



# **TECHNICAL MANUAL**

Installation, Operation and Maintenance Instructions

## **COMMANDER 18-1**

**HIGH TEMPERATURE DOOR TYPE**

Insinger Machine Company  
6245 State Road  
Philadelphia, PA 19135-2996

**800-344-4802**  
Fax: 215-624-6966  
[www.insingermachine.com](http://www.insingermachine.com)

INSTRUCTION BOOK  
DISHWASHING MACHINE  
MODEL COMMANDER - 18-1

INSINGER MACHINE COMPANY  
6245 State Road  
Philadelphia Pa. 19135

COMMANDER 18-1  
DISHWASHING MACHINE  
STEAM HEAT

	PAGE
Detail Specification	1
Installation Drawing	2
Installation Instruction	3
Operating Instructions	4
Cleaning Instructions	5
Basic Service Guide	6
Maintenance & Repair	7
Maintenance & Repair (Continued)	8
Parts Sheets - Basic Dishwasher	9
Parts Sheet - Pump	10
Parts Sheet - Drain	11
Parts Sheet - Float Switch	12
Parts Sheet - Control Panel	13
Wiring Diagram - Dishwasher	14
Steam Booster Installation	15

## Detail Specifications — Commander 18 Dishwasher

### Capacity:

55—20"x20" racks per hour, 1375 dishes per hour.

### Design:

Automatic door type with timed wash-and-rinse cycle. Designed for left to right or right to left operation, corner available. Two operating doors in addition to large inspection cleanout door.

### Construction:

Hood and tank of 16 gauge type 302 18-8 stainless steel. Hood unit all welded construction. All internal castings are non-corrosive Ni412<sup>®</sup> non-ferrous nickel alloy. Stainless steel tracks, stainless steel scrap screens, suction strainer, all stainless steel brackets and supports.

### Doors

Three doors—front inspection/cleanout door and two simultaneously opening operating doors. Operating doors, with fingertip control, balanced by externally mounted springs, eliminating all pulleys, chains and rollers.

### Control

NEMA 12 solid state electrical control box houses automatically timed wash and rinse controls mounted on the left side of machine. (Cycle set at 45 sec wash, 3 sec delay, then 12 sec rinse.) After power switch is turned on, dishwasher fills and operates automatically by closing the doors. Interlock prevents operation when front door is left open.

### Pump

Insinger built centrifugal type "packless" ball-bearing pump. Construction includes ceramic type seal, stainless parts mounted with balanced impeller on a precision ground shaft. All pump working parts are mounted as an assembly and removable as a unit without disturbing pump housing or motor. Pump has easily removable front and end plates for cleaning and inspection. Re-circulating wash pump capacity of 174 gallons per minute. (Pump rating actual re-circulating inside machine, not open weir.)

### Tank

Capacity to overflow level, 22.0 gallons.

### Motor

(1) 1 HP motor. Motor is standard frame horizontal base mounted. Motor is squirrel-cage induction run type, 60 cycle, 1725 RPM, internally fan cooled with ball-bearing construction.

### Spray System

Wash—three rotating arms above and three rotating arms below. Power wash arms designed for high pressure mechanical washing action. Wash arms removable without the use of tools.

### Final Rinse

Rinse—four rotating nozzles below and five stationary nozzles above with total rack coverage water pattern.

### Overflow & Drain

Functionally designed 17" skimmer with cleanout cap automatically skimming water surface. Drain valve is externally controlled. Overflow and drain assemblies removable without the use of tools for drain line inspection.

### Accessory Tank Heat (as specified.)

### Steam Injector

Silent steam injector fitted with air supply tube and automatic throttling type thermostat control.

### Electric Immersion Heater

5KW housed in Inconel sheath with remote mounted thermostat coupled with stainless steel ball float positive low water cutoff.

### Under Fired Gas Burner

21,000 BTU gas burner, baffle and built-in flue, down draft eliminator thermostatic control, safety pilot, stainless steel ball float positive low water cutoff.

### Standard Equipment

Two plate racks, one cup and bowl rack, one silver rack, eye level thermometers, vacuum breaker, cleanout brush, automatic tank fill, door interlock, front panel, control located on left side.

### Equipment Check List

- Steam Injector with thermostatic control
- Steam Coil with thermostatic control
- Gas with thermostatic control and positive low water cutoff and safety pilot.
- Electric immersion heater 5KW with thermostatic control and positive low water cutoff
- Steam booster
- Electric booster

### Optional Accessory Equipment

- Pressure reduction valve and ¾" line strainer
- Control box located on right side
- S/S legs
- S/S base frame

We reserve the right to substitute materials subject to availability and Federal critical classification.

RATED CAPACITY		OPERATION	TANK CAP. GALS.	PUMP CAPACITY SINGLE CHAMBER GPM	MOTOR HP	GAS BTU INPUT	STEAM USED LBS./HR. 10 PSI (MIN.)		ELECTRIC HEATER CONSUMPTION KW	FINAL RINSE CONSUMPTION		EXHAUST C.F.M.		DIST. BETWEEN TABLES
RAKES/HOUR	DISHES/HOUR						TANK HEAT	BOOSTER		GPM 20 P.S.I. FLOWING	GALS. PER HR.			
55	1375	MANUAL FEED—right or left hand or corner if specified	22	174	1	21,000	42	65	5	9	120	WALL HOOD 100 C.F.M. PER SQ. FT	ISLAND HOOD 150 C.F.M. PER SQ. FT	29"



Insinger Dishwashers...  
at sea with the U.S. Navy for more than 50 years



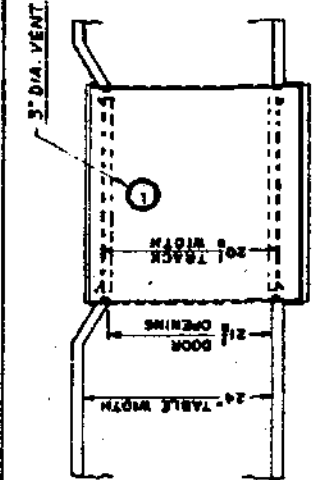
All current Insinger dishwashing machines carry NSF and UL seals, except new models pending approval

