

USER GUIDE  
UGG031-1013



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# Conair TF Series Granulator

Model TF-69 with RollFeed Model RFP-69



Thank you for purchasing Conair equipment. This manual is addressed to operators and **qualified technicians** to ensure correct use of this Conair equipment.

Ⓢ **IMPORTANT:** THIS MANUAL MUST BE READ BEFORE INSTALLATION. KEEP THIS MANUAL IN A PLACE ACCESSIBLE FOR ALL OPERATORS.

It's a good idea to record the model and serial number(s) of your equipment and the date you received it in the User Guide. Our service department uses this information, along with the manual number, to provide help for the specific equipment you installed.

Please keep this user guide and all manuals, engineering prints and parts lists together for documentation of your equipment.

Date: _____
Manual Number: <u>UGG031-1013</u> _____
Serial Number(s): _____
Model Number(s): _____
Software Version: _____

**Disclaimer:** Conair shall not be liable for errors contained in this User Guide or for incidental, consequential damages in connection with the furnishing, performance or use of this information. Conair makes no warranty of any kind with regard to this information, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose.

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## **SAFETY:**

CONAIR EQUIPMENT IS DESIGNED AND CONSTRUCTED WITH STATE OF THE ART PRECISION, FROM THE FINEST MATERIALS, TO GIVE YEARS OF SERVICE AND SAFE OPERATION.

**WARNING SIGNS AFFIXED TO THE MACHINES ARE FOR YOUR PROTECTION AND MUST BE ADHERED TO.**

## **PRECAUTIONS:**

1. **ALL OPERATORS AND MAINTENANCE PERSONAL** MUST BE FAMILIAR WITH THE CONTROLS, START-STOP-EMERGENCY STOP BUTTONS.
2. NO MACHINE IS TO BE SERVICED UNTIL POWER HAS BEEN COMPLETELY DISCONNECTED, AND LOCKED OUT PER **STANDARD PROCEDURES**.
3. NO ATTEMPT IS TO BE MADE TO OVERRIDE THE SAFETY SWITCHES OR OVERLOADS.
4. MACHINE IS NOT TO BE OPERATED WITH GUARDS REMOVED.
5. DO NOT REACH INSIDE THE HOPPER WHEN FEEDING MATERIAL INTO THE GRANULATOR, OR WHILE GRANULATOR IS IDLING.
6. DO NOT ATTEMPT TO START THE GRANULATOR WITH MATERIAL IN THE HOPPER.
7. ALLOW THE GRANULATOR TO CLEAN OUT BEFORE SHUTTING DOWN.
8. THIS GRANULATOR IS DESIGNED TO GRANULATE PLASTIC MATERIALS. **KEEP METAL AND FOREIGN MATERIAL FROM ENTERING THE MACHINE.**



## **MACHINE DESCRIPTION:**

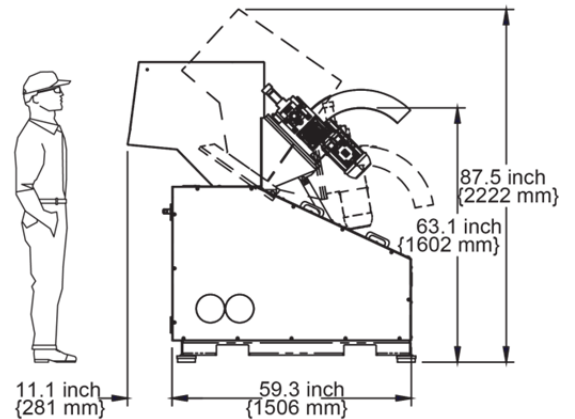
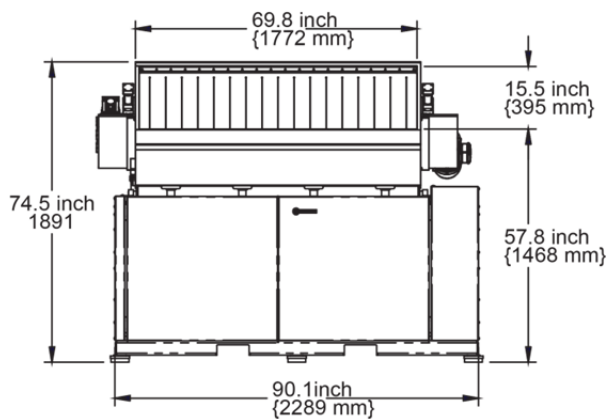
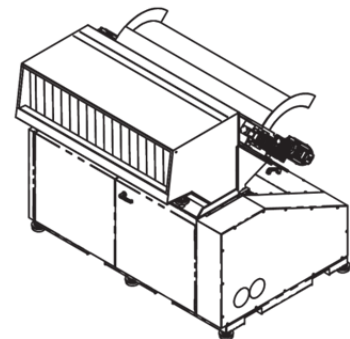
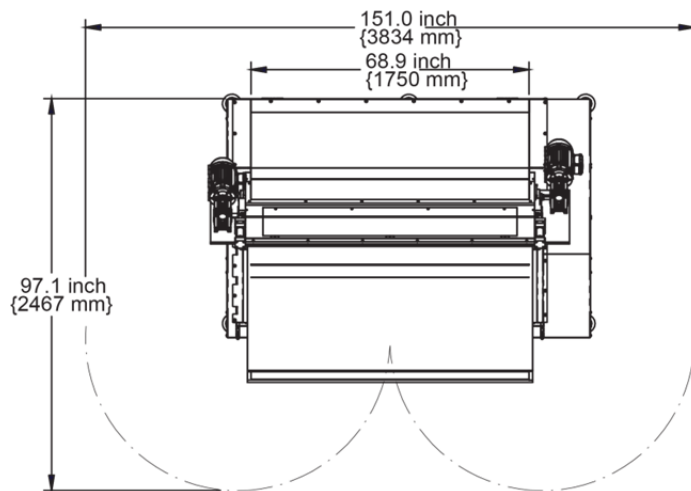
This machine is a knife granulator specially designed for thermoplastic materials.

