C. CRETORS AND COMPANY, 176 MITTEL DRIVE,
WOOD DALE, IL 60191, USA
TEL. (847) 616-6900 FAX (847) 616-6970 WEB: WWW.CRETORS.COM

ORIGINATE-AIR POPPER (Electric)

OPERATOR INSTRUCTIONS

**230-380 (400 Volt, 3N~,
Three Phase, 50 Hz**

**200, 208 or 240 Volt,
Two or Three Phase, 50 or 60 Hz**

All models approximately 10,000 watts

READ and **UNDERSTAND** these servicing, and safety instructions before servicing this popcorn machine

TABLE OF CONTENTS

INTRODUCTION

This manual is filled with time-saving and money-saving information regarding your Cretors popcorn machine. There is nothing, however, more important than the safety aids and warnings that are found throughout this document. The Safety Alert Symbol is used to identify topics of primary safety concern wherever they appear. A separate section has been included which deals exclusively with operation and accident prevention.

If, after reviewing this manual, anything is unclear or technical problems are encountered, contact the distributor from whom you purchased your machine. For assistance and if there are any additional questions, feel free to contact our Customer Service Department at the address and/or phone number listed on the last page of this manual. Always have the model and serial number of your machine available to assist in obtaining the correct information.

I. SAFETY ALERT SYMBOL

The symbol shown below is used to call your attention to instructions concerning your personal safety and the safety of others. Watch for this symbol. It points out important safety precautions and procedures. It means **ATTENTION**! **Become Alert**! **Your personal safety is at risk!** Read the message that follows and be alert to the risk of personal injury or death.

SAFETY FIRST

	The information in this manual is essential for safe installation and service of your Cretors popcorn machine. The manual must be read and understood before installing, or maintaining equipment, or equivalent training must be provided.

	"The employer must instruct each employee in the recognition and avoidance of unsafe conditions, regulations applicable to his work environment to control and eliminate any hazards or other exposure to illness or injury". Ref.: 29 CFR 1926.20 (b)(4)(a)(2)

	It is understood that safety rules within individual companies vary. If a conflict exists between the safety procedures contained in this manual and the rules of a using company, the more stringent rule should take precedence.

	Caution must be exercised when operating this machine. Temperatures in excess of 400 Deg Fahrenheit are required to pop popcorn. Some surfaces of this machine will reach temperatures that can scald or burn. Operators must take care not to make contact with these surfaces. Normal operation of this machine does not require the operator to contact these surfaces.

II. THEORY OF OPERATION

The operation of this machine is simple and when fully understood, it aids in proper operation of the equipment.

The rotating perforated drum in the machine has a helix in the center. Corn enters one end of the drum and is carried to the other end by the helix as the drum rotates. Electric heat elements heat the air at the inlet of a high volume air blower. This heated air is blown against the bottom of the popping drum and passes up through the perforations heating and popping corn. The air then passes out of the drum and through the elements where it is reheated and begins another circuit of the machine.

III. OPERATING & SAFETY CONTROLS

The control panel is found near the feed end of the popper on the right hand side when viewing from the feed end. The temperature controller is used to maintain temperature in the popper at a desired level. The control does this by opening and closing the power relays.

There is a **popper start** switch that will turn on the blower and drum, there is a **popper heat** switch that will turn on the heat elements and digital controller, and there is a **popper feeder** switch that will turn on the raw corn feeder.

There are two safety controls on the machine, which are connected with the control circuits.

One of the safety controls is a high temperature safety switch which is set at 500°F and will shut off the heat if the primary temperature controller fails and permits the popper to get too hot. When the safety is tripped the red light will light and the power to the elements will be shut off. The machine will stay in the reset position until the machine has cooled and the red reset button is pressed. The machine should resume normal operation if the problem has been corrected. The high temperature circuit is set at the factory and should not require further adjustment. The operating range settable on the digital temp controller is from 0 - 475°F.

The second safety control is a switch on the clean out door. If this door is opened during operation, the machine will shut down the drum, heat, blower and go into reset mode. The blower and heat will be de-energized until the problem is corrected. Close the door and press the reset button.