# INSINGER

MACHINE COMPANY

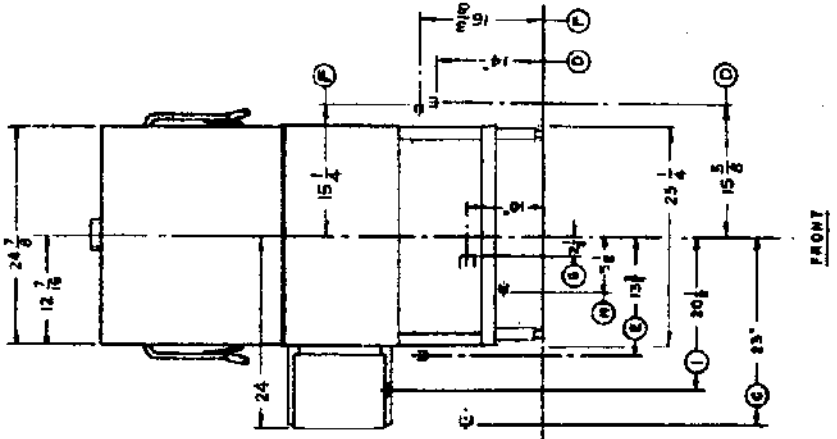
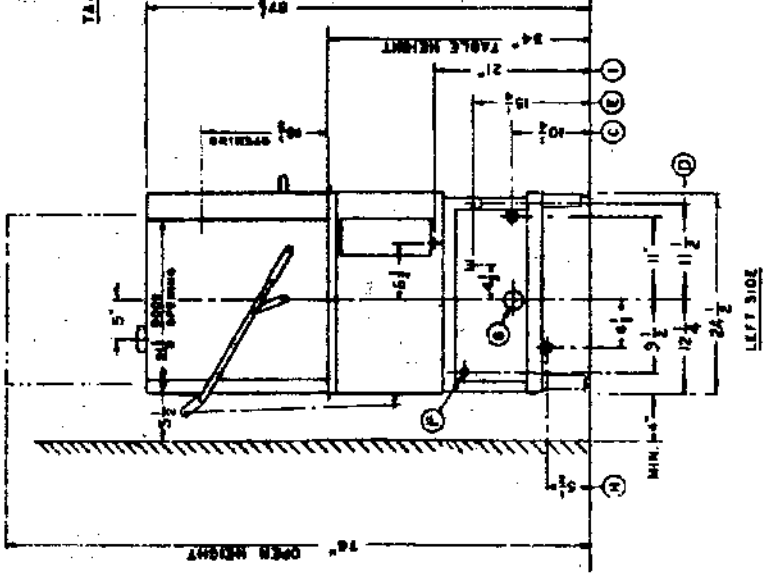
Your nearest source for Insinger equipment is:

6245 State Road • Philadelphia, Pa 19135  
Telephone (215) 624-4800 • TWX 710-670-1233



INSTALLATION CONNECTIONS		SIZE
LET	NAME	
A		
B	HOT WATER TO STEAM BOOSTER - 140°F	3/4" FEM IPS
C	STEAM TO TANK	1/2" FEM IPS
D	STEAM TO BOOSTER	1/2" FEM IPS
E	CONDENSATE RETURN - TANK	3/8" FEM IPS
F	DRAIN CONNECTION	3" FEM IPS
G	CONDENSATE RETURN - STEAM BOOSTER	3/8" FEM IPS
H	ELECTRIC CONNECTION	1 MP
I		
J		

TABLE CONNECTION DETAIL



- NOTE:
1. BUILT IN ACCORDANCE WITH C.O.D. 431 & C.O.D. 1950
  2. WASH TANK IS FILLED THRU THE FINAL RINSE LINE THRU STEAM BOOSTER.
  3. MAGNETIC STARTER WITH OVERLOAD FURNISHED AND INTERMINED.
  4. BOOSTER INSTALLATION CONNECTIONS SHOWN ARE FOR INSINGER STEAM HEAT EXCHANGE STYLE BOOSTER.

COMMANDER 18-1  
 AUTOMATIC DISHWASHING MACHINE  
 INSINGER MACHINE CO.  
 PHILADELPHIA, PA. 19136  
 DRAWN BY: S. J. G.  
 CHECKED: J. P. W.  
 DWG. NO. 8318A

INSINGER DISHWASHING MACHINE  
INSTALLATION INSTRUCTIONS

**PLACEMENT:** Uncrate machine carefully. Take caution not to damage component accessories which usually are appended to side of machine. Set machine in place and adjust feet as needed to set machine level. Most installations require fastening the turn-down lip of table to side of machine tank with flathead counter-sunk screws. The design of the tables should provide horizontal clearance underneath the table to allow 30" for servicing of electrical components. Under-shelves and drain troughs should also allow 30" free access to electrical parts.

If the machine is installed in a high humidity area, an overhead exhaust system will aid drying time.

**ELECTRICAL CONNECTIONS:** Connect electric lines suitable for proper amps, and check to be sure supply voltage and phase agrees with machine requirements indicated on identification tags, labels on terminal boxes or motor name plate. Check motor rotation. (CAUTION - do not run pump over 30 seconds without water in tank.) Motors should drive pumps in direction indicated by arrows cast in pump bodies. Additional connections may be required for electrically operated automatic controls. In all cases, connect to circuit breaker panel or fused disconnect switch (furnished by user) as required by local area codes. Wiring diagram is located inside control box.

**MECHANICAL CONNECTIONS:** Water and steam (if used) supply lines size should be at least as specified. Flush all lines prior to connection to remove debris in lines which will clog both manual and automatic valves. It is important not to reduce size of manufacturer's connection as steam supply and final rinse lines are particularly sizes to provide a stipulated rate of flow.

Pressure on the final rinse water connection should be 20 P.S.I. flowing (measured by pressure gauge with line open). Connect drain line to size not less than manufacturer's connection. Drain line should be properly vented and should have fall of not less than 1/4" to the foot for proper flow. Some area codes require drain to flow into open gap with opening twice the diameter of pipe connection. Connect waste to 2" I.P.S. waste line preferably to open gap floor drain.

COMMANDER - 18  
AUTOMATICALLY TIMED

OPERATING INSTRUCTIONS

1. Close drain valve.
2. Open water supply valve and turn electricity on.  
If machine is heated by gas, open appropriate supply valve.  
Check that gas pilot is burning.
3. Properly install all internal removable components.  
(suction strainer, scrap screens, spinners, etc.)
4. Pour 1 cup of sudless detergent into tank or turn on  
detergent dispenser as required. Place rack of soiled  
dishware in machine and lower all doors.
5. Move "Tank Fill" switch to "On" position. Allow 2-1/2 minutes  
for tank to fill. Return switch to "off" position.
6. Turn heat switch on, (or open steam valve on steam heated  
machine). When wash water temperature reaches 150° F.,  
machine is ready for operation.
7. Depress "Start Button". Machine will wash, rinse and  
shut off automatically. Red indicator light will go off  
when cycle is complete.
8. Raise side doors, remove rack of clean dishware.  
Slide in rack of soiled dishware and close doors.
9. For continuous operation repeat steps 7 and 8.  
Add approximately 1/2 cup of detergent after every ten  
cycles when machine is not equipped with automatic  
detergent dispenser.

GENERAL INSTRUCTIONS

1. Remove scraps from all dishware before placing in racks.
2. Maintain approx. 150° wash and 180° rinse temperatures.
3. Turn off tank heat before draining machine.
4. After use, clean and replace all internal removable parts.
5. When necessary, pump can be cleaned out by removing  
inspection plate.
6. Shut off water, electric, gas and steam supply when machine  
is not in use.

## CLEANING INSTRUCTIONS

For the best results, your Insinger dishwasher should be cleaned after using. The simple steps outlined below will insure clean, sanitized dishware.

