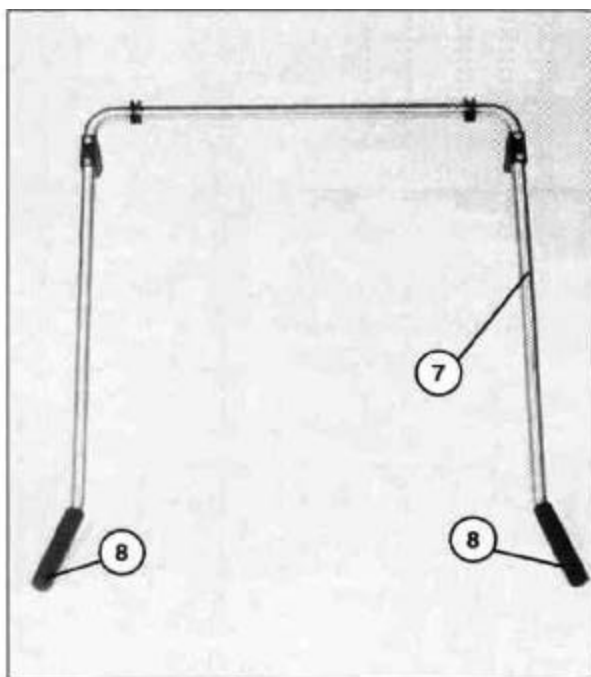


Figure 20 - D-HB/D-HI/D-LF  
Doors, Panels and Gauges

## D-HB/D-H1/D-LF DOORS, PANELS AND GAUGES

Fig 20	Part		
Item No	No	Part Description	Qty
1	107398-1	Block, door lift	2
2	107398-2	Roller, door lift block	2
3	0307326	Door, right side (Beginning with S/N 10400 through S/N 13809)	1
3	0709405	Door, right side (Beginning with S/N 13809 and above)	1
4	0501412	Screw (10-32 x 3/8 Truss hd)	14
5	0503722	Nut, hex(10-32 SST)	10
6	0308704	Guard, splash	2
7	110383	Screw (M8 x 12MM Pan hd)	4
8	304811	Plate, reinforcing	2
9	109395	Gasket, reinforcing plate	2
10	108053	Plug, corner post	2
11	107367	Chain, bead #10	1 ft
12	107368	Chain, end coupling	2
13	0501412	Screw (10-32 x 3/8 Truss hd)	2
14	0508752	Screw (4-40 x 5/8 Round hd)	2
15	0501419	Bolt (1/4 x 20 x 1/2 Hex hd)	4
16	0508144	Screw (8-32 x 3/4 Round hd)	36
17	108347	Guide, door	6
18	108410	Gasket, door guide (26")	6
19	108954	Nut, grip (6-32 w/nylon insert)	2
20	111026	Magnet, door safety switch	1
		(Beginning with S/N 12340M and above)	
20	109935	Magnet, door safety (Prior to S/N 12340M)	1
21	100779	Screw (1/4-20 x 5/8 Truss hd)	10
22	0307333	Bracket, booster support	1
23	0501539	Nut (1/4-20 SST Hex hd)	2
24	309070	Panel, perimeter	3
25	0707352	Door, front (Beginning with S/N 12340 through S/N 13808)	1
25	0709402	Door, front (Beginning with S/N 13809 and above)	1
26	0707351	Door, left side (Beginning with S/N 10400 through S/N 12339)	1
26	0708896	Door, left side (Beginning with S/N 12340 through S/N 13808)	1
26	0709404	Door, left side (Beginning with S/N 13809 and above)	1
27	0307327	Bracket, door lift (Prior to S/N 13809)	1
27	0309277	Bracket, door lift (Beginning with S/N 13809 and above)	1
28	0307328	Stop,door	2
29	107440	Thermometer, 8 ft (Wash)	1
30	107444	Overlay, wash thermometer	1
30	107442	Overlay, wash thermometer (Model D-LF only)	1
31	108391	Thermometer, 4 ft (Final rinse)	1
32	107445	Overlay, final rinse thermometer	1
32	107443	Overlay, final rinse (Model D-LF only)	1
33	305404	Cover, control cabinet	1
34	100135	Gauge, pressure	1
35	109765	Overlay, pressure gauge	1
36	111090	Switch, magnetic door safety	
		(Beginning with S/N 12340M and above)	1
36	109934	Switch, magnetic (Prior to S/N 12340M)	1



**NOTE:**

Door lift block parts (Items 14-19) are used on machines built prior to S/N 13809

Refer to Fig. 22, bottom of page 35, Door lift linkage parts (Items 26-33) are used on machines beginning with S/N 13809 and above.

Fig. 21 - D-HB/D-H1/D-LF Door Handle Assembly and Springs

## D-HB/D-H1/D-LF DOOR HANDLE ASSEMBLY AND SPRINGS

Fig 21	Part		
Item No	No	Part Description	Qty
1	107397	Block, spring hook	2
2	108066	Spring, extension	2
3	107969	Bolt, extension spring (5/16-18 x 4 Hex hd)	2
4	100154	Nut, plain (5/16-18)	4
5	102376	Washer (5/16 x 3/4 x 1/16)	4
6	106013	Washer, lock (5/16 split)	2
7	108363	Lever, door (Prior to S/N 13809)	1
7	0509166	Lever, door (Beginning with S/N 13809 and above)	1
8	107962	Handle, grip	2
9	304811	Plate, backing	2
10	108368	Gasket, backing	2
11	107436	Screw (M6 x 16mm Filister)	4
12	107420	Nut, plain (M6)	4
13	107399	Support, pivot block (Top and side view shown)	2
14	107398-1	Lift, block door	2
15	107398-2	Roller, door lift block	2
16	307645	Plate, door reinforcing	2
17	109395	Gasket, reinforcing plate	2
18	110383	Screw (M8 x 12mm Pan hd)	4
19	108022	Washer (8mm Plastic)	4
20	107437	Bolt (M6 x 45mm Hex hd)	4
21	107396	Block, upper pivot	2
22	107395	Block, lower pivot	2
23	107436	Screw (M6 x 16mm Filister)	2
24	107420	Nut, plain (M6)	4
25	107393	Pin, pivot	2
26	104002	Bolt (5/16-18x1-1/2)	2
27	100826	Washer, flat	2
28	0509274	Nut, acorn (5/16-18 SST)	4
29	0309167	Lift bar, door	2
30	0509264	Bushing, side door	2
31	See pages 32-33 for doors		
32	100740	Bolt (5/16-18 x 1 Hex hd)	2

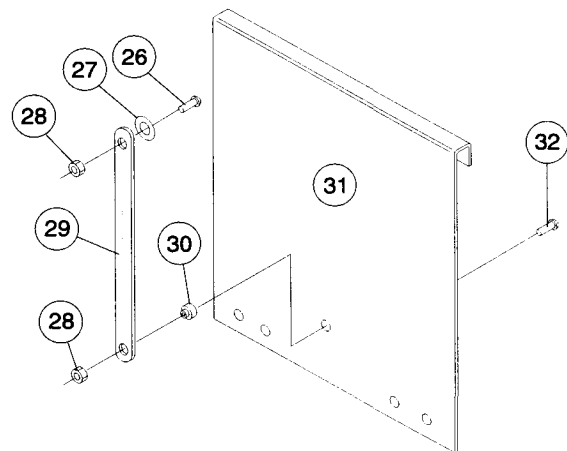


Fig. 22 - D-HB/D-H1/D-LF Door Linkage  
For machines beginning with S/N 13809 and above

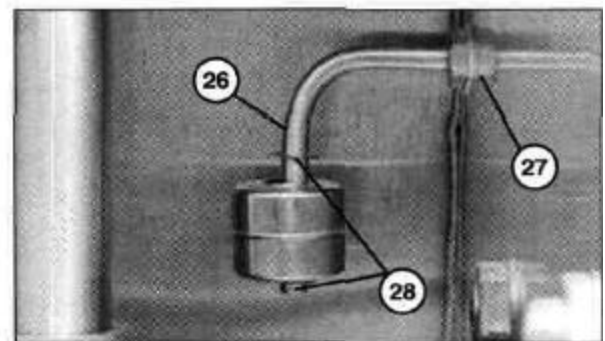
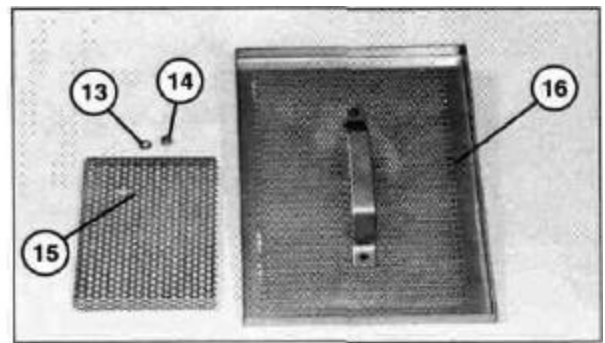
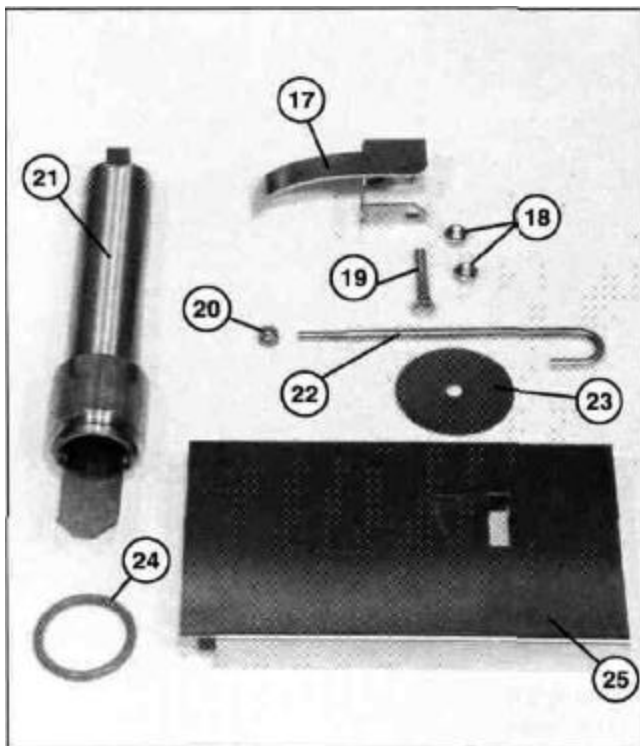
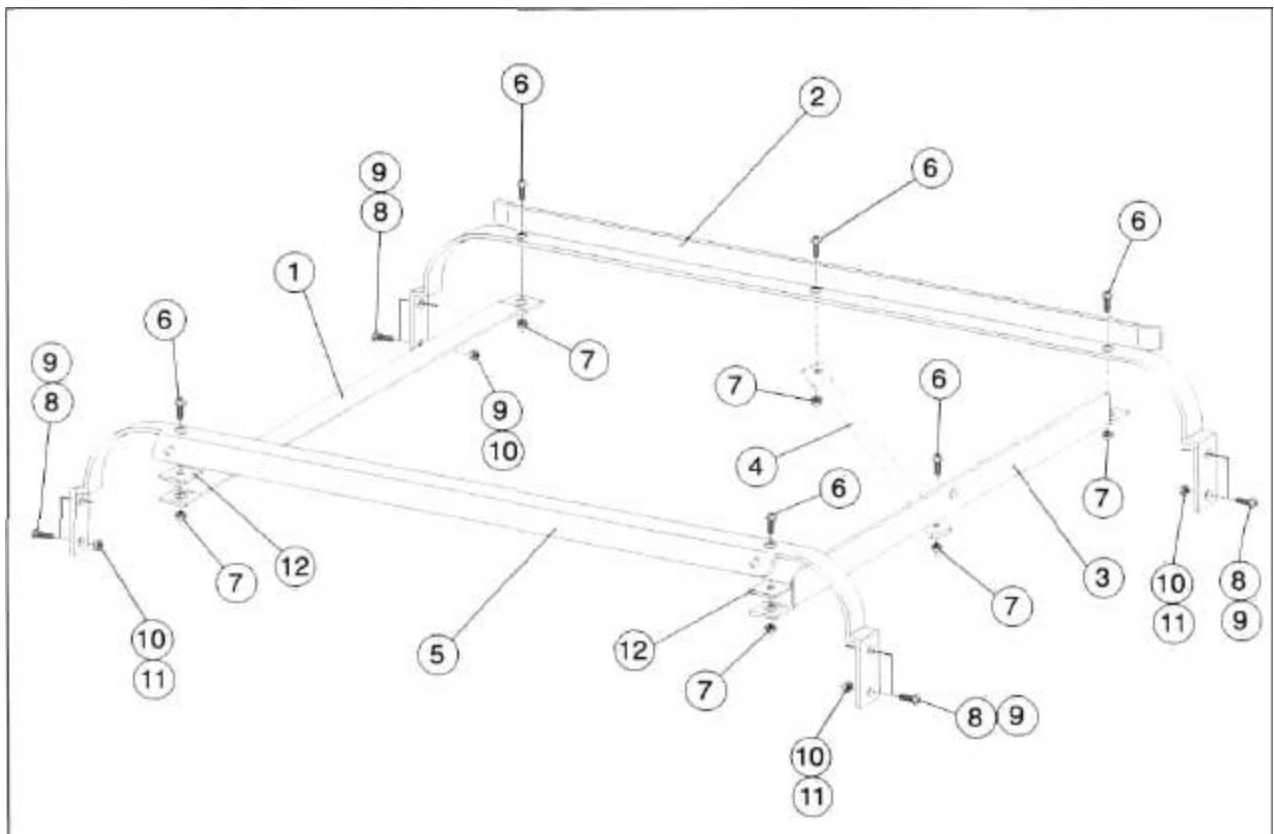


Fig. 23 - D-HB/D-H1/D-LF Track Assembly, Float Switch, and Drain Assembly

**D-HB/D-H1/D-LF TRACK ASSEMBLY, FLOAT SWITCH AND DRAIN ASSEMBLY**

Fig 23	Part		
Item No	No	Part Description	Qty
1	0309469	Guide, right hand	1
2	0309472	Track, rear	1
3	0309468	Guide, left hand	1
4	0309470	Support, rack	1
5	0309471	Track, front	1
6	106727	Screw (10-32 x 5/8 Flat Hd)	6
7	107966	Nut, grip (10-32 w/nylon insert)	6
8	100779	Bolt (1/4 -20 x 5/8 Truss Hd)	8
9	0501481	Washer, sealing	8
10	0501501	Washer, lock	8
11	0501539	Nut(1/4-20 Hex Hd)	8
12	0309473	Spacer	2
13	0507709	Washer, flat (#10 SST)	1
14	107966	Nut, grip (10-32 w/nylon insert)	1
15	308005	Strainer	1
16	305164	Scrap, screen (10 3/8)	2
17	0307310	Drain, lever	1
18	100154	Nut (Plain 5/16-18)	2
19	0507312	Bolt (5/16-18 x 1 3/4 Hex hd SST)	1
20	107967	Nut, grip (1/4-20 w/nylon insert)	1
21	0708493	Drain pipe assy	1
22	0307309	Standpipe, lift rod	1
23	0307355	Drain, cover plate	1
24	111532	O-ring, drain	1
25	0308514	Screen, filler	1
26	111092	Float switch	1
27	104584	Nut (Plain 1/2-13 Hex hd SST)	1
28	111151	C-clip	2

