TECHNICAL MANUAL
ENSIGN 40-2

Installation, Operation, and Maintenance Instructions

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

800.344.4802
Fax 215.624.6966
www.insingermachine.com

Thank you for purchasing this quality Insinger product.

On the space provided below please record the model, serial number and start-up date of this unit:

Model:_____

Serial Number:_____

Start-Up Date:_____

When referring to this equipment please have this information available.

Each piece of equipment at Insinger is carefully tested before shipment for proper operation. If the need for service should arise please contact your local Authorized Insinger Service Company.

A Service Network Listing is provided on our web site, www.insingermachine.com or call Insinger at 800-344-4802 for your local authorized servicer.

For proper activation of the *Insinger Limited Warranty* a SureFire™ Start-Up & Check-Out Service should be completed on your machine. Refer to the Introduction section in this manual for an explanation of Insinger SureFire™ Start-Up & Check-Out Program.

Please read the Insinger Limited Warranty and all installation and operation instructions carefully before attempting to install or operate your new Insinger product.

To register your machine for warranty by phone, fax or the internet or for answers to question concerning installation, operation, or service contact our Technical Services Department:

TECHNICAL SERVICE CONTACTS	
Toll-Free	**800-344-4802**
Fax	**215-624-6966**
E-mail	**service@insingermachine.com**
Web	**www.insingermachine.com**

TABLE OF CONTENTS

ENSIGN 40-2

INTRODUCTION

Purpose
The purpose of this technical manual is to provide installation, operation, cleaning and maintenance directions.

A section is provided for replacement parts.

Scope
This manual contains all pertinent information to assist in the proper installation, operation, cleaning, maintenance, and parts ordering for Ensign 40-2 series dishwashers.

The **installation instructions** are intended for qualified equipment installers. The **operation and cleaning instructions** are intended for the daily users of the equipment. The **maintenance and parts sections** are intended for qualified service and/or maintenance technicians. Replacement parts may be ordered directly from our factory or from your local Insinger Authorized Service Agency. You can speak to the **Insinger Technical Services Department, 800/344-4802**, or e-mail us at **service@insingermachine.com**. When calling for warranty information or replacement parts please provide the model and serial number of your Insinger Equipment. These important numbers should be noted in this manual on the spaces provided on the opening page.

Surefire™ Start-up & Check-out Program
Insinger is proud to offer our exclusive Surefire™ Start-up & Check-out Program to our commercial customers. This service is included in the purchase price of your new Insinger dishwasher. We will provide an authorized factory service technician for the initial start-up of your new Insinger dishwasher to ensure it is running at optimum levels from the very first pass. Please call the factory or your local Insinger Sales Representative to schedule this service.

NSF 3-2003 requirements for detergent and chemical sanitizer dispensers.

This machine must be operated with an automatic detergent dispenser and, if applicable, an automatic chemical sanitizer feeder, including a visual means to verify that detergents and sanitizers are delivered or a visual or audible alarm to signal if detergents and sanitizers are not available for delivery to the respective washing and sanitizing systems. Please see instructions for electrical and plumbing connections located in this manual and in the feeder equipment manual.

Definitions
Throughout this guide you will find the following terms: WARNING, CAUTION, & NOTE.

WARNING indicates potential physical danger.
CAUTION indicates potential equipment damage.
NOTE indicates helpful operating hints or tips.

You will visually be able to identify each as shown below:

WARNING:
Indicates potential physical danger.

NOTE:
Indicates helpful operating hints or tips.

CAUTION:
Indicates potential equipment damage.

ENSIGN 40-2

Safety Summary

The following are general safety precautions that are not related to any specific procedures. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

Keep Away From Live Circuits

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position. To avoid casualties, always remove power, red tag machine and ground a circuit before touching it.

Do Not Service or Adjust Alone

Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

Resuscitation

Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Such information may be obtained from the Bureau of Medicine and Surgery.

INSINGER MACHINE COMPANY LIMITED WARRANTY

Insinger Machine Company, Inc. (Insinger) hereby warrants to the original retail purchaser of this Insinger Machine Company, Inc. product, that if it is assembled and operated in accordance with the printed instructions accompanying it, then for a period of either 15 months from the date of shipment from Insinger or 1 year (12 months) from the date of installation, that said Insinger product shall be free from defects in material and workmanship. Whichever one of the two aforestated limited warranty time periods is the longest shall be the applicable limited warranty coverage time period.

Insinger may require reasonable proof of your date of purchase; therefore, you should retain your copy of invoice or shipping document.

This limited warranty shall be limited to the repair or replacement of parts which prove defective under normal use and service and which on examination shall indicate, to Insinger's satisfaction, they are defective. Any part that is claimed to be defective and covered by this limited warranty must be returned to Insinger, this may be done through an Authorized Service Agency. Furnish serial number of machine with shipment and send to:

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

If Insinger's inspection confirms the defect and the claim, Insinger will repair or replace such part without charge and return it to you freight or postage prepaid.

This limited warranty does not cover any failure or accident, abuse, misuse, alteration, misapplication, improper installation, fire, flood, acts of God or improper maintenance or service, or failure to perform normal and routine maintenance as set out in the instruction booklet (operating instructions) or for improper operation or failure to follow normal operating instructions (as set out in the instruction booklet). Insinger is not responsible nor liable for any conditions of erosion or corrosion caused by corrosive detergents, acids, lye or other chemicals used in the washing and or cleaning process.

Service must be done by either Insinger Appointed Service Agencies or agencies receiving prior authorization from Insinger.

All warranty work must be done during normal working hours, unless purchaser receives prior authorization from Insinger.

There are no other express warrants except as set forth herein and any applicable implied warranties of merchantability and fitness are limited in duration to the period of coverage of this express written limited warranty. This limited warranty supersedes all other express warranties, implied warranties of merchant-ability and fitness or limited warranties as of this date, January 1, 1998. Some states do not allow limitation on how long an implied warranty lasts so this limitation may not apply to you.

Insinger is not liable for any special, indirect or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so this limitation nor exclusion may not apply to you.

Insinger does not authorize any person or company to assume for it any other obligation or liability in connection with the sale, installation, use, removal, return or replacement of its equipment: and no such representations are binding on Insinger.

INSINGER MACHINE COMPANY LIMITED WARRANTY
COMMERCIAL MARINE USE

Insinger Machine Company, Inc. (Insinger) hereby warrants to the original retail purchaser of this Insinger Machine Company, Inc. product, that if it is assembled and operated in accordance with the printed instructions accompanying it (installation manual), then for a period of 18 months from the date of installation on board the vessel, that said Insinger product shall be free from defects in material and workmanship.

Insinger may require reasonable proof of your date of equipment install, therefore, you should retain your copy of invoice or shipping document.

This limited warranty shall be limited to the replacement of parts which prove defective under normal use and service and which on examination shall indicate, to Insinger's satisfaction, they are defective. Any part that is claimed to be defective and covered by this limited warranty must be returned to Insinger. Furnish serial number of machine with shipment and send to:

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

If Insinger's inspection confirms the defect and the claim, Insinger will repair or replace such part without charge and return it to you freight or postage prepaid. If part damages are not covered, Insinger will contact the customer and advise.

If a factory trained authorized technician is required to repair or replace defective parts or material during the 18 month warranty period, the cruise line will be responsible for the payment of travel expense and a minimum of four hours labor.

Labor will be billed to the customer at a reduced rate of $40.00 per hour. If sailing with a vessel is required, then an eight hour per day minimum will apply.

This limited warranty does not cover accident, abuse, misuse, alteration, misapplication, improper installation, fire, flood, or improper maintenance or service, or failure to perform normal and routine maintenance as set out in the instruction booklet (operating instructions) or for improper operation or failure to follow normal operating instructions (as set out in the instruction booklet).

Insinger is not responsible nor liable for any conditions of erosion or corrosion caused by corrosive detergents, acids, lye or other chemicals used in the washing, caring and or cleaning process.

Warranty service must be done by either Insinger Appointed Service Agencies or agencies, customers galley engineers receiving prior authorization from Insinger.

There are no other express warrants except as set forth herein and any applicable implied warranties of merchantability and fitness are limited in duration to the period of coverage of this express written limited warranty. This limited warranty supersedes all other express warranties, implied warranties of merchantability and fitness or limited warranties as the above date.

Insinger does not authorize any person or company locally or overseas to assume for it any other obligation or liability in connection with the sale, installation, use, removal, return or replacement of its equipment; and no such representations are binding on Insinger.

INSTALLATION INSTRUCTIONS

Machine Specifications

Insinger Model Ensign 40-2 stainless steel counter type dishwasher with automatic timing of the wash and rinse cycle with either electric immersion heater for tank heat and electric heat exchange booster for rinse or steam coils for tank heat and steam heat exchange booster for rinse.

ELECTRICAL REQUIREMENTS

(specified by end-user):
1/2 HP, 110-120/240 single phase or 208-220/460VAC three phase, 60 cycle. Motor operates through a timed cycle controller. Rinse operates through a 24VAC solenoid valve actuated by the timed cycle controller.

FEED:

Side door loading, counter top installation. Direction of feed specified by end-user.

Tools:

No special tools required for cleaning or maintenance. Cleanout brush provided for the spray pipes. Machine must be welded into the tabletop (unless provided with a stand).

DISHBASKETS:

16” square plastic inserts.

Placement

Carefully uncrate machine. Take caution not to damage components which may be mounted on the top or sides of the machine. Set unit in the table cut-out. Refer to installation drawing in this section for table cut-out dimensions. Weld the dish machine into the table. Install temp gauges.

Electrical Connections

Connect electrical lines sized for the correct voltage, current and phase of the machine. These should agree with the machine requirements indicated on the nameplate and labels on the control panel. A single-point electrical connection is provided for the pumps, control circuit, and wash tank heater.

If an electric booster is provided, connect power directly to the booster.

CAUTION:

Connections must be made to a circuit breaker or fused disconnect as provided by the end-user and required by local codes.

A laminated wiring diagram is inside the control panel.

Chemicals

Upon the completed installation of the dishwasher, contact a local detergent/chemical supplier for the correct chemicals for your soil load and geographical area.

Electrical connection points for the detergent dispenser and rinse injector are located inside the control panel. Refer to the wiring diagram for this machine for the proper connection points.

Dispensers may be connected on either the primary voltage side of the machine or the 24VAC control voltage side.

CAUTION:

When connecting on the 24VAC control voltage side of the transformer, total VA *must* not exceed 50VA.

Tabling

Load and unload tables should be pitched towards the machine to return excess water into the machine

Insinger dishmachines are user-friendly, making them the easiest dishmachines on the market to operate and maintain.

By following these operating procedures your Insinger dishwasher will give you years of trouble free service.

OPERATION INSTRUCTIONS

1. Ensure drain overflow tube is in place. Close all tank drain valves. One drain is provided for each tank of the dishmachine.
2. Check for proper installation and cleanliness of all internal, removable components such as suction strainers, scrap screens, and spray manifolds.
3. Ensure all water & steam lines are open. Ensure electrical circuits are on.
4. Close machine doors.

NOTE:
An interlock is provided to shut the machine down if the doors are open, therefore the machine will not run if the doors are opened.

5. Move the power toggle switch to the ON position. The machine will fill the tank, run through a complete wash/rinse cycle and shut-off.
6. When the tanks are full the tank heat will operate automatically. Proper wash tank temperature is 156ºF minimum. Proper final rinse temperature is 180ºF minimum at 20 PSI, while in the final rinse cycle.

CAUTION:

To ensure proper operation
of the auto tank fill feature and the tank heaters,
the tank level floats MUST be cleaned daily.

7. Open doors.
8. Insert a rack of soiled dishware in machine and lower doors. Depress the cycle start button, machine will wash and rinse automatically. When the rinse indicator light goes off the machine cycle is complete

CAUTION:

Overloading racks will minimize the proper cleaning of ware.

WARNING:

Do not open the doors during the wash/ rinse cycle as hot water is being sprayed. An interlock is provided to stop the wash/rinse cycle if the doors are opened but hot water may spray out if doors are opened too quickly.

9. Open doors and remove rack of clean ware. For continuous operation repeat steps 2B19 & 2B10
10. Upon completion of ware cleaning move the power toggle switch to the “OFF” position.
11. Refer to the cleaning procedures for proper clean-up of the dishmachine.
12. A switch on the control panel labeled “Wash Cycle” is provided for use when de-liming the machine. When activated, this switch will keep the machine in an indefinite wash cycle. This feature can also be used to wash heavily soiled ware on an extended wash cycle.
13. Report any unusual occurrences to qualified service personnel.

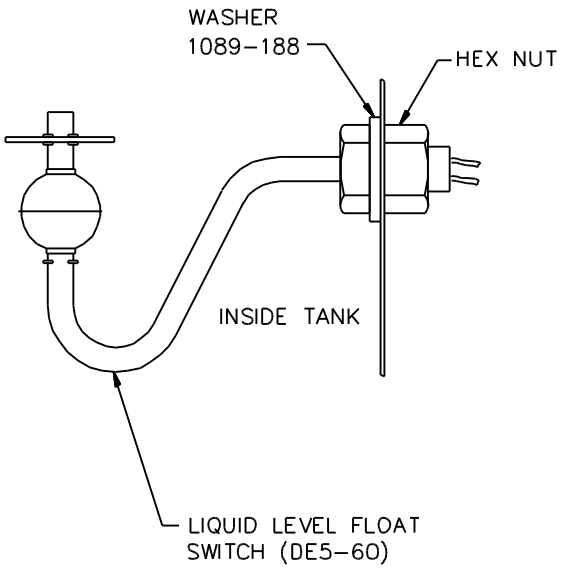
The following cleaning procedures should be done daily, at the end of the shift.

Cleaning Procedures, Daily

1. Remove all internal removable parts including spray manifolds, scrap screens, drain overflow tube and suction strainer.
2. Remove the end caps from the spray manifolds and clean with the brush provided. Flush the manifolds.
3. Flush scrap screens
4. Clean drain overflow tube.
5. Clean suction strainer of build-up.

NOTE:
Improper cleaning of the suction strainers will cause the pumps to cavitate. This will cause poor washing results.

6. Clean the tank level float with a plastic abrasive pad (do not use steel wool).



CAUTION:

Level floats must be cleaned daily. Build-up of grease and dirt will cause faulty operation of the tank fill heating system.

7. Final rinse nozzles should be cleaned of matter clogging the jet spray.

8. A door should be left open to allow drying of interior surfaces.

The following is a basic guide for the repair and replacement of common dishwasher parts. Refer to the Basic Services Guide for troubleshooting tips.

MAINTENANCE REQUIREMENTS

Daily

1. Refer to the operations and cleaning instructions provided in this manual for daily cleaning procedures.

Weekly

1. The entire machine should be wiped down using an industrial grade stainless steel cleaner.
2. Under the supervision of your detergent supplier the machine interior must be properly de-limed.

> **NOTE:**
> The water quality in some areas requires de-liming to be done more frequently. Contact your detergent supplier for recommended de-liming frequency.

Quarterly

1. Remove and clean the strainer screens on the water and steam lines. If the screens cannot be cleaned, replace.
2. Inspect the condition of the solenoid valve seats, and diaphragms. Replace where necessary.

MAINTENANCE PROCEDURES

Solenoid Valve Disassembly

1. Disconnect the power supply to the machine. Turn off the water supply.
2. Remove cap on top of the coil. Remove the coil.
3. Remove the 4 hex bolts and lift bonnet from valve body. Note positioning of spring and plunger.
4. Remove main piston.
5. Inspect for dirt, wear or lime build-up. Clean or replace as required.
6. Reassemble in reverse of disassembly.

Liner Strainer Disassembly

1. Shut off water or steam supply.
2. Remove large hex nut on bottom of strainer body.
3. Remove strainer screen. Inspect and clean or replace as necessary.
4. Reassemble in reverse of disassembly. Water flow must be same direction as arrow on line strainer body. Use new gaskets to insure a tight seal.

Pump Disassembly

1. Before disassembling pump ensure there are no obstructions in the pump intake. Remove and clean the suction strainer (inside tank). See dwg. SK-2456A

> **NOTE:**
> It is not necessary to remove the pump housing from the machine to disassemble pump.

2. Remove the pump motor and impeller by removing the 4 hex bolts attaching them to the pump housing.
3. Repair or replace the pump parts as required.
4. Reassemble in reverse of disassembly.

MAINTENANCE PROCEDURES

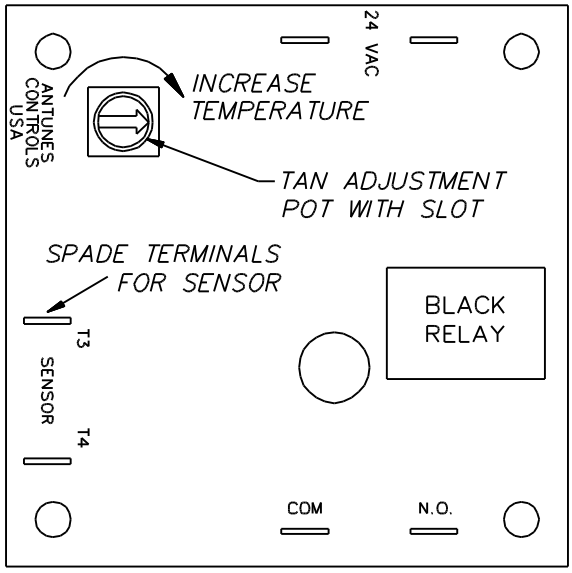
Immersion Heater Replacement

1. The immersion heater MUST be completely submerged at all times. If this is not the case contact a qualified service technician. The heated surface should never be in contact with sludge. See dwg. SK-4703.
2. Remove the housing covering the wiring terminations. Disconnect the immersion heater wires.
3. Remove the immersion heater by loosening and removing the large hex nut.
4. Install in reverse of removal.