IV. INITIAL START UP

Open the clean out door and be sure there is no foreign material, rags, paper, wood or tools, etc., inside the popper case, then close the clean out door. Turn on the **popper start** switch that will start the blower, drum, and digital controller (but will not begin to heat until the heat switch is turned on). Once the digital temperature display turns on, press the red reset button under the “High Temp Alarm” light. Set the temperature for about 435°F by

pressing the up or down arrow, followed by the return button. Then turn on the **popper heat** switch which will put power to the heat elements. Allow the unit to heat up. The cabinet should reach 435°F in about 10 minutes, at which point the temperature controls will shut off the elements for a few seconds. The power to the elements will then go off and on maintaining the set point temperature. It will be noticed that the "off" time of the heaters will gradually lengthen and that the "on" cycle will shorten.

Make sure the hopper shut off is closed, then fill the raw corn/product hopper. When popper reaches temperature set point (about 10 minutes from initial start) the unit is fully heated and ready to pop corn. Turn on the feeder switch and open the slide gate to begin feeding raw corn/pellets into the popper.

This popper is fully tested at the factory but it is advisable to attend the machine on the first warm up to be sure all temperature controls and safeties are functioning properly and have not been damaged in transit.

If supplied with optional coating drum, place a box of topping oil on the shelf below the scrap bin and connect the gray connector to the topping oil bag. Fill the salt/seasoner hopper. When popped corn starts discharging from the popper into the plastic coating drum, turn on the salter and topper pump switches. The amount dispensed can be changed by increasing or decreasing the value on the pots next to the switches.

V. POPPING CORN

Fill the raw corn hopper with corn. If this is the first time you will be operating the machine set the temperature at 435deg. F.

The corn will be inside the popper for about 65 seconds and should be fully popped when it exits. If the scrap rate is too high it will be necessary to increase the popping temperature.

When making any adjustment to the poppers it is important to use small increments and wait long enough for the change to take effect. The drum speed is set to produce a residence time of approximately 65 seconds as such any change to temperature will require at least 100 seconds after the temperature has reached the new temperature before the effects will be noticeable.

A popper is usually considered to be operating correctly if the corn is heard to be popping at the discharge of the popping drum. If the corn is popping in the sifter after it leaves the machine the temperature is too low or some other adjustment is not correct.

VI. OPERATING ADJUSTMENTS

Temperature

If the corn looks hot, small and dark, decrease the temperature 2-1/2 degrees at a time and wait at least 3 minutes between such changes to see the results of the adjustment. As the temperature is lowered, the corn will become larger and lighter colored. As the temperature decreases, there will be a corresponding increase in waste in the form of unpopped corn. A

good rule of thumb to decide optimum temperature setting is to lower the temperature until the corn is popping just before it discharges.

This machine will run a waste factor of between 3% and 10% of raw corn input. The density will depend on the type of corn used and the temperature at which it is popped. The density may range from 1.5 to 2 pounds per cubic foot.

It must be remembered that as the temperature is decreased the density decreases and the waste increases. Each operator will have to decide what balance of density and waste is best for his particular application.

VII. SHUT DOWN

Turn off the feeder switch and shut off the slide gate on the raw product hopper then allow the popper drum to empty. Then shut off the salt and oil switches. The high operating temperature of this machine makes it necessary to cool the blower and drum before stopping their rotation. Turn off the main heat switch, which will allow the machine to cool. **With the heat off, the machine should be allowed to run until cooled to 250F. At this temperature the blower and drum may be shut off by turning off the popper rocker switch.**

VIII. CLEANING

1. The scrap bin is located at the discharge end of the machine. It is a poly bin that slides into a track below the sifting section of the popping drum. This bin should be removed and emptied before it becomes too full. The frequency of emptying will depend on the quality of the corn being popped. At the maximum popping rate this will be 2 to 3 hours depending on the quality of the corn being popped and the operation of the machine.

	CAUTION Popcorn scrap exits the popper at temperatures in excess of 400 Deg F and will cause the scrap bin to become hot. The scrap bin may be hot to the touch.

2. The interior of machine should be cleaned out daily. This is done by turning off the machine and permitting it to cool to a safe temperature. After the machine is cooled open the clean out door at the rear of the machine and sweep or vacuum out any corn scrap or chaff that may have collected while popping corn.

3. If equipped with coater, the poly drum can be cleaned in place with soap and water or the drum can be easily removed by pressing the button at the bottom of the pin and pull the pin out of the shaft. Then the whole drum can be pulled off and cleaned in the sink. The salt tube may need to be removed and cleaned regularly.