The thermoplastic material to be granulated enters the infeed hopper and falls into the cutting chamber where the blades cut the material between the rotating and fixed knives. The cut material then drops into the discharge hopper. Granulated material size depends exclusively on the screen hole size and not on blade design or quantity.

This machine is designed for thermoplastic materials, but can granulate other materials like leather, paper, resin, rubber, and materials with similar density as thermoplastics. Metals and other similar hard materials cannot be processed and will severely damage the equipment.


This machine has been designed for long life and heavy duty conditions as long as the machine is correctly used and maintained.

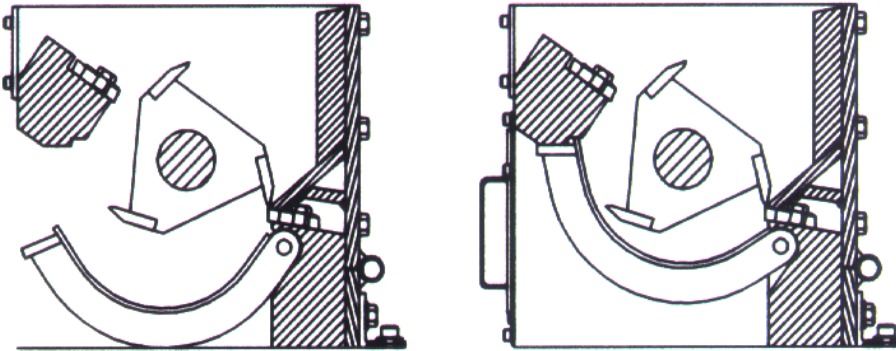
## **SPECIFICATIONS:**



## **PRE-INSTALLATION CHECK:**

1. Insure the proper electrical voltage supply is provided. Refer to the serial tag on the granulator.
2. With electrical power off and locked out, open the machine completely. Visually inspect the hopper and screen cradle for any foreign objects.
3. Close machine completely.
4. Remove any foreign objects on or around the unit.

 **NOTE:** When opening screen cradle, you must clean thoroughly before closing. The screen cradle must close tightly to the cutting chamber. Failure to clean could result in screen or cradle damage.



**CAUTION:** Never use iron washers or lock washers. These types of washers are deformed when tightened and can even break when tightened at the indicated torque.

## **ELECTRICAL INSTALLATION:**

Upon receiving the equipment, verify that the voltage supply corresponds to the data plate as specified for the granulator.

We recommend installing a disconnect between the power supply and the granulator starter in order to energize the equipment and to protect the electrical system. Always disconnect the electrical supply before cleaning the machine, performing maintenance or adjusting blades.



**CAUTION:** The wrong selection of wire gauge size can cause irreparable damage to the granulator. A qualified electrician will need to determine the proper wire size based on your application.




**CAUTION:** Only an experienced electrician should wire the control panel. Wiring by a qualified electrician must be in accordance with all local and national requirements.

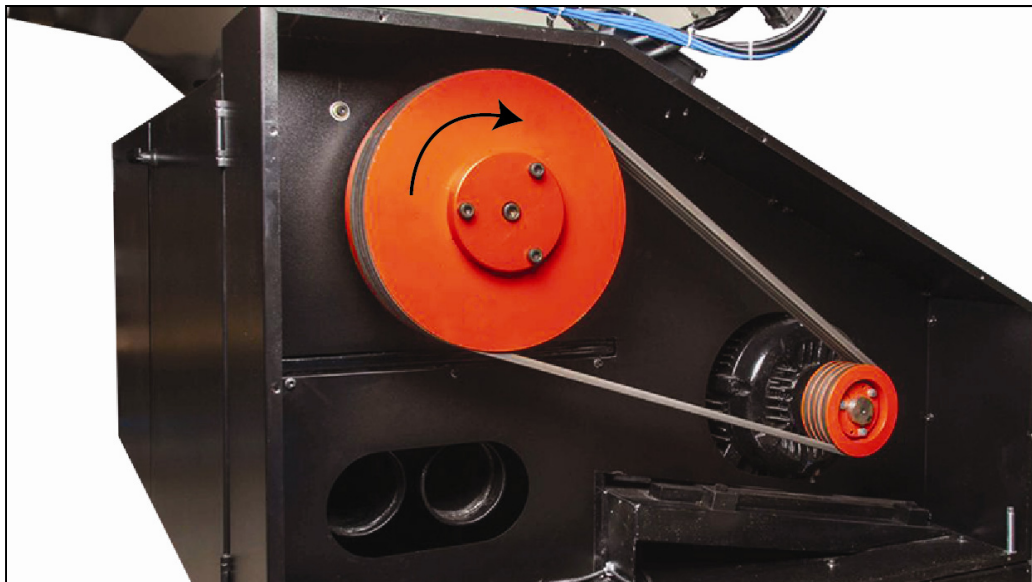
Connect power to the main control panel. Refer to the wiring diagrams that are supplied with your equipment.

## **VERIFYING ROTATION:**

Check the direction of rotation of the motor. Remove the drive side cover. Jog the granulator motor and verify the rotor pulley is rotating in the correct direction. It is very important to verify the correct rotation of the rotor in the direction indicated by the arrow located on the drive pulley. If rotation is incorrect, follow proper lock out procedures and swap any two of the three incoming main power wires.