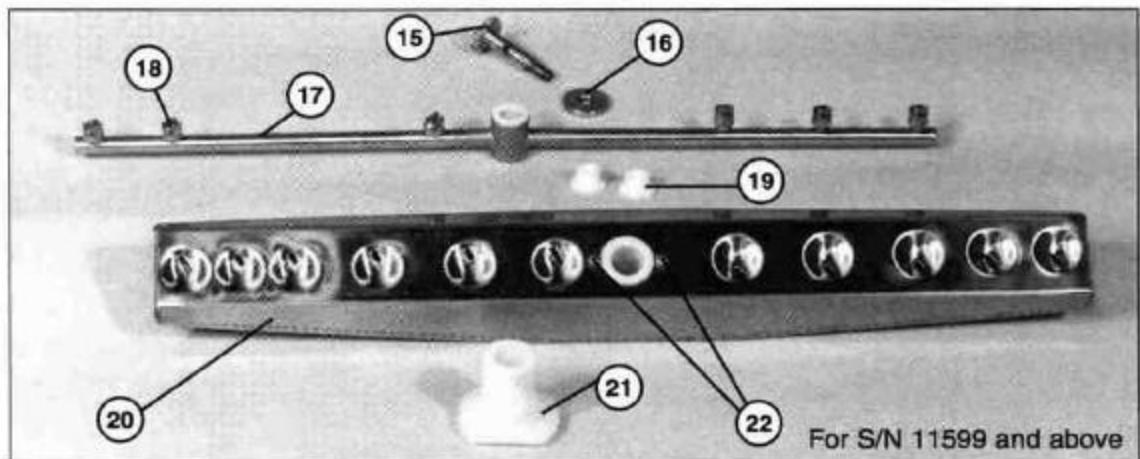
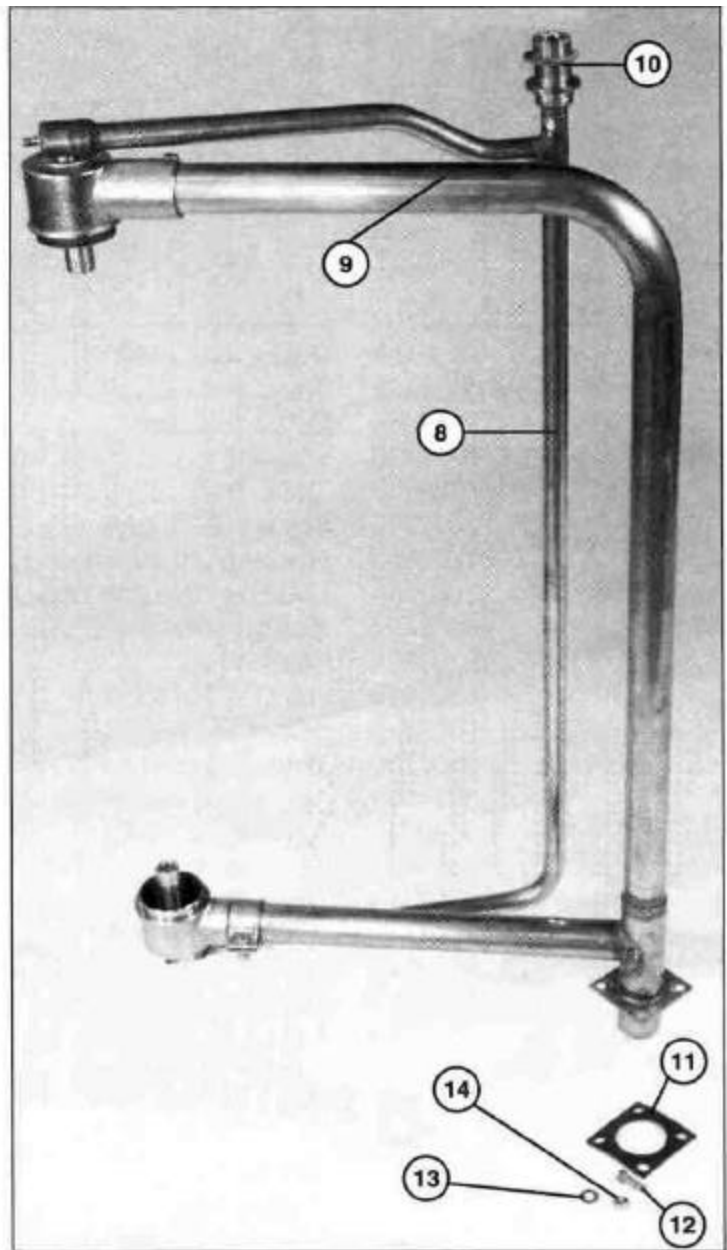
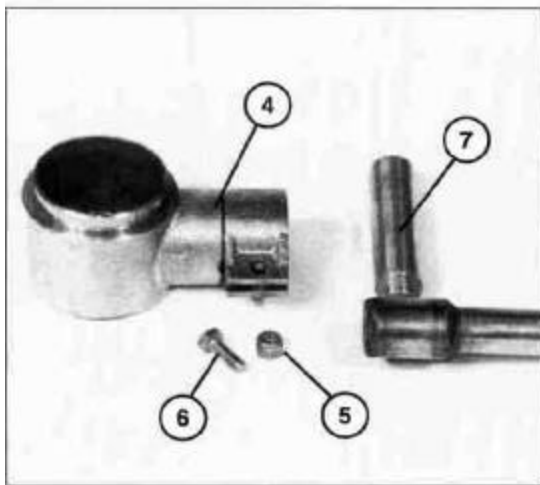
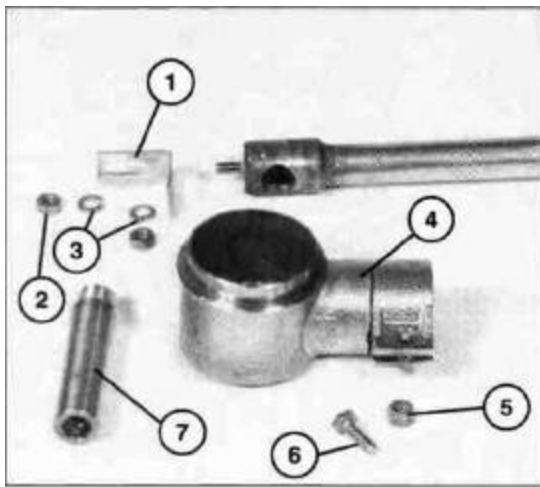


Fig. 24 - D-HB/D-H1/D-LF Wash/Rinse  
Spray System Assembly

**D-HB/D-H1/D-LF WASH/RINSE SPRAY SYSTEM  
ASSEMBLY**

(Items 1-14 apply to machines beginning with S/N 10702M and above)

Fig 24 Item No	Part No	Part Description	Qty
1	309441	Support, standpipe	1
2	0501539	Nut (1/4-20 Hex hd SST)	2
3	0501501	Washer, split lock (SST)	2
4	109864	Support, wash arm	2
5	107967	Nut, grip (1/4-20)	2
6	100736	Bolt (1/4-20 x 3/4 Hex hd)	2
7	0507445	Spindle, wash arm	2
8	109783	Standpipe, rinse	1
9	109781	Standpipe, wash	1
10	108620	Gasket, rinse pipe	1
11	109854	Gasket, standpipe wash	1
12	100740	Bolt (5/16-18 x 1 Hex hd)	4
13	102376	Washer, flat (5/16 x 3/4 x 050 SST)	8
14	100154	Nut plain (5/16-18 SST)	4

(Items 15-16 apply to machines beginning with S/N 11599 and above)

15	0507443	Spindle, rinse arm	2
16	0507444	Nut, rinse arm	2
17	0707453	Rinse arm assy (Includes 18 & 19)	2
17	—	Nozzle, rinse arm (SST) (Model D-LF only)	12
18	0508376	Nozzle, rinse arm	12
18	0708899	Rinse arm assy (Model D-LF only)	1
19	112164	Bearing, rinse arm	4
20	0707452-S	Wash arm assy (Includes 21 & 22)	2
21	0507446	Bearing, wash arm	2
22	0501563	Screw (#8 XC 1/2 Pan hd)	4
—	0707450	Rinse arm (Does not include items 18-19)	
—	0707456	Wash arm (Does not include item 21)	

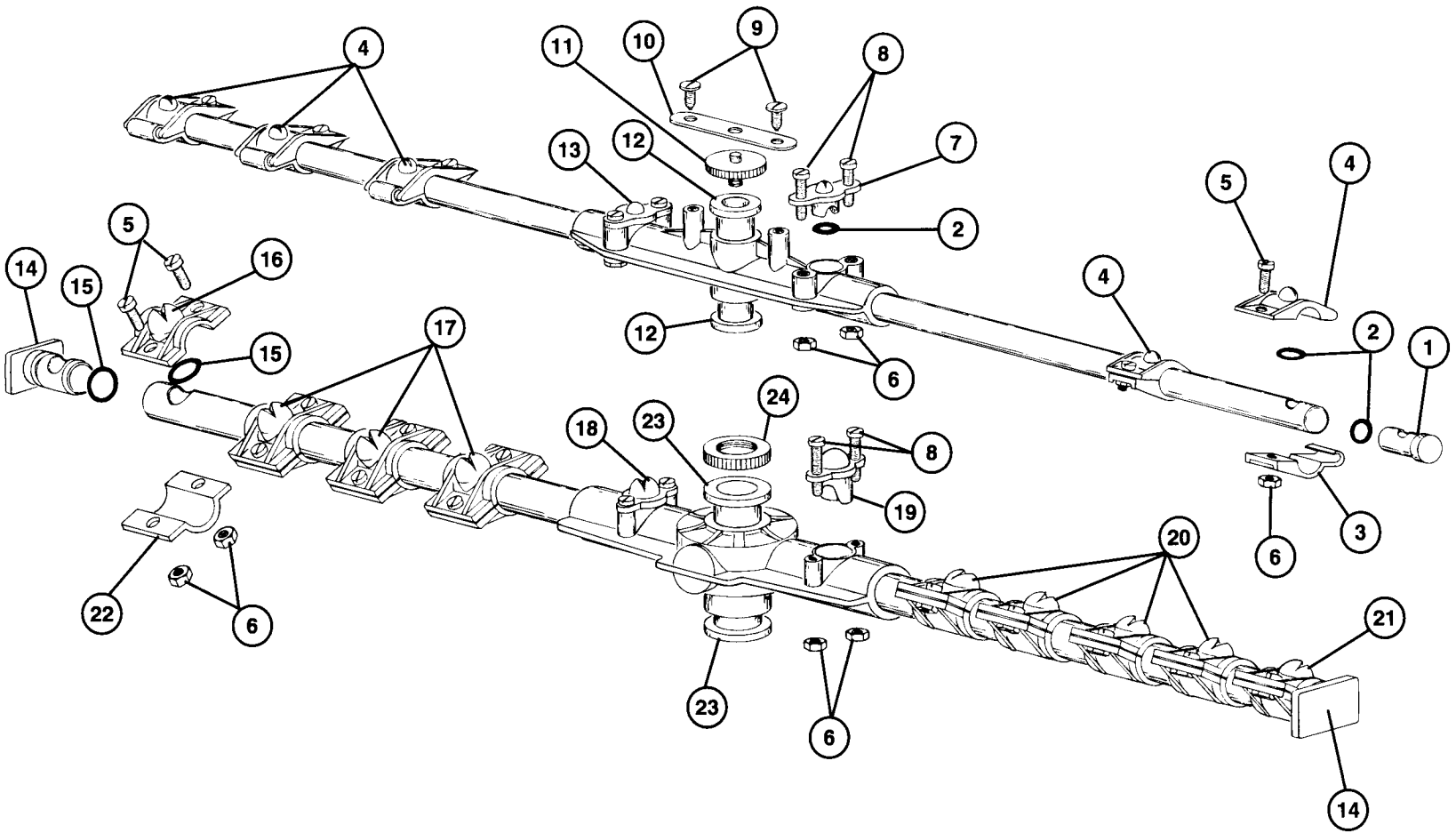


Fig. 25 - D-HB/D-HI/D-LF  
Wash/Rinse Spray Arms  
(For machines beginning with S/N 77855 through S/N 11599)

**D-HB/D-H1/D-LF**  
**WASH/RINSE SPRAY ARMS**  
(For machines beginning with S/N 77855 through S/N 11599)

Fig 25	Part		
Item No	No	Part Description	Qty
1	107329	Plug, rinse arm	2
2	108016	O-ring	9
3	107330	Nozzle, bottom rinse	5
4	108730	Nozzle, top rinse	5
5	107336	Screw (M4 x 12 Pan hd)	28
6	107337	Nut, plain (M4)	36
7	109833	Nozzle, rinse center (Plastic)	1
8	109491	Screw (M4 x 25)	8
9	109835	Screw (8 x1/2) Pan hd	4
10	109836	Bracket, retaining screw	1
11	109837	Screw, retaining	1
12	110394	Bearing, rinse arm	2
13	109834	Cap, rinse (Plastic)	1
14	107328	Plug, wash arm	2
15	108021	O-ring	13
16	107335	Nozzle, top wash (RH)	1
17	108364	Nozzle, top wash (RH)	3
18	109489	Nozzle, wash arm	1
19	109488	Nozzle, wash arm	1
20	108365	Nozzle, top wash (LH)	4
21	107334	Nozzle, top wash (LH)	1
22	107332	Nozzle, bottom wash	7
23	110341	Bearing, wash arm	2
24	109863	Retainer, wash arm	1
—	109862	Spindle(Not shown)	2
	900747	Rebuild kit, wash arm (Plastic hub)(Includes items 5, 6, 8, 14-23) (Rebuilds one arm)	A/R
—	900748	Rebuild kit, rinse arm (Plastic hub) (Includes items 1-11) (Rebuilds one arm)	A/R

Complete wash or rinse arm assy. shown in Fig. 25 are no longer available.