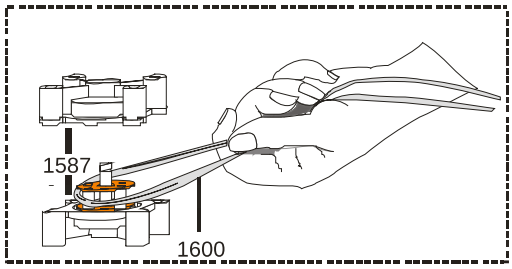
4. Salt should not be left in the salt/seasoner hopper for a few days without use as it may attract moisture and become a solid block. Empty bin if it will not be used. The bin is removed by pulling out the pin and then lifting off the locating pins welded to the top.

IX. MAINTENANCE

Very little maintenance is required by the machine itself, but it is recommended that the manufacturer's manuals for the temperature control and drum drive be carefully read and their service requirements adhered to.

There is little periodic maintenance required. It is recommended to clean the interior of the machine daily. The blower shaft bearings should be lubricated every three weeks with Shell Oil Company Alvanis #2, or equivalent. The drum support bearings should be lubricated on the same schedule as the blower bearings. Chain should be lubricated monthly, scrap bin emptied daily. Door gaskets should be inspected monthly and should be replaced when they begin to leak. Plan on replacing them every two years.

The pump tubing is a wearable item and will need to be replaced regualarly, how often will depend on use. Follow the instructions provided with the spare tubing. Replace with new tyraps or replace with tubing clamps (caution: some clamps will cut tubing and cause leaking.



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Additional copies of this manual can be obtained from C. Cretors and Company at the address listed below. Please provide model and serial number when requesting additional copies of this manual. There will be a nominal charge for additional copies.

Cretors guarantees this machine to be free of defects in parts, materials and workmanship for two years. Please take this time to fill out the factory registration card and return it to Cretors to activate your warranty. If you have any questions concerning the Cretors' warranty, please contact your local distributor or the Customer Service Department at C. Cretors and Company.

RECOMMEND SPARE PARTS LIST

PART DESCRIPTION	PART NUMBER
DOOR GASKET – 4 FEET	18318
DOOR LATCH	3041
HINGE-PAIR	18287
THERMOCOUPLE	3070
DOOR SAFETY SWITCH	3094
TEMPERATURE CONTROLLER	16604
V-BELT	3030 for 60hz ; 18718 for 50hz
PILLOW BLOCK	3140-NP(1" SHAFT)
HEAT ELEMENTS	15461 for 208V and 15461-C for 240V and 400V machines)

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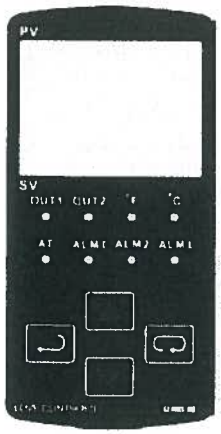


FRONT KEY FUNCTIONS

Key functions are as follows:

INDEX: Pressing the INDEX key advances the display to the next menu item.

UP ARROW: Increments a value or changes a menu item. If pressed during the Operation Mode, the set point value will be increased.

DOWN ARROW: Decrements a value or changes a menu item. If pressed during the **Operation Mode**, the set point value will be decreased.

ENTER: Stores the value or item change. If not pressed, the previously stored value or item will be retained. When pressed during the **Operation Mode**, the controller switches to the **Regulation Mode**. If held for more than 3 seconds during the **Operation Mode**, the controller switches to the **Initial Setting Mode**. If pressed during the **Regulation Mode** or **Initial Setting Mode**, the controller will return to the **Operation Mode**.

SECURITY FEATURES

The C series controller has two built in security lock settings to prevent unauthorized personnel from changing parameter settings. These parameters are set in the **Operation Mode**.

The LoC1 setting affects all parameters in the controller. If LoC1 setting is enabled, the operator will have to unlock the controller to make any changes to the controller's parameters.

The LoC2 setting affects all parameters except the set point. If LoC2 setting is enabled, the only parameter that the operator will be able to change is the set point. In order to change any other parameters, the operator will have to unlock the control before making a change.