> **NOTE:**
> Use plumbers putty as gasketing around the immersion heater to minimize leaks.

Tank Heat Temperature Adjustment

1. A temperature control board is provided in the control panel for easy adjustment of tank temperature. Though tank temperature is adjusted during the machines factory test it is sometimes necessary to re-adjust the temperature at start-up.
2. Locate the temperature control board (P/N DE9-96). Use the control panel layout drawing located in Section 4, Electrical Schematic and Replacement Parts.
3. Adjust the tank temperature to the desired temperature by turning the potentiometer located on the temperature control board. An arrow on the potentiometer indicates increase.
4. If the temperature does not change refer to Troubleshooting Tank Temperatures in the next section.



TANK TEMPERATURE CONTROL BOARD

(DE9–251)

Troubleshooting Tank Temperatures

Electric Heat

1. If temperature does not change check the temperature control board (P/N DE9-251) proper operation. If the temperature control board is faulty, replace.
2. Verify tank heat contactor is working correctly. If not, replace.
3. Verify all immersion heaters are working properly and not limed. If not, replace.

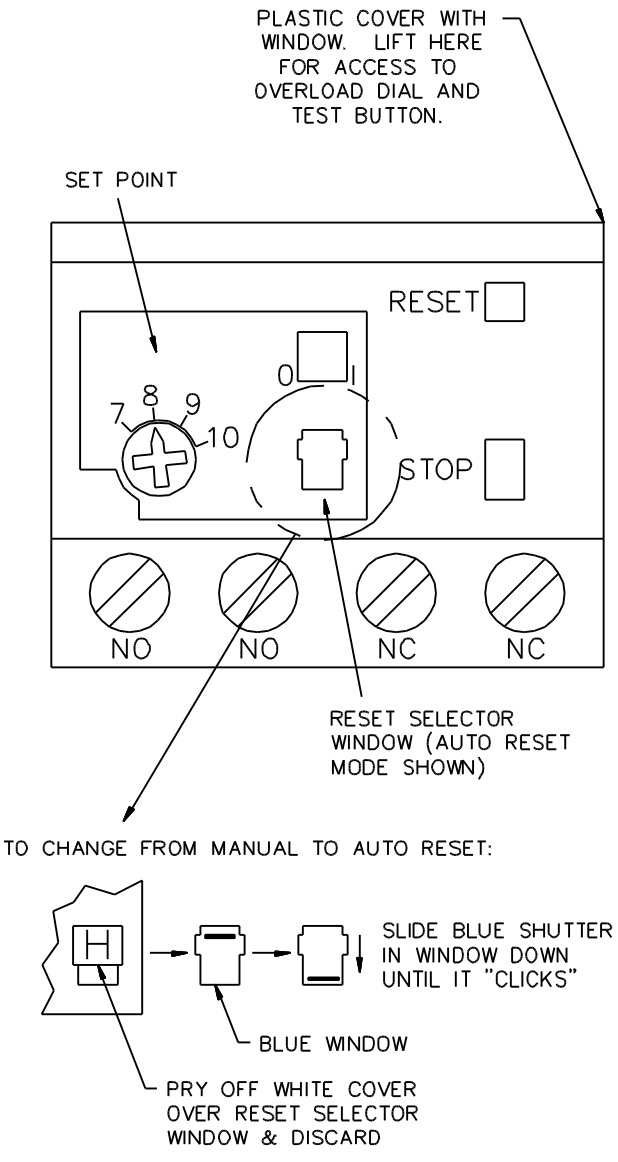
Steam Heat

1. If temperature does not change check the temperature control board (P/N DE9-251) proper operation. If the temperature control board is faulty, replace.
2. Verify steam pressure per machine specifications.
3. Verify steam trap is not clogged. If so, replace.

Motor Overloads

All motors used on Insinger Machines are provided with motor overloads. Motor overloads are adjusted when the machines are factory tested. Should it be necessary to adjust the motor overloads in the field first verify the motor current draw for the voltage the machine is using.

Using the Control Panel Component Layout Dwg. located in Section 3 to identify the overload adjust by turning the dial to the appropriate AMP draw.



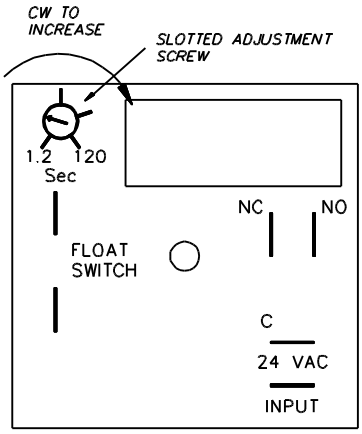
SKETCHA\SK-3829 OVERLOAD RELAY

Level System

The level control system consists of one overfill timer (P/N DE7-35) and one level float (P/N DEF-60) per tank.

When the system is powered-up, the tank(s) will begin to fill (assuming no water is in the tanks).

When the level float is actuated, the overfill timer begins to time-out and continues the filling process until the tank(s) is full.



Liquid Level Timer DE7-35
Sk-4698

Final Rinse Actuator

The final rinse is actuated by a level located on the rear wall of the dishwasher near the exit end. When a rack depresses it a switch is closed and a solenoid energized.

The activation of the lever also resets the Energy Saver Timer (P/N DE7-28). The timer will then start counting from 0. The timer is adjustable between 0 and 300 seconds (5 minutes). See dwg. 116-145.

NOTE:
The overfill timer MUST be adjusted during initial start-up. Adjustment depends on water fill pressure. The water level MUST be 1/4" below the lip of the overflow tube. Adjust by increasing or decreasing the potentiometer on the level timer.

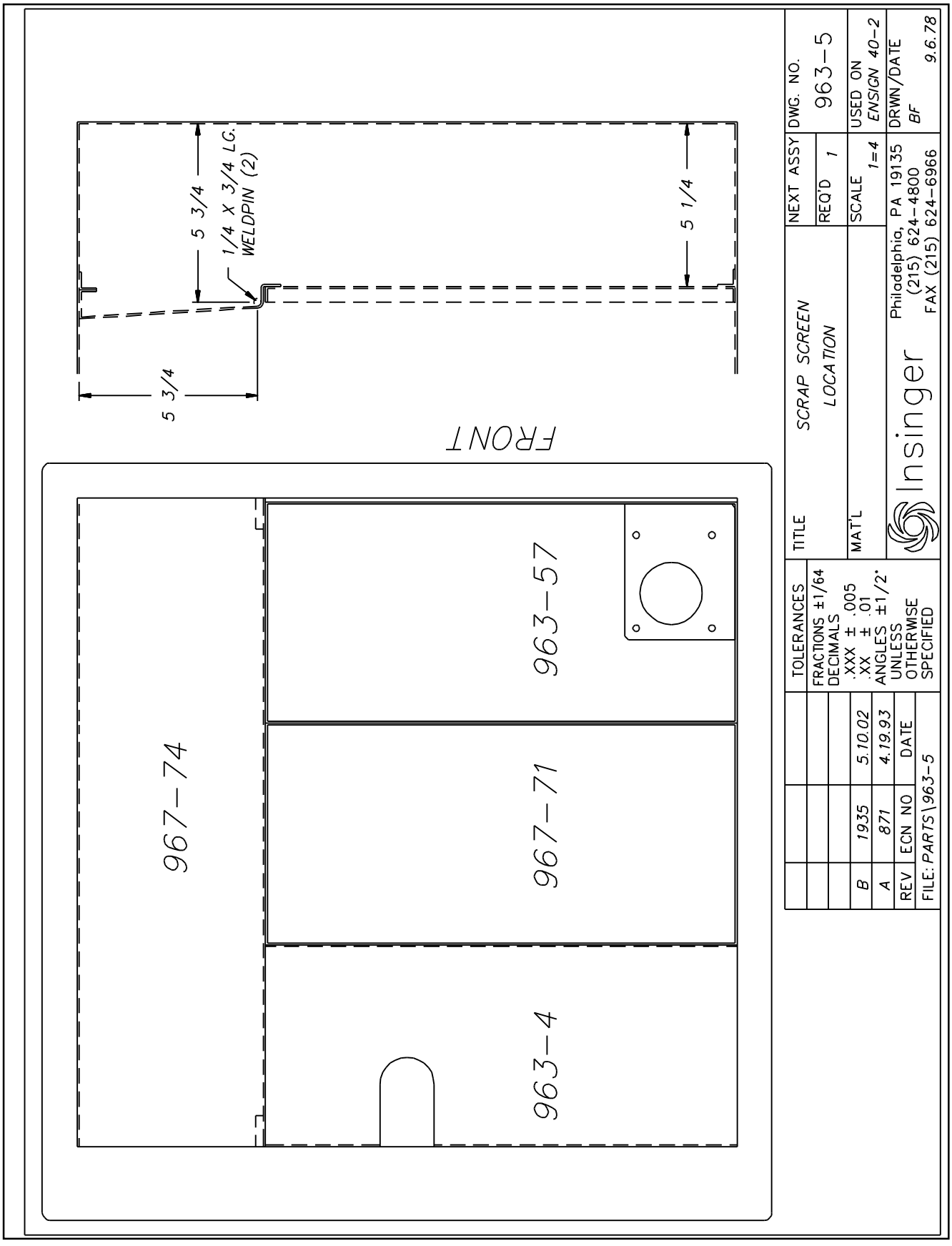
NOTE:
Dirty level floats will cause the tank heat to energize with no water in the tanks.
LEVEL FLOATS MUST BE CLEANED DAILY.

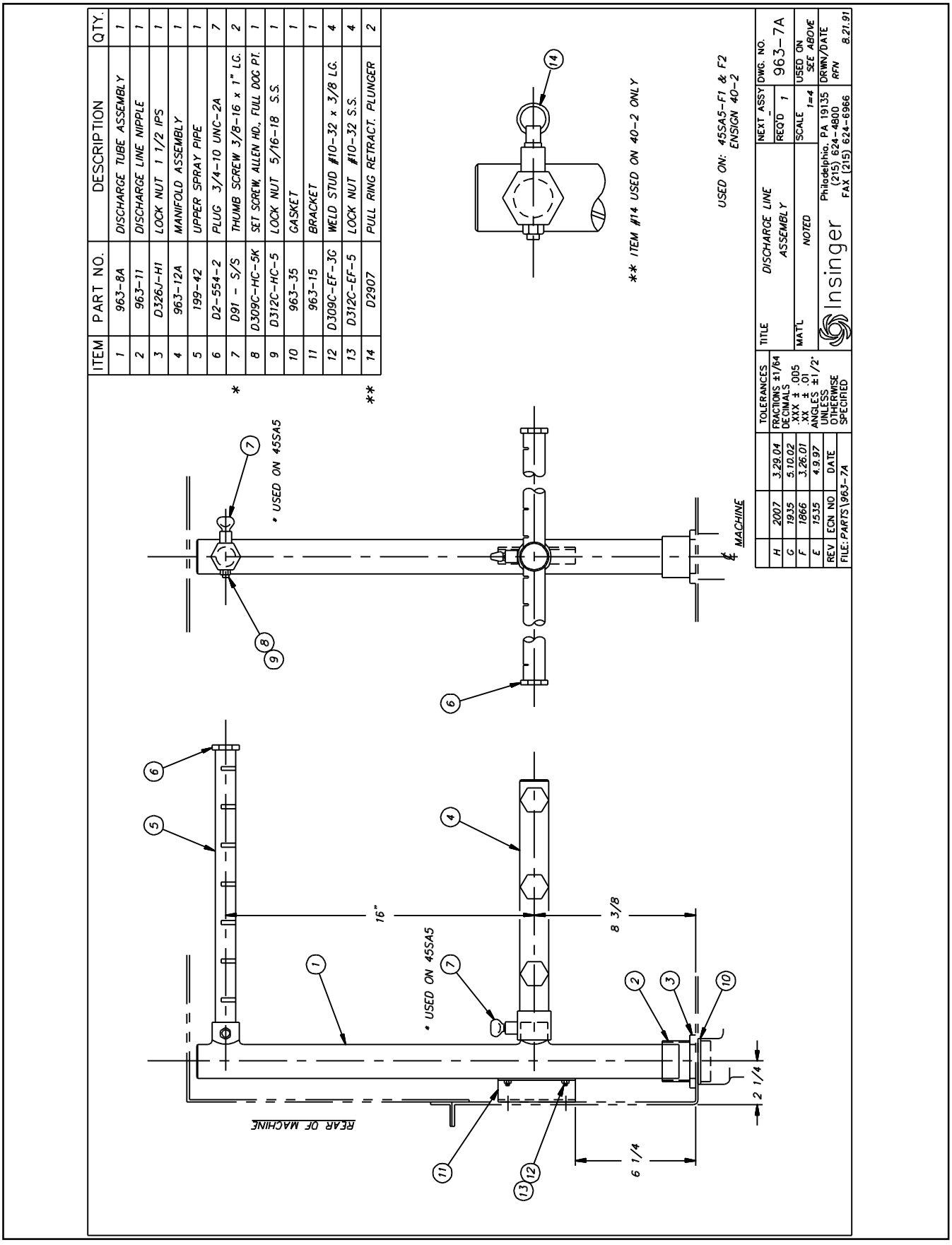
BASIC SERVICE GUIDE

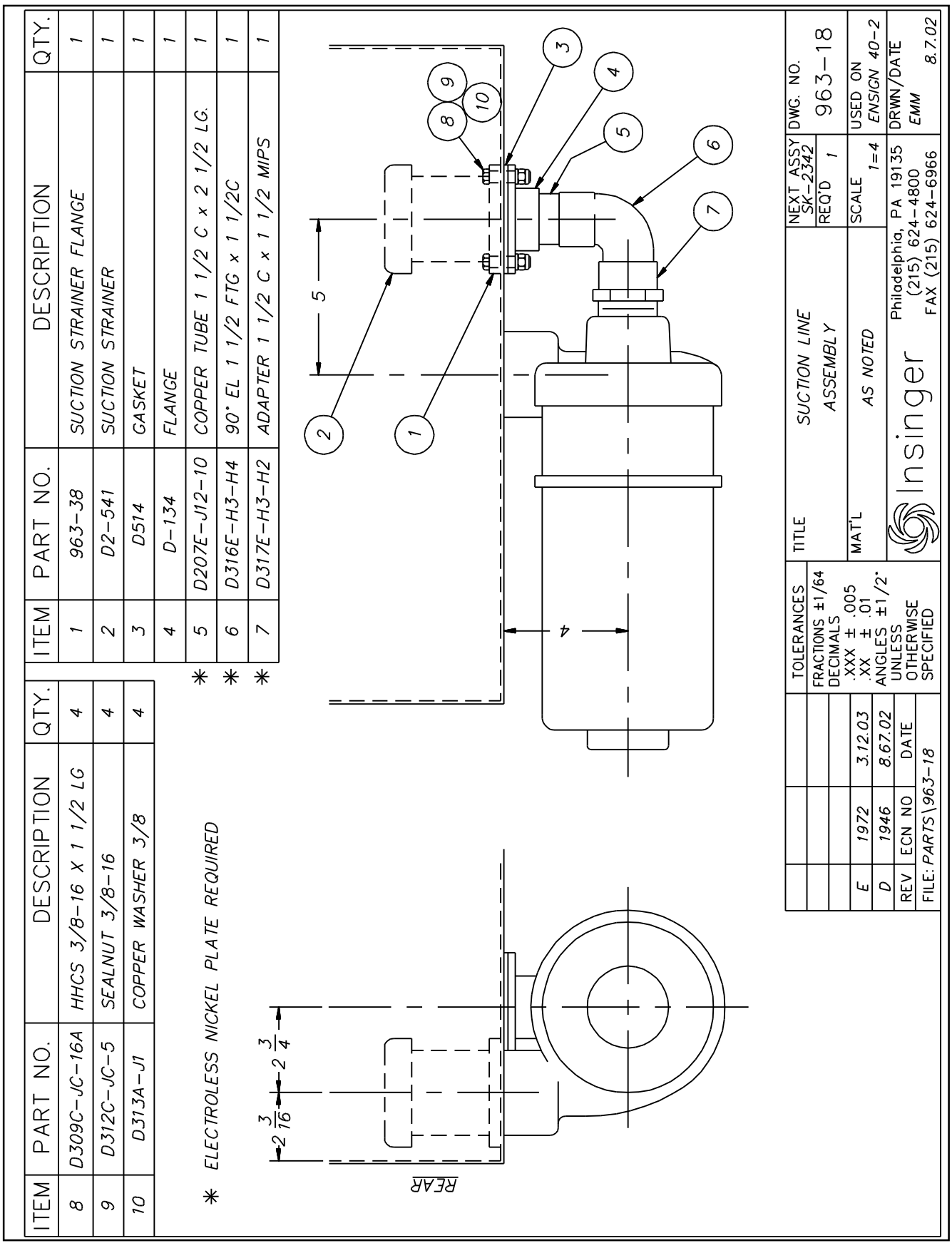
SYMPTON	POSSIBLE CAUSE	SOLUTION
1. Machine will not operate	A. No power	A. Check power supply
	B. Blown fuse or tripped breaker	B. Replace fuse; reset breaker
	C. Motor overloads tripped	C. Reset overload
	D. Door magnet broken or missing	D. Replace
	E. Door Switch on manual	E. Switch to automatic
2. Tank will not hold water	A. Drain not closed/no handle	A. Close drain
	B. Drain overflow not seated or installed	B. Reseat or install drain overflow
	C. Pump petcock opened	C. Close pump petcock
3. Tank fill beyond overflow	A. Obstruction in overflow tube or drain line	A. Remove obstruction
	B. Float dirty or bad	B. Clean and/or replace
4. Water leaks around door	A. Doors not seating	A. Reseat doors
	B. Clogged spray pipe	B. Clean spray pipe with brush provided
	C. Missing end caps	C. Install end caps
5. Weak or ineffective spray	A. Clogged spraypipe	A. Clean spraypipe with brush provided
	B. Endcap missing	B. Install endcap
	C. Manifolds not installed properly	C. Ensure proper placement of upper and lower pipes
	D. Pump rotation reversed	D. Arrow on pump housing indicates direction, correct electrically
	E. Suction strainer clogged	E. Clean suction strainer
6. Weak or ineffective final rinse spray	A. Lime deposits in spray nozzles	A. Clean or replace nozzles
	B. Low water pressure	B. Adjust to 20PSI
	C. Clogged line strainer	C. Remove line strainer and clean
	D. Closed water supply valve	D. Open ball valve
	E. Water valve/Diaphragm	E. Replace Diaphragm
7. Water hammer	A. Excessive water line pressure	A. Install water hammer valve
8. Machine vibrates or is noisy	A. Pump rotation reversed	A. Arrow on pump housing indicates direction, correct electrically
	B. ???ING IN PUMP	
9. Final rinse will not shut off	A. Final rinse solenoid valve clogged	A. Disassemble valve and clean internal parts of scale or replace
	B. Diaphragm worn	B. Replace with solenoid valve repair kit
	C. Solenoid valve still powered-up	C. Check final rinse actuating circuit for proper operation
	D. Float dirty or bad	D. Clean and/or replace