- Wash arm assy. replaced by P/N 0707452-S (All SST with bearings)
- Rinse arm assy. replaced by P/N 0707453 (All SST with bearings)

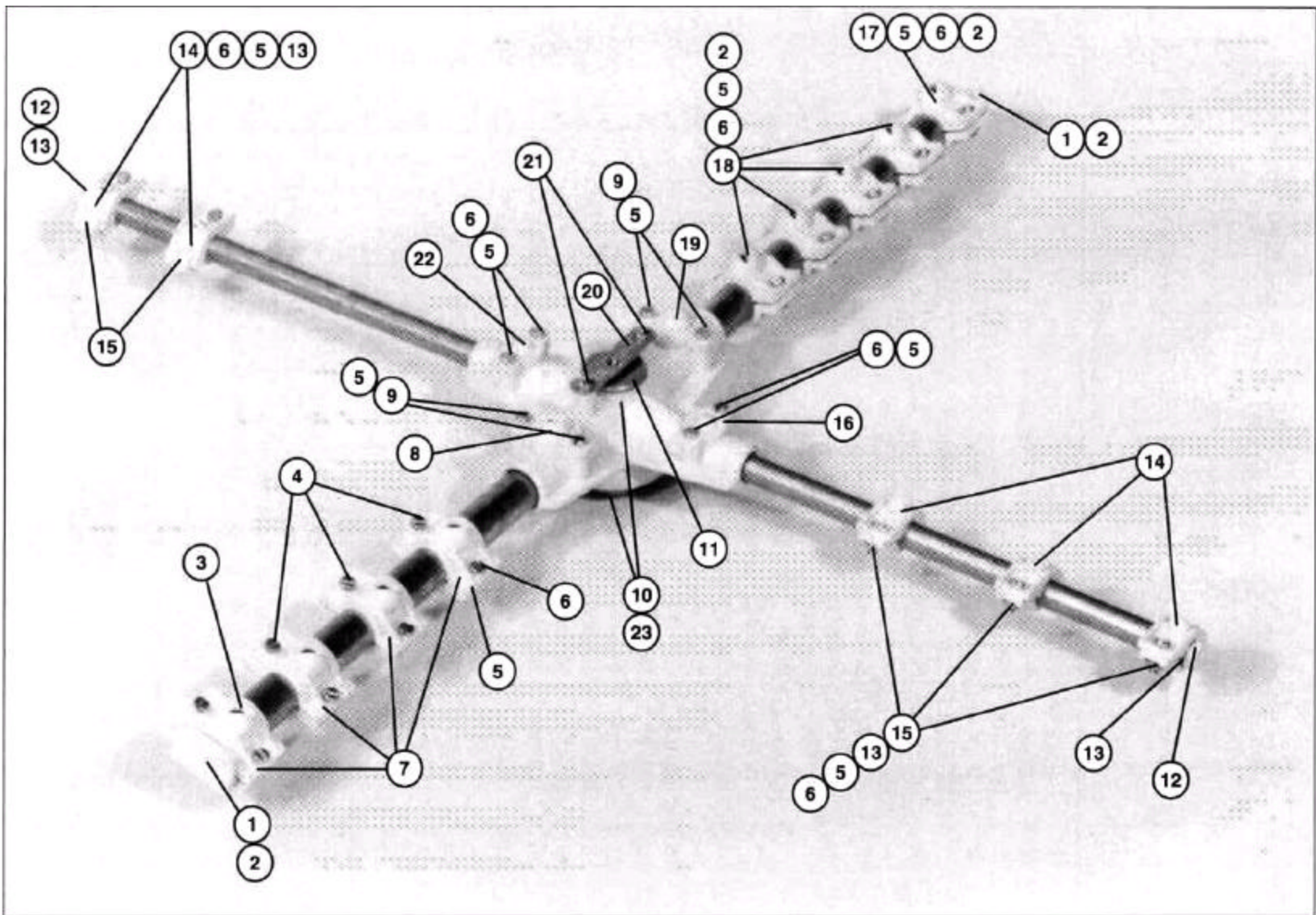


Fig. 26 - D-HB/D-HI/D-LF  
Wash/Rinse Spray Arms  
(For machines built prior to S/N 77854)

**D-HB/D-H1/D-LF WASH/RINSE SPRAY ARMS**  
(For machines prior to S/N 77854)

Fig 26	Part		
Item No	No	Part Description	Qty
1	107328	Plug wash arm	2
2	108021	Wash, O-ring	11
3	107334	Nozzle, top wash (LH)	1
4	108364	Nozzle, top (RH)	3
5	107337	Nut (Plain M4)	36
6	107336	Screw (M4 x 12 Pan hd)	32
7	107332	Nozzle, bottom wash	9
8	109489	Nozzle, wash arm	1
9	109491	Screw (M4 x 25)	4
10	110394	Bearing, lower (Short) (For plastic hub)	1
11	109837	Screw, retaining	1
12	107329	Plug, rinse arm	2
13	108016	Rinse, O-ring	7
14	108730	Nozzle, top rinse	5
15	107330	Nozzle, bottom rinse	5
16	109834	Cap-rinse, center	1
17	107335	Nozzle, top wash (RH)	1
18	108365	Nozzle, top (LH)	4
19	109488	Nozzle, wash arm	1
20	109836	Bracket, retaining screw	1
21	109491	Screw (M4 x 25)	2
22	109833	Nozzle, center rinse	1
23	110394	Bearing, upper (Short) (For plastic hub)	1
—	404801	Wash/Rinse arm assy complete (Includes items 1 -23)	2
—	109033	Spindle, wash arm (Not shown)	2
—	109546	Support, wash arm (Not shown)	2
—	900749	Rebuild kit, combination arm (Includes items 1-10, 12-19, 23) (Rebuilds one assembly)	A/R
—	0708414	Wash and Rinse arm conversion kit (Includes 2 complete wash arms)	2

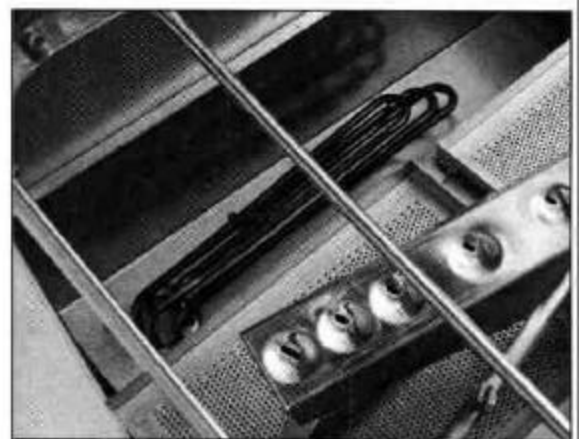
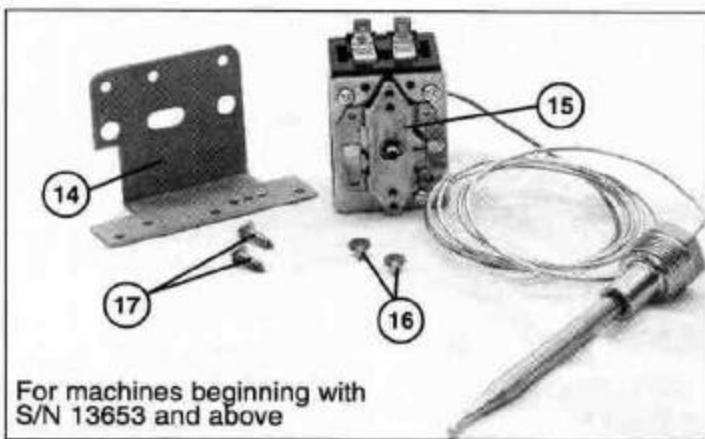
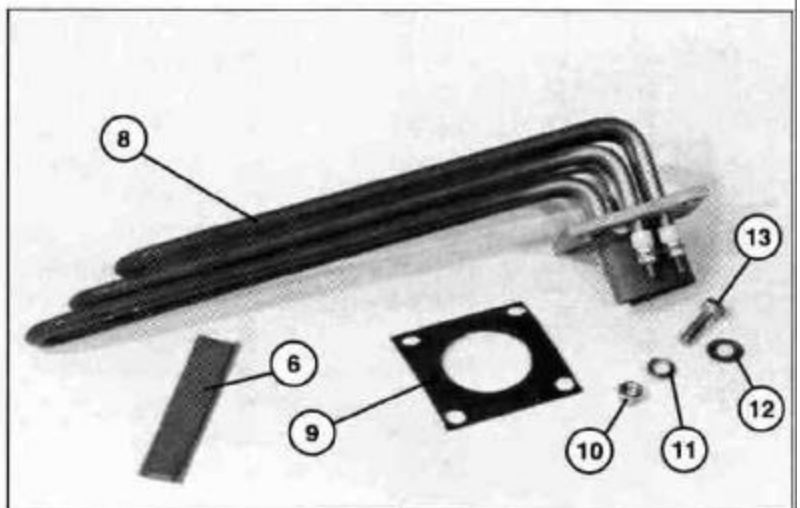
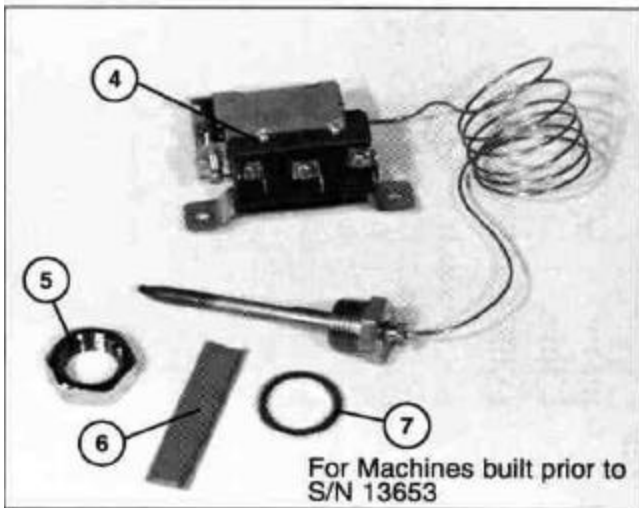
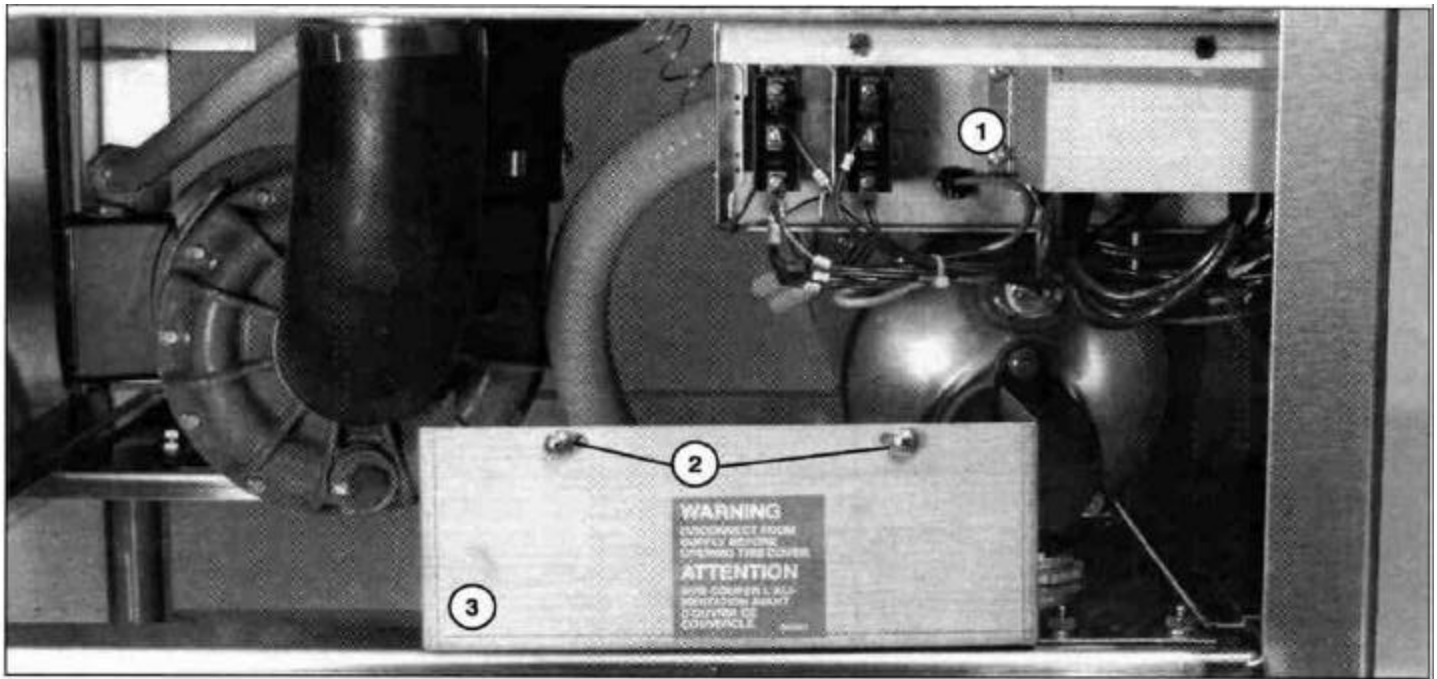
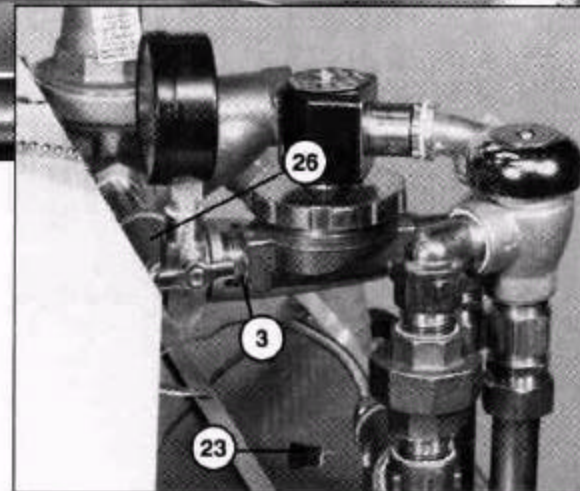
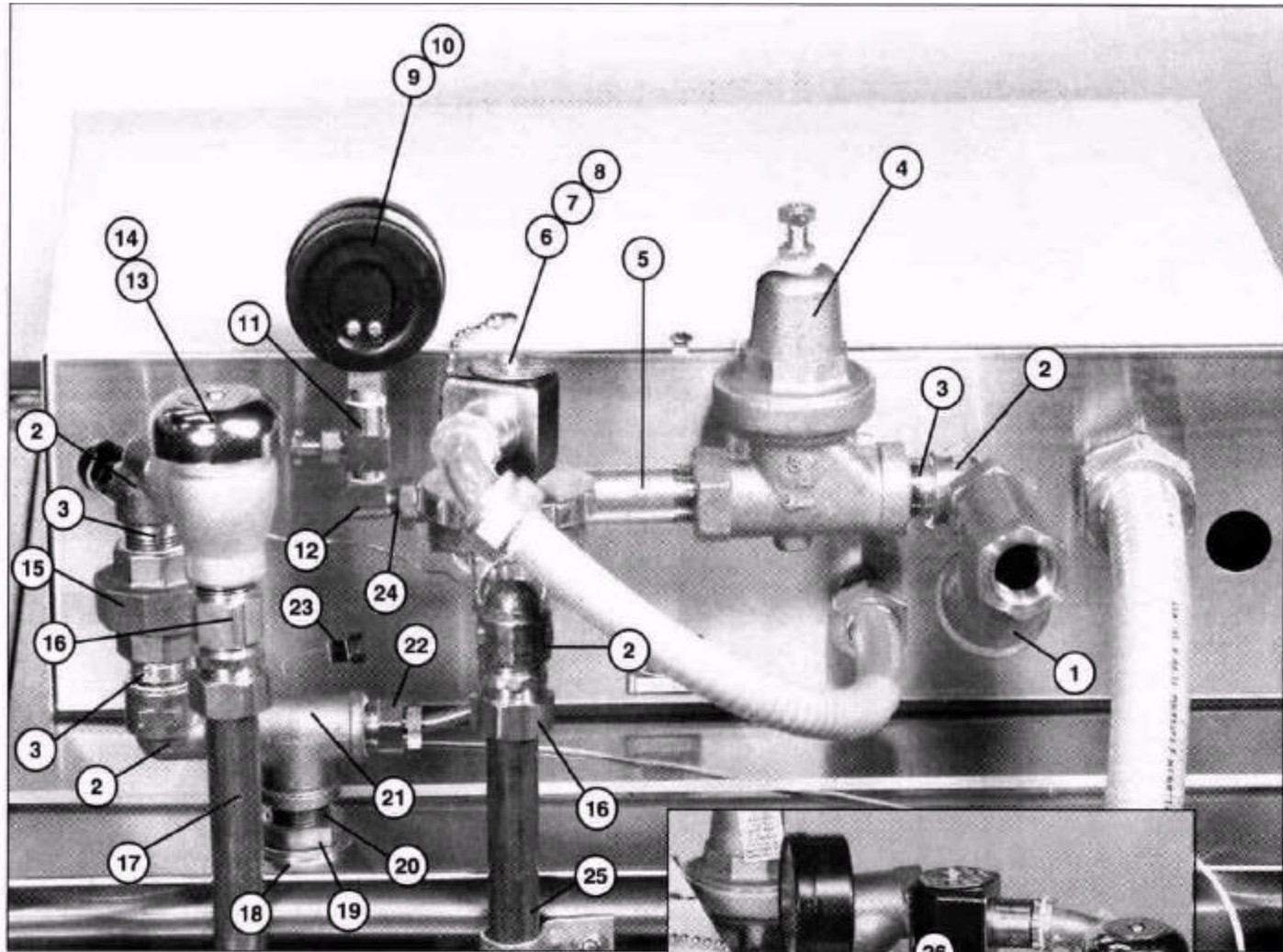
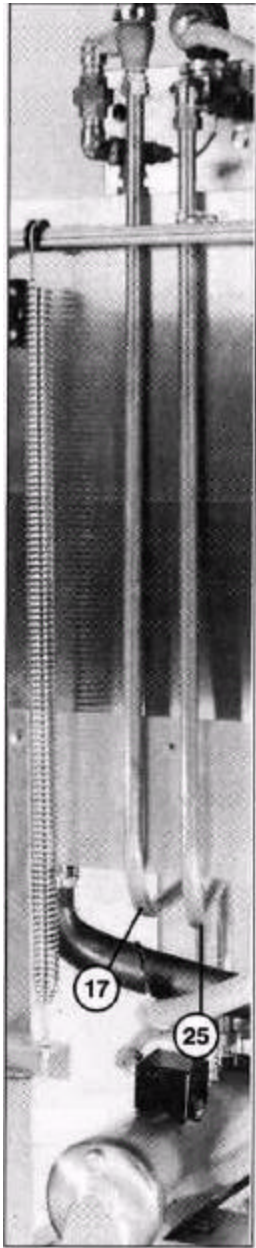