In order to unlock the control, the operator must depress the ENTER and INDEX key simultaneously.

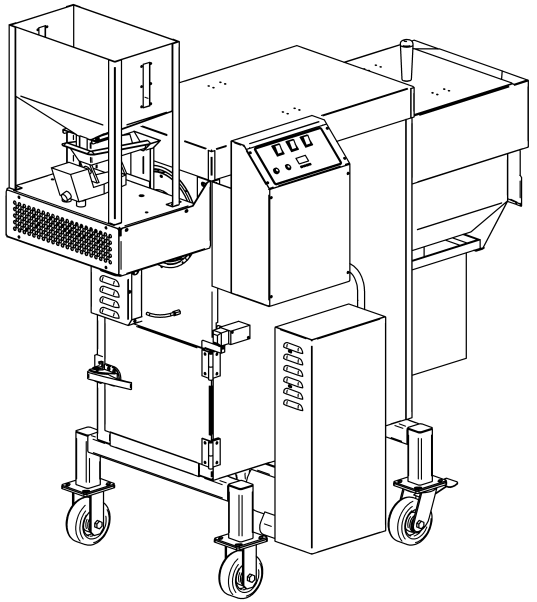
REGULATION MENU

Press the ENTER key while at the Home Display in order to access the Regulation Menu. Pressing the INDEX key will cycle through the below menu items. The parameter will be displayed in the top display, while its value will be displayed in the bottom display. The UP and DOWN arrows change the values of the parameters. The ENTER key must be pressed after any changes.

AT		Auto Tune. The controller will evaluate the process and select the PID values to maintain good control. Only available when the control mode is set to PID.
	on	Start learning the process. After the process has been learned the menu will revert to oFF.
	oFF	Disables Auto Tune.
	P	Proportional Band Setting.
	I	Integral time (reset time).
	d	Derivative time (rate time).
Pdof		PD Offset Correction Setting. only available when control mode is set to PID and integral time = 0. See Programming and Operation of PID function for moving information.
Iofn		Integral Deviation Offset Correction associated with each PID Profile. (n = 0 to 4).
HtS		Heating Hysteresis (Differential) Setting. Sets the value for the amount of difference between the turn off point (set point) and the turn on point. Figure A shows the output behavior for a heating (reverse acting) application. Only available when control mode set to on/off control.
CtS		Cooling Hysteresis (Differential) Setting. Sets the value for the amount of difference between the turn off point (set point) and the turn on point. Figure A shows the output behavior for a cooling (direct acting) application. Only available when control mode set to on/off control.

Item Number	Document Number	Title	Quantity
1	10128	3/8" MED. SPLT L/W, T304 GR 5	4
2	10133	3/8-16 X 1" HEX BOLT. T304SS GR5	4
3	10976	3/8-16 SS HEX NUT	4
4	1248	SPACER-1/4 x 1/2 (BAFFLE PLATE)	2
5	13592	CASTER-TOTAL LOCKING-SWIVEL	2
6	13593	CASTER-RIGID	2
7	15461	ELEMENTS-3000W/208V	3
8	17114	PULLEY, 1G-4.6"PD-0.625" BORE	1
9	17239	SCRAP BIN-FT80	1
10	18275	BLOWER SHAFT	1
11	18276	BLOWER WHEEL	1
12	18277	BLOWER INLET CONE	1
13	18278	MOTOR-BLOWER-1/3 HP	1
14	18279	HEAT SLINGER/SHAFT COOLER	2
15	18280	FLANGE BEARING-3/4"	2
16	18283-1	DRUM MOTOR MOUNT - FT40 / ORIGINATE AIR	1
17	18286	DISCHARGE CHUTE	1
18	18288	GUSSET SUPPORT	1
19	18289-ASSY	DOOR ASSEMBLY	1
20	18294-CW	MOTOR - CLOCKWISE	1
21	18295	ELEMENT COVER - FT40 / ORIGINATE AIR	1
22	18311	HINGE BLOCK	2
23	18312	ELEMENT BRACKET	1
24	18313	SHAFT GUARD - FT 40 / ORIGINATE AIR	1
25	18315	BELT GUARD - FT 40 / ORIGINATE AIR	1
26	18317	BELT-BLOWER-FT-40	1
27	18319-1	CHAIN GUARD COVER - FT 40 / ORIGINATE AIR	1
28	18322	BLOWER SHAFT TUBE - FT40 / ORIGINATE AIR	2
29	18323	CONTROL BOX SUPPORT - FT40 / ORIGINATE AIR	2
30	18328	CONDUIT NUT	4
31	18446	ELEMENT SUPPORT BRACKET - FT40	1
32	18480	DOOR CATCH SHIM - FT40	1
33	18491	TANK BODY-FT40	1
34	18492	FEED END COVER	1
35	18493	DISCHARGE END PANEL - FT40	1
36	18494	SIDE PANEL - OPERATOR SIDE - FT40	1
37	18495	SIDE PANEL - FT40	1
38	18496	SUB FRAME - FT40	1
39	18497	BOTTOM PANEL - FT 40	1

