

MANUAL

CL-79



WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at info@conairgroup.com or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

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1. Introduction

This manual is for CONAIR MARTIN's 79 series granulators. The abbreviations mean:

-B = Band conveyor -U = Suction blower
-L = Low level -V = Ejector (Air Veyor).

The manual **should** be studied carefully before installing and using the equipment, in order to prevent personal injury and damage to the machinery.



Always take great care when the knives are within reach, since they are very sharp and can cause personal injury.

CONAIR MARTIN granulators are built for granulation of injection moulded, blow moulded or extruded plastic waste where the granulator's size and performance corresponds to the type of waste. For any other products or materials, approval must be obtained from the dealer or head-office in order for the conditions of the guarantee to remain valid.

The different types of granulator are designed so that maintenance and cleaning can be carried out quickly and simply, both during routine maintenance as well as when changing colour or material.

All servicing work should be carried out by a person with technical training or corresponding professional experience. The manual contains instructions for both handling and servicing the granulator. Chapter 7, which contains servicing instructions, is intended for service engineers. Other chapters contain instructions for the daily operator.

Delivered with the granulator are a manual, tool kit and touch-up paint.

Any modifications, changes, or rebuilding of the granulator must be approved by CONAIR MARTIN in order to avoid personal injury and damage to machinery and to ensure that the documentation remains correct.

If you have any questions, please contact your local dealer or our head-office.

2. Technical specifications

2.1 Dimensions

See chapter 10, Layout.

2.2 Data

Serial Number _____

Motor power _____

Capacity _____

V-belts _____

Voltage _____

Blower type (optional) _____

Rotating knives _____

Fixed knives _____

Screen _____

Weight: -L= 185 kg

..... -LB = 220 kg

..... -LBU = 250 kg

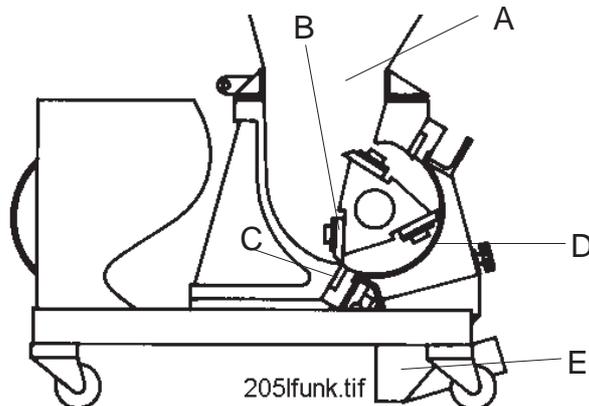
..... -LBV= 240 kg

3. Functional description

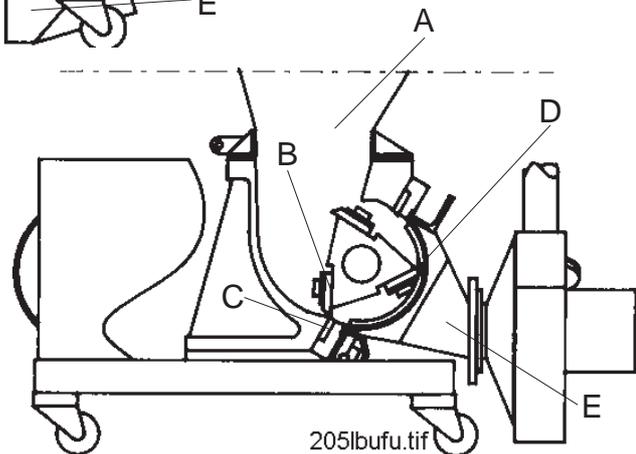
3.1 Overview

79 granulators are designed for grinding different types of plastic waste.

79



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The granulator is controlled from an electrical cabinet with a start/stop function and an emergency stop button.

The material is fed into the hopper (A) and falls down to the rotor. The rotor's knives (B) grind the material against the fixed knives (C) in the cutter housing. Both the fixed and rotating knives can be changed or re-sharpened when necessary. The sharpening is carried out in a special fixture outside of the granulator.