Fig. 27 - D-HB/D-H1/D-LF Tank Heater  
 Element and Thermostat

**D-HB/D-H1/D-LF TANK HEATER ELEMENT AND THERMOSTAT**

Fig 27 Item No	Part No	Part Description	Qty
1	0308488	Box, electrical	1
2	0501412	Screw (Slot 10-32 x 38 Truss hd SST)	2
3	0307330	Cover, electrical box	1
4	109069	Thermostat, temperature control (Prior to S/N 13653)	1
5	201029	Locknut (1/2 NPT)	1
6	104889	Compound, gray (Water sealing putty)	1 ft
7	201041	Washer (7/8 x 1-3/16 x 1/8)	1
8	109756	Heater, 3KW (240V)	1
8	109755	Heater, 3KW (480V)	1
8	0507707	Heater, 3KW (575V)	1
9	108345	Gasket, heater	1
10	100154	Nut, plain (5/16-18)	4
11	106013	Washer, lock (5/16 Split)	4
12	102376	Washer (5/16 x 3/4 x 1/16)	4
13	100740	Bolt (5/16-18 x 1 Hex hd)	4
14	112185	Bracket, thermostat (Beginning with S/N 13653 and above)	2
15	112204	Thermostat, Ranco (Beginning with S/N 13653 and above)	2
16	—	Screw (6/32 x 1/4")	2
17	—	Screw, sheet metal (#8 x 3/16")	2



**D-HB**  
**FILL PIPING ASSEMBLY**

Fig 28	Part		
Item No	No	Part Description	Qty
1	110768	Strainer, line (3/4 Brass)	1
2	102444	Elbow, street (3/4 x 90° Brass)	4
3	100184	Nipple, close (3/4 NPT Brass)	4
4	107550	Valve, pressure reducing (3/4")	1
5	102470	Nipple (3/4 x 3 Brass)	1
6	111437	Valve, solenoid (3/4")	1
7	109903	Repair Kit, solenoid valve (3/4") (Not shown)	1
8	108516	Coil, solenoid valve (120V) (Not shown)	1
9	100135	Gauge, pressure (0-60 psi)	1
10	109765	Overlay, pressure gauge (Not shown)	1
11	0502781	Valve, needle	1
12	101261	Elbow, street (1/4 x 90° Brass)	1
13	104429	Breaker, vacuum (3/4" Brass)	1
14	108351	Repair Kit, vacuum breaker (3/4")	1
15	100571	Union (3/4 NPT Brass)	1
16	109879	Fitting, compression (7/8 OD x 3/4 NPT Male)	2
17	0309057	Outlet tube, booster	1
18	0308862	Washer (1-1/4 ID x 1-3/4 OD)	1
19	100156	Nut lock (3/4" Brass)	1
20	109783	Standpipe, final rinse	1
21	0308728	Tee (3/4 x 1/2 x 3/4)	1
22	108391	Thermometer (4 ft)	1
23	107424	Plug (1/8")	1
24	102388	Bushing, reducer (1/2 x 1/4 Brass)	1
25	0309056	Inlet tube, booster	1
26	102525	Tee (3/4 x 1/2 x 3/4)	1

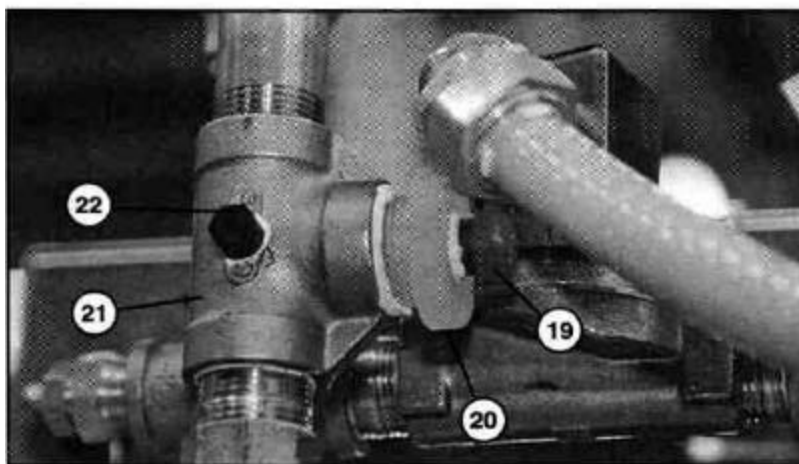
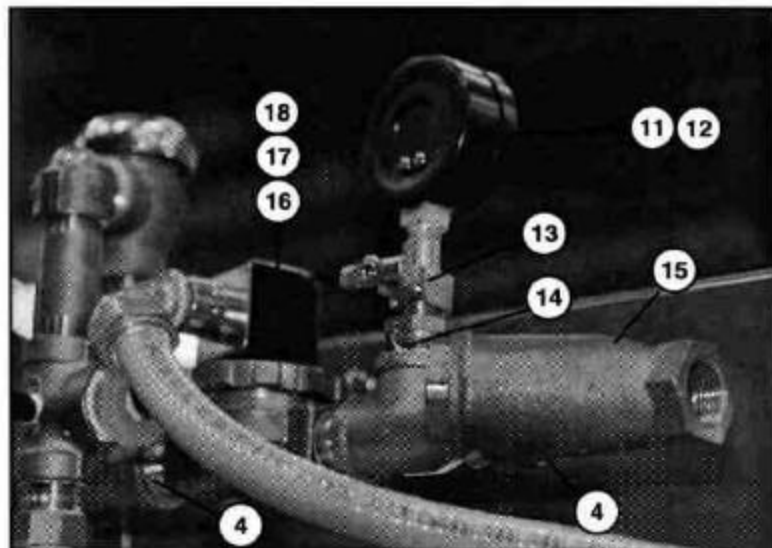
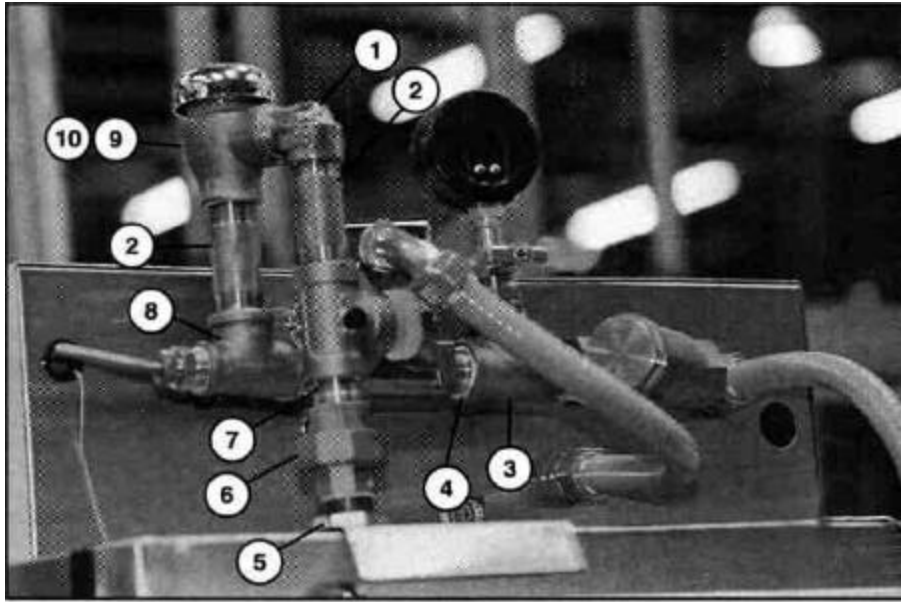


Fig-29-D-HI/D-LF  
Fill Piping Assembly

**D-H1 and D-LF  
FILL PIPING ASSEMBLY**

Fig 29	Part	Part Description	Qty
Item No	No		
1	102444	Elbow, street (3/4 x 90°) Brass	1
2	102470	Nipple (3/4 x 3) Brass	2
3	0507463	Tee (3/4) Brass	1
4	100184	Nipple, close (3/4 NPT) Brass	3
5	100156	Locknut (3/4) Brass	1
6	100571	Union, close (3/4) Brass	1
7	100051	Nipple, close (3/4) SST	1
8	102525	Tee, rod (3/4 x 1/2 x 3/4) Brass	1
9	104429	Vacuum breaker (3/4) Brass	1
10	108351	Kit, repair (3/4) (Not shown)	1
11	100135	Gauge, pressure	1
12	109765	Overlay, pressure gauge (Not shown)	1
13	100123	Gauge, cock	1
14	102403	Bushing, reducing (3/4 x 1/4) Brass	1
15	110768	Strainer, line (3/4) Brass	1
16	111437	Valve (3/4)	1
17	109903	Kit, repair (3/4) (Not shown)	1
18	108516	Valve, coil (3/4) (Not shown)	1
19	107463	Plug (1/4)	1
20	108181	Bushing, reducing (3/4 x 1/4) Plastic	1
21	203183	Tee, modified (3/4) SST	1
22	107424	Plug (1/8)	1

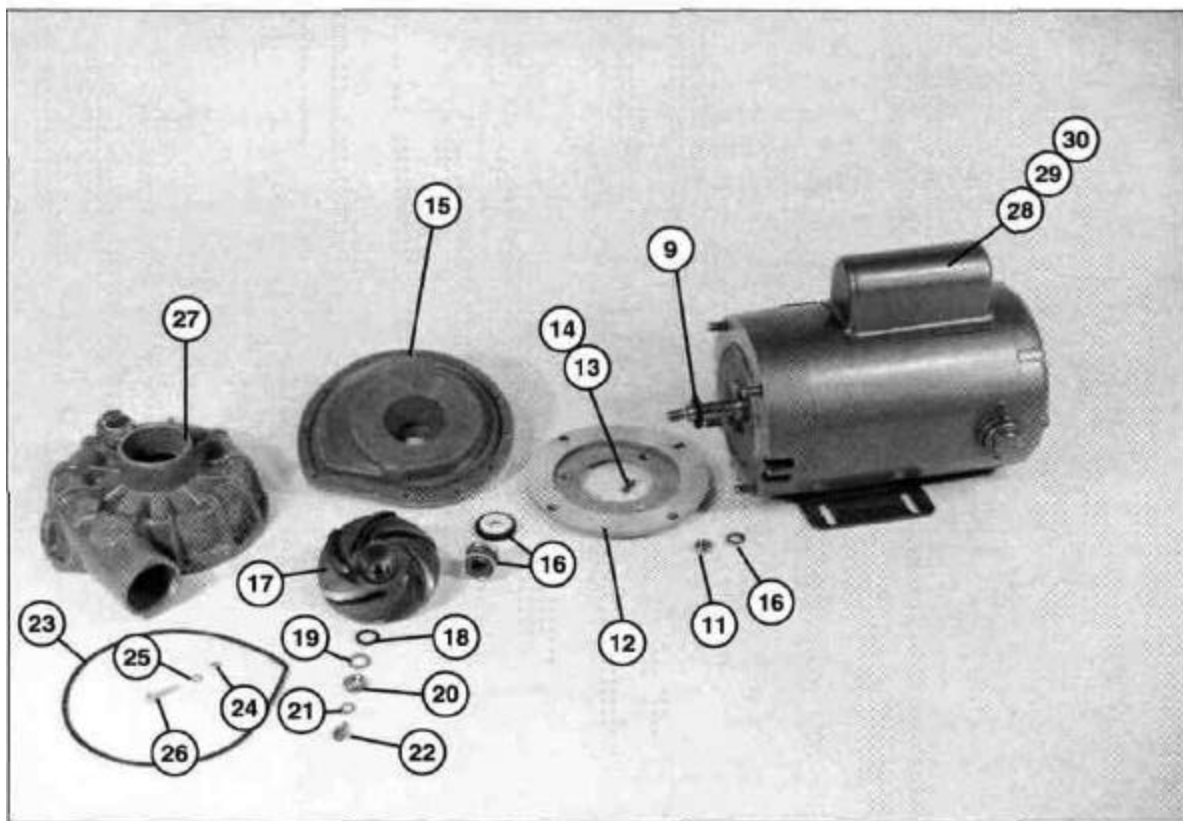
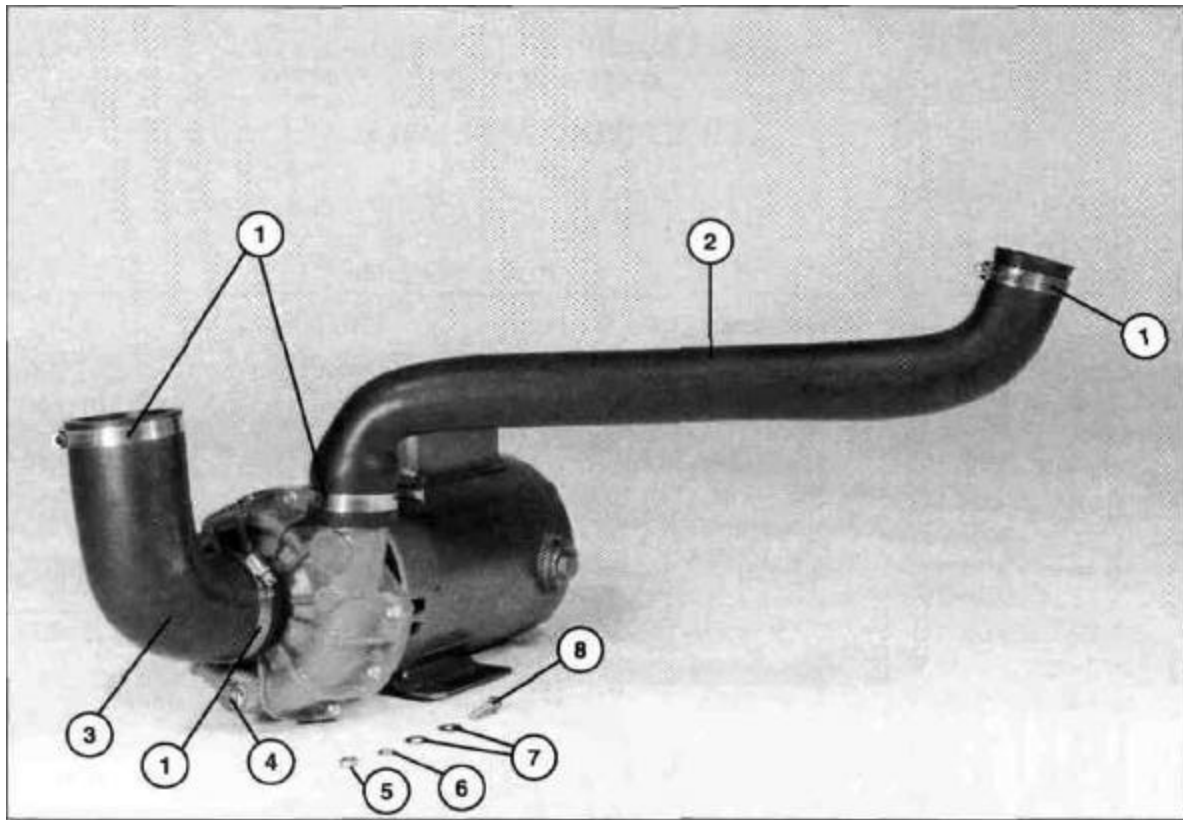