1. Before cleaning, shut off the steam, water and electrical supplies.
2. Open drain(s) and wait until tank(s) are empty.
3. Remove wash manifolds, rinse manifolds, scrap screens and suction strainers.
4. Clean dishwasher tank(s) preferably by using a hose. Be careful not to bend or twist any ball float arms. Wipe down inside of hood.
5. Clean and replace suction strainers.
6. Clean and replace scrap screens
7. Clean all spray pipes using the brush provided with machine. The end caps must first be removed.
8. Replace caps and install manifolds in their proper positions.
9. Wipe down outside of hood.

It is sometimes necessary to remove lime deposits which may build up over a period of time. There are several excellent de-liming solutions on the market. Follow the instructions from the manufacturer.

INSINGER MACHINE CO.  
6245 State Rd.  
Phila., Pa. 19135



INSINGER DISHWASHING MACHINES  
BASIC SERVICE GUIDE

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1. Machine will not operate -
  - a) Check power supply
  - b) Possible blown fuse or circuit breaker
  - c) Power could be shut off at disconnect switch
  - d) On units with manual reset overload protection, press reset button and try again.
2. Tank will not hold water -
  - a) Check that drain petcock at base of pump is closed.
  - b) Check for proper seating of drain valve.
  - c) Check condition of drain seat "O" rings.
3. Tank overflows - Fills past overflow -
  - a) Check overflow pipe for obstructions.
  - b) See that drain line is clear by opening drain valve. If water still does not go down, the drain pipe must be cleaned.
4. Water leaks from around door -
  - a) Check for proper seating of door.
  - b) Check for clogged spray pipes. Clean with brush provided with machine.
5. Weak or ineffective spray -
  - a) Could be clogged spray pipes - Clean as described above.
  - b) Check for proper placement of spray pipes, upper pipes should spray down and lower pipes should spray up.
  - c) Check for rag or other foreign material caught in pump. This may occur when machine is operated without pump suction strainer in place.
  - d) Check for proper rotation of pump. Arrow on pump indicates direction.
6. Inadequate rinse spray -
  - a) Spray nozzles could be coated with lime and require cleaning.
  - b) Water pressure may be low. Should be 15 to 20 PSI flowing pressure.
  - c) Line strainer may be clogged.
  - d) Check supply valve. It may be closed.
7. Rinse will not shut off, -
  - a) Disassemble rinse valve and clean internal parts of lime and scale. Also check disc and seat for wear - replace if necessary.
  - b) Check that power is released from solenoid type valves at end of cycle.
8. Water hammer -
  - a) Check for excess line pressure
  - b) Shock absorbing air chambers may be required.
9. Machine vibrates or is noisy -
  - a) Check motor and pump alignment
  - b) Check drive couplings for looseness or wear.

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MAINTENANCE & REPAIR INSTRUCTIONS  
COMMANDER 18

1. **MAINTENANCE:** - This machine has all sealed bearings and requires no lubrication. For best results, it should be cleaned per the following schedule.
  - a. **DAILY:** Drain machine completely after use and remove spinner assemblies, scrap screens, drain overflow tube and drain strainers. Clean all waste from these parts, wipe out the tank and re-assemble. Leave doors open when machine is not in use.
  - b. **WEEKLY:** Wipe down the superstructure using a good grade stainless steel cleaner. **DO NOT HOSE MACHINE.**
  - c. **SEMI-ANNUALLY:** Remove and clean or replace strainer screens on steam lines and incoming water supply line. Inspect condition of valve seats and packing on supply valves and drain valve.
  
2. **REPAIR:** Most common problems are covered in the Basic Service Guide (enclosed). The service indicated in this guide can be performed by the scullery personnel or building maintenance men. If the machine still will not operate properly after using this guide, a qualified dishwasher serviceman should be called in.
  
3. **MAINTENANCE PROCEDURES -**
  - a. **How to disassemble the solenoid valve**
    1. Disconnect power supply to machine. Shut off water supply.
    2. Remove cap nut on top of coil.
    3. Remove coil.

4. Unscrew large hexagon nut and lift off bonnet from valve body. Note positioning of spring and pilot plunger.
  5. Remove main piston.
  6. Inspect for dirt, wear, lime build-up or bent spindle. Clean or replace as required.
  7. Reassembly is reverse of disassembly procedure.
- b. How to disassemble strainer for cleaning
1. Shut off water or steam supply
  2. Open large hex nuts at each end of strainer body. Strainer assembly can now be removed from the line.
  3. Remove screen, inspect, clean or replace.
  4. When re-assembling, be sure the strainer screen is installed in proper direction. Use new gaskets at each end to insure a tight seal.
- c. Disassembly of pump
1. Before attempting to disassemble pump, it is advisable to remove inspection plate to see if the trouble could be caused by a foreign object which may have been sucked into the pump.
  2. Working parts of pump can be serviced by removing the pump cover assembly (held on by (4) 3/8 dia. hex head. cap screws.) IT IS NOT NECESSARY TO REMOVE PUMP BODY FROM THE MACHINE.
  3. Repair or replace pump cover assembly as required. Always use a new gasket whenever pump cover assembly has been removed.