 **NOTE:** Do not change other wires in the main enclosure. Change only the power leads if rotation is incorrect.

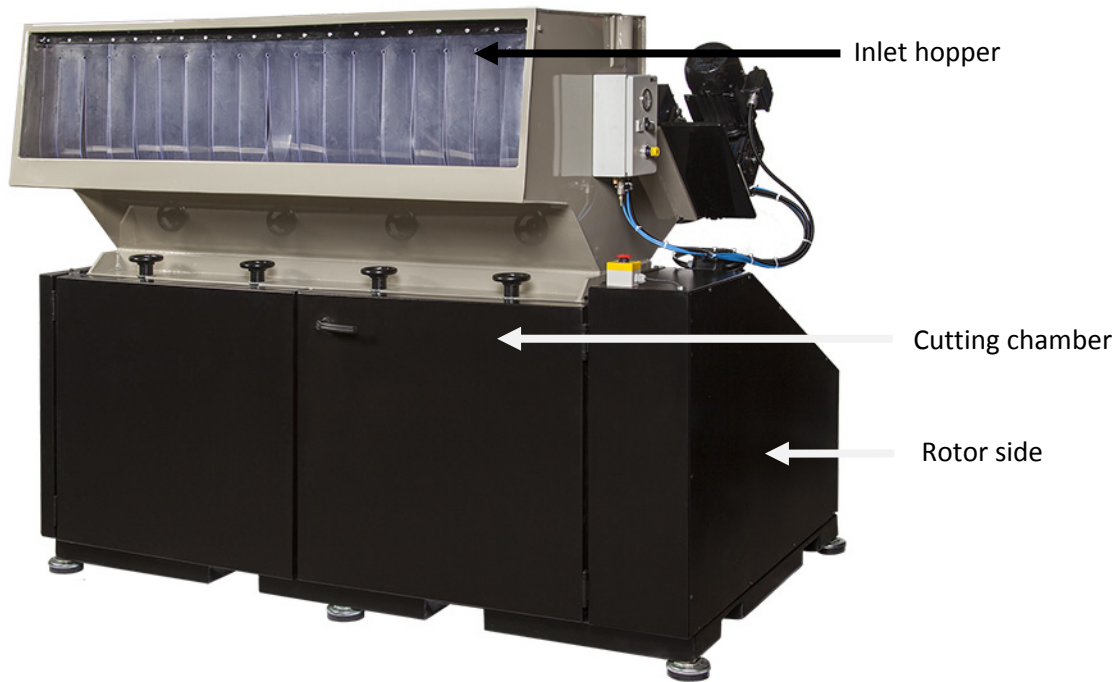
The granulator is now ready for operation.



## **FIRST TIME OPERATION:**

Before operating the granulator it is necessary to perform a careful inspection, checking that there are no materials inside the cutting chamber, especially metallic parts or debris that might have fallen into it during transportation. After verifying this, spin the rotor manually using the pulley or flywheel as an aid, to check for free spinning. Verify blade adjustment. (See stationary knife adjustment section in this manual.) Verify that the blade bolts are properly torqued. (See the blade / knife replacement section in this manual.) Close the granulator.

 **CAUTION:** These procedures should be performed with the power turned OFF to avoid injury and equipment damage.



Connect the power and start up the granulator by pressing the start button.

## **GRANULATOR OPERATION:**

Conair recommends running the granulator for the first time, with low quality material and giving it two or three passes through the granulator, so that the internal walls of the machine can be cleaned from quantities of rust inhibitor grease or dust.

Before starting the granulator, make sure that there is no material in the cutting chamber and the pulley can rotate manually. Once the rotor has reached its maximum speed, you can gradually feed the parts through the feeding hopper. In case of material overfeeding, the granulator's overload protection will stop the motor.

The overload is a sustained condition of a higher current than motor rated current on the serial tag. During operation, current will show very high instant peaks, this will not cause an overload as long as high current is not constant.

When the granulator stops because of an overload, it will be necessary to:

- Disconnect the main power.
- Open the cutting chamber and remove excess material.
- Verify that there are no blown fuses.
- Verify that the overload relay element has been reset.
- Close the granulator, restore power, and start the machine again.

Before the granulator is turned off, allow it to operate several minutes without material, to allow regrind material to clear the cutting chamber. If you do not perform this step, it will be necessary to manually remove material from the cutting chamber before starting the granulator again.

It is important to mention that the operator should use caution and avoid allowing metallic parts inside the cutting chamber since this will cause severe damage to the equipment.


## **MAINTENANCE:**

### **LUBRICATION:**

Do not over grease bearings. This can cause damage to the seal. The frequency of lubrication is in direct proportion to the hours of actual granulator operation. See suggested lubrication schedule.

<b>HOURS OF OPERATION</b>	<b>AMOUNT</b>	<b>LUBRICATION PERIOD IN WEEKS</b>
8	1 OUNCE TO 1/4 OF TUBE	12
16	2 OUNCES AS REQUIRED	6
24	3 OUNCES AS REQUIRED	4

**Conair recommends the use of SKFGRA-TM3 grade 3MLGI grease or a type that is compatible.**

 **NOTE:** If grease is protruding from bearing seals you are over greasing. Remove excess grease protruding out of bearing and extend your lubrication periods.

### **DRIVE BELTS:**

Periodically check the tension of the drive belts. Disconnect and lock out power per standard procedures. To access the belts, remove the belt guard cover plate and rear sound enclosure. Always maintain proper belt tension and care. Adjust the motor tensioning bolts in order to tension the drive belts.


## **SCREEN REMOVAL:**

1. Disconnect and lock out power per standard procedures.
2. Remove the discharge bin.
3. Remove the bolts on the screen cradle access door.
4. Remove the screen cradle bolts and lower with caution.
5. Remove screen from cradle and inspect for any wear or damage. Be sure to observe screen orientation as screen is not reversible. The stamped number on the screen should face you during installation.

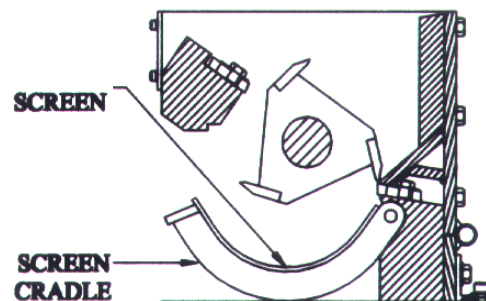
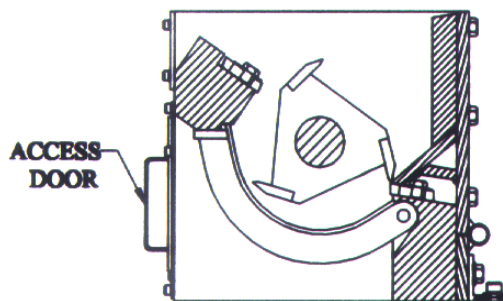


## **SCREEN INSTALLATION:**

1. Remove all regrind and foreign material from the screen, cradle and its mating surfaces. In order for the screen to hold firmly in place, the cradle must close without interference.