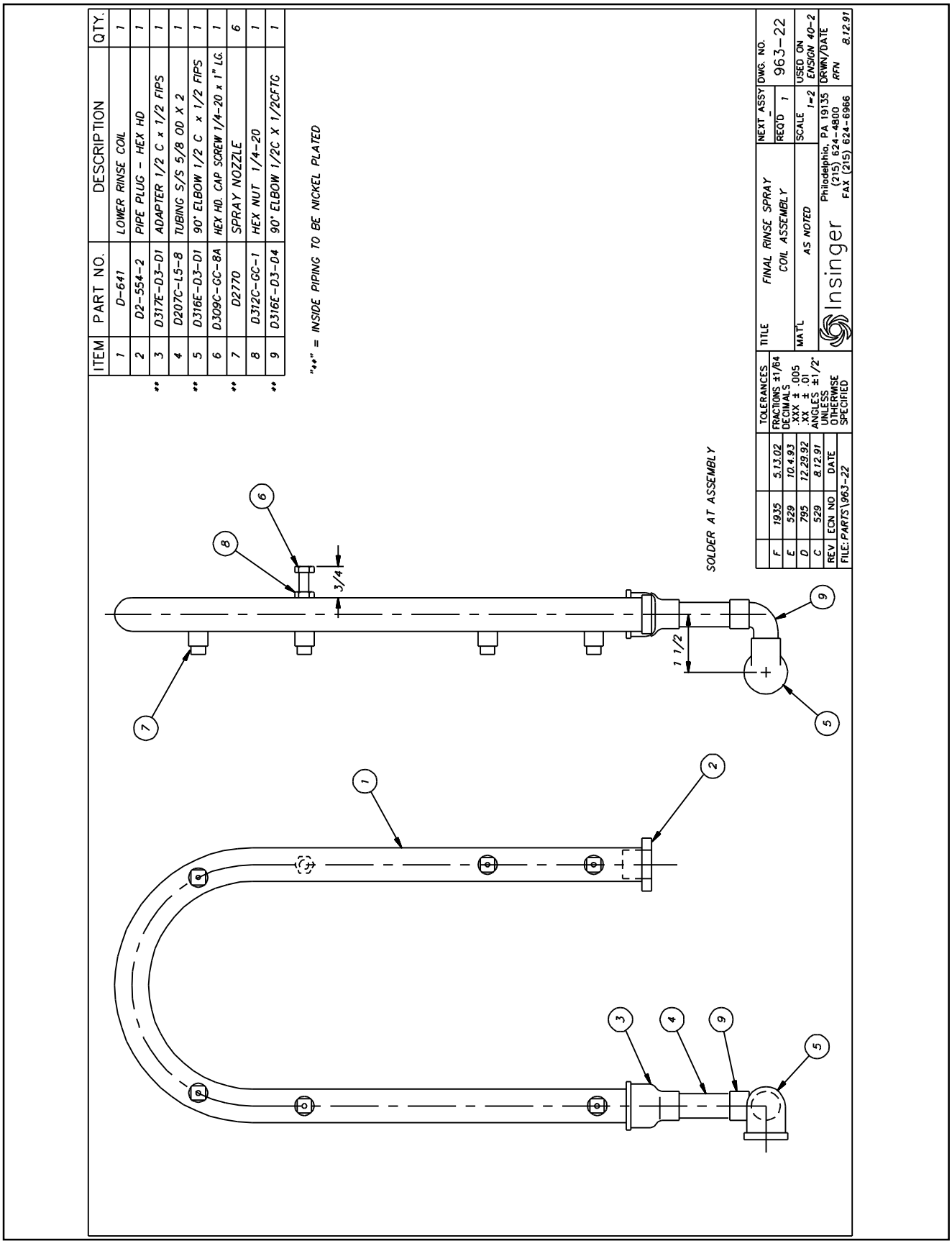
BASIC SERVICE GUIDE

SYMPTON	POSSIBLE CAUSE	SOLUTION
10. Tank not filling/tank heat coming on with no water in tank	A. Level float dirty B. Level control system not working	A. Clean level float B. Troubleshoot level control circuit
11. Tank temperature too low/high	A. Thermostat not adjusted B. Heat circuitry not working C. Electric heat—power turned off D. Electric heat—immersion heaters limed E. Steam heat—steam turned off F. Steam heat—not enough steam G. Steam heat—condensate traps clogged	A. Adjust thermostat B. Troubleshoot circuitry C. Check circuit breakers D. De-lime machine E. Turn steam on F. Adjust steam pressure per machine spec's G. Clean or replace condensate traps


5 3/4
1/4 X 3/4 LG.
WELDPIN (2)
5 1/4
5 3/4
FRONT
967-74
963-57
967-71
963-4
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS
OTHERWISE
SPECIFIED
TITLE
SCRAP SCREEN
LOCATION
MAT'L
NEXT ASSY
REQ'D 1
SCALE 1=4
DWG. NO. 963-5
USED ON ENSIGN 40-2
DRWN/DATE BF 9.6.78
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
B 1935 5.10.02
A 871 4.19.93
REV ECN NO DATE
FILE: PARTS\963-5

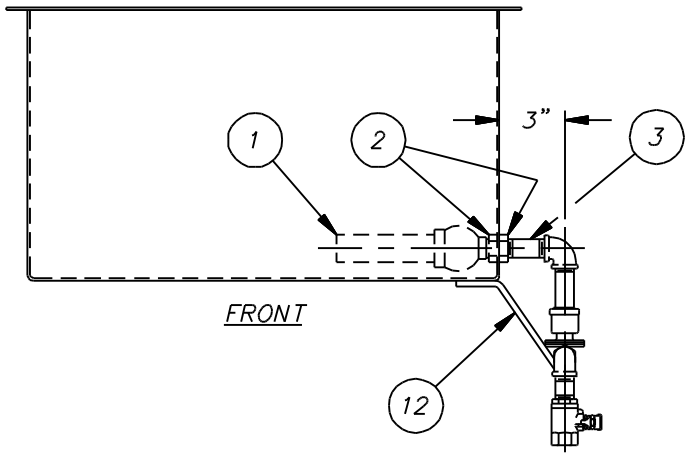

ITEM | PART NO. | DESCRIPTION | QTY.
1 | 963-8A | DISCHARGE TUBE ASSEMBLY | 1
2 | 963-11 | DISCHARGE LINE NIPPLE | 1
3 | D326J-H1 | LOCK NUT 1 1/2 IPS | 1
4 | 963-12A | MANIFOLD ASSEMBLY | 1
5 | 199-42 | UPPER SPRAY PIPE | 1
6 | D2-554-2 | PLUG 3/4-10 UNC-2A | 7
7 * | D91 - S/S | THUMB SCREW 3/8-16 x 1" LG. | 2
8 | D309C-HC-5K | SET SCREW, ALLEN HD., FULL DOG PT. | 1
9 | D312C-HC-5 | LOCK NUT 5/16-18 S.S. | 1
10 | 963-35 | GASKET | 1
11 | 963-15 | BRACKET | 1
12 | D309C-EF-3G | WELD STUD #10-32 x 3/8 LG. | 4
13 | D312C-EF-5 | LOCK NUT #10-32 S.S. | 4
14 ** | D2907 | PULL RING RETRACT. PLUNGER | 2
* USED ON 45SA5
** ITEM #14 USED ON 40-2 ONLY
USED ON: 45SA5-F1 & F2
ENSIGN 40-2
TOLERANCES
FRACTIONS ±1/64
DECIMALS .XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED
TITLE
DISCHARGE LINE ASSEMBLY
MAT'L
NOTED
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
NEXT ASSY
REQ'D 1
DWG. NO.
963-7A
SCALE 1=4
USED ON
SEE ABOVE
DRWN/DATE
RFN 8.21.91
H 2007 3.29.04
G 1935 5.10.02
F 1866 3.26.01
E 1535 4.9.97
REV ECN NO. DATE
FILE: PARTS\963-7A
MACHINE
REAR OF MACHINE
16"
8 3/8
6 1/4
2 1/4

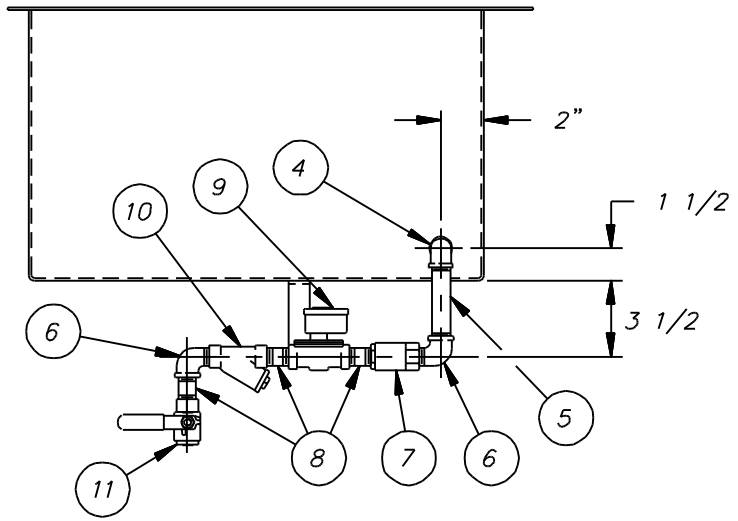

ITEM | PART NO. | DESCRIPTION | QTY.
1 | 963-38 | SUCTION STRAINER FLANGE | 1
2 | D2-541 | SUCTION STRAINER | 1
3 | D514 | GASKET | 1
4 | D-134 | FLANGE | 1
* 5 | D207E-J12-10 | COPPER TUBE 1 1/2 C x 2 1/2 LG. | 1
* 6 | D316E-H3-H4 | 90° EL 1 1/2 FTG x 1 1/2C | 1
* 7 | D317E-H3-H2 | ADAPTER 1 1/2 C x 1 1/2 MIPS | 1
ITEM | PART NO. | DESCRIPTION | QTY.
8 | D309C-JC-16A | HHCS 3/8-16 X 1 1/2 LG | 4
9 | D312C-JC-5 | SEALNUT 3/8-16 | 4
10 | D313A-J1 | COPPER WASHER 3/8 | 4
* ELECTROLESS NICKEL PLATE REQUIRED
REAR
2 3/16
2 3/4
5
4
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS
OTHERWISE
SPECIFIED
E 1972 3.12.03
D 1946 8.67.02
REV ECN NO DATE
FILE: PARTS\963-18
TITLE
SUCTION LINE
ASSEMBLY
MAT'L
AS NOTED
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
NEXT ASSY SK-2342
REQ'D 1
SCALE 1=4
DWG. NO. 963-18
USED ON ENSIGN 40-2
DRWN/DATE EMM 8.7.02


ITEM | PART NO. | DESCRIPTION | QTY.
1 | D-641 | LOWER RINSE COIL | 1
2 | D2-554-2 | PIPE PLUG - HEX HD | 1
** 3 | D317E-D3-D1 | ADAPTER 1/2 C x 1/2 FIPS | 1
4 | D207C-L5-8 | TUBING S/S 5/8 OD X 2 | 1
** 5 | D316E-D3-D1 | 90° ELBOW 1/2 C x 1/2 FIPS | 1
** 6 | D309C-GC-8A | HEX HD. CAP SCREW 1/4-20 x 1" LG. | 1
** 7 | D2770 | SPRAY NOZZLE | 6
8 | D312C-GC-1 | HEX NUT 1/4-20 | 1
** 9 | D316E-D3-D4 | 90° ELBOW 1/2C X 1/2CFTC | 1
"**" = INSIDE PIPING TO BE NICKEL PLATED
SOLDER AT ASSEMBLY
3/4
1 1/2
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED
TITLE
FINAL RINSE SPRAY
COIL ASSEMBLY
AS NOTED
MATL
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
NEXT ASSY
REQ'D 1
SCALE 1-2
DWG. NO.
963-22
USED ON
ENSIGN 40-2
DRWN/DATE
RFN 8.12.91
F 1935 5.13.02
E 529 10.4.93
D 795 12.29.92
C 529 8.12.91
REV ECN NO DATE
FILE: PARTS\963-22

ITEM	PART NO.	DESCRIPTION	QTY.
1	D-942	STEAM INJECTOR 1/2 IPS	1
2	D326F-D1	LOCK NUT 1/2 IPS	2
3	D314F-DL-28	NIPPLE 1/2 IPS x 3 1/2 LOE	1
4	D316F-D1-D1	90° ELBOW 1/2 IPS	1
5	D314F-DS-32	NIPPLE 1/2 IPS x 4" LG.	1
6	D316F-D1-D2	90° STREET ELBOW 1/2 IPS	2

ITEM	PART NO.	DESCRIPTION	QTY.
7	D-2453	CHECK VALVE 1/2 IPS	1
8	D314F-DC-00	CLOSE NIPPLE 1/2 IPS	3
9	D-2594	SOLENOID VALVE 1/2 IPS	1
10	D-2483A	"Y" STRAINER 1/2 IPS	1
11	D-2339	BALL VALVE 1/2 IPS	1
12	D-963-31	BRACKET (STEAM PIPING)	1



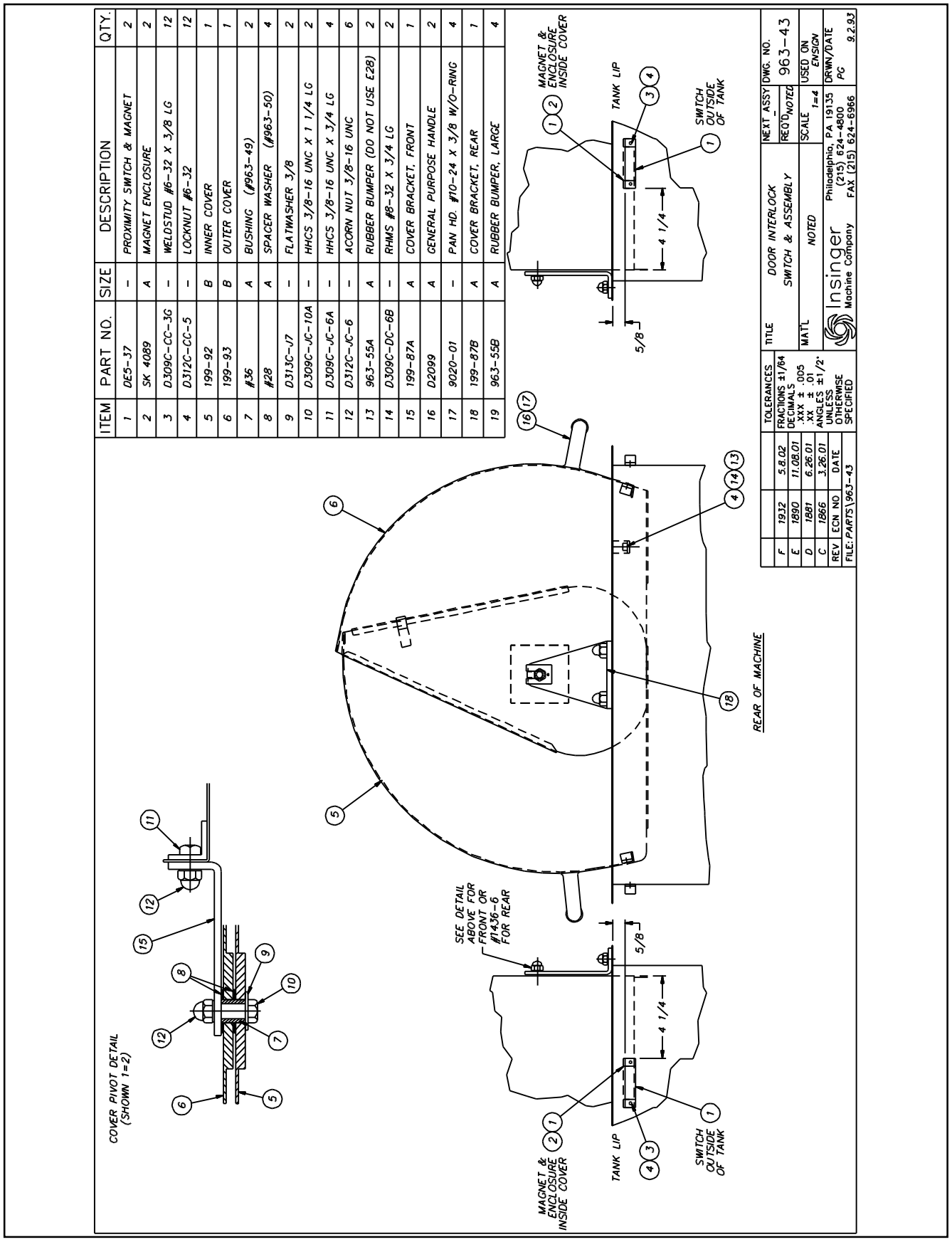


SUPERSEDES DWG. SAME NO. NO REV. DATED 6.22.88

TOLERANCES	TITLE	NEXT ASSY	DWG. NO.
FRACTIONS ±1/64 DECIMALS .XXX ± .005 .XX ± .01 ANGULAR ±1/2 UNLESS OTHERWISE SPECIFIED	STEAM INJECTOR PIPING ASSEMBLY	REQ. 1	963-30
	MAT'L. AS NOTED	SCALE 1:8	USED ON ENSIGN 40-2
	Insinger Machine Company Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966		DRWN/DATE RFN 8.16.91