Under the rotor is a screen (D) through which the granulate passes before it comes down into the granule bin. The screen is available with various hole sizes depending on the required degree of coarseness of the granulate.

The granulated material is then collected in the granule bin (E). The standard -L model is fitted with a suction pipe. The -LBU is fitted with a suction blower which sucks the granulate out of the granule bin. The -LBV is fitted with an ejector (air veyor).

The granule bin, screen and screen box are designed to be removed so that the rotor can easily be cleaned. The hopper is constructed so that it can be opened up to allow improved access for cleaning and maintenance.

3.2 Safety system

Since there are rotating knives inside the granulator, there is a built-in safety system to prevent personal injury.

Emergency stop: The equipment is fitted with an emergency stop switch on the electrical cabinet. The emergency stop is activated by pushing the button. It is reset by turning the button in the direction of the arrow (anti-clockwise).

Safety switches: The safety system includes 2 safety switches. The switches are located as follows:

- 1 by the hopper
- 1 by the screenbox

The system is designed so that you have to unscrew the break screw by the screenbox to be able to open it. The break screw actuates the safety switch, which cuts off the power so that the rotor stops before the screenbox can be opened.

The hopper must be lowered and locked before the granulator can be operated. The safety switch has been installed so that it is not possible to start the granulator when the hopper is open.

4. Safety regulations

4.1 Overview

The granulator is equipped with safety switches to prevent the front door and the hopper from being opened during operation.

The following safety measures should always be observed when handling the granulator:

- **Always switch off the power supply using the main circuit-breaker (on top of the electrical cabinet) before opening the granulator.**
- **Never put any part of your body into any openings on the granulator unless the main circuit-breaker is in the "OFF" (=0) position.**
- **Always be careful when the knives are in reach since they are very sharp. When the rotor has to be rotated manually, this must be done with the greatest care!**
- **Be careful when the hopper and screenbox are opened and closed so that no part of your body gets caught.**
- **The granulator cannot be started until the doors and the hopper are locked.**

4.2 Sound level

- Equivalent continuous A-weighted acoustic pressure level $79 = 83.6$ dBA
Value measured 1 m from the surface of the machine and 1.6 m above the surface of the floor during grinding of 5 litres of PE bottles (polyethylene).

5. Installation

All instructions must be carried out in the order described, to prevent personal injury or damage to machinery.



Always take great care when handling the knives since they are very sharp and can cause personal injury.

The granulator should be connected to the mains supply by an authorised electrician.

5.1 Pre-start checks

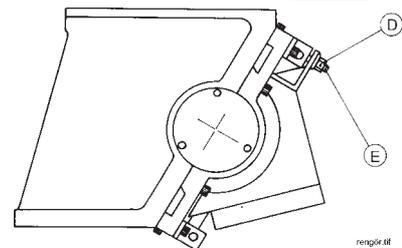
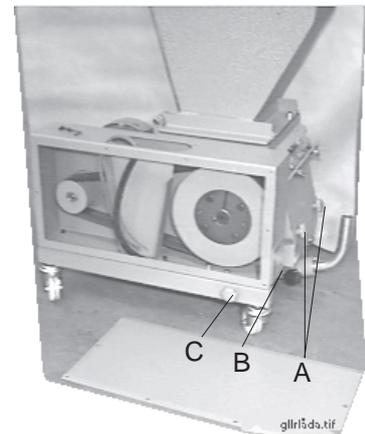
- Before the granulator is installed, the rust preventive should be carefully cleaned from the parts which are not painted or rustproof.

5.2 Opening and closing the hopper and screenbox

Screenbox:

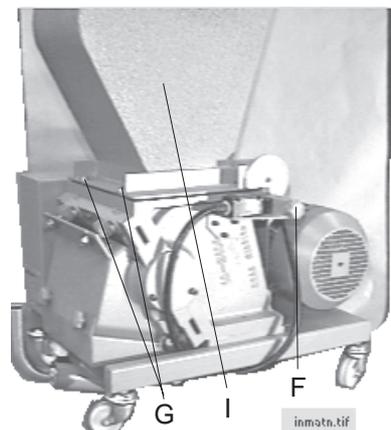
1. Unscrew the star knob (A) and pull out the granule bin (B).
2. Unscrew the breakscrew (C) until the door's stop plate is released. A safety switch is then activated, which cuts off the current to prevent the machine from being started when the screenbox is open.
3. Loosen the nuts (D).
4. Raise the link screws (E).
5. Lower the screenbox and lift out the screen.