PARTS LIST

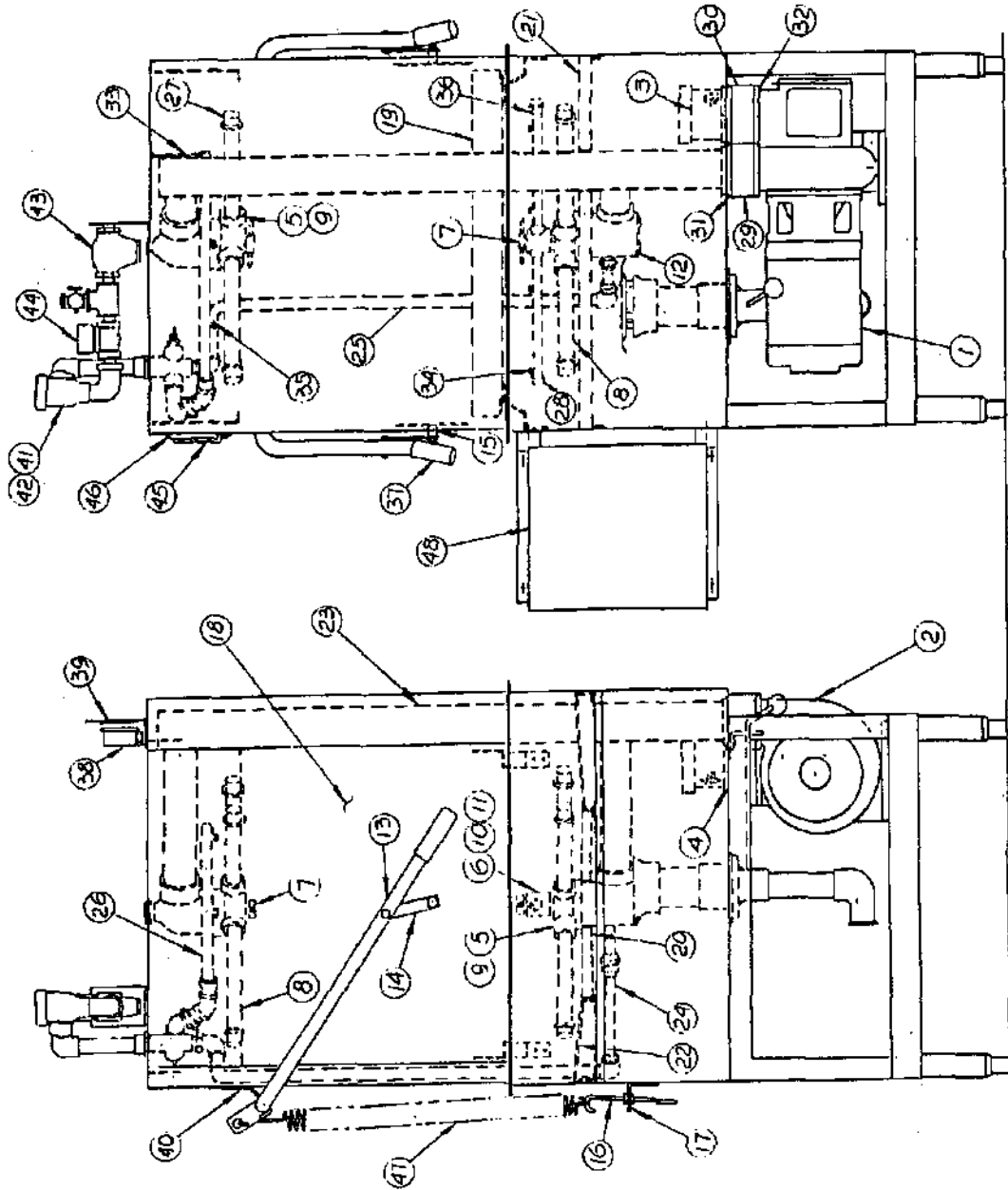
ITEM	PART NO.	PART NAME	QTY.
1	0-2471	MOTOR (SPECIFY VOLTAGE)	1
2	11-28	PUMP ASSY. (SEE SK 2456)	1
3	11-152	SUCTION STRAINER	1
4	372-51A	SUCTION STRAINER FLANGE	1
5	372-52	SPRAY PIPE HUB-WASH	2
6	372-52	ROTATING RINSE HUB-LOWER	1
7	372-56	KEEPER STUD	2
8	372-58	WASH SPRAY PIPE	6
9	372-80	WASH SPRAY BUSHING	6
10	468-104	BUSHING-UPPER RINSE	4
11	468-89	BUSHING-LOWER RINSE	1
12	681-23	SHAFT-MANIFOLD ASSY.	1
13	957-23	DOOR ARM	1
14	957-25	DOOR LINK	1
15	957-26	DOOR LINK SPACER	2
16	957-27	SPRING EXTENSION ROD	2
17	957-28	SPRING ADJ. BRACKET	2
18	971-9	DOOR	2
19	971-22	TRACK ASSY.	2
20	971-24	SCRAP SCREEN	2
21	971-25	SCRAP TRAY-FRONT	2
22	971-26	SCRAP TRAY-REAR	1
23	971-30	DISCH. LINE ASSY.	1
24	971-31	HORIZONTAL COPPER TUBE ASSY.	1
25	971-32	VERTICAL COPPER TUBE ASSY.	1
26	971-33	UPPER RINSE SPRAY COIL ASSY.	1
27	D-21A	SPRAY PIPE CAP 3/4	6
28	D-86	SPRAY PIPE CAP 3/8	2
29	D-424B	SHIM-DISCHARGE	1
30	D-425B	SHIM-SUCTION	1
31	D-514	GASKET-DISCHARGE	1
32	D-530	GASKET-SUCTION	2
33	D-701	RINSE COIL BRACKET	1
34	D-1021	RINSE SPRAY NOZZLE-LOWER	4
35	D-2021	RINSE SPRAY NOZZLE-UPPER	4
36	D-2050	RINSE SPRAY PIPE	5
37	D-2245	DOOR HANDLE GRIP	2
38	D-2390	THERMOMETER	2
39	D2-755	THERMOMETER GUARD	1
40	D3-803	DOOR ARM PINOT BRACKET	2
41	D2243	VACUUM BREAKER 3/4	1
42	D2244	VACUUM BREAKER POPPET DISC.	1
43	D2364	V STRAINER 3/4 IPS	1
44	D2397	SOLENOID VALVE 3/4 IPS	1
45	DE5-13	SWITCH	1
46	DE5-14	MAGNET	1
47	SK2294A	SPRING	1
48		CONTROL BOX	2