A ECN# 529 8.16.91

FILE: E:\PARTS\963-30



ITEM	PART NO.	SIZE	DESCRIPTION	QTY.
1	DE5-37	–	PROXIMITY SWITCH & MAGNET	2
2	SK 4089	A	MAGNET ENCLOSURE	2
3	D309C-CC-3G	–	WELDSTUD #6-32 X 3/8 LG	12
4	D312C-CC-5	–	LOCKNUT #6-32	12
5	199-92	B	INNER COVER	1
6	199-93	B	OUTER COVER	1
7	#36	A	BUSHING (#963-49)	2
8	#28	A	SPACER WASHER (#963-50)	4
9	D313C-J7	–	FLATWASHER 3/8	2
10	D309C-JC-10A	–	HHCS 3/8-16 UNC X 1 1/4 LG	2
11	D309C-JC-6A	–	HHCS 3/8-16 UNC X 3/4 LG	4
12	D312C-JC-6	–	ACORN NUT 3/8-16 UNC	6
13	963-55A	A	RUBBER BUMPER (DO NOT USE E28)	2
14	D309C-DC-6B	–	RHMS #8-32 X 3/4 LG	2
15	199-87A	A	COVER BRACKET, FRONT	1
16	D2099	A	GENERAL PURPOSE HANDLE	2
17	9020-01	–	PAN HD. #10-24 X 3/8 W/O-RING	4
18	199-87B	A	COVER BRACKET, REAR	1
19	963-55B	A	RUBBER BUMPER, LARGE	4

REV	ECN NO	DATE
F	1932	5.8.02
E	1890	11.08.01
D	1881	6.26.01
C	1866	3.26.01

FILE: PARTS\963-43

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE
DOOR INTERLOCK SWITCH & ASSEMBLY

MAT'L
NOTED

Insinger
Machine Company
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966

NEXT ASSY
REQ'D NOTED

DWG. NO.
963-43

SCALE
1=4

USED ON
ENSIGN

DRWN/DATE
PC 9.2.93

REAR OF MACHINE

SEE DETAIL ABOVE FOR FRONT OR #14.36-6 FOR REAR

MAGNET & ENCLOSURE INSIDE COVER

TANK LIP

SWITCH OUTSIDE OF TANK

5/8

4 1/4

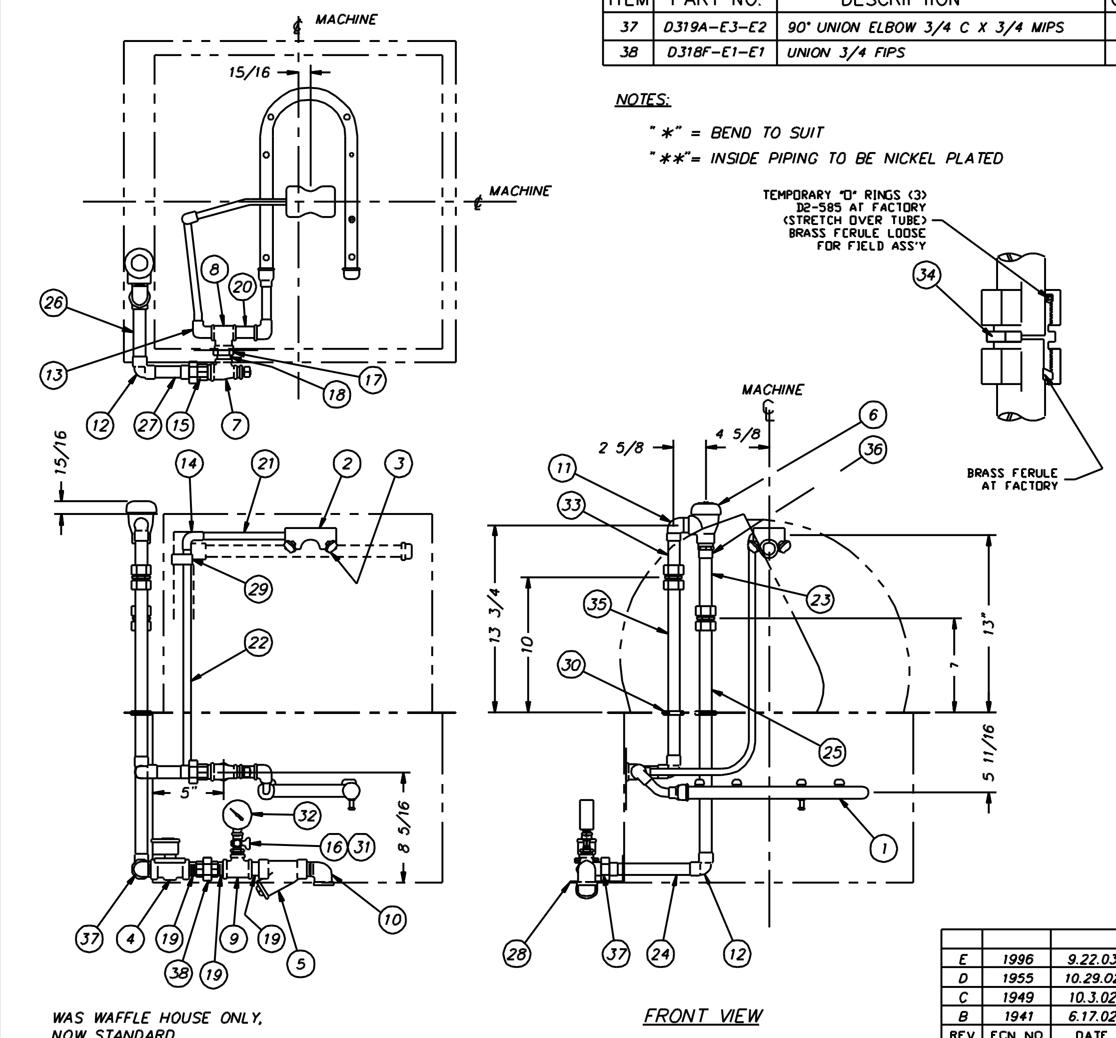
COVER PIVOT DETAIL (SHOWN 1=2)

ITEM	PART NO.	DESCRIPTION	QTY.
37	D319A-E3-E2	90° UNION ELBOW 3/4 C X 3/4 MIPS	1
38	D318F-E1-E1	UNION 3/4 FIPS	1

NOTES:

" * " = BEND TO SUIT

" ** "= INSIDE PIPING TO BE NICKEL PLATED



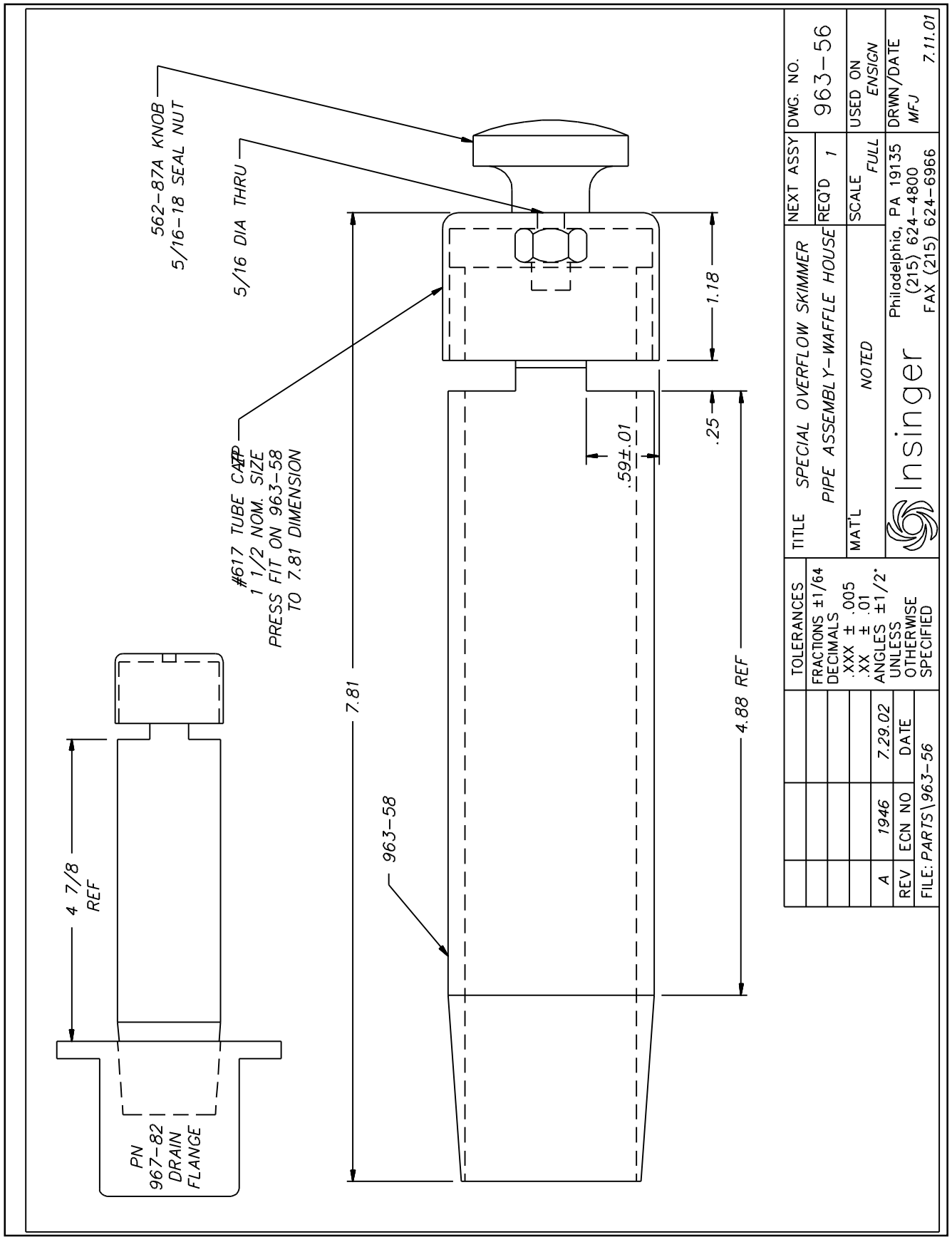
	ITEM	PART NO.	DESCRIPTION	QTY.
	1	963-22	SPRAY COIL ASSEMBLY	1
	2	D-160	SPRAY BODY - UPPER	1
	3	D2769	SPRAY NOZZLE	4
	4	D2597	SOLENOID VALVE 3/4 IPS	1
	5	D2482	"Y" STRAINER 3/4 IPS	1
	6	D2243	VACUUM BREAKER 3/4 IPS	1
	7	D320F-E1D1E1	TEE 3/4 FIPS x 1/2 FIPS x 3/4 FIPS	1
**	8	D320J-D1D1E1	TEE 1/2 FIPS x 1/2 FIPS x 3/4 FIPS	1
	9	D320F-E1E1D1	TEE 3/4 FIPS x 3/4 FIPS x 1/2 FIPS	1
	10	D316F-E1-E2	90° ST ELL, 3/4 F X 3/4 M	1
	11	D316A-E3-E2	90° ST ELL, 3/4 C x 3/4 MIPS	1
	12	D316A-E3-E3	90° ELBOW 3/4 C	3
**	13	D316J-D2-D3	90° ST ELL, 1/2 C x 1/2 MIPS	1
**	14	D347E-D3-D3	90° ELBOW 1/2 C	1
	15	D318A-E3-E2	UNION 3/4 C x 3/4 MIPS	1
	16	D322F-D2-B1	HEX RED. 1/2 MIPS x 1/4 FIPS	1
	17	D326F-E1	LOCK NUT 3/4 IPS	1
	18	D314F-EA-14	NIPPLE 3/4 IPS x 1 3/4 LG. ALL THD.	1
	19	D314F-EC-00	CLOSE NIPPLE 3/4 IPS	3
**	20	D314J-DS-16	NIPPLE 1/2 IPS x 2" LG.	1
*	21	D207C-L5-29	TUBING S/S 5/8 OD X 7 1/4 LG	1
*	22	D207C-L5-96	TUBING S/S 5/8 OD X 24 LG	1
	23	D207A-B6-20	COPPER TUBE 3/4 CTS x 5" LG.	1
	24	D207A-B6-28	COPPER TUBE 3/4 CTS x 7 LG.	1
	25	D207A-B6-71	COPPER TUBE 3/4 CTS x 17 3/4 LG.	1
	26	D207A-B6-16	COPPER TUBE 3/4 CTS x 4" LG.	1
	27	D207A-B6-9	COPPER TUBE 3/4 CTS x 2 1/4 LG.	1
	28	963-24	BRACKET	1
	29	963-51	UPPER RINSE TUBE CLIP	1
	30	D2062	GROMMET	2
	31	D2497	PETCOCK	1
	32	SK-1433	PRESSURE GAUGE	1
	33	D207A-B6-12	COPPER TUBE 3/4 CTS x 3" LG	1
	34	D317F-E5-E5	ADAPTER 3/4C COMPRESSION, NO FLARE	2
	35	D207A-B6-55	COPPER TUBE 3/4 CTS x 13 5/8 LG	1
	36	D317A-E3-E2	3/4 C x 3/4 MIPS ADAPTER	1

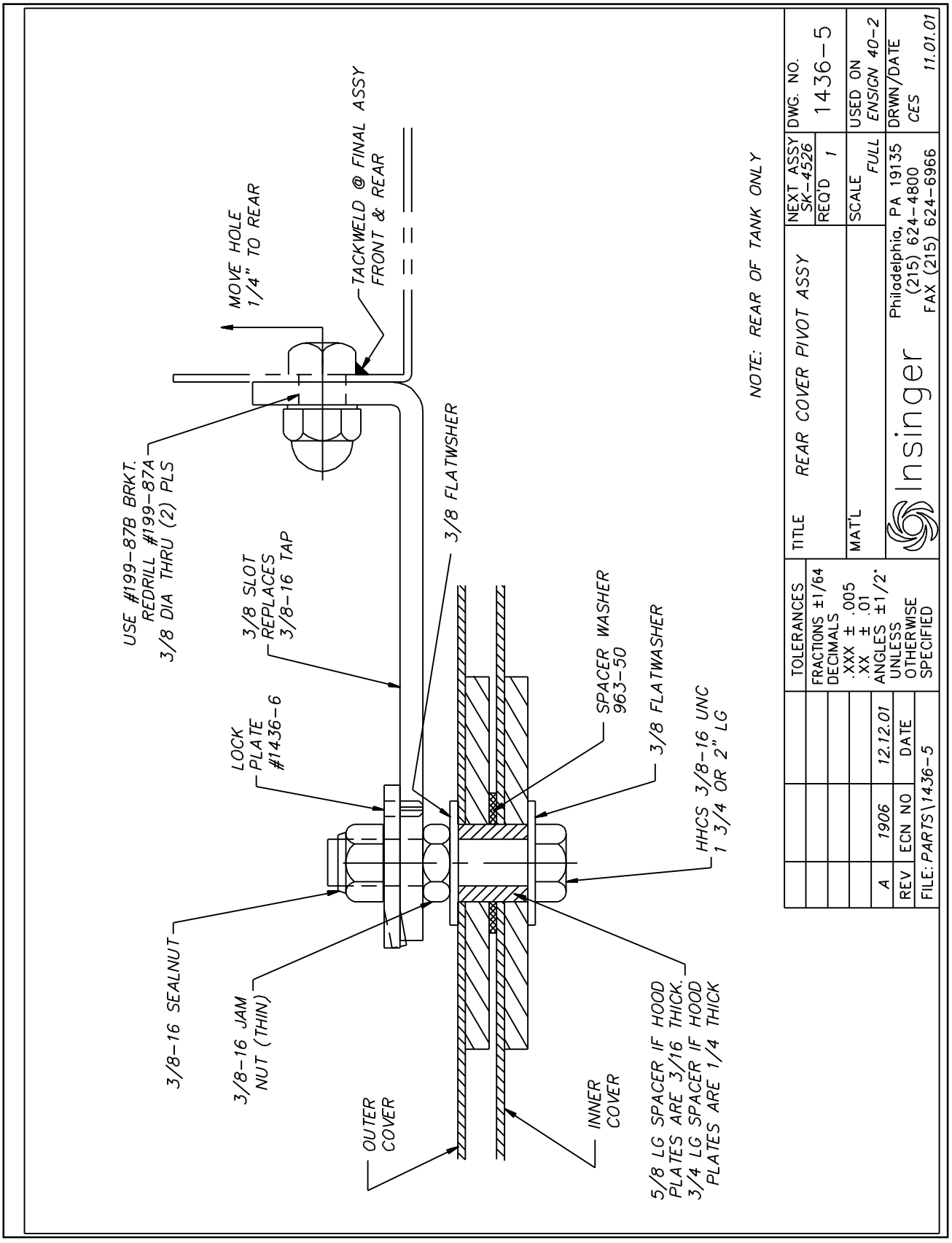
REV	ECN NO	DATE
E	1996	9.22.03
D	1955	10.29.02
C	1949	10.3.02
B	1941	6.17.02