 **NOTE:** This is a non-reversible type screen. Screen part number stamp on the edge should face the front in the screen cradle.

2. Place screen in cradle and lift into place.
3. Install the bolts onto the cradle and tighten. Refer to the torque chart for bolts.
4. Install the screen access door, and bolt in place. Refer to the torque chart for bolts.
5. Close sound hood doors.
6. Install the discharge bin.



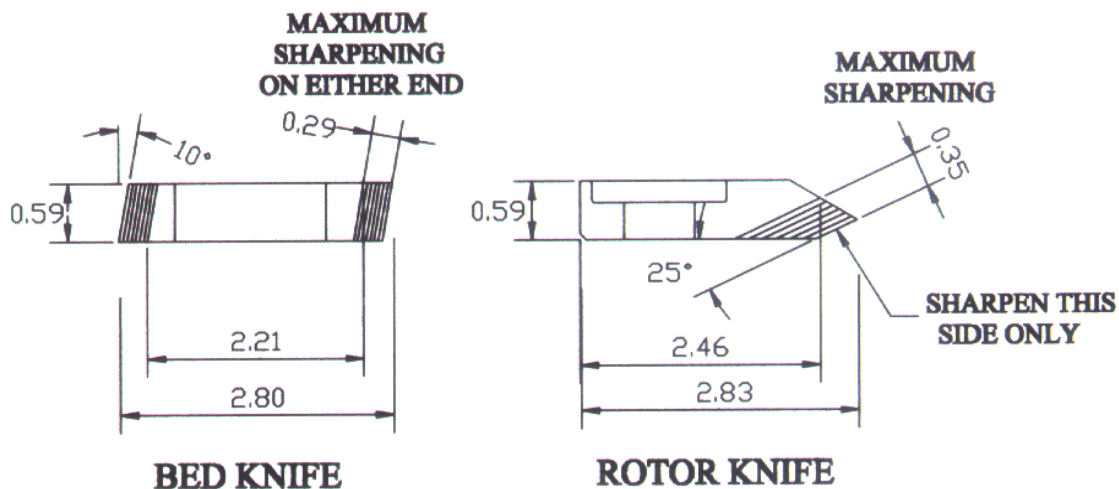
## **BLADE / KNIFE SHARPENING:**

When the granulator begins to be noisy or when the regrind material starts getting dusty it could mean that the blades need adjusted and/or sharpened. Disconnect and lock out power per standard procedures. Inspect blade gap and blade wear. If blades have excessive gap adjust as instructed.

Remove and sharpen blades after checking the condition (if necessary). If metal fragments have accidentally fallen into the granulator and chipped the cutting edges Conair advises blades be replaced as sharpening will not remove traces of the chipping. The sharpening angles are given on the next page.


When rotor knives are sharpened they must be kept in sets. The sharpened knives within a set are to be within tolerance of +0.002 to -0.002 from the back edge of the knife to the cutting edge of all knives within a set, one blade to another.

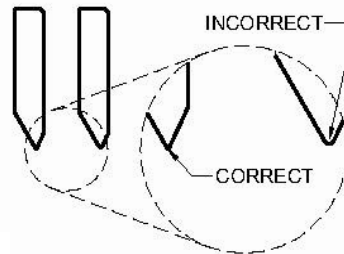
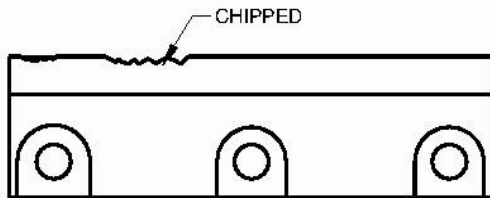
You will obtain maximum performance from your granulator and minimum amount of dust material in the regrind if the blades are correctly sharpened, observing the angles shown below. Please note that failure to maintain the proper angle on the knife edge when sharpening voids all warranties and will diminish the performance of the granulator.



## **BLADE / KNIFE REPLACEMENT:**

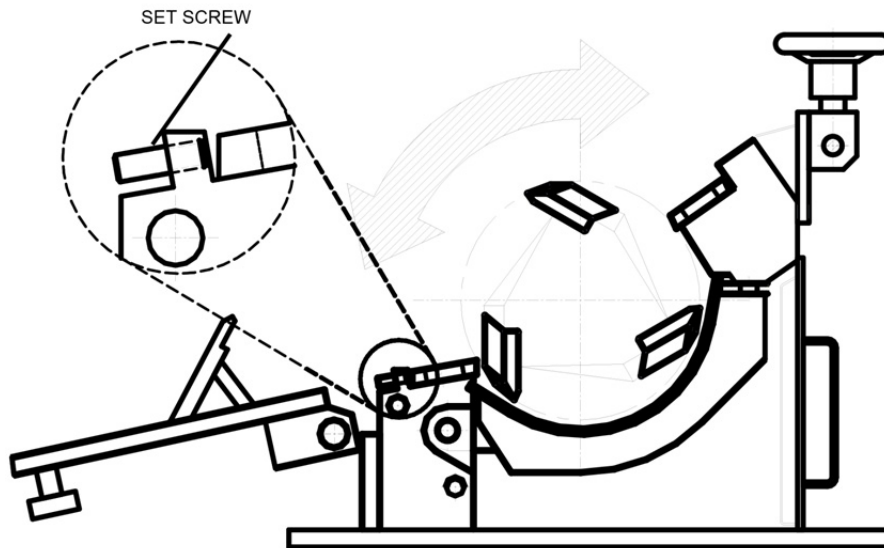
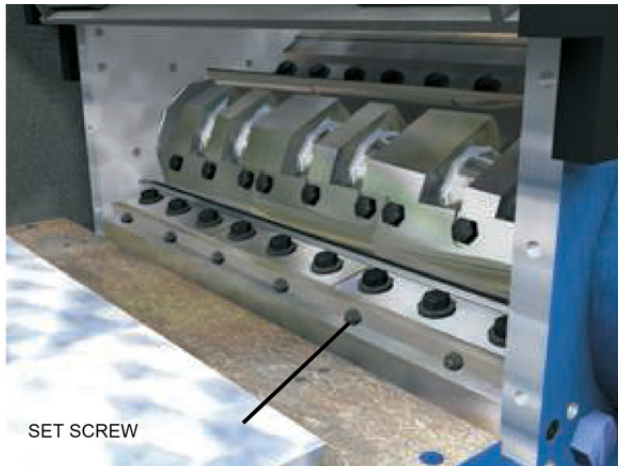
1. Disconnect and lock out power per standard procedures.
2. Open sound enclosure doors, if applicable.
3. Remove sound panels from the rear of the machine, if applicable.
4. Open rear cutting chamber door.
5. **Make sure the hopper hold down bolts are loosened, swung free from the hopper frame first. Open hopper using the powered actuator.**
6. Remove and discard the bolts that hold down the bed knives.
7. Remove the bed knives.
8. Remove and discard the bolts that are attaching the rotor knives to the rotor.
9. Remove the rotor knives.
10. Loosen bed knife adjusting bolts until the bolt is flush on the back side of bed support.
11. Install the bed knives making them flush on the back side of the bed support. Make sure the bed supports are clear of foreign material between the bed knife and the surface of the bed support. If not clean, it will make proper knife adjustments impossible and could cause damage to the knives and cutting chamber.
12. Install new bed knife bolts and slightly tighten.
13. Install rotor knives to the rotor. The surface between standoff and knife must also be clean to insure a firm fit against the rotor knife and standoff to make a proper adjustment.
14. Install a new rotor knife bolts and torque to 215 ft-lb for 5/8 inch bolts. Install the center knives first then the outside knives.
15. Proceed to stationary knife adjustment section.