Fig. 30 - D-HB/D-H1/D-LF  
Pump Assembly

**D-HB/D-H1/D-LF**  
**PUMP/MOTOR ASSEMBLY**  
**(For machines beginning with S/N 10629M and above)**

Fig 30 Item No	Part No	Part Description	Qty
1	104203	Clamp hose	5
2	109856	Hose, discharge	1
3	109562	Hose, suction	1
4	107463	Plug(1/4")	1
5	100142	Nut, grip (5/16-18)	4
6	106013	Washer, lock (5/16")	1
7	102376	Washer, flat (5/16")	8
8	100739	Bolt (5/16-18 x 3/4" Hex hd)	4
9	109654	Pump, slinger washer	1
10	106407	Washer, lock (3/8" Split)	4
11	107690	Nut, jam (3/8-16)	4
12	204460	Backing plate, machined	1
13	100754	Screw, flat (10-32 x 1/2)	4
14	110270	Washer, counter-sunk (SST)	4
15	109649	Back pump housing	1
16	111111	Pump seal	1
17	111143	Impeller	1
18	110458	O-ring	1
19	110248	Washer, flat (440 x 750 x 043)	1
20	110247	Nut, jam (7/16-20)	1
21	106482	Washer, lock (1/4" Split)	1
22	100734	Bolt (1/4-20 x 1/2" Hex hd)	1
23	109653	Gasket O-ring	1
24	100194	Nut, grip (10-32)	11
25	0501505	Washer, lock	11
26	107137	Bolt (10-32 x 7/8" Hex hd)	11
27	109651	Volute	1
28	111145	Motor, 14 HP (208-240V/460V/60/3PH)	1
29	111144	Motor, 14 HP (115V/208-240V/60/1PH)	1
30	0507708	Motor, 14 HP (575V/60/3PH)	1
—	109645	Kit, pump (Includes items 15, 23, 27)	A/R
—	451643	Pump/Motor assembly, complete 1.4 HP (208-240V/460V/60/3PH)	1
—	451642	Pump/Motor assembly, complete 1.4 HP (115V/208-240V/60/1PH)	1
—	0707549	Pump/Motor assembly, complete 1.4 HP (575V/60/3PH)	1
—	900665	Impeller and seal kit (Includes items 16, 17)	A/R

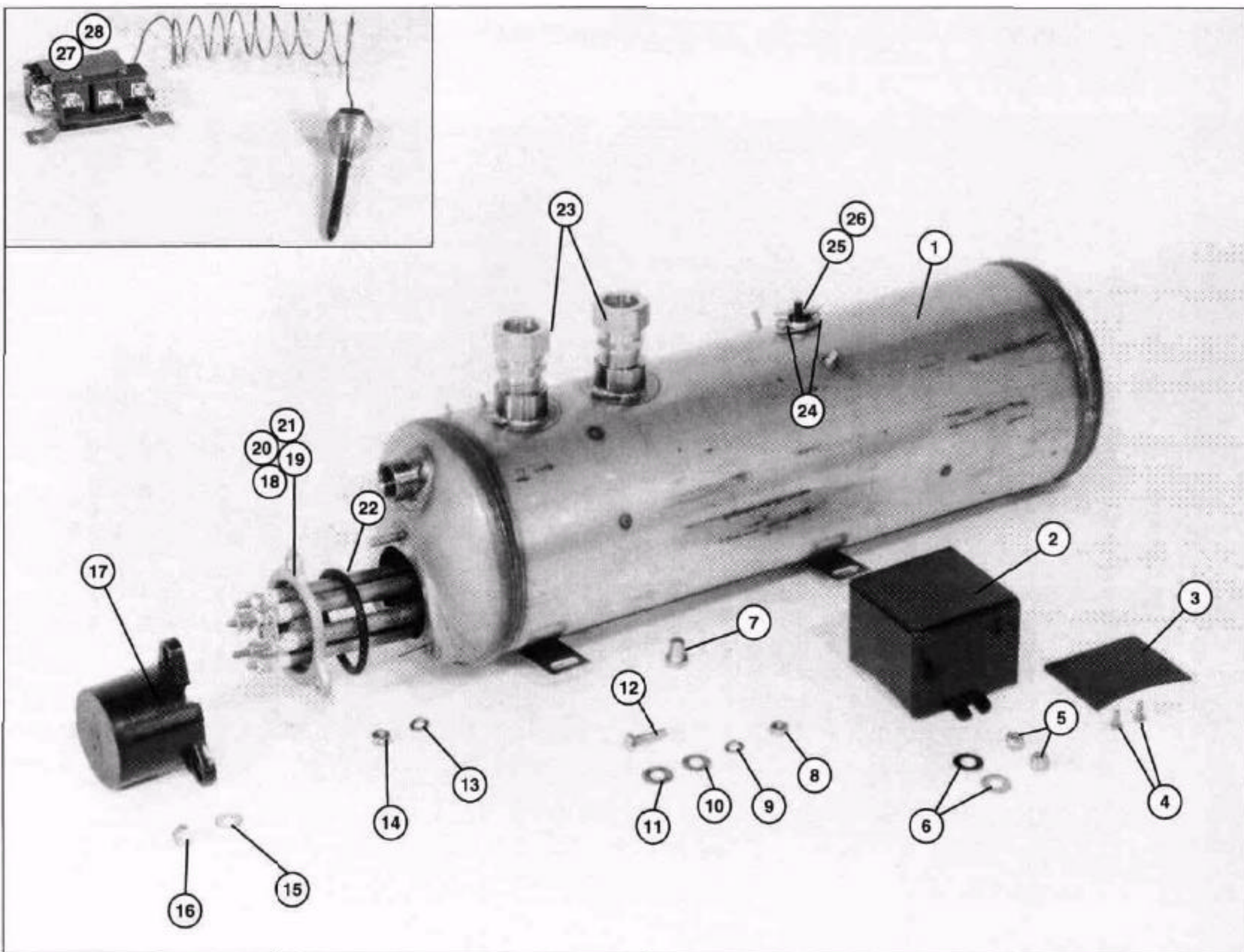


Fig. 31 - D-HB  
Electric Booster Assembly and Thermostat

**D-HB**  
**ELECTRIC BOOSTER ASSEMBLY AND THERMOSTAT**

Fig 31 Item No	Part No	Part Description	Qty
1	0508779	Tank, booster (Beginning with S/N 11783 thru S/N 13101)	1
1	0509042	Tank, booster (Beginning with S/N 13102 and above)	1
2	110929	Box, thermostat	1
3	110930	Cover, box	1
4	109835	Screw (#8 x 1/2" Phil hd)	2
5	107966	Nut, grip (10-32 w/nylon insert)	2
6	107033	Washer, flat	2
7	100210	Plug(18"SST)	1
8	100154	Nut, plain (5/16-18)	2
9	106013	Washer, lock 5/16 (Split)	2
10	104618	Washer, flat (3/8 x 7/8 x 1/16)	2
11	102376	Washer, flat (5/16 x 3/4 x 1/16)	2
12	100740	Bolt (5/16-18 x 1 Hex hd)	2
13	106482	Washer, lock (1/4 Split)	3
14	100003	Nut, plain (1/4-20 SST)	3
15	106026	Washer (1/4 x 5/8 x 1/16 SST)	3
16	107967	Nut, grip (1/4-20 w/nylon insert)	3
17	107908	Cover, heater	1
18	111233	Heater, booster (208-240V) 40° rise - 9KW	1
19	108579	Heater, booster (480V) 40° rise - 9KW	1
20	111266	Heater, booster (208-240V) 70° rise - 18KW	1
21	111267	Heater, booster (480V) 70° rise - 18KW	1
22	109985	O-ring	1
23	109879	Fitting, compression (7/8 OD x 3/4 NPT Male)	2
24	108954	Nut, grip (6-32 w/nylon insert)	2
25	110562	Thermostat, high limit	1
26	110563	Compound, heat sink	1
27	109069	Thermostat, booster heat control (Prior to S/N 13653)	1
28	112204	Thermostat, booster heat control (Beginning with S/N 13653 and above)	1

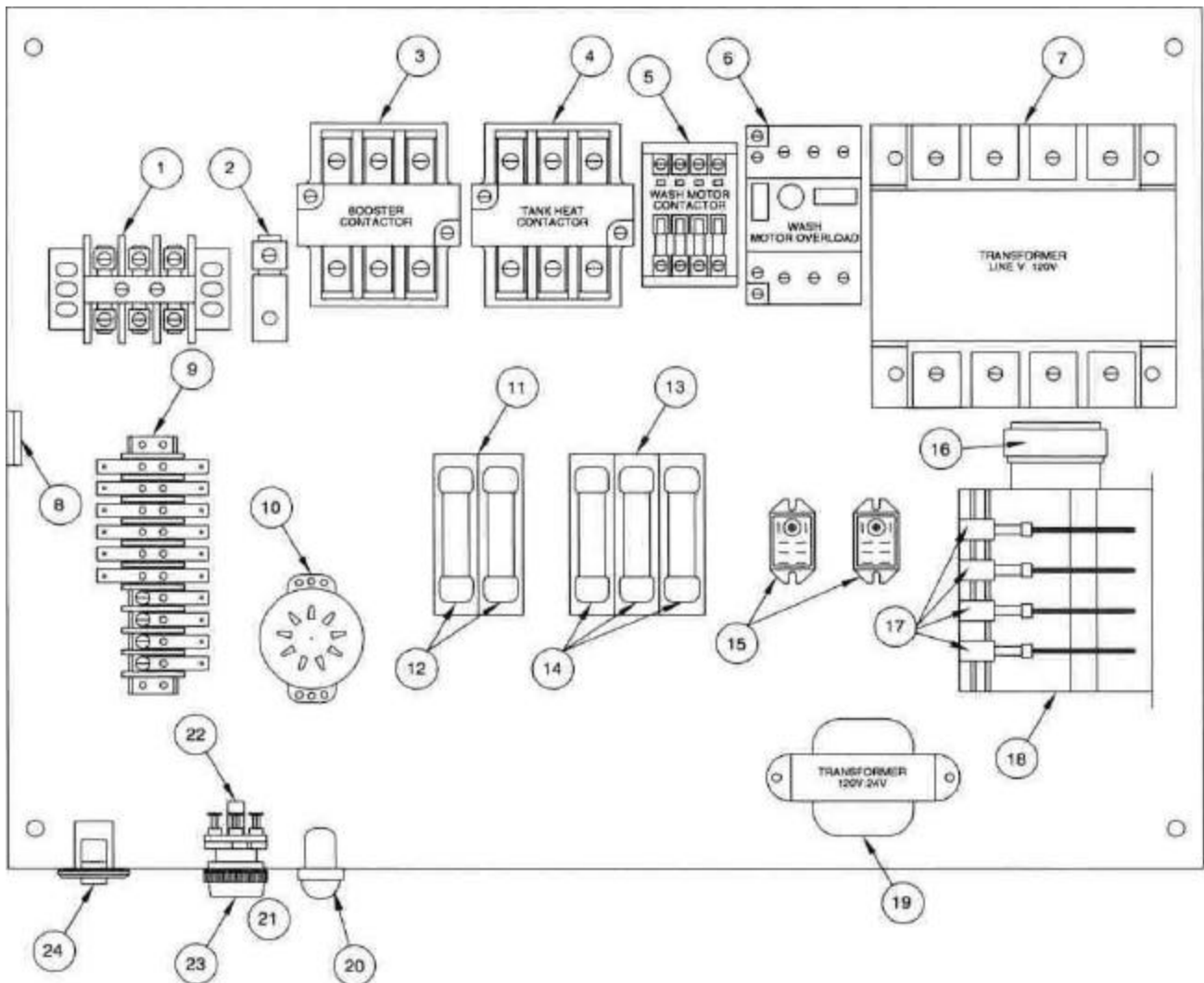


Fig. 32 - D-HB/D-H1/D-LF  
Control Cabinet

**D-HB/D-H1/D-LF**  
**CONTROL CABINET**  
**(For machines beginning with S/N 12305M and above)**

Fig 32 Item No	Part No	Part Description	Qty
1	106963	Terminal block, 1 Phase	1
1	106010	Terminal block, 3 Phase	1
2	103309	Wire lug, ground	1
3	105514	Contactor, booster (All voltages/3PH) 40° and 70° rise	1
4	105514	Contactor, tank heat (All voltages) 1 & 3 Phase	1
5	111642	Contactor, wash motor (All voltages) 1 & 3 Phase	1
6	111632	Overload, motor, manual-14 HP Wash (115V/1PH)	1
6	111630	Overload, motor, manual-14 HP Wash (208-240 V/1PH)	1
6	111628	Overload, motor, manual-14 HP Wash (208-240V/3PH)	1
6	111627	Overload, motor, manual-14 HP Wash (380-415 V/3PH)	1
6	111626	Overload, motor, manual-14 HP Wash (480V/3PH)	1
6	111626	Overload, motor, manual-14 HP Wash (575 V/3PH)	1
7	109064	Transformer, control (208-240V/3PH, 480V/3PH)	1
7	111464	Transformer, control (380-415V/3PH)	1
7	111521	Transformer, control (575V/3PH)	1
8	111090	Reed switch, magnetic	1
9	0508895	Terminal block	1
10	0508469	Timer, fill assembly	1
11	106402	Fuse block, 2 Pole (1 & 3 Phase)	1
12	107289	Fuse 25A (208-240V/1PH)	2
12	107289	Fuse 25A (208-240V/3PH)	2
12	0508707	Fuse 1A (380-415V/3PH)	2
12	0508707	Fuse 1A (480V/3PH)	2
12	0508708	Fuse 25A (575V/3PH)	2
13	106925	Fuse block, 3 Pole (1 & 3 Phase)	1
14	0508676	Fuse 30A (115V/1PH)	3
14	107384	Fuse 20A (208-240V/1PH)	3
14	0508675	Fuse 10A (208-240V/3PH)	3
14	100913	Fuse 10A (380-415V/3PH)	3
14	100906	Fuse 5A (480-575V/3PH)	3
15	111067	Relay, 24V	2
16	0508773	Motor, timer	1
17	0501379	Switch, timer	4
18	0708769	Timer, cycle assembly	1
19	111277	Transformer, 24V	1
20	106364	Indicator light	1
21	900725	Kit, pushbutton (Includes items 22, 23)	1
22	111617	Contact block (NO)	1
23	111614	Switch, pushbutton	1
24	110844	Circuit breaker 5A (Prior to S/N 13116)	1
24	111980	Circuit breaker 5A (Beginning with S/N 13116 and above)	1
25	0508668	Decal, control cabinet	1