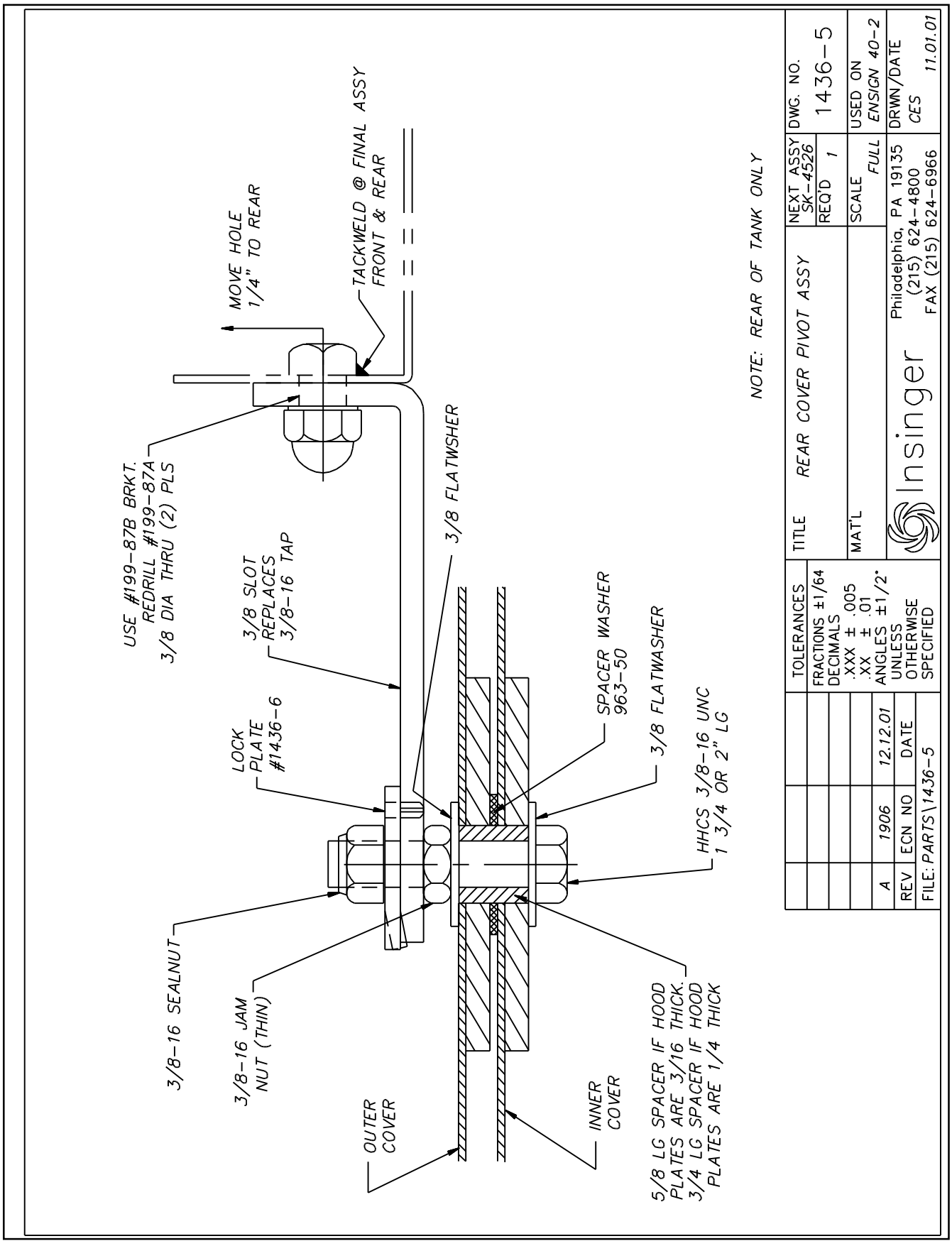
FILE: PARTS\963-52

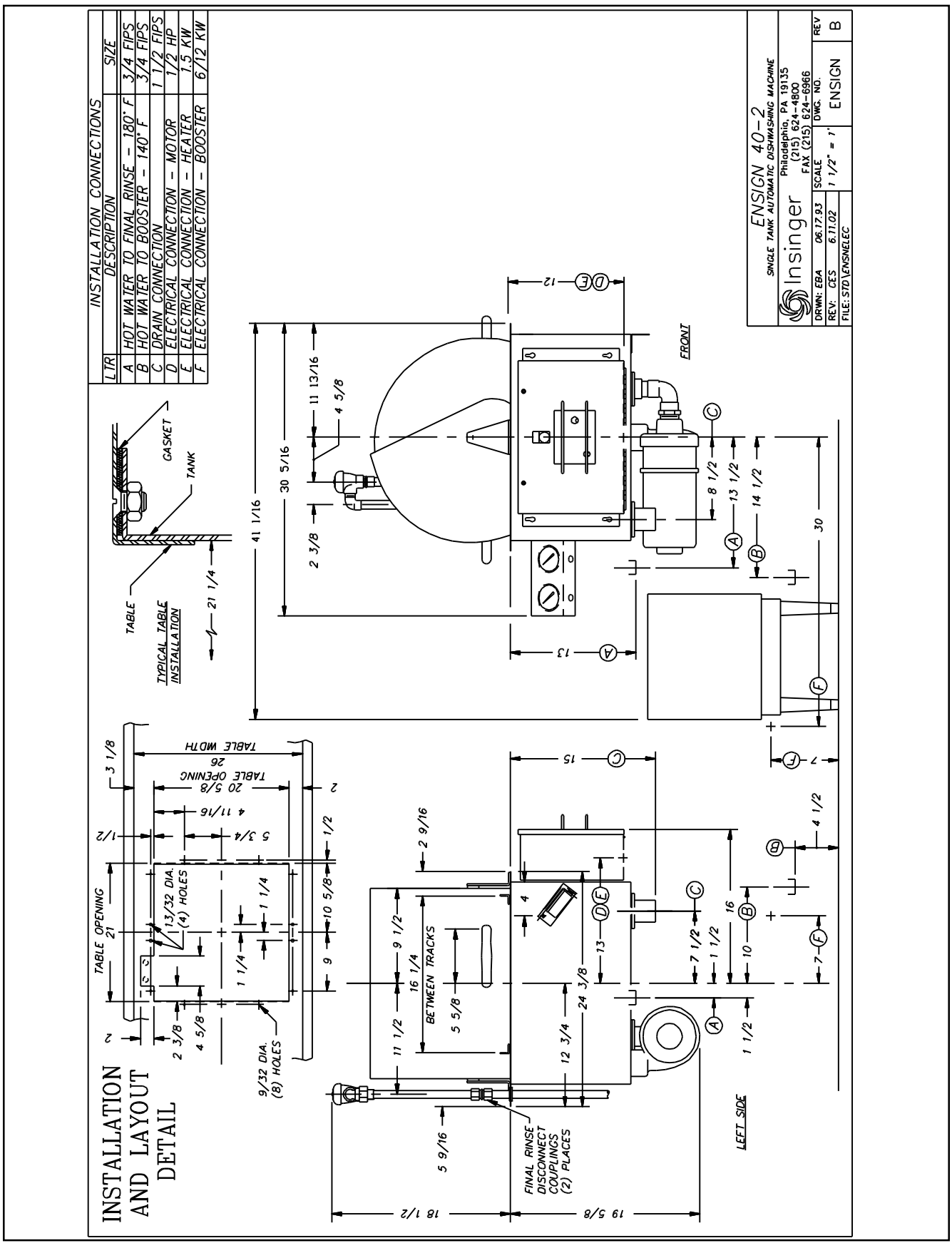
TOLERANCES: FRACTIONS ±1/64; DECIMALS .XXX ± .005, .XX ± .01; ANGLES ±1/2°; UNLESS OTHERWISE SPECIFIED

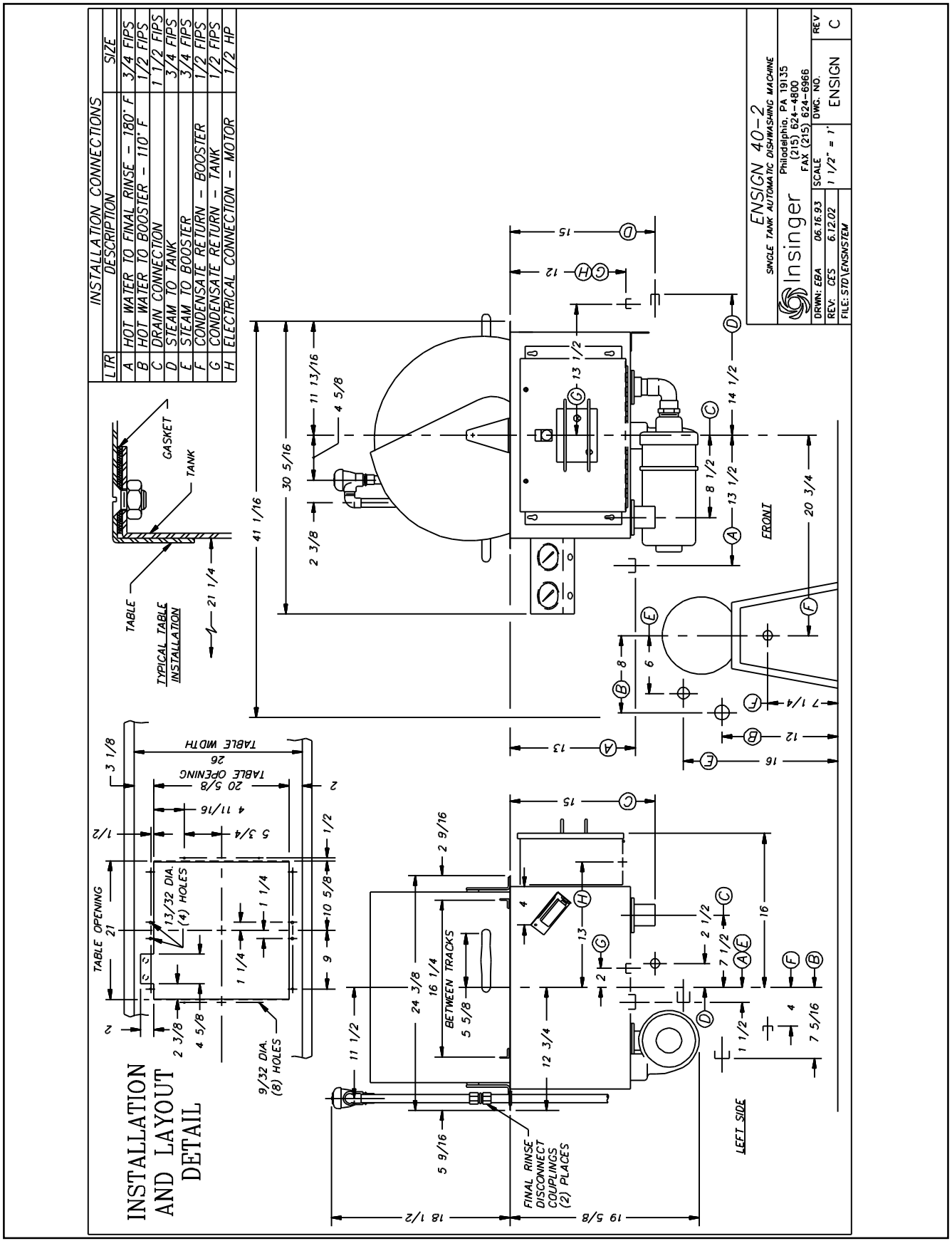
TITLE: FINAL RINSE PIPING ASS'Y	NEXT ASSY: -	DWG. NO.	963-52
	REQ'D: 1		
MAT'L: AS NOTED	SCALE: 1=8	USED ON	ENSIGN 40-2
Insinger — Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966		DRWN/DATE: GP	5.21.01

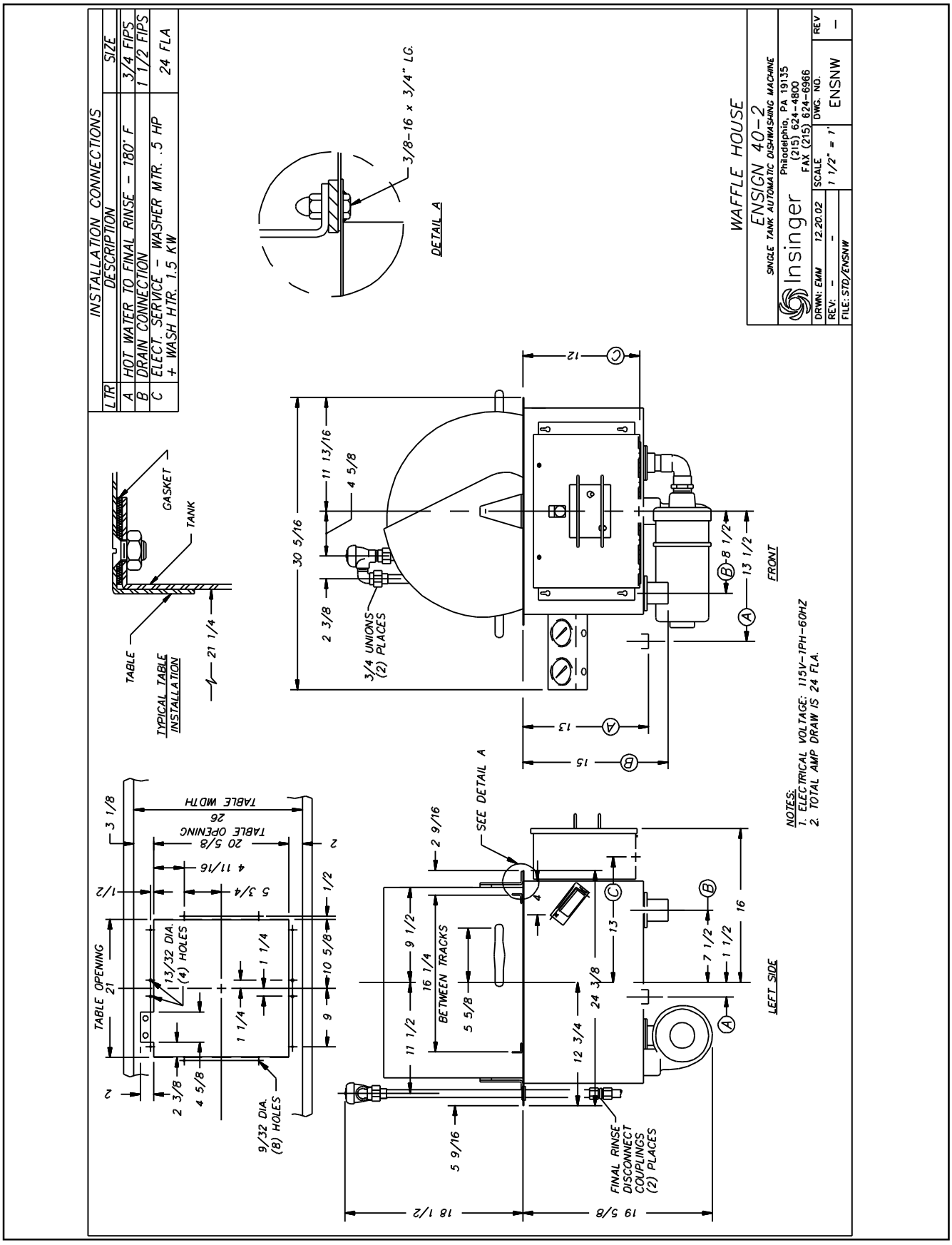

562-87A KNOB
5/16-18 SEAL NUT
5/16 DIA THRU
#617 TUBE CAP
1 1/2 NOM. SIZE
PRESS FIT ON 963-58
TO 7.81 DIMENSION
1.18
.59±.01
.25
7.81
4.88 REF
963-58
4 7/8
REF
PN
967-82
DRAIN
FLANGE
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS
OTHERWISE
SPECIFIED
TITLE SPECIAL OVERFLOW SKIMMER
PIPE ASSEMBLY-WAFFLE HOUSE
MAT'L NOTED
NEXT ASSY
REQ'D 1
SCALE FULL
DWG. NO. 963-56
USED ON ENSIGN
DRWN/DATE MFJ 7.11.01
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
A 1946 7.29.02
REV ECN NO DATE
FILE: PARTS\963-56