Item Number	Document Number	Title	Quantity
40	18498	TOP COVER - FT40	1
41	18500	END RING- FT 40	2
42	18502	CENTER BAFFLE - FT 40	1
43	18503	SIDE BAFFLE - FT 40	1
44	18504	SCRAP CHUTE WELDMENT - FT40 / FT23	1
45	18505	DISCHARGE SUPPORT - FT40 / FT23	1
46	18506	DISCHARGE COVER - FT 40 / FT23	1
47	18507	SCRAP SHIELD - FT23 / FT40	1
48	18511	DOOR SEAL STRIP - ORIGINATE - AIR	1
49	18565	PELLET SHIELD	1
50	18577	PULLEY, 3.4"PD-0.75" BORE	1
51	18587	GUSSET SUPPORT-1IIN	1
52	18594	MOTOR MOUNTING FRAME - FT40 / ORIGINATAIR	1
53	18595	DRUM MOTOR CONDUIT	1
54	18612	DOOR SWITCH LEVER	1
55	18617	FEED SUPPORT-FT-40	1
56	18618	HOPPER SUPPORT - IN-LINE FEED	1
57	18623	PLATE - INLET - IN-LINE FEED	1
58	18704	AUGER-FT40	1
59	18715	ENDCAP-AUGER SHAFT-FT40	1
60	3070	THERMOCOUPLE	2
61	3094	BIN LEVEL SWITCH	1
62	3140-NP	PILLOW BLOCK - NICKEL - 1" BORE	2
63	3572	FEED CHUTE-80 PUFFER	1
64	3574-40	FEED HOPPER-FT40 PUFFER	1
65	3599	FMC FEEDER	1
66	OR-Q1	CONTROL BOX	1



REV.	DESCRIPTION OF REVISION	BY	DATE

C. CRETORS & COMPANY
3243 N. CALIFORNIA AVE., CHICAGO, IL 60618-5890
TEL: 773/588-1690 FAX: 773/588-2171

TOLERANCES
X.XX = ±0.020
X.XXX = ±0.005
FRACT. = ±1/64
125 SURFACE FINISH
∠ ±.5°
ALL HOLES +.005 -.000

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APPROVED	DATE:	REV:	

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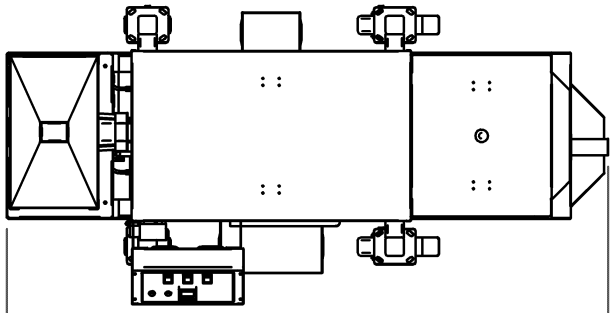