\* MOTOR P/N D246BGM1A1BP

COMMANDER 18-1

INSINGER MACHINE CO.  
PHILA. PA. 19135

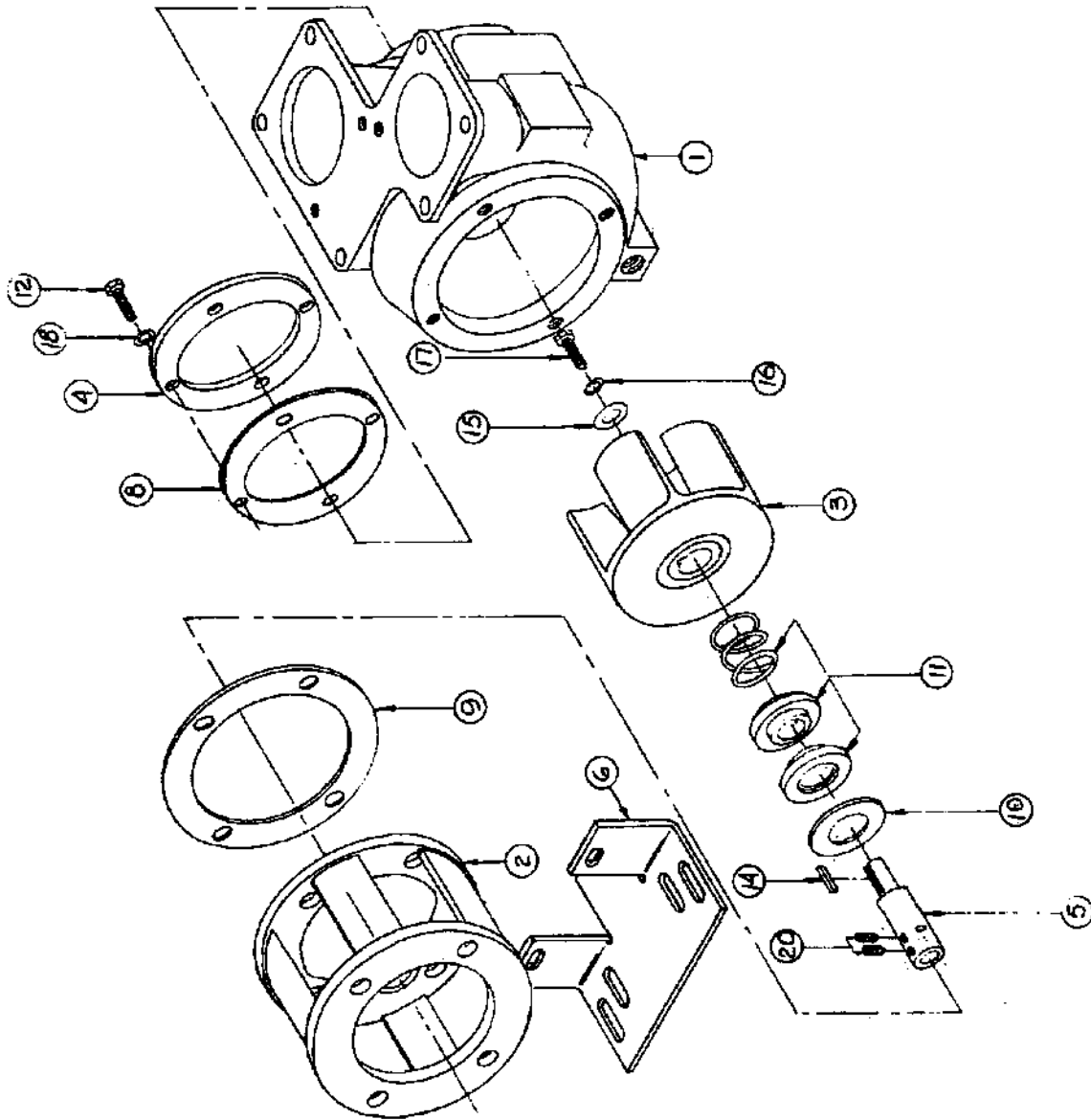
SK-2457  
A.F. 11.6.60



INSINGER MODEL 24 SUP PUMP ASSEMBLY

ITEM	PART NO.	NAME OF PART	REQ.
1	UP-1	PUMP BODY	1
2	D-635	ADAPTER	1
3	SUP-2	IMPELLER	1
4	SUP-3	END COVER PLATE	1
5	D3-805	PUMP SHAFT	1
6	D3-816	MOUNTING BRACKET	1
7			
8	UP-8	END COVER GASKET	1
9	UP-9	HOUSING COVER GASKET	1
10	UP-13	FLINGER	1
11	UP-15	CERAMIC SEAL	1
12	UP-19	END COVER BOLT	12
13			
14		KEY	1
15		WASHER	1
16		LOCK WASHER	1
17		IMPELLER BOLT	1
18		WASHER	12
19			
20		SET SCREW	2

PART NO. D2471A FOR COMPLETE ASSEMBLY



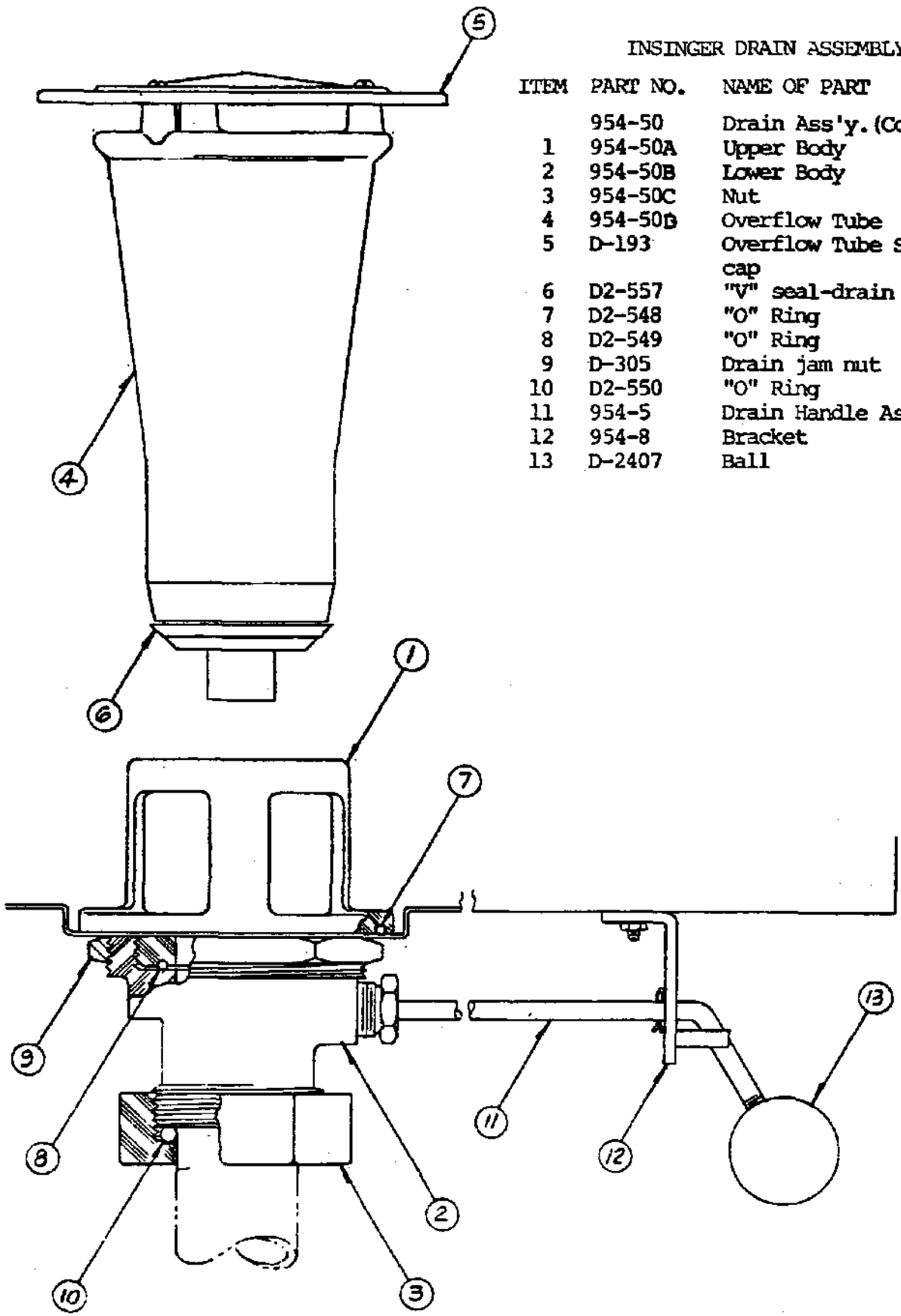
INSINGER MACHINE CO.  
PHILA., PA. 19135

SK NO. 2456 A

S.P. 4.23.BL

INSINGER DRAIN ASSEMBLY

ITEM	PART NO.	NAME OF PART	REQ.
	954-50	Drain Ass'y. (Comp)	-
1	954-50A	Upper Body	1
2	954-50B	Lower Body	1
3	954-50C	Nut	1
4	954-50D	Overflow Tube	1
5	D-193	Overflow Tube Skinner cap	1
6	D2-557	"V" seal-drain seat	1
7	D2-548	"O" Ring	1
8	D2-549	"O" Ring	1
9	D-305	Drain jam nut	1
10	D2-550	"O" Ring	1
11	954-5	Drain Handle Assy.	1
12	954-8	Bracket	1
13	D-2407	Ball	1