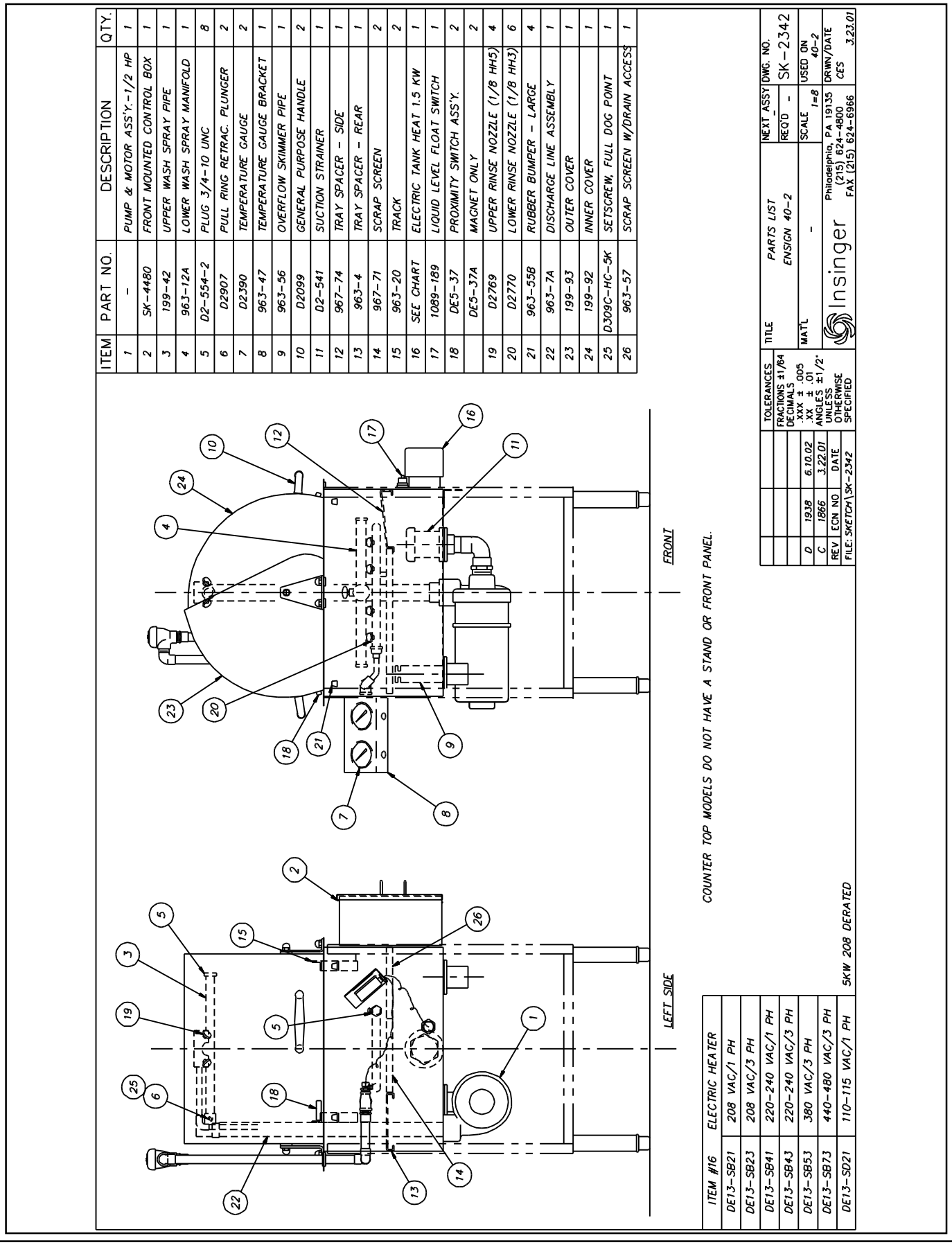

MOVE HOLE 1/4" TO REAR
TACKWELD @ FINAL ASSY FRONT & REAR
USE #199-87B BRKT. REDRILL #199-87A 3/8 DIA THRU (2) PLS
3/8 SLOT REPLACES 3/8-16 TAP
3/8 FLATWSHER
LOCK PLATE #1436-6
SPACER WASHER 963-50
3/8 FLATWASHER
HHCS 3/8-16 UNC 1 3/4 OR 2" LG
3/8-16 SEALNUT
3/8-16 JAM NUT (THIN)
OUTER COVER
INNER COVER
5/8 LG SPACER IF HOOD PLATES ARE 3/16 THICK.
3/4 LG SPACER IF HOOD PLATES ARE 1/4 THICK
NOTE: REAR OF TANK ONLY
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED
TITLE REAR COVER PIVOT ASSY
MAT'L
NEXT ASSY SK-4526
REQ'D 1
SCALE FULL
DWG. NO. 1436-5
USED ON ENSIGN 40-2
DRWN/DATE CES 11.01.01
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
A 1906 12.12.01
REV ECN NO DATE
FILE: PARTS\1436-5

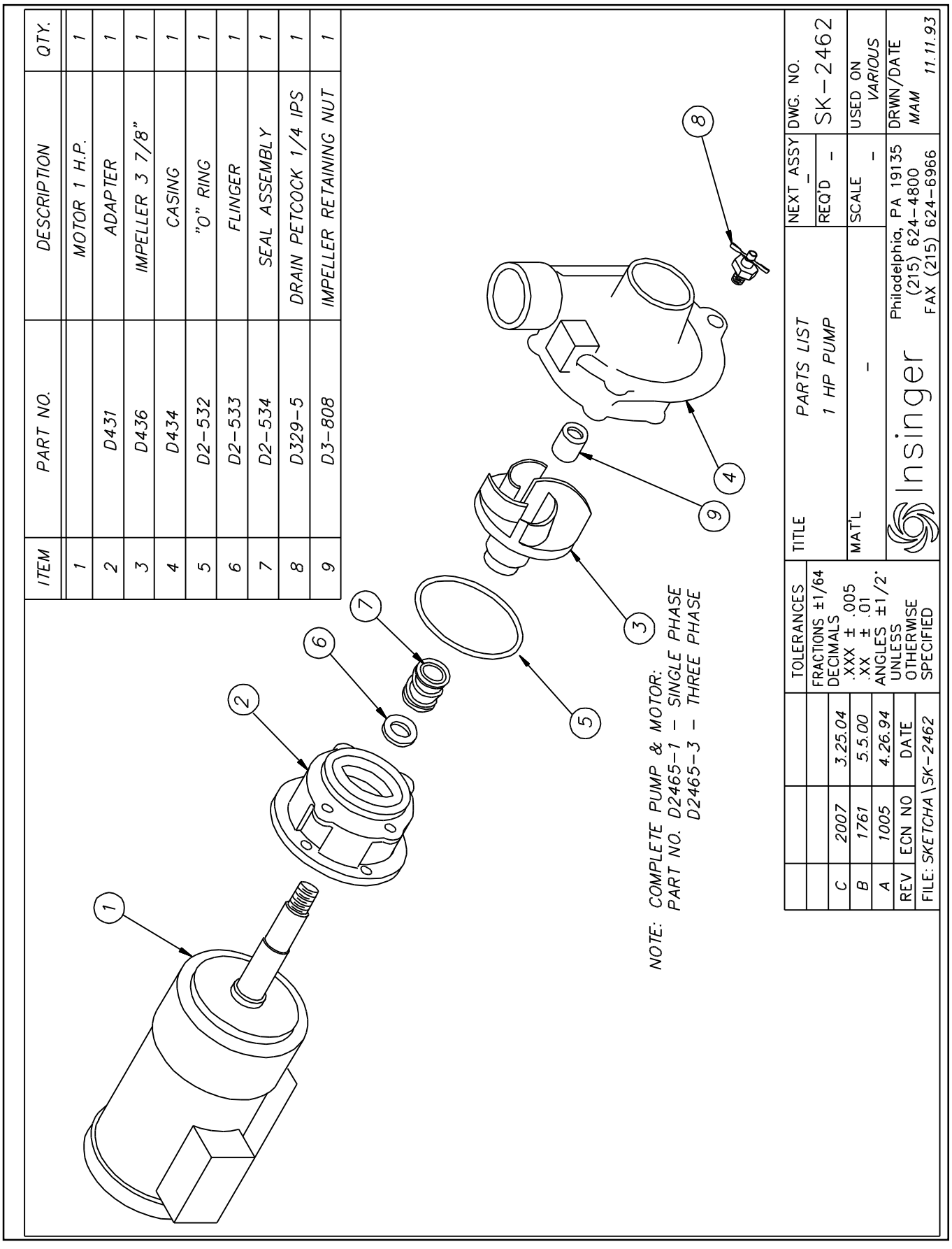

USE #199-87B BRKT.
REDRILL #199-87A
3/8 DIA THRU (2) PLS
MOVE HOLE
1/4" TO REAR
TACKWELD @ FINAL ASSY
FRONT & REAR
3/8 SLOT
REPLACES
3/8-16 TAP
3/8 FLATWSHER
LOCK
PLATE
#1436-6
SPACER WASHER
963-50
3/8 FLATWASHER
HHCS 3/8-16 UNC
1 3/4 OR 2" LG
3/8-16 SEALNUT
3/8-16 JAM
NUT (THIN)
OUTER
COVER
INNER
COVER
5/8 LG SPACER IF HOOD
PLATES ARE 3/16 THICK.
3/4 LG SPACER IF HOOD
PLATES ARE 1/4 THICK
NOTE: REAR OF TANK ONLY
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS
OTHERWISE
SPECIFIED
TITLE REAR COVER PIVOT ASSY
MAT'L
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
NEXT ASSY SK-4526
REQ'D 1
SCALE FULL
DWG. NO. 1436-5
USED ON ENSIGN 40-2
DRWN/DATE CES 11.01.01
A 1906 12.12.01
REV ECN NO DATE
FILE: PARTS\1436-5


INSTALLATION CONNECTIONS
LTR DESCRIPTION SIZE
A HOT WATER TO FINAL RINSE - 180° F 3/4 FIPS
B HOT WATER TO BOOSTER - 140° F 3/4 FIPS
C DRAIN CONNECTION 1 1/2 FIPS
D ELECTRICAL CONNECTION - MOTOR 1/2 HP
E ELECTRICAL CONNECTION - HEATER 1.5 KW
F ELECTRICAL CONNECTION - BOOSTER 6/12 KW
ENSIGN 40-2
SINGLE TANK AUTOMATIC DISHWASHING MACHINE
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN: EBA 06.17.93
REV: CES 6.11.02
FILE: STD\ENSNELEC
SCALE 1 1/2" = 1'
DWG. NO. ENSIGN
REV B
INSTALLATION AND LAYOUT DETAIL
TYPICAL TABLE INSTALLATION
GASKET
TANK
TABLE
21 1/4
41 1/16
30 5/16
11 13/16
4 5/8
2 3/8
FRONT
12
13
8 1/2
13 1/2
14 1/2
30
7
TABLE WIDTH
26
TABLE OPENING
21
20 5/8
4 11/16
5 3/4
3 1/8
2
1/2
13/32 DIA.
(4) HOLES
1 1/4
10 5/8
9
9/32 DIA.
(8) HOLES
2 3/8
4 5/8
15
2 9/16
4
9 1/2
16 1/4
BETWEEN TRACKS
5 5/8
11 1/2
24 3/8
12 3/4
13
7 1/2
1 1/2
16
10
4 1/2
1 1/2
5 9/16
FINAL RINSE
DISCONNECT
COUPLINGS
(2) PLACES
18 1/2
19 5/8
LEFT SIDE


INSTALLATION CONNECTIONS
LTR DESCRIPTION SIZE
A HOT WATER TO FINAL RINSE - 180° F 3/4 FIPS
B HOT WATER TO BOOSTER - 110° F 1/2 FIPS
C DRAIN CONNECTION 1 1/2 FIPS
D STEAM TO TANK 3/4 FIPS
E STEAM TO BOOSTER 3/4 FIPS
F CONDENSATE RETURN - BOOSTER 1/2 FIPS
G CONDENSATE RETURN - TANK 1/2 FIPS
H ELECTRICAL CONNECTION - MOTOR 1/2 HP
ENSIGN 40-2
SINGLE TANK AUTOMATIC DISHWASHING MACHINE
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN: EBA 06.16.93
REV: CES 6.12.02
FILE: STD\ENSN\STEM
SCALE 1 1/2" = 1'
DWG. NO. ENSIGN
REV C
INSTALLATION AND LAYOUT DETAIL
TYPICAL TABLE INSTALLATION
GASKET
TANK
TABLE
FRONT
LEFT SIDE
TABLE OPENING
TABLE WIDTH
TABLE OPENING
13/32 DIA. (4) HOLES
9/32 DIA. (8) HOLES
BETWEEN TRACKS
FINAL RINSE DISCONNECT COUPLINGS (2) PLACES


INSTALLATION CONNECTIONS
LTR DESCRIPTION SIZE
A HOT WATER TO FINAL RINSE – 180° F 3/4 FIPS
B DRAIN CONNECTION 1 1/2 FIPS
C ELECT. SERVICE – WASHER MTR. .5 HP + WASH HTR. 1.5 KW 24 FLA
WAFFLE HOUSE
ENSIGN 40-2
SINGLE TANK AUTOMATIC DISHWASHING MACHINE
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN: EMM 12.20.02
REV: – –
FILE: STD/ENSNW
SCALE 1 1/2" = 1'
DWG. NO. ENSNW
REV –
DETAIL A
3/8-16 x 3/4" LG.
GASKET
TANK
TABLE
TYPICAL TABLE INSTALLATION
21 1/4
30 5/16
11 13/16
4 5/8
2 3/8
3/4 UNIONS (2) PLACES
12
13
15
8 1/2
13 1/2
FRONT
SEE DETAIL A
2 9/16
9 1/2
16 1/4
BETWEEN TRACKS
5 5/8
11 1/2
24 3/8
12 3/4
5 9/16
FINAL RINSE DISCONNECT COUPLINGS (2) PLACES
18 1/2
19 5/8
7 1/2
1 1/2
16
LEFT SIDE
TABLE WIDTH
26
TABLE OPENING
21
20 5/8
4 11/16
5 3/4
3 1/8
1/2
2
10 5/8
9
1 1/4
13/32 DIA. (4) HOLES
2 3/8
4 5/8
9/32 DIA. (8) HOLES
NOTES:
1. ELECTRICAL VOLTAGE: 115V-1PH-60HZ
2. TOTAL AMP DRAW IS 24 FLA.


ITEM | PART NO. | DESCRIPTION | QTY.
1 | - | PUMP & MOTOR ASS'Y.-1/2 HP | 1
2 | SK-4480 | FRONT MOUNTED CONTROL BOX | 1
3 | 199-42 | UPPER WASH SPRAY PIPE | 1
4 | 963-12A | LOWER WASH SPRAY MANIFOLD | 1
5 | D2-554-2 | PLUG 3/4-10 UNC | 8
6 | D2907 | PULL RING RETRAC. PLUNGER | 2
7 | D2390 | TEMPERATURE GAUGE | 2
8 | 963-47 | TEMPERATURE GAUGE BRACKET | 1
9 | 963-56 | OVERFLOW SKIMMER PIPE | 1
10 | D2099 | GENERAL PURPOSE HANDLE | 2
11 | D2-541 | SUCTION STRAINER | 1
12 | 967-74 | TRAY SPACER - SIDE | 1
13 | 963-4 | TRAY SPACER - REAR | 1
14 | 967-71 | SCRAP SCREEN | 2
15 | 963-20 | TRACK | 2
16 | SEE CHART | ELECTRIC TANK HEAT 1.5 KW | 1
17 | 1089-189 | LIQUID LEVEL FLOAT SWITCH | 1
18 | DE5-37 | PROXIMITY SWITCH ASS'Y. | 2
DE5-37A | MAGNET ONLY | 2
19 | D2769 | UPPER RINSE NOZZLE (1/8 HH5) | 4
20 | D2770 | LOWER RINSE NOZZLE (1/8 HH3) | 6
21 | 963-55B | RUBBER BUMPER - LARGE | 4
22 | 963-7A | DISCHARGE LINE ASSEMBLY | 1
23 | 199-93 | OUTER COVER | 1
24 | 199-92 | INNER COVER | 1
25 | D309C-HC-5K | SETSCREW, FULL DOG POINT | 1
26 | 963-57 | SCRAP SCREEN W/DRAIN ACCESS | 1
FRONT
LEFT SIDE
COUNTER TOP MODELS DO NOT HAVE A STAND OR FRONT PANEL.
ITEM #16 ELECTRIC HEATER
DE13-SB21 208 VAC/1 PH
DE13-SB23 208 VAC/3 PH
DE13-SB41 220-240 VAC/1 PH
DE13-SB43 220-240 VAC/3 PH
DE13-SB53 380 VAC/3 PH
DE13-SB73 440-480 VAC/3 PH
DE13-SD21 110-115 VAC/1 PH
5KW 208 DERATED
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED
D 1938 6.10.02
C 1866 3.22.01
REV ECN NO DATE
FILE: SKETCH\SK-2342
TITLE PARTS LIST ENSIGN 40-2
MATL -
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
NEXT ASSY REQ'D -
DWG. NO. SK-2342
SCALE 1=8
USED ON 40-2
DRWN/DATE CES 3.23.01



ITEM	PART NO.	DESCRIPTION	QTY.
1		MOTOR 1 H.P.	1
2	D431	ADAPTER	1
3	D436	IMPELLER 3 7/8"	1
4	D434	CASING	1
5	D2-532	"O" RING	1
6	D2-533	FLINGER	1
7	D2-534	SEAL ASSEMBLY	1
8	D329-5	DRAIN PETCOCK 1/4 IPS	1
9	D3-808	IMPELLER RETAINING NUT	1