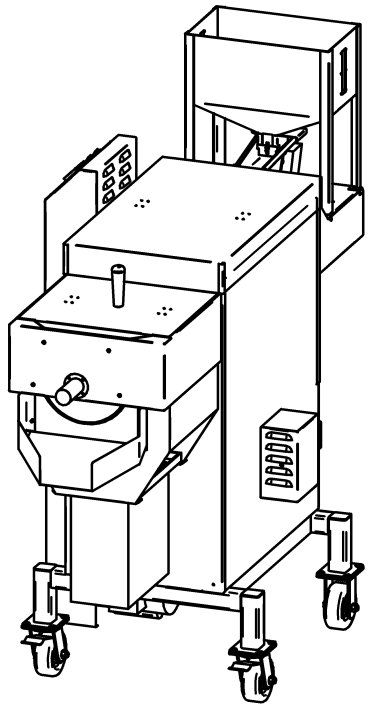

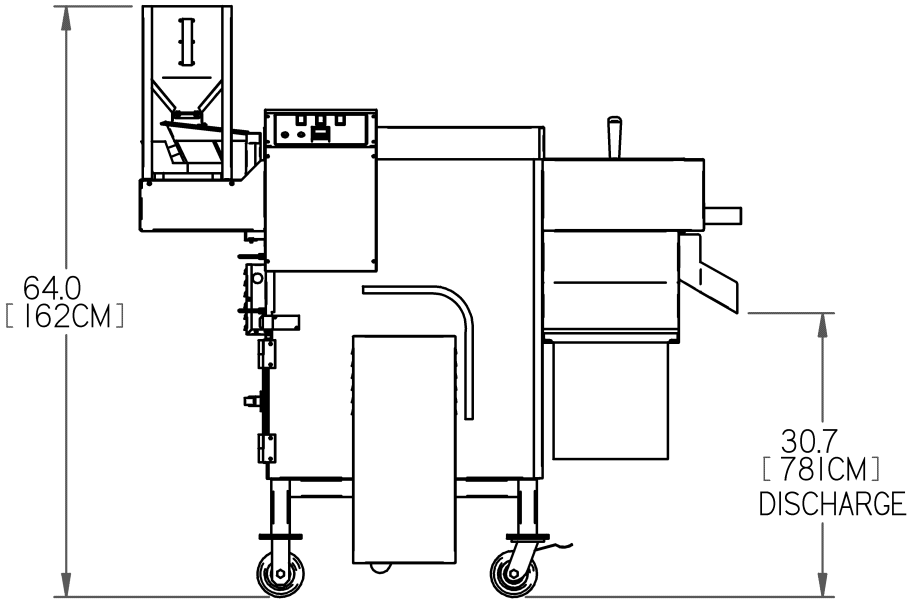

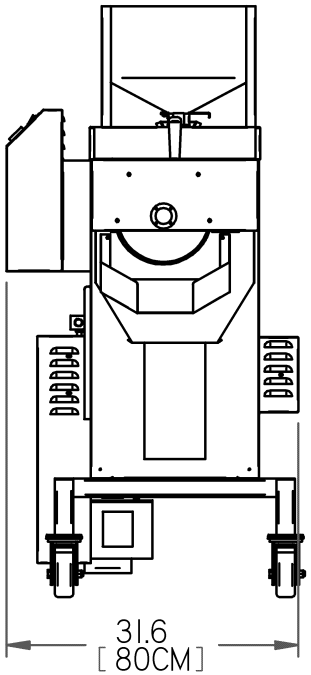

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