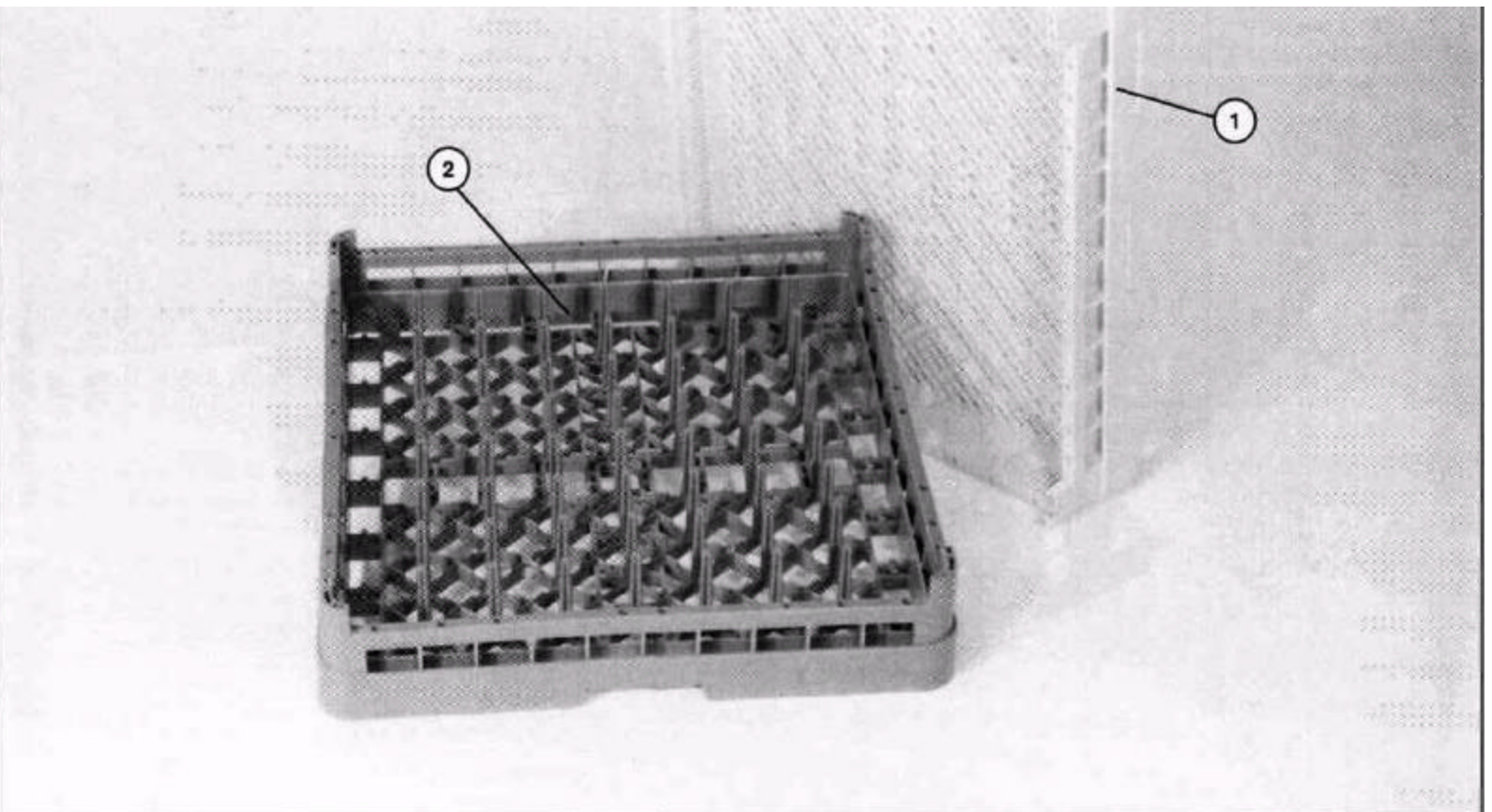


Fig. 33 - D-HB/D-HI/D-LF  
Dishracks

**D-HB/D-H1/D-LF  
DISHRACKS**

Fig 33 Item No	Part No	Part Description	Qty
1	101273	Rack, (Flat bottom)	1
2	101285	Rack, (Peg)	1

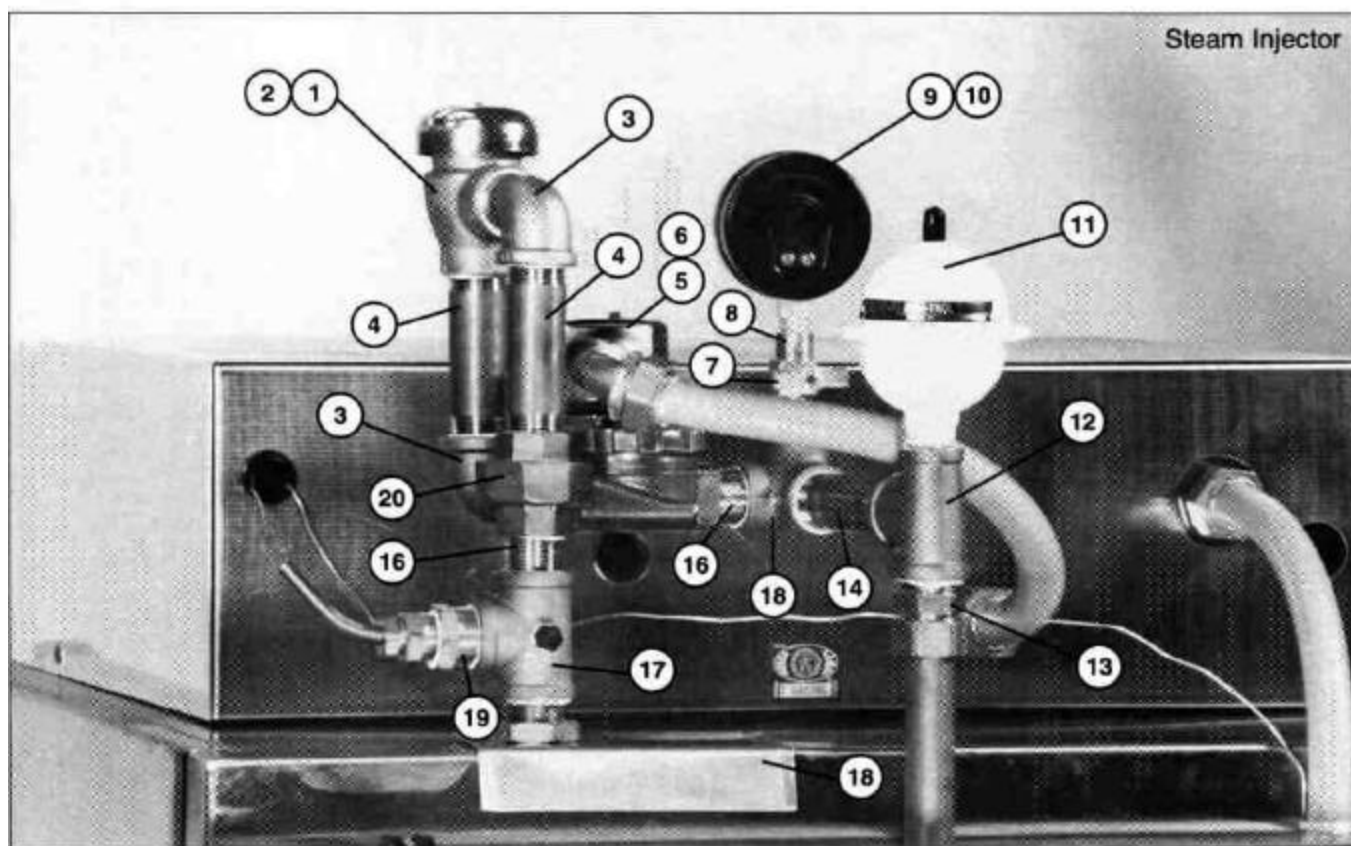
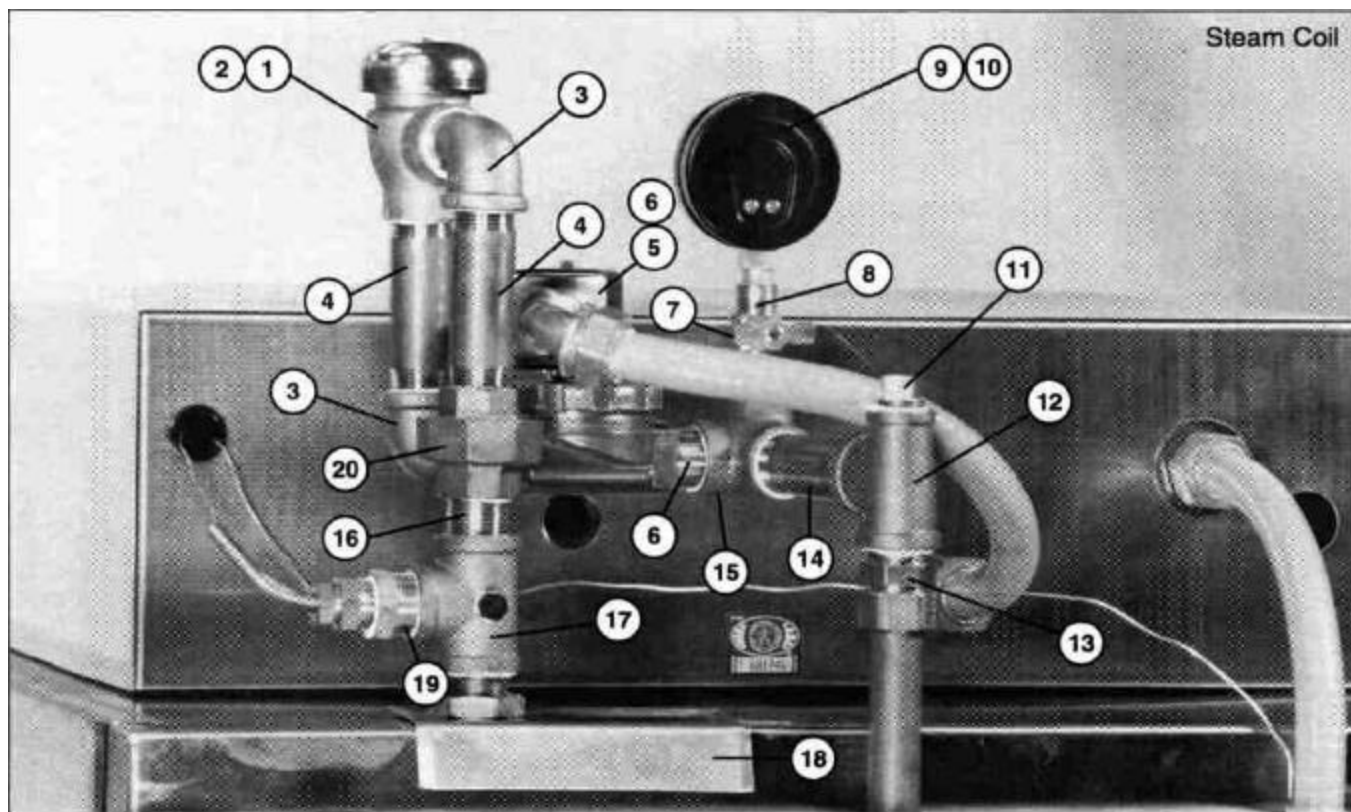


Fig. 34 - D-HB Steam Coil/Steam Injector  
Fill Piping

**D-HB**  
**STEAM COIL/STEAM INJECTOR FILL PIPING**

Fig 34	Part		
Item No	No	Part Description	Qty
1	104429	Vacuum breaker, (3/4" Brass)	1
2	108351	Repair kit, 3/4" vacuum breaker (Not shown)	1
3	102444	Elbow, street (3/4 x 90° Brass)	2
4	102652	Nipple (3/4 x 3-3/4 Brass)	2
5	111437	Valve, solenoid (3/4" HW)	1
6	110598	Kit, repair (3/4" HW) (Not shown)	1
7	102403	Bushing, reducing (3/4 x 1/4 Brass) (Not shown)	1
8	0502781	Cock, gauge (1/4")	1
9	100135	Gauge, pressure (0-60 psi)	1
10	109765	Overlay, pressure gauge (Not shown)	1
11	102504	Plug (1/2 NPT Square hd Brass)	1
*11	104681	Optional 1/2" silencer (Used on steam injector units)	1
12	102525	Tee, red (3/4 x 1/2 x 3/4)	1
13	109879	Fitting, compression (7/8 OD x 3/4 NPT Male)	1
14	102653	Nipple (3/4 x 4 Brass)	4
15	102797	Elbow (3/4 x 90° Side Outlet Brass)	1
16	100184	Nipple, close (3/4 NPT Brass)	2
17	202692	Tee, rinse injector (3/4 Brass)	1
18	305501	Deflector	1
19	102392	Bushing, reducing (3/4 x 1/2 Brass)	1
20	100571	Union (3/4 NPT Brass)	1