NOTE: COMPLETE PUMP & MOTOR:
PART NO. D2465-1 - SINGLE PHASE
D2465-3 - THREE PHASE

REV	ECN NO	DATE
C	2007	3.25.04
B	1761	5.5.00
A	1005	4.26.94

FILE: SKETCHA\SK-2462

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS
OTHERWISE
SPECIFIED

TITLE
PARTS LIST
1 HP PUMP

MAT'L -

NEXT ASSY -
REQ'D -

SCALE -

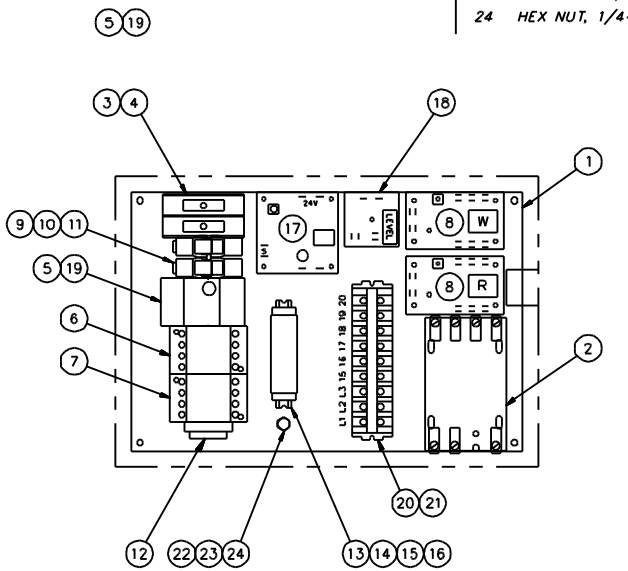
DWG. NO. SK-2462

USED ON VARIOUS

DRWN/DATE MAM 11.11.93

Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966

ITEM	DESCRIPTION	PART NO.	QTY
18	TIMER (LIQUID LEVEL)	DE7-35	1
19	OVERLOAD BASE	DE2-60	1
20	TERMINAL BLOCK	DE3-3A	9
21	TERMINAL BLOCK END	DE3-3B	1
22	GROUNDING STUD, 1/4-20	D309C-GC-4G	1
23	LOCKWASHER, 1/4	D313C-G5	1
24	HEX NUT, 1/4-20	D312C-GC-2	1



ITEM	DESCRIPTION		PART NO.	QTY
1	COMPONENT MOUNTING PLATE		SK-4481	1
2	TRANSFORMER (100 VA, 24 VAC)			1
	ALL VOLTAGES EXCEPT 120 V		DE6-6	
	120 V		DE6-14	
3	FUSE BLOCK (100 VA XFMR)		DE9-185	1
4	FUSE (100 VA TRANSFORMER PRIMARY)			2
	440 - 480 V	FNQ-R-.75	DE9-166	
	380 V	FNQ-R-.75	DE9-166	
	220 - 230 V	FNQ-R-1.4	DE9-168	
	208 V	FNQ-R-1.5	DE9-200	
	115 V	FNQ-R-2.8	DE9-201	
5	OVERLOAD RELAY (1/2 HP PUMP)			1
	460/3/60	1-1.6 A	DE2-50	
	380/3/50	1-1.6 A	DE2-50	
	230/3/60	1.6-2.5 A	DE2-52	
	220/3/50	1.6-2.5 A	DE2-52	
	220/1/60	4-6 A	DE2-54	
	208/3/60	1.6-2.5 A	DE2-52	
	115/1/60	7-10 A	DE2-56	
6	CONTACTOR (PUMP)	SP4	DE1-93	1
7	CONTACTOR (ELECT TANK HEAT) SP4		DE1-93	1
8	TIME DELAY BOARD (WASH & RINSE)		DE7-27	2
9	RELAY BASE		DE2-37	AR
10	RELAY		DE2-38	AR
11	RELAY HOLD DOWN SPRING		DE3-43	AR
12	DIN RAIL (35 mm)		DE9-84	1
13	DIN RAIL (15 mm)		DE3-42	1
14	TERMINAL SECTION		DE3-39	14
15	TERMINAL END COVER PLATE		DE3-40	1
16	TERMINAL END CLAMP		DE3-41	2
17	TEMPERATURE CONTROL BOARD		DE9-251	1

NOT SHOWN

ELECTRIC IMMERSION HEATER (1.5 KW)		1
440-480 V, 3 PH	DE13-SB73	
380 V, 3 PH	DE13-SB53	
220-240 V, 3 PH	DE13-SB43	
208V, 3PH	DE13-SB23	
220-240 V, 1 PH	DE13-SB41	
208V, 1 PH	DE13-SB21	
110-120 V, 1 PH (5KW 208 DERATED)	DE13-SD21	
TEMPERATURE SENSOR	DE9-252	1

SHEET 1 OF 2

TITLE: ENSIGN 40-2
FRONT MOUNTED CONTROL PANEL LAYOUT

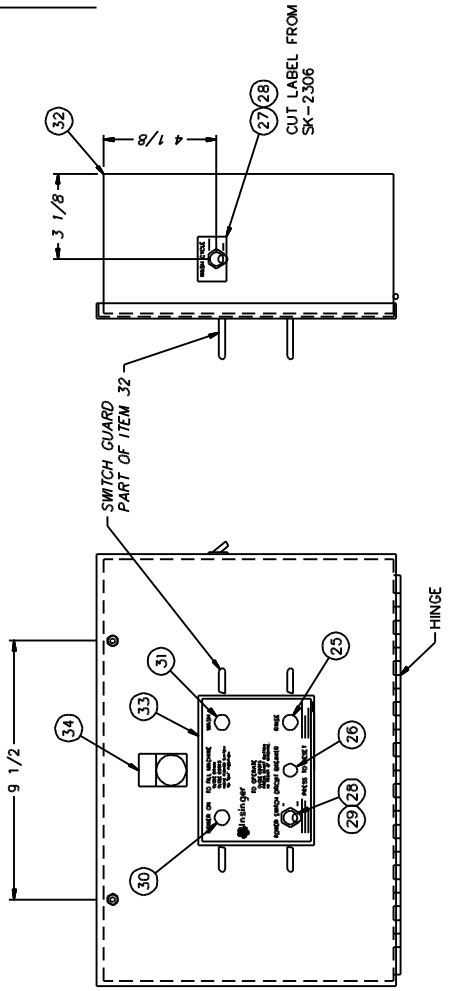
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966

DRWN/DATE: MFJ 5.11.01

REV	ECN NO	DATE
C	1986	8.1.03
B	1945	7.17.02
A	1933	5.7.02

FILE: SKETCH\SK-4480
SCALE: 1/4
DWG. NO.: SK-4480

ITEM	DESCRIPTION	PART NO.	QTY
25	PILOT LIGHT (AMBER)	DE9-109	1
26	CIRCUIT BREAKER (5A)	DE9-43	1
27	SWITCH (AUTO - MANUAL)	DE5-11	1
28	BOOT	DE9-13	2
29	SWITCH, DPDT (POWER ON)	DE5-11	1
30	PILOT LIGHT (RED)	DE9-107	1
31	PILOT LIGHT (WHITE)	DE9-108	1
32	CONTROL BOX	SK-4482	1
33	LEGEND DECAL	SK-4468	1
34	PUSHBUTTON ASSY, START	DE8-64	1



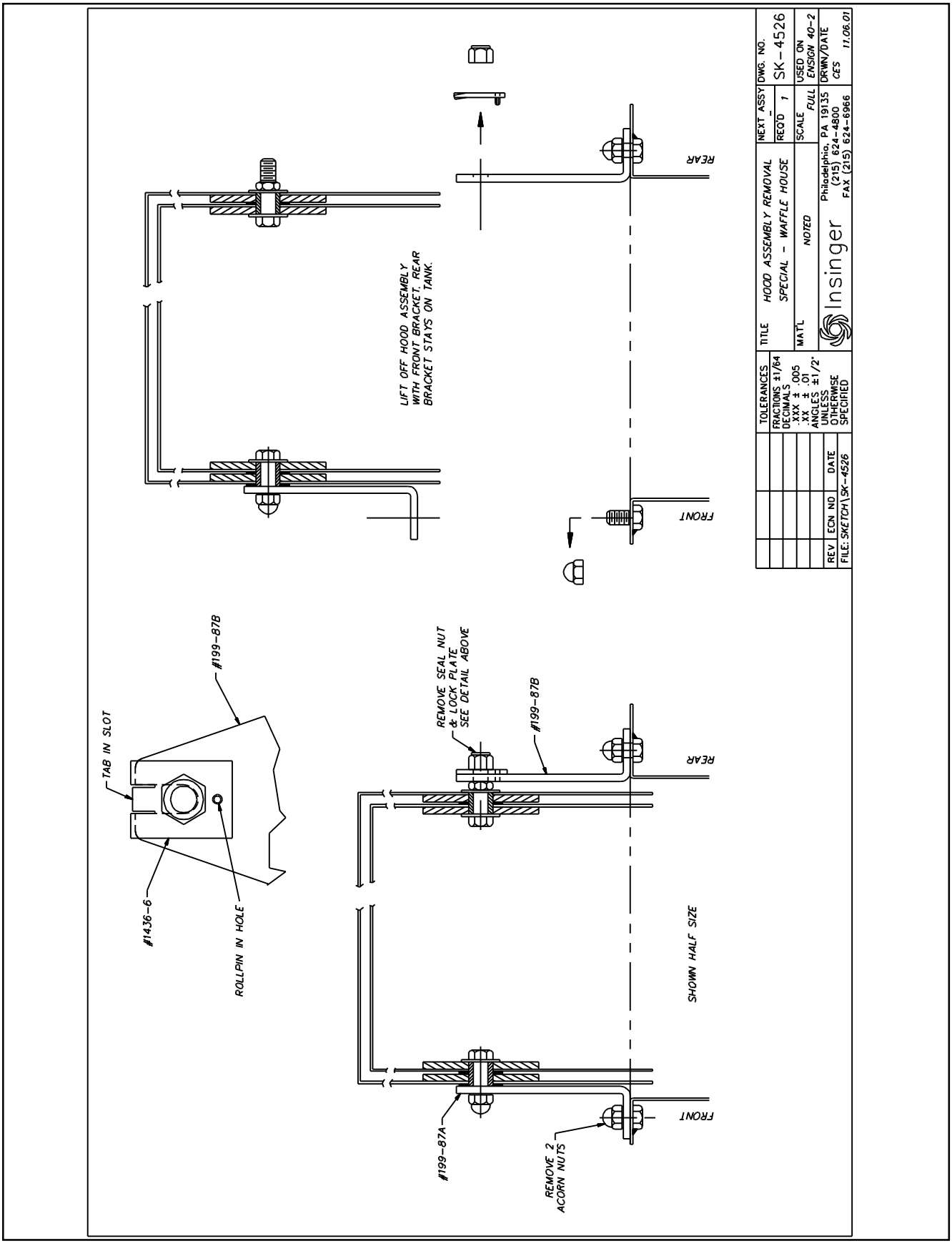
SHEET 2 OF 2

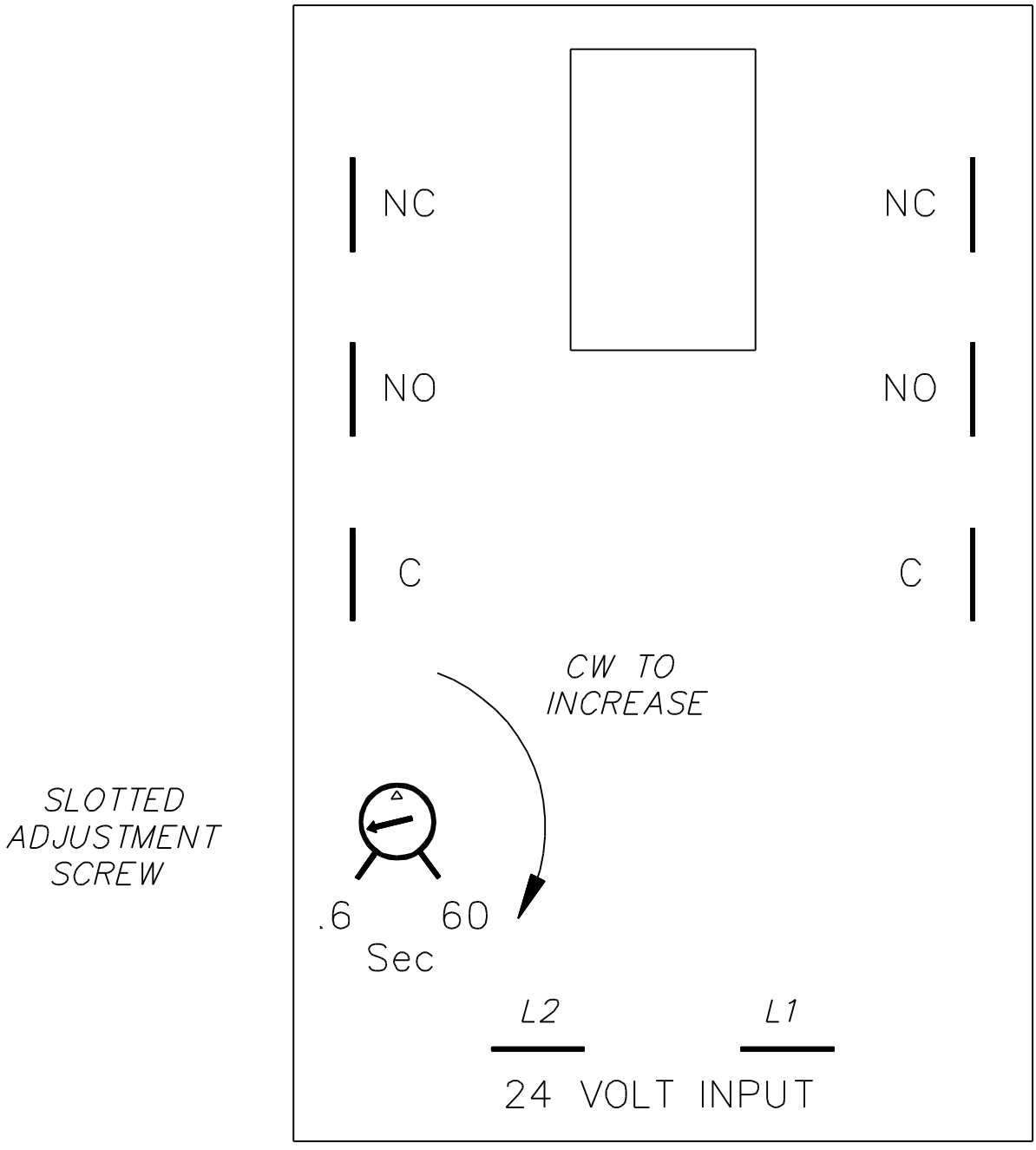
TITLE: ENSIGN 40-2 FRONT MOUNTED CONTROL PANEL LAYOUT

Insinger — Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966

REV	ECN NO	DATE
C	1986	8.1.03
B	1945	7.17.02
A	1933	5.7.02

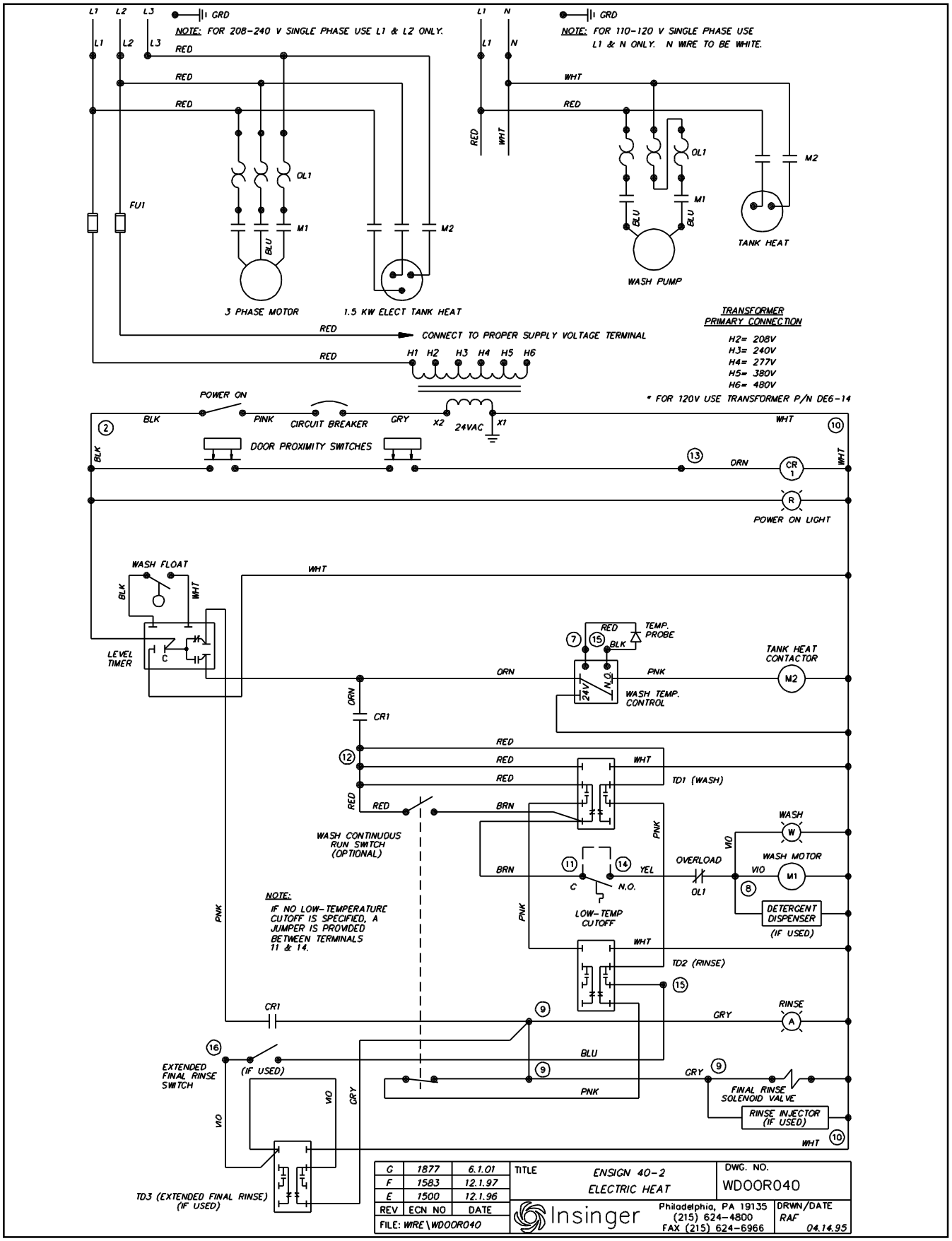
DRWN/DATE MFJ 5.11.01
FILE: SKETCH\SK-4480
SCALE 1/4
DWG. NO. SK-4480