 **NOTE:** Both rotor and bed knives are installed with grade 8 bolts. It is the recommendation of the bolt manufacturer that new bolts be installed each time knives are reinstalled. Grade 8 bolts are marked with a distinctive symbol bearing six grooves engraved on the head.



## **STATIONARY KNIFE ADJUSTMENT:**

1. Using a 0.006 up to a 0.010 feeler gauge at the cutting edge of a bed knife, turn the rotor in reverse, by hand, and turn the set screws until there is a snug fit with the feeler gauge between the cutting edge of the highest rotor knife tip and the bed knife.
2. Follow the same procedure between all bed.
3. Torque bed knife bolts to 215 ft-lb for 5/8 inch bolts.
4. Recheck the gap between all rotating knives and bed knives.



**NOTE:** There will be a slight variation of the gap between some rotor knives and the bed knives. However, with the tightest gap being 0.006 the variation is acceptable.

**TF-69 SPARE PARTS LIST:**

	<b>Part number</b>	<b>Description</b>	<b>Quantity</b>
1	12651015E100A	TF-69 OPEN ROTOR 3X4	1
2	122040080000A	BED KNIFE 2535 STD	8
3	12204008CB00A	SHORT BED KNIFE 2535	4
4	12654001E000A	ROTOR KNIFE PULLEY SIDE TF-69 3X4	3
5	12654002E000A	ROTOR KNIFE OPPOSITE PULLEY SIDE TF-69 CH 3X4	3
6	12654003E000A	ROTOR KNIFE CENTRAL PULLEY SIDE TF-69 CH 3X4	3
7	12654004E000A	ROTOR KNIFE CENTRAL OPPOSITE PULLEY SIDE TF-69 CH 3X4	3
8	12655001B200A	TF-69 SCREEN Ø 3/8 inch	2
9	5TRABALF23024	BEARING FAG [23024 CC/W33]	2
10	5TRABANGS5106	GATES BELTS SUPER HC "5V" [1060]	4
11	5TXXHECA06048	HEX. NC BOLT 5/8 inch Ø-NC X 1-1/2 inch GRADE 8 (SCREEN SUPPORT)	6
12	5TXXHECA06068	HEX. NC BOLT 5/8 inch Ø-NC X 2 inch GRADE 8 (ROTOR KNIFE)	113
13	5TXXHECA06068	HEX. NC BOLT 5/8 inch Ø-NC X 2 inch GRADE 8 (BED KNIFE)	40
14	5MECPREXACAK1	OPRESOR ALLEN 3/8 inch-NC X2-1/2i inch (UPPER BED KNIFE )	10
15	5MECPREXACAK0	OPRESOR ALLEN 3/8 inch-NC X1-1/4 inch (BED KNIFE )	10
16	5MECTUJEXHCAK0	HEX. NUT GALV. 3/8 inch-NC (BED KNIFE)	20
17	5TRAPLEB457BA	PULLEY 4 GROOVES "5V" O.D. 7.0 inch, Ø2-1/8 inch BUSHING " W1, C1/2"	1
18	5MTRS2440TE20	MOTOR 50HP 220/440 TRIF, 4P, ARM 326, STD, F2	1