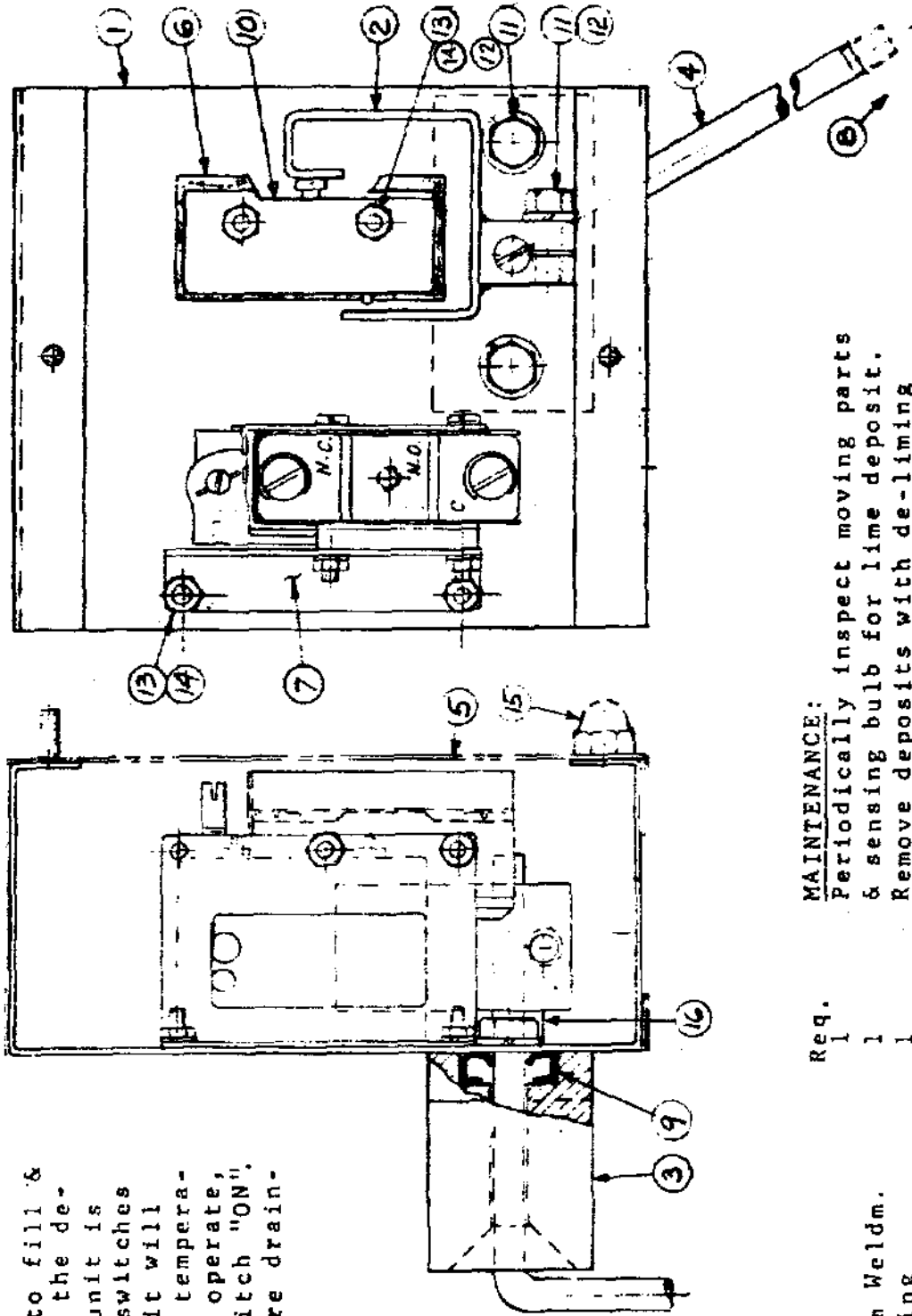
**INSINGER MACHINE CO.**  
PHILA., PA. 19135

SK - 2519

RAF 4-20-82

**OPERATION:**

This unit is designed to fill & automatically maintain the desired water level. If unit is equipped with two (2) switches & one (1) thermostat, it will also control the water temperature automatically. To operate, simply turn control switch "ON". Turn switch "OFF" before draining tank.



ITEM	Part No.	NAME	Req.
1	956-2	Back Plate	1
2	956-4	Contact Arm Weldm.	1
3	956-6	Float Bearing	1
4	956-7	Float Arm	1
5	956-8	Cover	1
6	519-8	Switch Insulator	2
7	DE9-32	Thermostat	1
8	D-2405	Float	1
9	D2-529	Seal	1
10	DE5-7	Microswitch	2
11		Hex HD Screw 1/4-20 S/S	3
12		Lockwasher Split 1/4 S/S	3
13		Hex Nut #6-32 S/S	2
14		Lockwasher Split #6 S/S	2
15		Acorn Nut #10-32	2
16	956-9	Spacer	2

**MAINTENANCE:**

Periodically inspect moving parts & sensing bulb for lime deposit. Remove deposits with de-liming solution. **NOTE:** Thermostat and float level are set at factory & should not require adjustment.