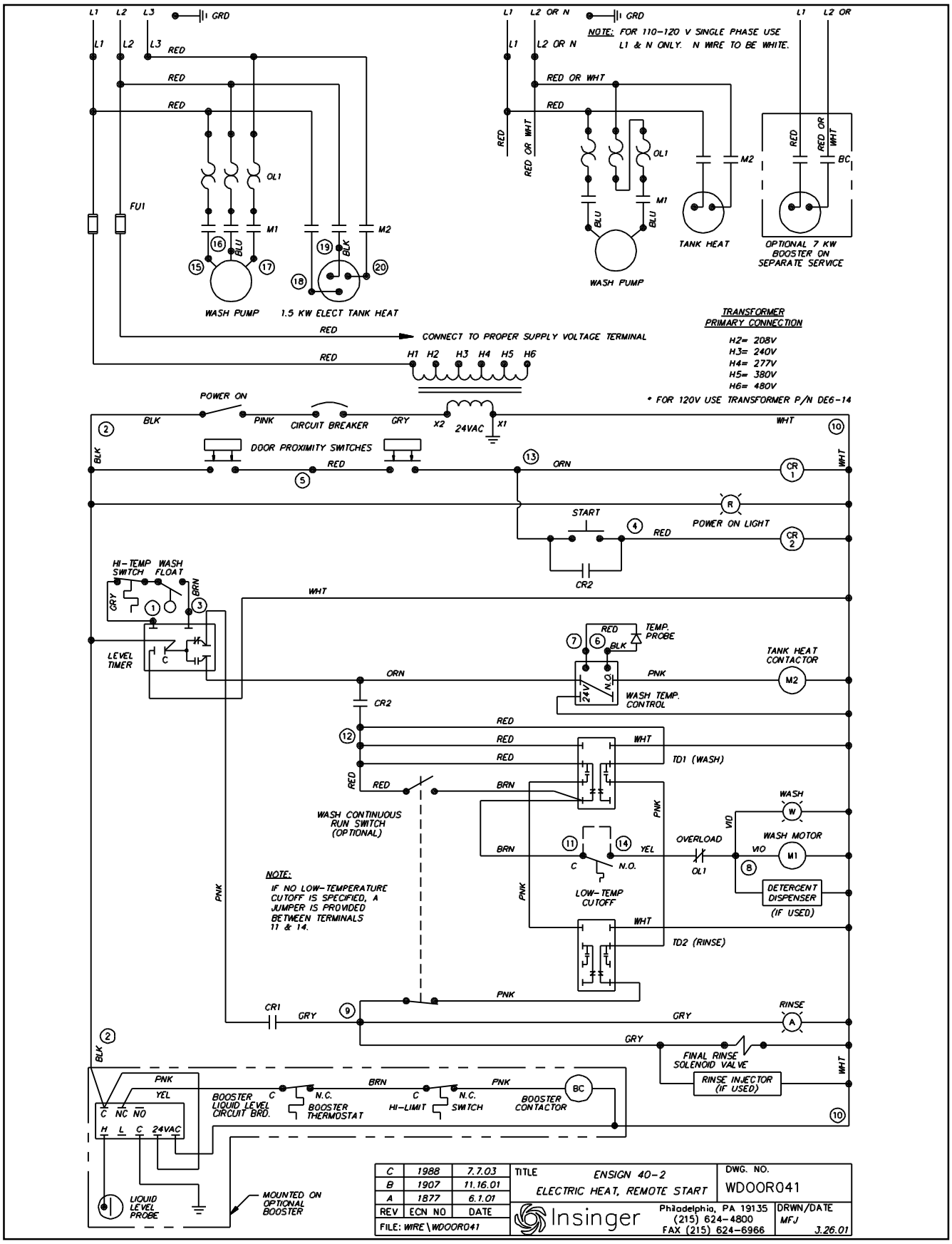

LIFT OFF HOOD ASSEMBLY WITH FRONT BRACKET. REAR BRACKET STAYS ON TANK.
REAR
FRONT
#199-87B
TAB IN SLOT
#1436-6
ROLLPIN IN HOLE
REMOVE SEAL NUT & LOCK PLATE SEE DETAIL ABOVE
#199-87B
REAR
SHOWN HALF SIZE
#199-87A
REMOVE 2 ACORN NUTS
FRONT
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED
TITLE
HOOD ASSEMBLY REMOVAL
SPECIAL - WAFFLE HOUSE
MATL
NOTED
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
NEXT ASSY
REQ'D 1
SCALE FULL
DWG. NO.
SK-4526
USED ON
ENSIGN 40-2
DRWN/DATE
CES 11.06.01
REV
ECN NO
DATE
FILE: SKETCH\SK-4526

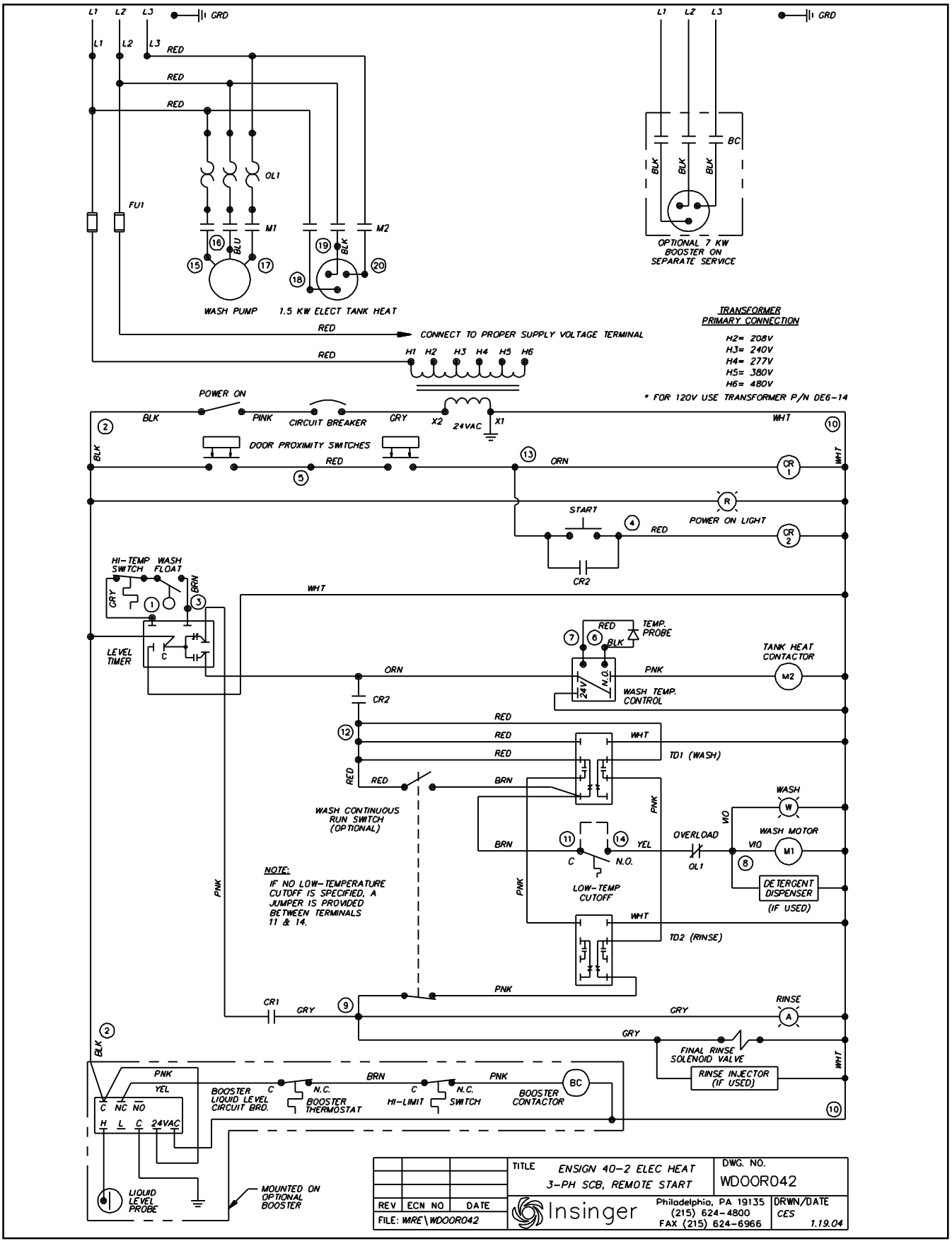


WASH & RINSE TIMER DE7-27

SKETCHA\SK-4708


L1 L2 L3 GRD
NOTE: FOR 208-240 V SINGLE PHASE USE L1 & L2 ONLY.
L1 N GRD
NOTE: FOR 110-120 V SINGLE PHASE USE L1 & N ONLY. N WIRE TO BE WHITE.
RED
WHT
FU1
OL1
M1
M2
BLU
3 PHASE MOTOR
1.5 KW ELECT TANK HEAT
WASH PUMP
TANK HEAT
CONNECT TO PROPER SUPPLY VOLTAGE TERMINAL
H1 H2 H3 H4 H5 H6
TRANSFORMER PRIMARY CONNECTION
H2= 208V
H3= 240V
H4= 277V
H5= 380V
H6= 480V
* FOR 120V USE TRANSFORMER P/N DE6-14
POWER ON
BLK
PINK
CIRCUIT BREAKER
GRY
X2
24VAC
X1
DOOR PROXIMITY SWITCHES
ORN
CR 1
R
POWER ON LIGHT
WASH FLOAT
LEVEL TIMER
TEMP. PROBE
WASH TEMP. CONTROL
TANK HEAT CONTACTOR
CR1
TD1 (WASH)
WASH CONTINUOUS RUN SWITCH (OPTIONAL)
BRN
YEL
OVERLOAD
WASH MOTOR
VIO
DETERGENT DISPENSER
(IF USED)
NOTE:
IF NO LOW-TEMPERATURE CUTOFF IS SPECIFIED, A JUMPER IS PROVIDED BETWEEN TERMINALS 11 & 14.
LOW-TEMP CUTOFF
TD2 (RINSE)
RINSE
GRY
EXTENDED FINAL RINSE SWITCH
(IF USED)
FINAL RINSE SOLENOID VALVE
RINSE INJECTOR (IF USED)
TD3 (EXTENDED FINAL RINSE)
(IF USED)
G 1877 6.1.01
F 1583 12.1.97
E 1500 12.1.96
REV ECN NO DATE
FILE: WIRE\WDOOR040
TITLE
ENSIGN 40-2
ELECTRIC HEAT
DWG. NO.
WDOOR040
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN/DATE
RAF
04.14.95


L1 L2 L3 GRD
L1 L2 L3
RED
RED
RED
OL1
FU1
M1
M2
BLU
BLK
16
19
15
17
18
20
WASH PUMP
1.5 KW ELECT TANK HEAT
L1 L2 OR N GRD
NOTE: FOR 110-120 V SINGLE PHASE USE L1 & N ONLY. N WIRE TO BE WHITE.
L1 L2 OR N
RED OR WHT
RED
RED OR WHT
OL1
M1
M2
BLU
BLU
TANK HEAT
WASH PUMP
L1 L2 OR
RED
RED OR WHT
BC
OPTIONAL 7 KW BOOSTER ON SEPARATE SERVICE
RED
CONNECT TO PROPER SUPPLY VOLTAGE TERMINAL
RED
H1 H2 H3 H4 H5 H6
TRANSFORMER PRIMARY CONNECTION
H2= 208V
H3= 240V
H4= 277V
H5= 380V
H6= 480V
* FOR 120V USE TRANSFORMER P/N DE6-14
POWER ON
BLK
PINK
CIRCUIT BREAKER
GRY
X2
24VAC
X1
WHT
2
10
BLK
DOOR PROXIMITY SWITCHES
RED
5
13
ORN
CR 1
WHT
START
R
POWER ON LIGHT
4
RED
CR 2
CR2
HI-TEMP WASH SWITCH FLOAT
GRY
BRN
1
3
WHT
LEVEL TIMER
C
7
6
RED
BLK
TEMP. PROBE
TANK HEAT CONTACTOR
ORN
PNK
M2
CR2
24V
N.O.
WASH TEMP. CONTROL
RED
12
RED
WHT
RED
TD1 (WASH)
RED
RED
BRN
WASH CONTINUOUS RUN SWITCH (OPTIONAL)
PNK
WASH
W
VIO
WASH MOTOR
M1
11
14
YEL
OVERLOAD
BRN
C
N.O.
VIO
OL1
B
DETERGENT DISPENSER
(IF USED)
NOTE:
IF NO LOW-TEMPERATURE CUTOFF IS SPECIFIED, A JUMPER IS PROVIDED BETWEEN TERMINALS 11 & 14.
PNK
PNK
LOW-TEMP CUTOFF
WHT
TD2 (RINSE)
PNK
CR1
GRY
9
GRY
RINSE
A
GRY
FINAL RINSE SOLENOID VALVE
RINSE INJECTOR (IF USED)
WHT
2
BLK
PNK
YEL
C NC NO
H L C 24VAC
BOOSTER LIQUID LEVEL CIRCUIT BRD.
C
N.C.
BOOSTER THERMOSTAT
BRN
C
HI-LIMIT
N.C.
SWITCH
PNK
BOOSTER CONTACTOR
BC
10
LIQUID LEVEL PROBE
MOUNTED ON OPTIONAL BOOSTER
C 1988 7.7.03
B 1907 11.16.01
A 1877 6.1.01
REV ECN NO DATE
FILE: WIRE\WDOOR041
TITLE ENSIGN 40-2
ELECTRIC HEAT, REMOTE START
DWG. NO. WDOOR041
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN/DATE MFJ 3.26.01


L1 L2 L3 GRD
RED
OL1
FU1
M1
M2
WASH PUMP
1.5 KW ELECT TANK HEAT
BC
BLK
OPTIONAL 7 KW BOOSTER ON SEPARATE SERVICE
CONNECT TO PROPER SUPPLY VOLTAGE TERMINAL
H1 H2 H3 H4 H5 H6
TRANSFORMER PRIMARY CONNECTION
H2= 208V
H3= 240V
H4= 277V
H5= 380V
H6= 480V
* FOR 120V USE TRANSFORMER P/N DE6-14
POWER ON
CIRCUIT BREAKER
PINK
GRY
X2
24VAC
X1
WHT
DOOR PROXIMITY SWITCHES
ORN
CR 1
START
POWER ON LIGHT
CR 2
CR2
HI-TEMP WASH SWITCH FLOAT
BRN
LEVEL TIMER
TEMP. PROBE
TANK HEAT CONTACTOR
WASH TEMP. CONTROL
TD1 (WASH)
WASH CONTINUOUS RUN SWITCH (OPTIONAL)
WASH
WASH MOTOR
OVERLOAD
VIO
YEL
N.O.
OL1
DETERGENT DISPENSER
(IF USED)
LOW-TEMP CUTOFF
TD2 (RINSE)
NOTE:
IF NO LOW-TEMPERATURE CUTOFF IS SPECIFIED, A JUMPER IS PROVIDED BETWEEN TERMINALS 11 & 14.
CR1
RINSE
FINAL RINSE SOLENOID VALVE
RINSE INJECTOR (IF USED)
BOOSTER LIQUID LEVEL CIRCUIT BRD.
BOOSTER THERMOSTAT
HI-LIMIT SWITCH
BOOSTER CONTACTOR
C NC NO
H L C 24VAC
LIQUID LEVEL PROBE
MOUNTED ON OPTIONAL BOOSTER
TITLE ENSIGN 40-2 ELEC HEAT
3-PH SCB, REMOTE START
DWG. NO. WD00R042
REV ECN NO DATE
FILE: WIRE\WD00R042
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN/DATE CES 1.19.04

Initial Start-Up Adjustments

Tank Overfill Adjustment

1. Locate tank overfill timer in the control panel. See the control panel layout drawing located in Section 6, Electrical Schematic and Replacement Parts.
2. The overfill timer starts timing when the upper level float is actuated. Adjust the overfill timer potentiometer to turn the tank fill solenoid off when the water level is 1/4” below the lip of the overflow tube.
3. The timer has a built in dwell timing delay of 5 seconds (nominal to dampen float bounce caused by tank water motion.

Conveyor Jam Adjustment

1. Remove the mechanism guard to gain access to the conveyor drive.
2. Locate the compression spring (refer to Drawing #1397-1, Drive Mechanism Assembly).
3. The factory set compression dimension is a nominal 3 13/16”. Installations washing heavier ware may need to adjust this for more compression to keep the machine from shutting down prematurely.
4. Should the drive mechanism switch be activated by a conveyor jam, the Check Conveyor Light on the control panel will illuminate and the machine will shut down.
5. To restart the machine, clear the jam and press the green Start Button.

Final Rinse Pressure Adjustment

1. The final rinse pressure must be adjusted to 20PSI. This is done by adjusting the pressure regulator.

6245 State Road
Philadelphia, PA 19135-2996

800.344.4802
Fax 215.624.6966
www.insingermachine.com