\*Optional part used on steam injector units

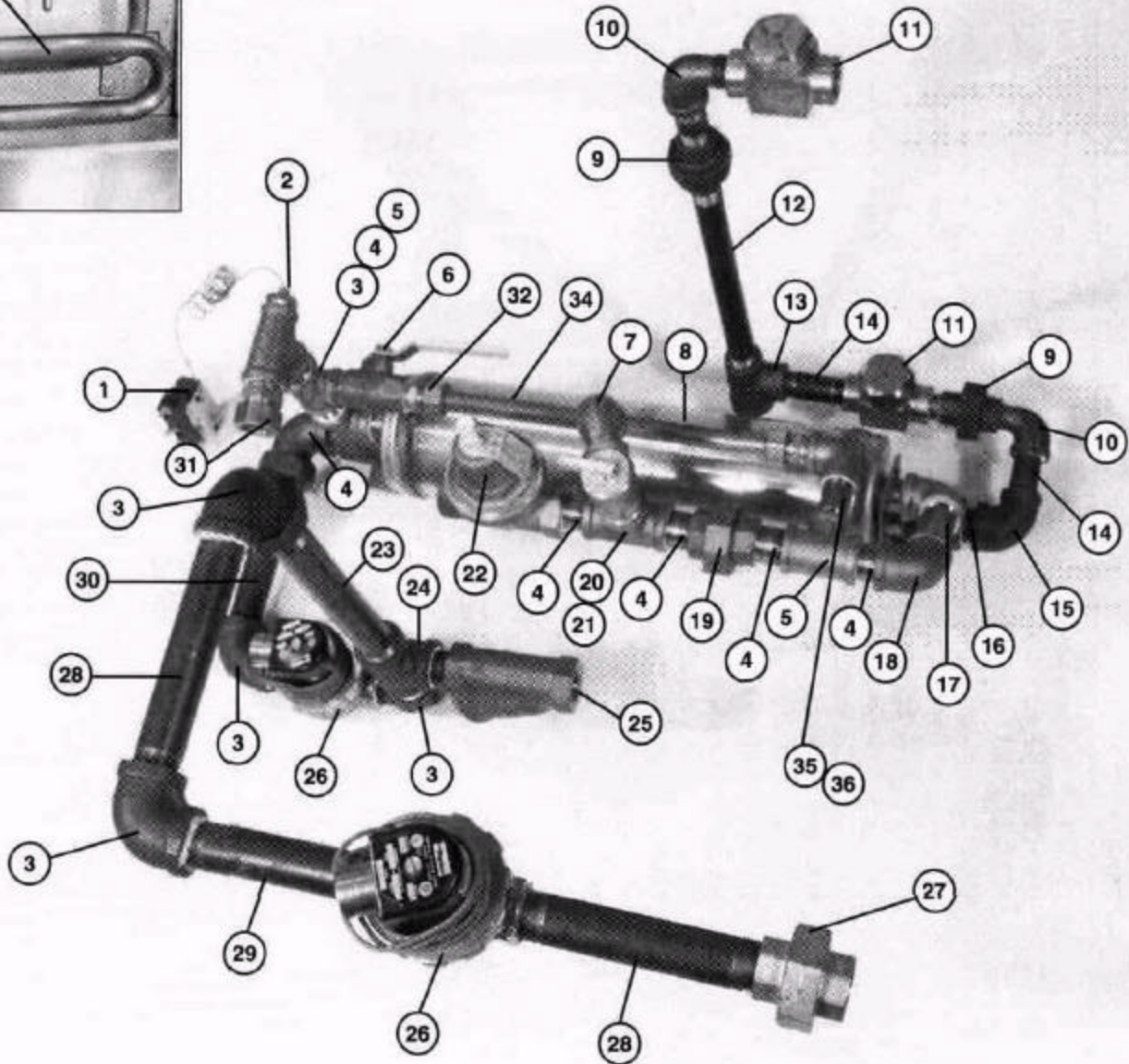
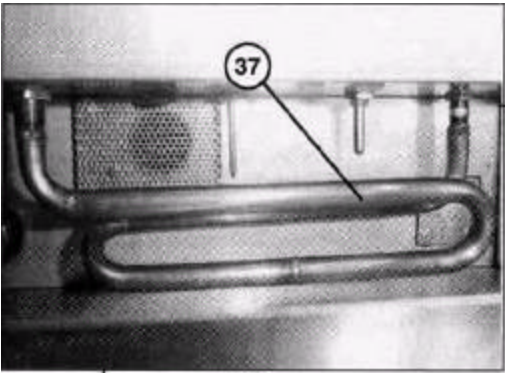


Fig. 35 - D-HB  
Steam Coil and Booster Assembly

**D-HB**  
**STEAM COIL AND BOOSTER ASSEMBLY**

Fig 35	Part		
Item No	No	Part Description	Qty
1	109069	Thermostat, temperature control	1
2	102525	Tee, reducing (3/4 x 1/2 x 3/4 Brass)	1
3	105730	Elbow (3/4 x 90)	4
4	100184	Nipple, close (3/4 NPT Brass)	5
5	102526	Tee, reducing (3/4 x 3/4 x 1/2 Brass)	2
6	104749	Valve, ball (1/2")	1
7	102444	Elbow, street (3/4 x 90° Brass)	1
8	311654	Booster assy, modified	1
9	105778	Union (1/2 NPT)	2
10	100147	Elbow, street (1/2 x 90°)	2
11	111380	Trap, steam (1/2)	1
12	105796	Nipple (1/2x7)	1
13	105757	Tee, reducing (3/4 x 1/2 x 1/2)	1
14	105783	Nipple (1/2 x 2)	2
15	105738	Elbow, reducing (3/4 x 1/2 x 90°)	1
16	105803	Nipple, close (3/4 NPT)	1
17	102490	Nipple(3/4 x 3 1/2 Brass)	1
18	102442	Elbow (3/4 x 90° Brass)	1
19	100571	Union (3/4 NPT Brass)	1
20	102521	Tee (3/4 NPT Brass)	1
21	104649	Valve, relief (3/4")	1
22	107550	Valve, pressure reducing (3/4")	1
23	105834	Nipple (3/4x8)	7
24	105752	Tee (3/4 NPT)	1
25	110768	Strainer (3/4" Brass)	1
26	109887	Valve, steam (3/4")	2
27	105779	Union (3/4 NPT)	1
28	105823	Nipple (3/4 x 5 1/2)	2
29	105819	Nipple (3/4 x 4 1/2)	1
30	105821	Nipple (3/4x5)	1
31	109879	Fitting, compression (7/8 OD x 3/4 NPT Male)	1
32	109925	Fitting, compression (5/8 x 1/2 NPT Con)	2
33	106485	Union, elbow (3/4 x 90° Female)	1
34	107380	Tubing (1/2")	15 ft
35	102435	Elbow (1/2 x 90° Brass)	1
36	102492	Nipple (1/2 x 2 Brass)	1
37	316906	Coil, steam	1

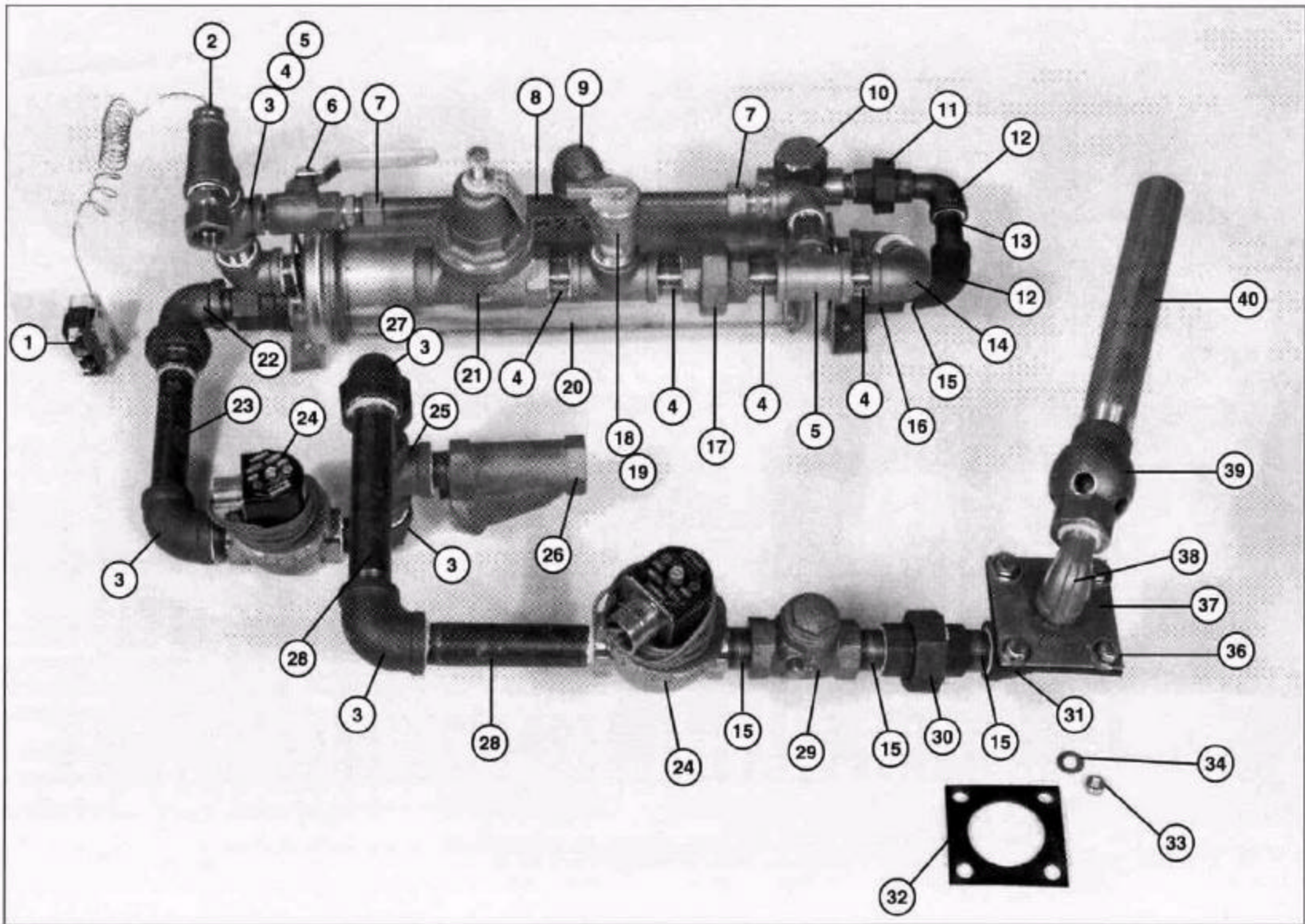


Fig. 36 - D-HB  
Steam Injector and Booster Assembly

**D-HB**  
**STEAM INJECTOR AND BOOSTER ASSEMBLY**

Fig 36	Part		
Item No	No	Part Description	Qty
1	109069	Thermostat, temperature control	1
2	102525	Tee, reducing (3/4 x 1/2 x 3/4 Brass)	1
3	105730	Elbow (3/4 x 90°)	4
4	100184	Nipple, close (3/4 NPT Brass)	5
5	102526	Tee, reducing (3/4 x 3/4 x 1/2 Brass)	2
6	104749	Valve, ball (1/2")	1
7	109925	Fitting, compression (5/8 x 1/2 NPT Con)	2
8	107380	Tubing (1/2")	15ft
9	102444	Elbow, street (3/4 x 90° Brass)	1
10	111380	Steam, trap (1/2")	1
11	105778	Union (1/2 NPT)	1
12	100147	Elbow, street (1/2 x 90°)	2
13	105783	Nipple (1/2 x 2)	1
14	102442	Elbow (3/4 x 90° Brass)	1
15	105803	Nipple, close (3/4 NPT)	4
16	102490	Nipple(3/4 x 3 1/2 Brass)	1
17	100571	Union (3/4 NPT Brass)	1
18	102521	Tee (3/4 NPT Brass)	1
19	104649	Valve, relief (3/4")	1
20	311654	Booster, tank	1
21	107550	Valve, pressure reducing (3/4")	1
22	106485	Union, elbow (3/4 x 90° Female)	1
23	105821	Nipple (3/4x5)	1
24	109887	Valve, steam (3/4")	2
25	105752	Tee (3/4 NPT)	1
26	110768	Strainer line (3/4" Brass)	1
27	105834	Nipple (3/4x8)	1
28	105823	Nipple (3/4 x 5 1/2)	2
29	100853	Valve, check (3/4")	1
30	105779	Union (3/4 NPT)	1
31	105738	Elbow, reducing (3/4 x 1/2 x 90°)	1
32	108345	Gasket	1
33	100154	Nut, plain (5/16-18)	4
34	102376	Washer (5/16 x 3/4 x 1/16)	8
35	106013	Washer, lock (5/16 Split) (Not shown)	4
36	100740	Bolt (5/16-18 x1 Hex hd)	4
37	305143	Flange	1
38	100516	Elbow, street (1/2 x 90° SST)	1
39	201110	Steam, injector	1
40	101677	Nipple (1x9 SST)	1

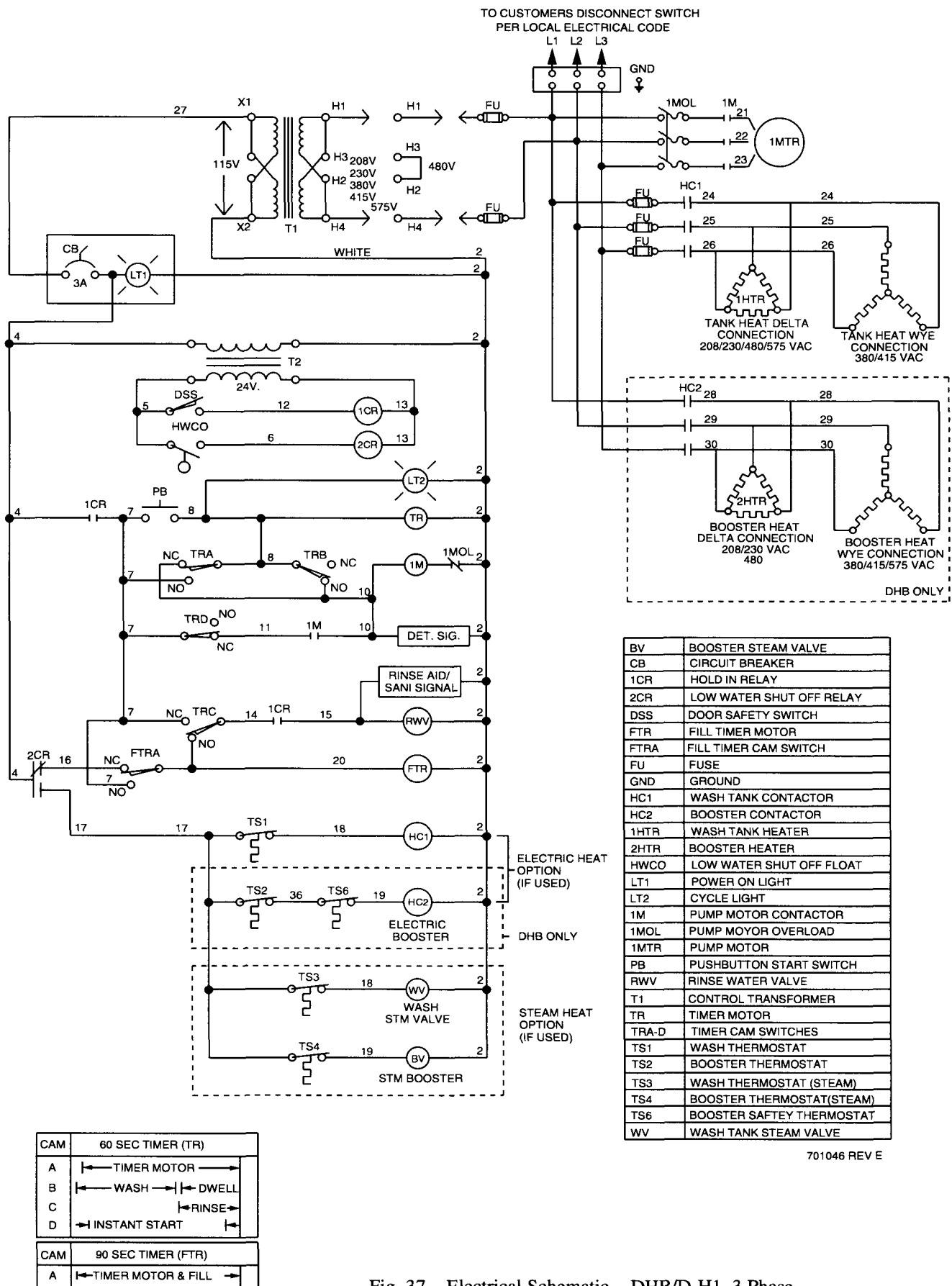
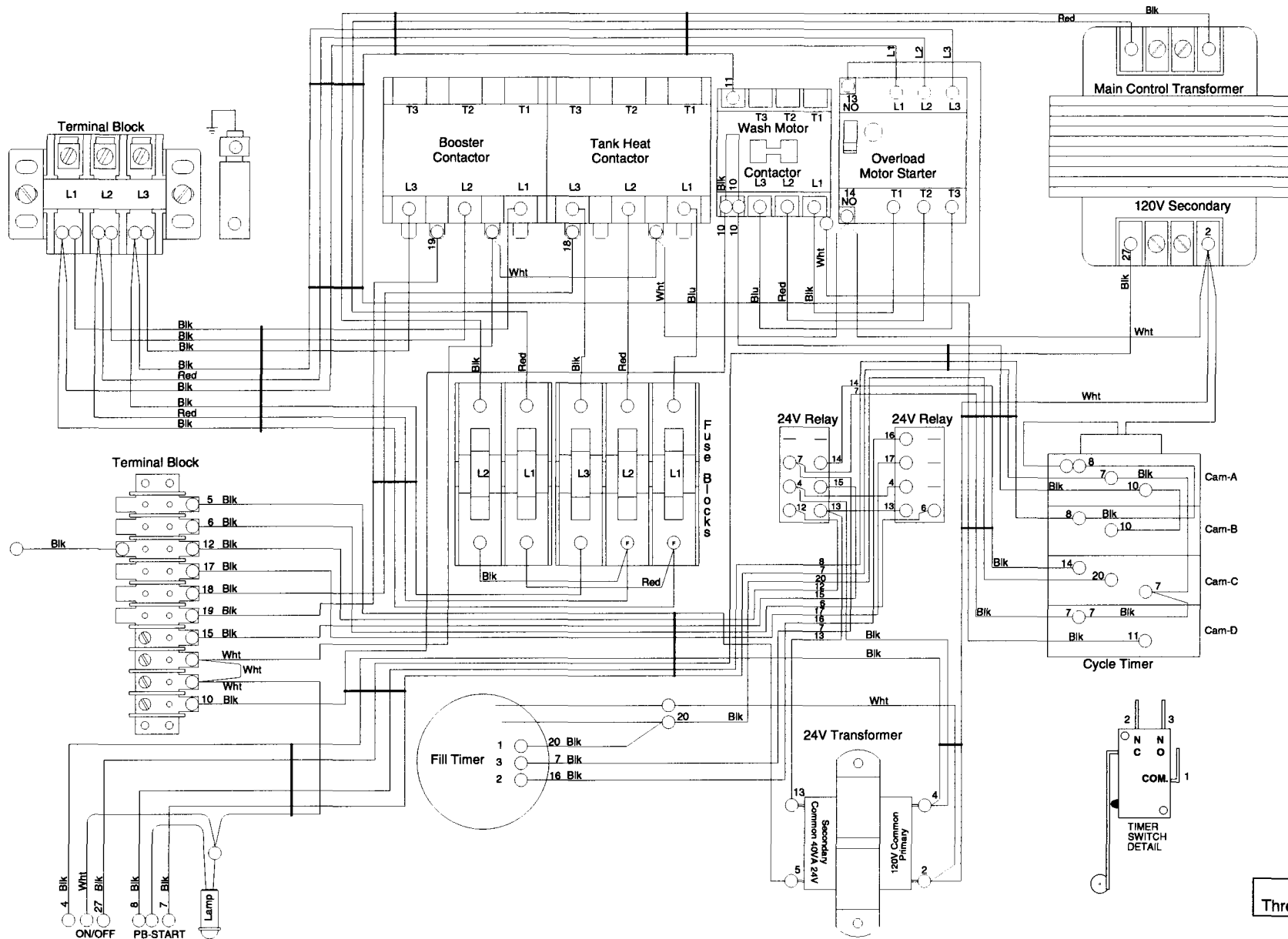