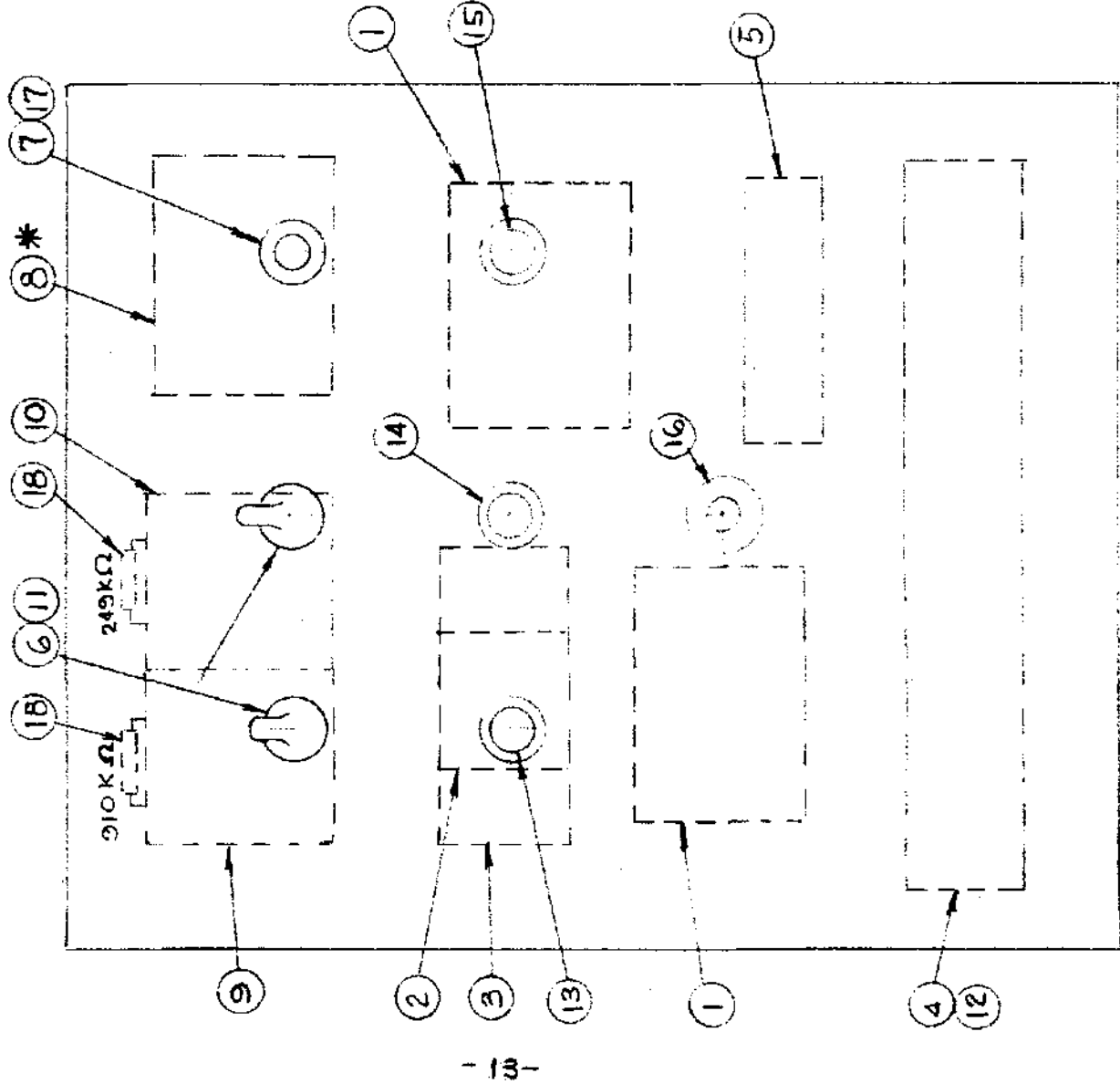
**FLOAT SWITCH ASSEMBLY**

**INSINGER MACHINE CO.**

PHILA., PA. 19135

**SK-2304A**

AF 2-25-52



ITEM	NAME	PART NO.	REQ'D
1	CONTACTOR	DE1-12	2
2	RELAY	DE2-6	1
3	RELAY BASE	DE2-7	1
4	TERMINAL BLOCK	DE3-6	1
5	OVERLOAD	DE4-2	1
6	TOGGLE SW.	DE5-8	2
7	SWITCH P.B.	DE5-9	1
8	TRANSFORMER	DE6-2	1*
9	TIMER	DE7-5	1
10	TIMER	DE7-6	1
11	BOOT, RUBBER	DE9-13	2
12	INSULATOR	DE9-15	1
13	LIGHT, AMBER	DE9-16	1
14	LIGHT, RED	DE9-17	1
15	LIGHT, WHITE	DE9-18	1
16	BREAKER	DE9-19	1
17	BOOT, RUBBER	DE9-26	1
18	RESISTOR	SPECIFY VALUE	2

\*ONLY WHEN REQ'D.

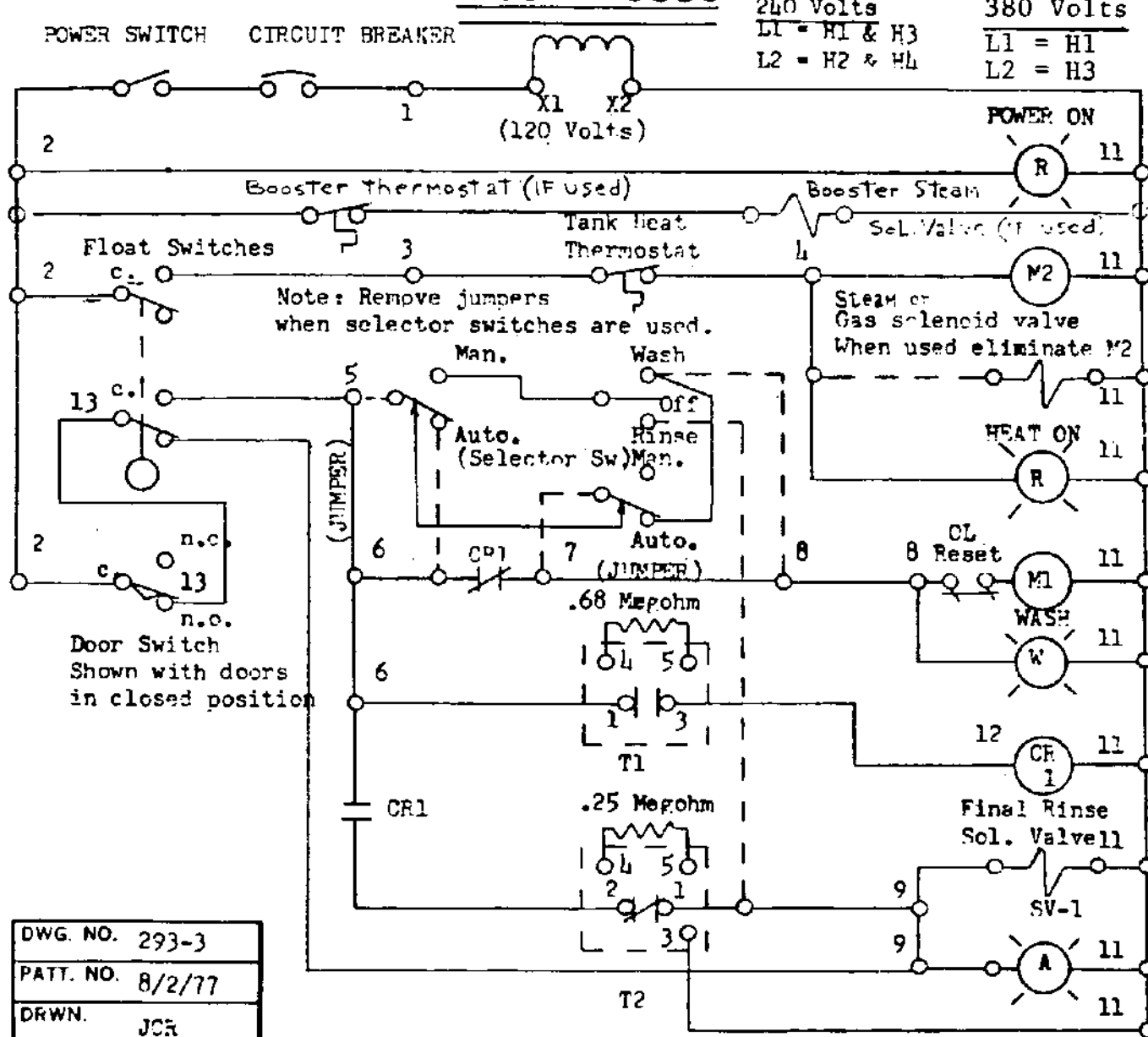
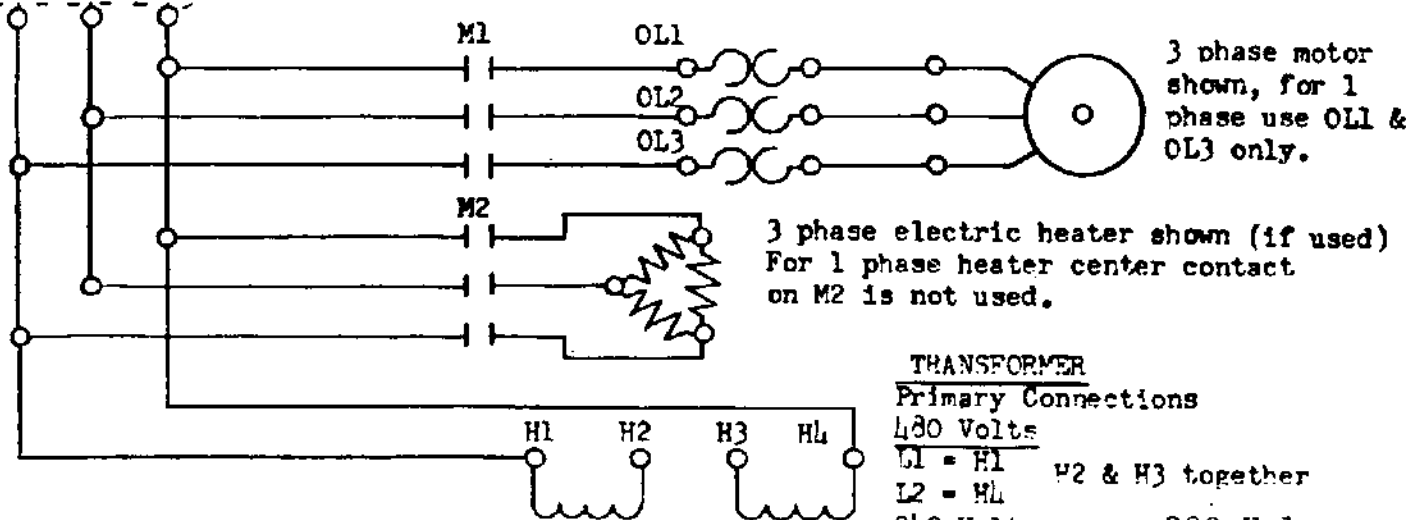
NOTE: USE PART NO. 293-5  
FOR COMPLETE ASSY