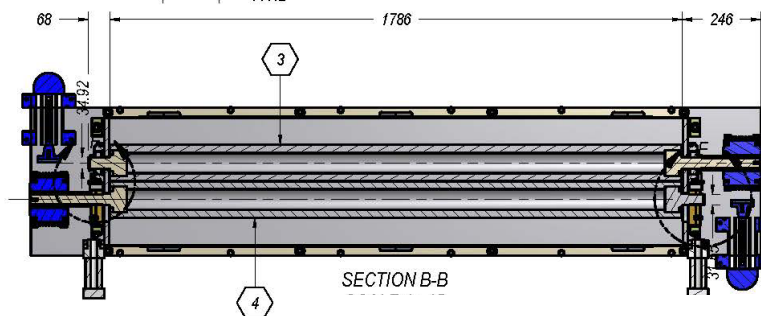
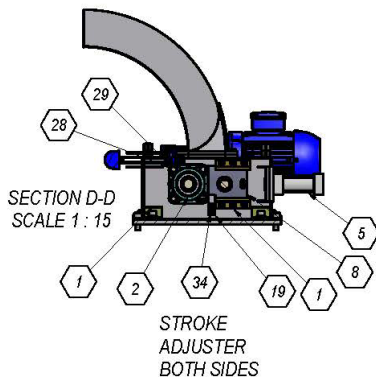
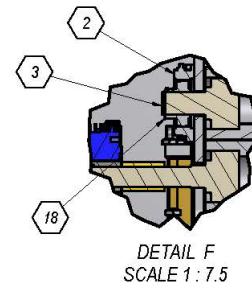
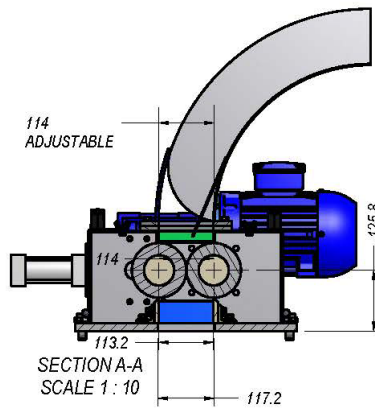
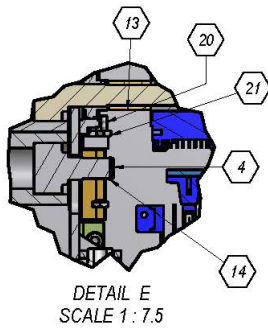
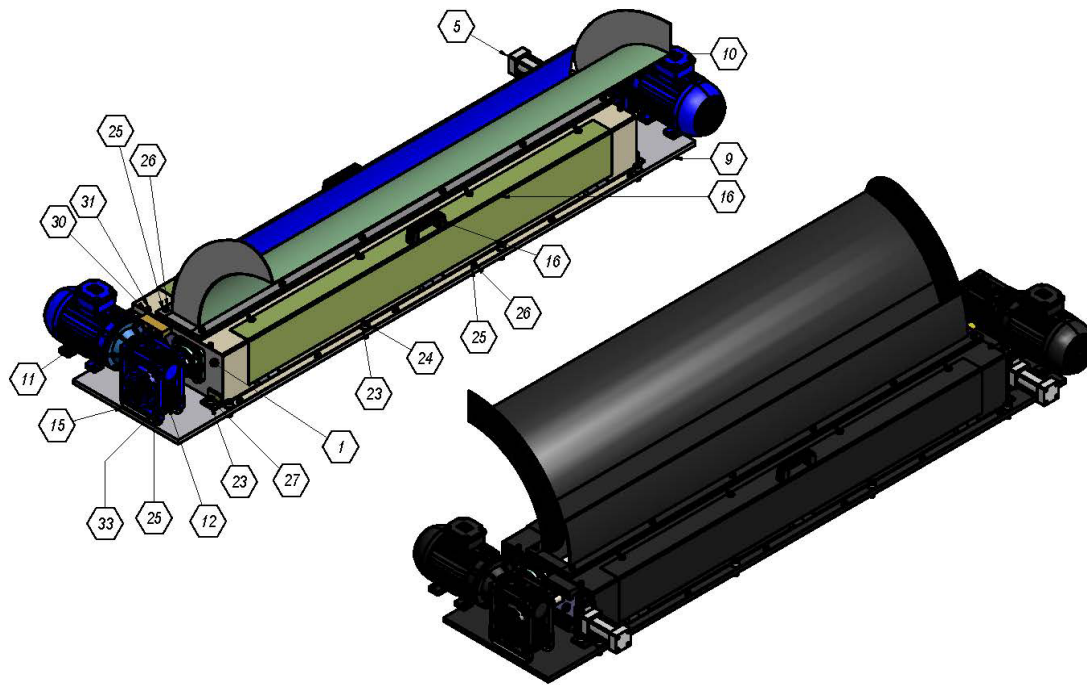


## ROLLFEED RFL-69

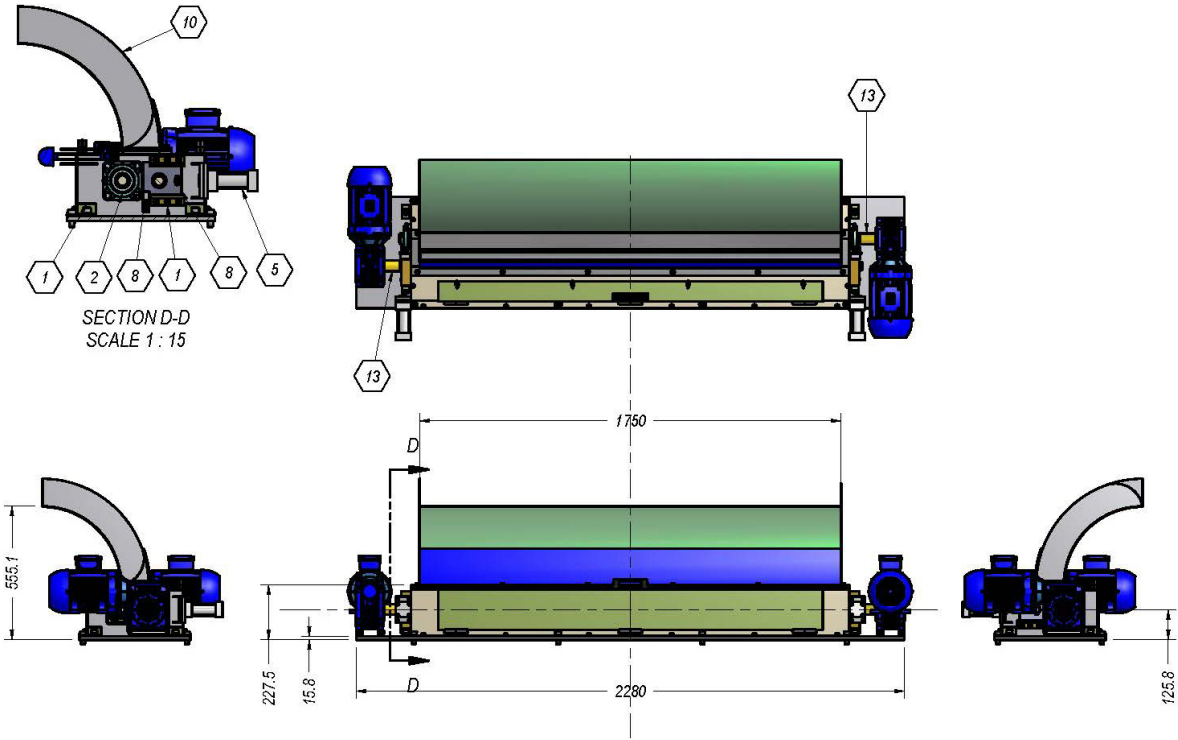
### PARTS LIST:

	<b>Part number</b>	<b>Description</b>	<b>Quantity</b>
1	100620022M10A	SIDE PLATE RFL-69	2
2	5TRACHUD12420	BALL BEARING DODGE Ø 1-3/8 INCH	2
3	100610012M10A	FIXED DRIVE ROLLER	1
4	100610012M20A	MOBILE DRIVE ROLLER	1
5	5NEUCLNXNEDL1	PNEUMATIC CYLINDER	2
7	5TRACHUD1253A	BALL BEARING Ø 1-1/4 INCH	2
8	10062018M10A	SHEET PROTECTION RFL-69 ROLL FEEDER	2
9	1006120052M10A	BASE PLATE RFL-69 ROLL FEEDER	1
10	100630012M10A	HOPPER RFL-69 ROLL FEEDER	1
11	5MTRG2440TC30	MOTOR 2 HP 220/440 TRIF, 4P, ARM 145, BR-C, F3	2
12	5TRAREDF075C0	GEAR FAULK 30:1 RATIO, 1.5 HP, 140TC	2
13	10066015M10A	SPACE ROLL FEEDER RFL-69	2
14	5MECSEGW51250	RETAINING RING	1
15	100620042M10A	PLATE GEAR	4
16	100620062M10A	COVER RFL-69 ROLL FEEDER	1
18	5MECSEGW51370	RETAINING RING	1
19	100660060000A	STROKE ADJUSTER PLATE	2
20	5MECPREA02060	HEXAGON SOCKET FLAT POINT 3/8 INCH X 2 INCH	2
21	5MECTUEXHCAK0	HEX NUT 3/8 INCH -NC GALV	2
23	5MECRNDXPRAM1	REGULAR SPRING LOCK WASHER 5/8 INCH GALV	12
24	5TXXALCA06040	HEXAGON SOCKET CAP SCREW NC 5/8 INCH X 1-1/2 INCH	8
25	5MECRNDPRAK01	REGULAR HELICAL SPRING LOACK WASHER 3/8 INCH GALV	32
26	5TXXHECA02011	HEX NC BOLT 3/8 INCH X 3/4 INCH GALV	24
27	5TXXALCA06020	HEXAGON SOCKET CAP 5/8 INCH X 1 INCH	4
28	5MECRNDXPRAL1	REGULAR HELICAL SPRING LOCK WASHER 1/2 INCH GALV	8
29	5TXXHECA04031	HEX BOLT NC 1/2 INCH X 1-1/4 INCH GALV	8
30	5MECRNDXPRAJ1	REGULAR SPRING LOCK WASHER 5/16 INCH GALV	4
31	5TXXHECA01011	HEX NC BOLT 5/16 INCH X 3/4 INCH GALV	4
33	5TXXHECA0203C	HEX NC BOLT 3/8 INCH X 1-1/4 INCH	8
34	5TXXALCA02040	HEXAGON SOCKET CAP SCREW NC 3/8 INCH X 1-1/2 INCH	4

**PARTS LIST:**



**PARTS LIST:**



## **TROUBLESHOOTING GRANULATORS:**

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>SUGGESTED SOLUTION</b>
Stalled machine	<ol style="list-style-type: none"><li>1. Overloading</li><li>2. Worn or damaged knives</li><li>3. Screen and/or blower blockage</li><li>4. Loss of power</li></ol>	<ol style="list-style-type: none"><li>1. Slow rate of feeding material.</li><li>2. Re-adjust or sharpen improperly set knives as required.</li><li>3. Check to see if screen is clogged and check rotation of motor.</li><li>4. Check power supply, electrical hook-up and safety interlock.</li></ol>
Material overheating	<ol style="list-style-type: none"><li>1. See items 1, 2, 3</li><li>2. Screen too small</li></ol>	<ol style="list-style-type: none"><li>1. Same as above.</li><li>2. Install large hole screen.</li></ol>
Too many fines	<ol style="list-style-type: none"><li>1. Worn or damaged knives</li></ol>	<ol style="list-style-type: none"><li>1. Re-adjust or replace as required.</li></ol>
Knife breakage	<ol style="list-style-type: none"><li>1. Foreign material in granulator</li></ol>	<ol style="list-style-type: none"><li>1. Check material for foreign items.</li></ol>
Screen breakage	<ol style="list-style-type: none"><li>1. Improperly seated</li><li>2. Foreign material</li><li>3. Screen cradle not closed</li></ol>	<ol style="list-style-type: none"><li>1. Check that screen is properly installed.</li><li>2. Check material for foreign items.</li><li>3. Clean screen area, cradle must close, tight to upper chamber.</li></ol>
Motor will not start	<ol style="list-style-type: none"><li>1. Main power</li><li>2. Overheated motor</li><li>3. Starter failure</li><li>4. Safety interlocks</li><li>5. Cutting chamber full of materials</li></ol>	<ol style="list-style-type: none"><li>1. Check fuses and / or circuit breakers.</li><li>2. Allow motor to cool and reset overloads.</li><li>3. Repair /replace starter.</li><li>4. Check safety switches for operation mechanically and electrically.</li><li>5. Clean cutting chamber completely</li></ol>



## TORQUE CHART FOR BOLTS:

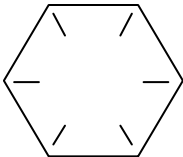
### Tightening torque guide SAE Grade 8 - coarse thread