Fig. 37 – Electrical Schematic DHB/D-H1 3 Phase

Fig. 38 – Wiring Diagram D-HB, 3 Phase



D-HB  
Three Phase

0308894

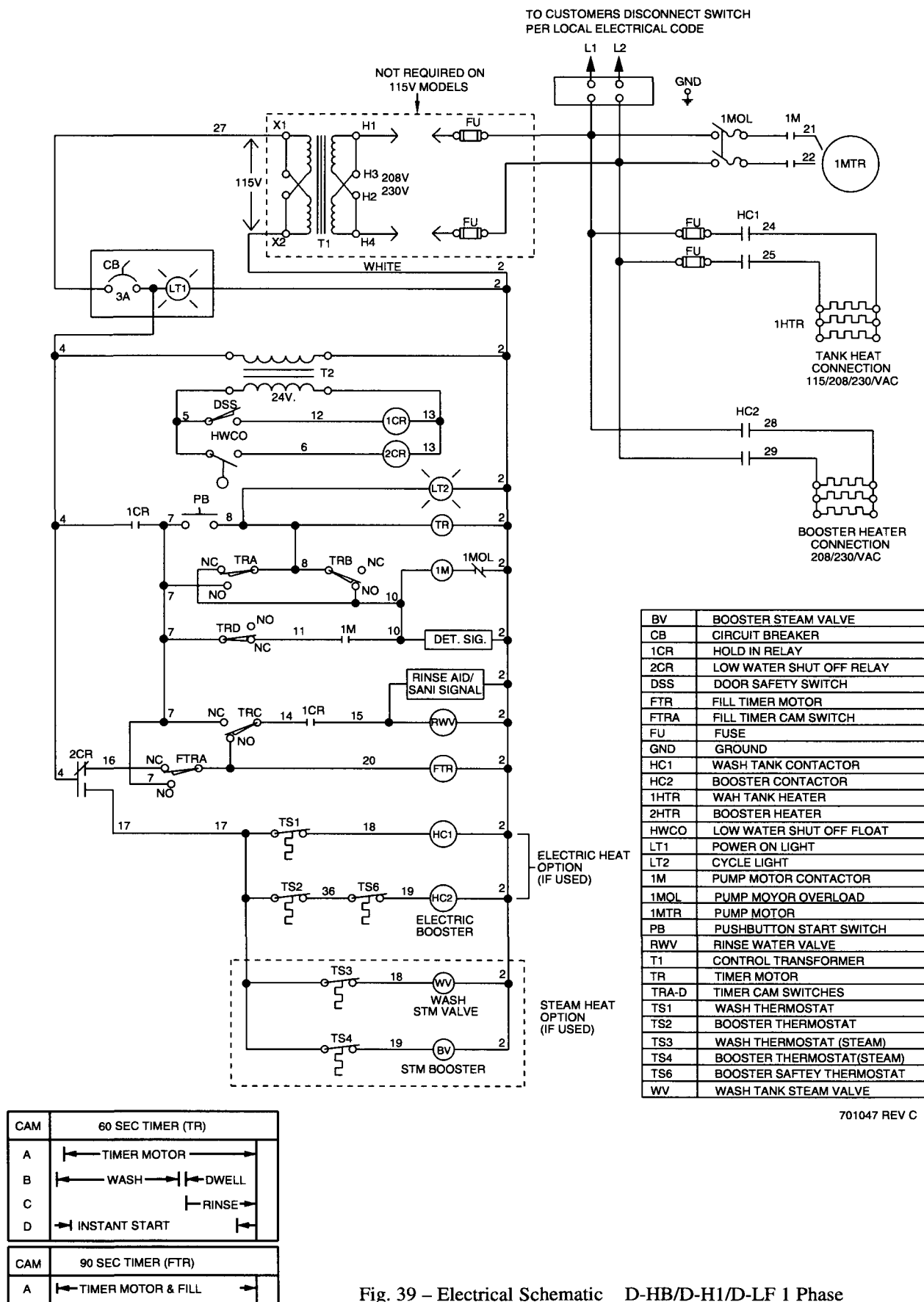
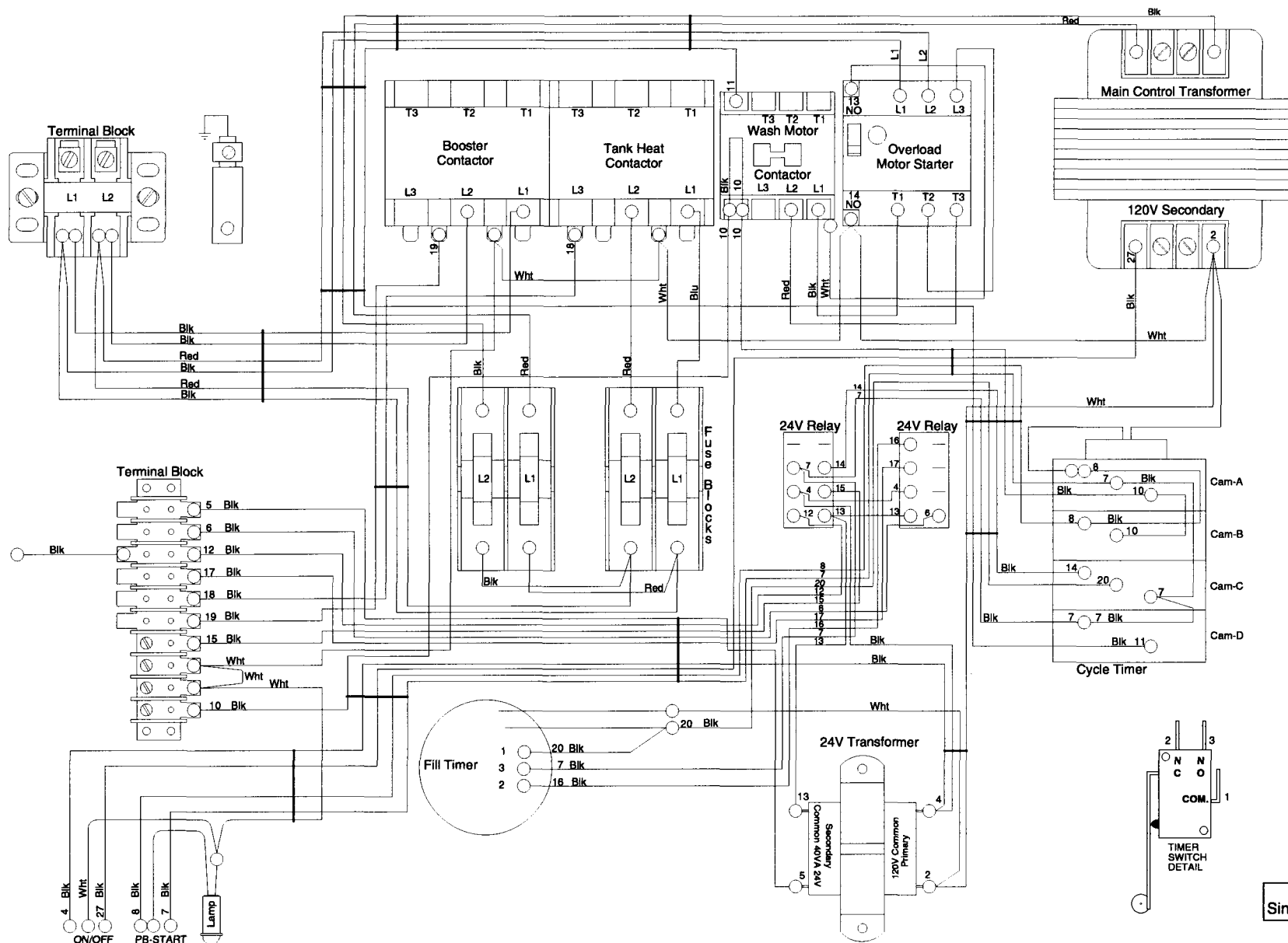


Fig. 39 – Electrical Schematic D-HB/D-H1/D-LF 1 Phase

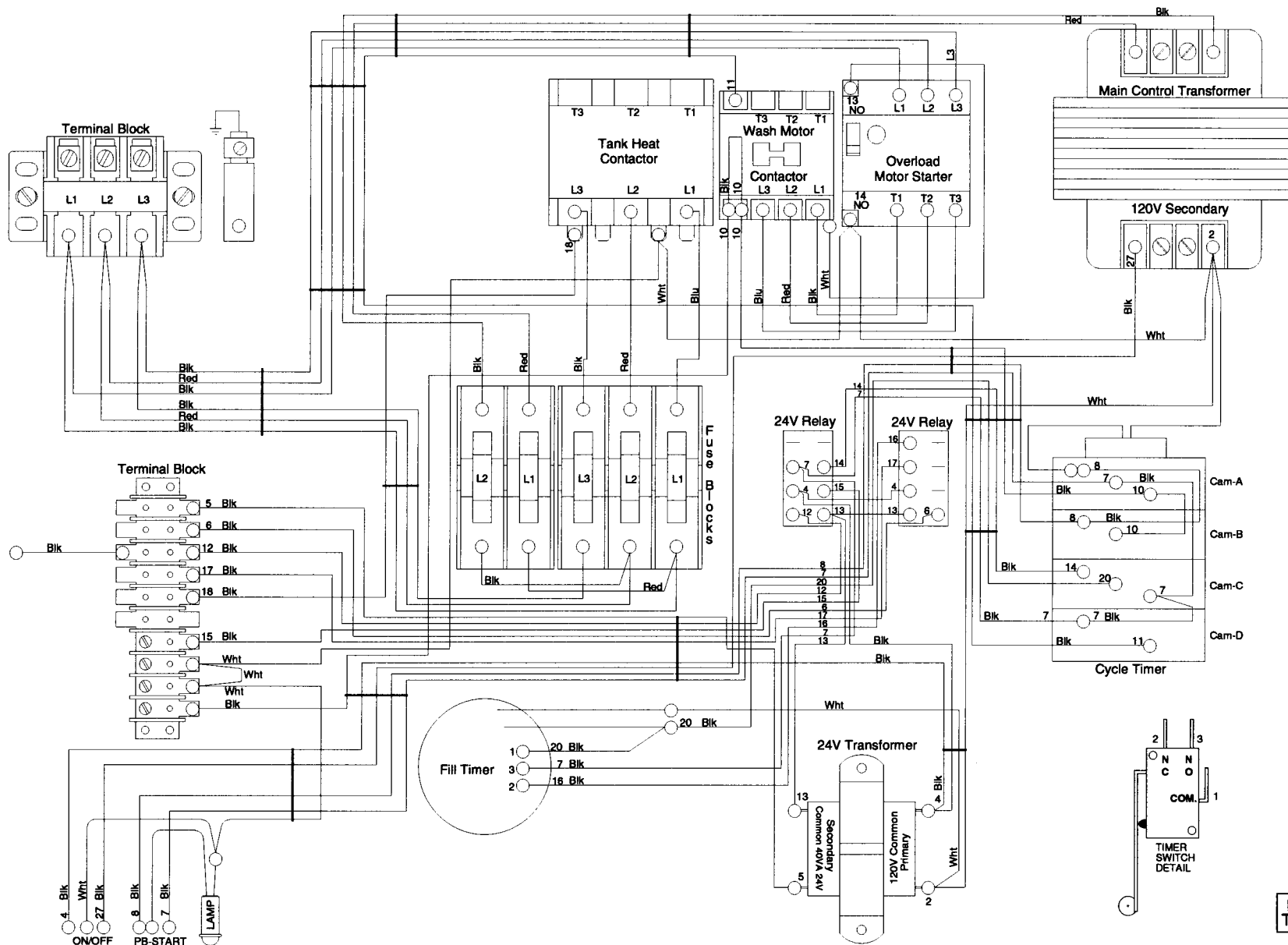
Fig. 40 - Wiring Diagram D-HB, 1 Phase



D-HB  
Single Phase

0308011

Fig. 41 – Wiring Diagram D-H1/D-LF, 3 Phase



D-H1, D-LF  
Three Phase