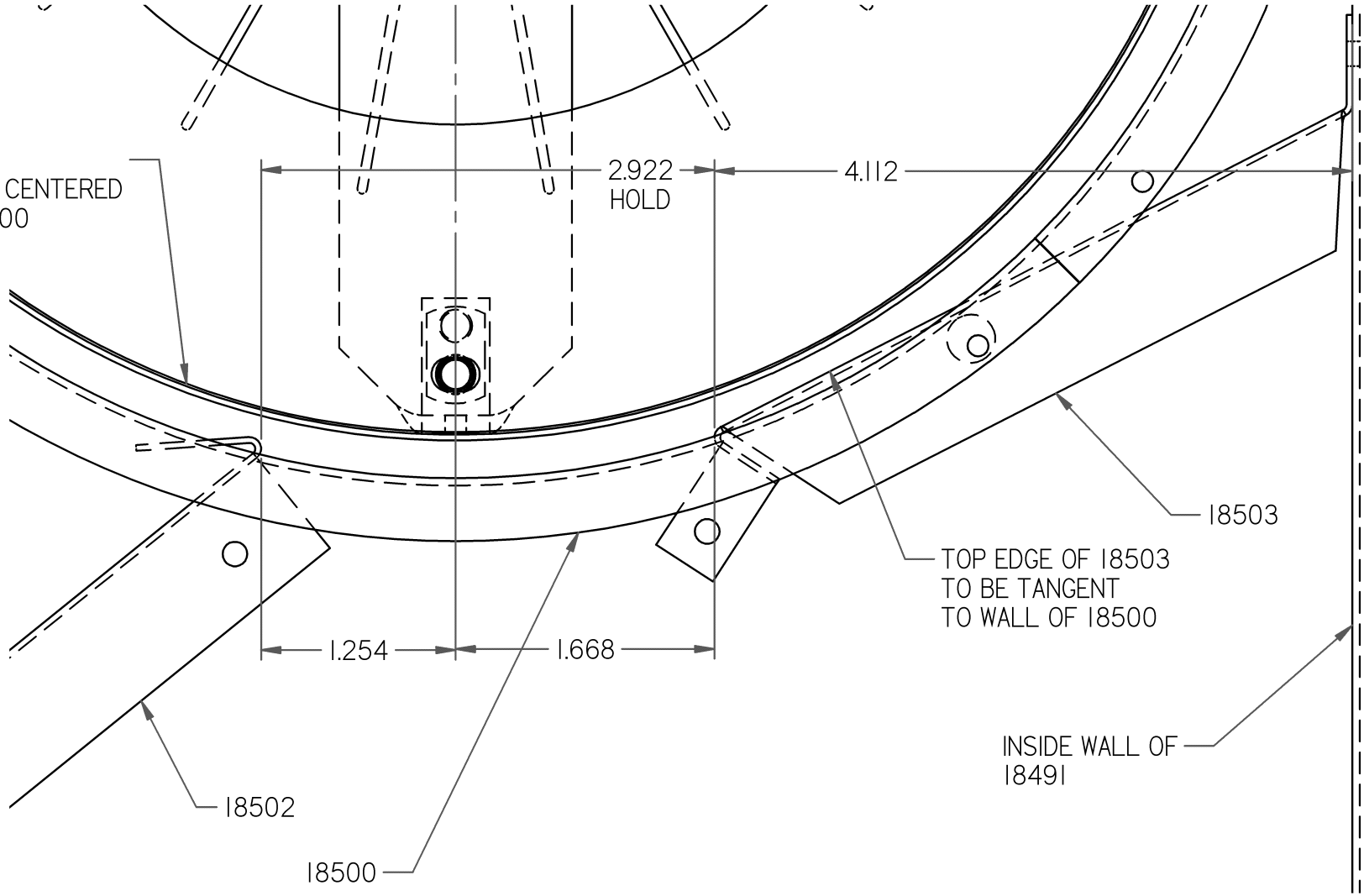

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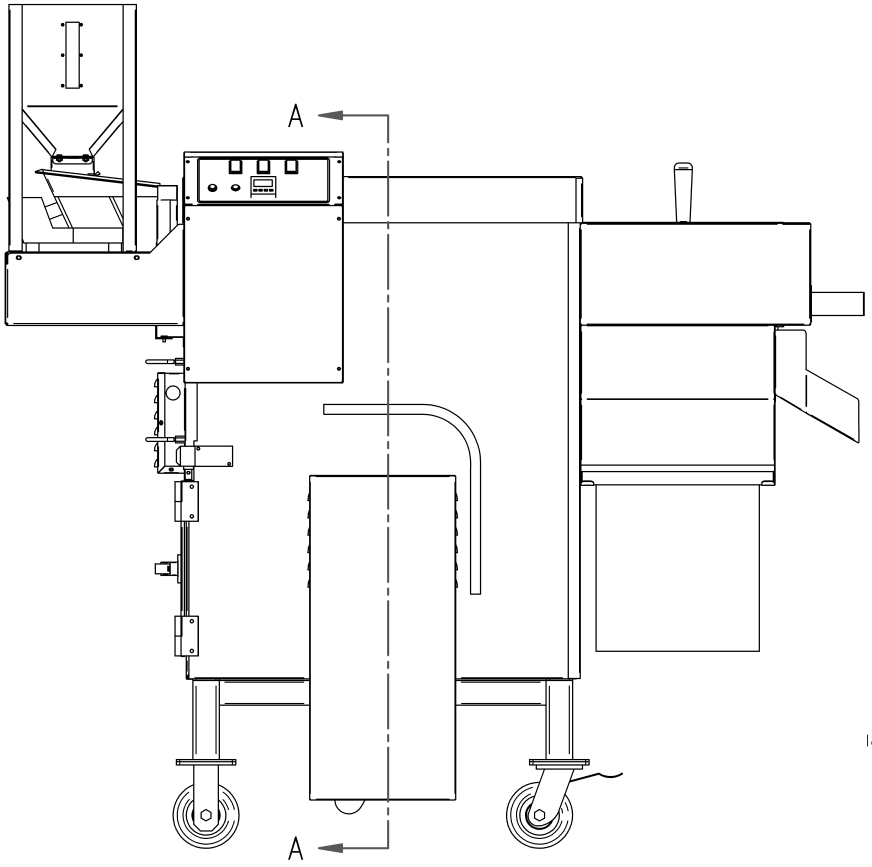