CONTROL PANEL ASSY  
40-2 ENSIGN & CDR. 18

INSINGER MACHINE CO.  
PHILA., PA. 19135

DR. A.P. 11-G-78 SK-2380





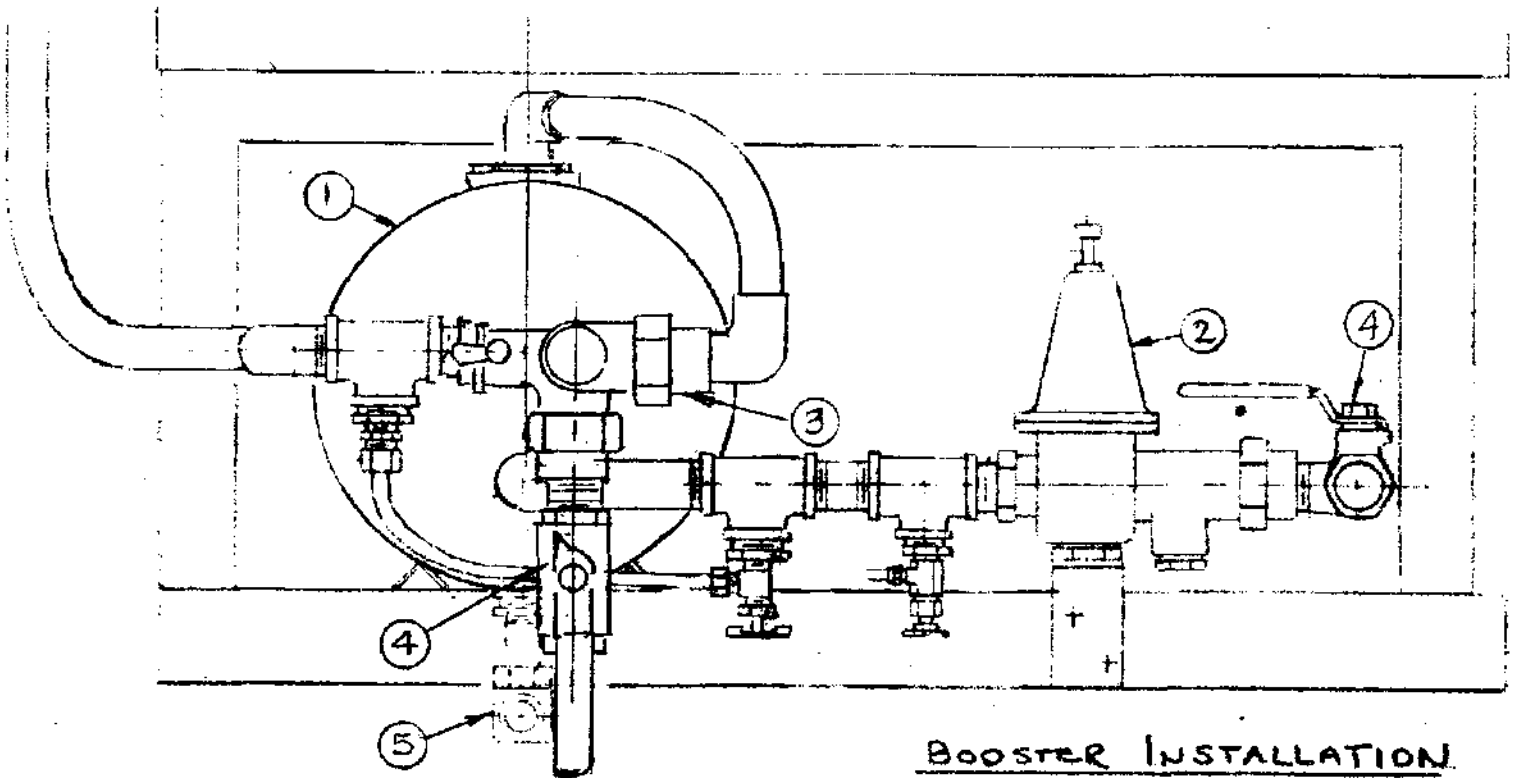
DWG. NO.	293-3
PATT. NO.	8/2/77
DRWN.	JCR
CHKD.	
APPD.	

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PHILA., PA. 19135



## PARTS LIST

NO	NAME	PART NO	REQ.
1	BOOSTER	D2100	1
2	PRESSURE REGULATOR	D1012	1
3	STEAM THERMOSTAT	D970A	1
4	BALL VALVE	D2340	2
5	CONDENSATE TRAP	D2102	1



BOOSTER INSTALLATION

DWG No SK-2634

DRAWN BY 3-30-83



Insinger Machine Company  
6245 State Road  
Philadelphia, PA 19135-2996  
800-344-4802  
Fax: 215-624-6966  
[www.insingermachine.com](http://www.insingermachine.com)