SIZE	CLAMP LOAD	PLAIN FT-LB	PLATED FT-LB
1/4-20	2,850	12	9
5/16-18	4,725	25	18
3/8-16	6,975	44	33
7/16-14	9,600	70	52
2-13	12,750	106	80
9/16-12	16,350	153	115
5/8-11	20,325	212	159
3/4-10	30,075	376	282
7/8-9	41,550	606	454
1-8	54,525	909	682
1-1/8-7	68,700	1,288	966
1-1/4-7	87,225	1,817	1,383
1-3/8-6	103,950	2,382	1,787
1-1/2-6	126,450	3,161	2,371


### Tightening torque guide SAE Grade 8 - fine thread

SIZE	CLAMP LOAD	PLAIN FT-LB	PLATED FT-LB
1/4-28	3,263	14	10
5/16-24	5,113	27	20
3/8-24	7,875	49	37
7/16-20	10,650	78	58
2-20	14,400	120	90
9/16-18	18,300	172	129
5/8-18	23,025	240	180
3/4-16	33,600	420	315
7/8-14	45,825	668	501
1-12	59,700	995	746
1-14	61,125	1,019	764
1-1/8-12	77,025	1,444	1,083
1-1/4-12	96,600	2,012	1,509
1-3/8-12	118,350	2,712	2,034
1-1/2-6	142,275	3,557	2,668

### S.A.E. Grade 8 Bolts:

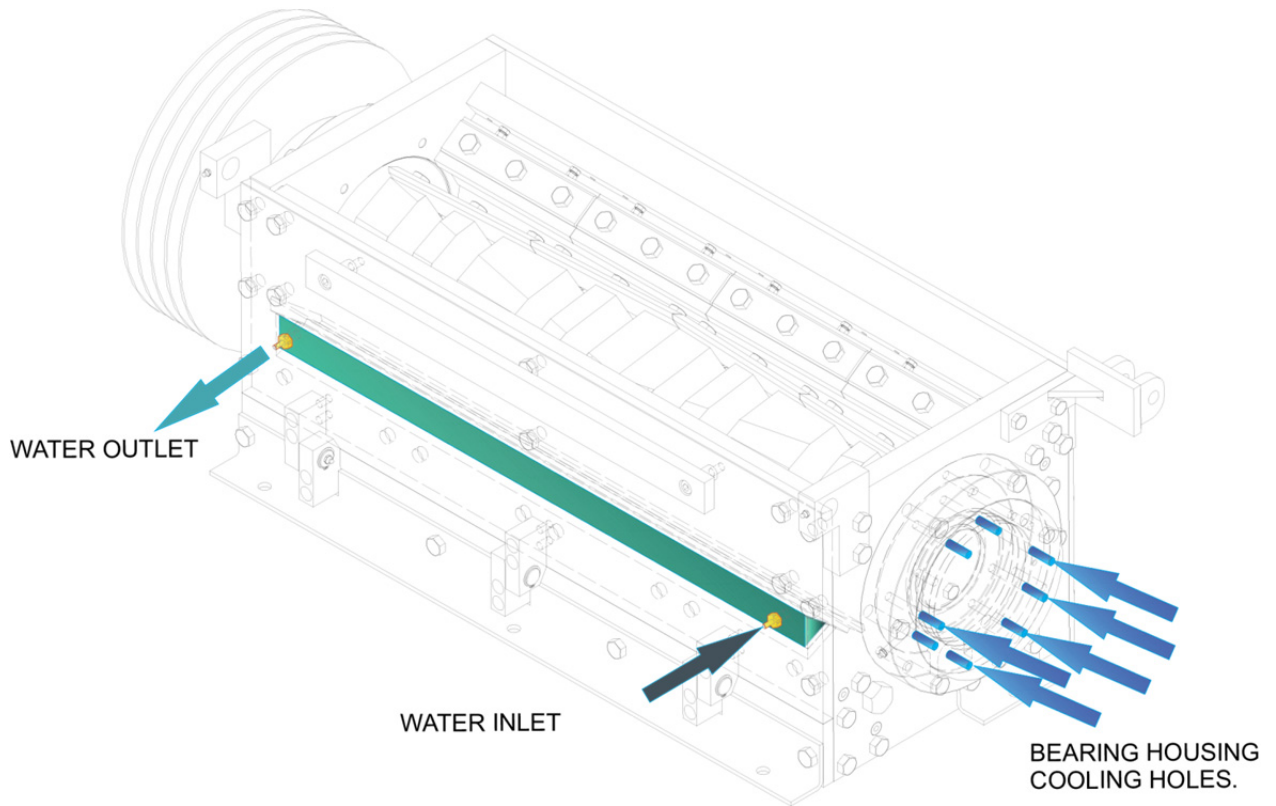


S.A.E. Grade 8 fasteners are recognized for the six lines stamped on the head of the bolt.

 **NOTE:** Do not lubricate the bolts.

## **OPTIONAL COOLING SYSTEM:**

Series TF granulators have bores in the bearing housings (as shown in the illustration below) to allow the air flow created by the knives to cool the cutting chamber. Additionally the granulator uses cooling water in the inclined plate. The use of cooling water is not always required. It will depend on the operator experience or if material to be granulated has a low melting temperature. Needed quantity of water will vary, but standard tap water pressure will usually be enough.






## We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

## How to Contact Customer Service

To contact Customer Service personnel, call:



 **NOTE:** Normal operating hours are 8:00 am - 5:00 pm EST. After hours emergency service is available at the same phone number.

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

### Before You Call...

If you do have a problem, please complete the following checklist before calling Conair:

- Make sure you have all model, control type from the serial tag, and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- Make sure power is supplied to the equipment.
- Make sure that all connectors and wires within and between control systems and related components have been installed correctly.
- Check the troubleshooting guide of this manual for a solution.
- Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- Check that the equipment has been operated as described in this manual.
- Check accompanying schematic drawings for information on special considerations.



## Equipment Guarantee

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

## Performance Warranty

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

## Warranty Limitations

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.