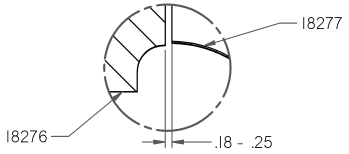

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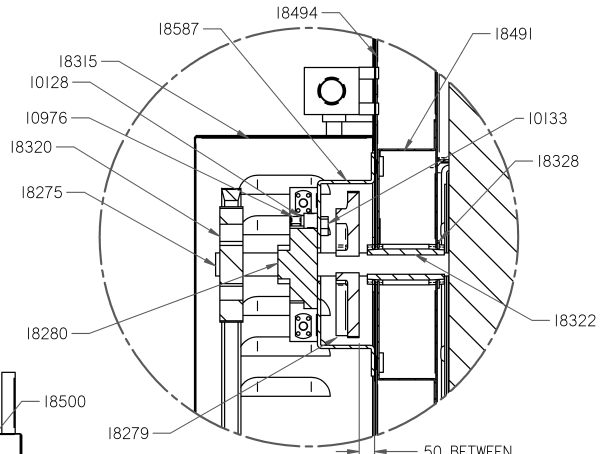

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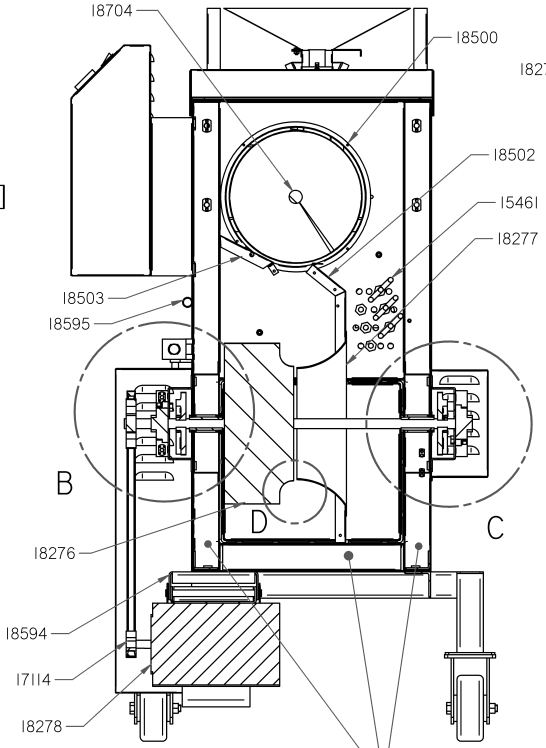
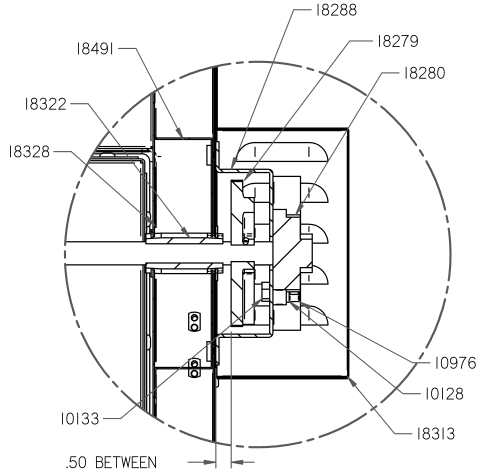


SECTION A-A

IMPORTANT
FILL ALL VOIDS WITH
CRETORS SUPPIED
INSULATION BEFORE
ASSEMBLING



DETAIL C

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