NOTE: When mounting the screenbox the link screws' nuts (D) must be tightened quite hard to avoid only one of the link screws taking the whole load. Tighten them quite hard so that the break screw turns easily.



Hopper:

1. Unscrew the break screw (F) on the right side of the hopper.
2. Loosen the nuts (G).
3. Raise the hopper (I).



5.3 Electrical connection

The granulator should be connected up by an authorised electrician.

- Connect the granulator to the mains supply. See Electrical scheme, chapter 9, connecting (Q1).

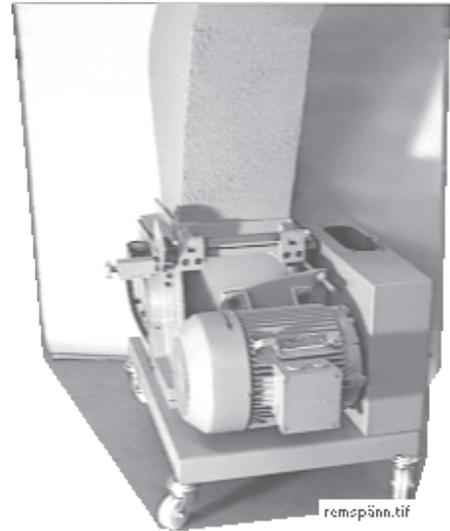
Check the granulator motor's rotation direction as follows:

- Set the main circuit-breaker on the control box to position (1) = "On".
- Check that the emergency stop switch is not activated. It can be reset by turning the knob in the direction of the arrow (anti-clockwise).
- Check that the break screws to the screenbox's and hopper's safety switches are completely tightened.
- Press in the "START" push-button.
- Check that the granulator motor's rotation direction is consistent with the arrow on the hood.

If a blower is connected, check that its rotation direction is consistent with the arrow on the blower hood.

If the rotation direction is not correct:

- Change the incoming phases.



6. Operation and daily maintenance

6.1 Starting and stopping

The start and stop functions are controlled by a change-over button on the electrical cabinet.

NOTE: The granulator should not be stopped until it has finished grinding all the material in the hopper and cutter housing. Any remaining material can slow down the rotor when it is re-started which can overload the motor and trigger the overload protector. (See 6.4)

6.2 Inspection

There should **not** be any material in the granulator when the inspection is to be carried out.

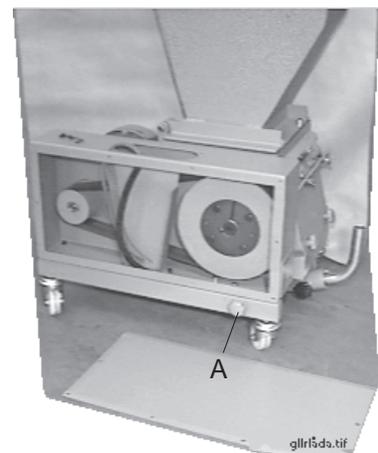
6.2.1 Daily inspection

- **Flaps in the hopper.** Check that the flaps are not damaged. Damaged parts should be replaced immediately to prevent bits of the flaps from falling into the cutter housing and damaging the knives. There is also a risk that damaged flaps can be thrown back by the machine.
- **Emergency stop.** Check the emergency stop function by starting the granulator and then stopping it using the emergency stop button. The emergency stop is reset by turning the emergency stop button in the direction of the arrow. The machine can then be re-started by pressing “START”.

6.2.2 Weekly inspection

- **Cables.** Inspect all cabling in the machine to see that there is no wear or other damage. For reasons of personal protection, damaged parts should be replaced immediately.
- **Safety switches.** There are two safety switches, one for the screen box and one for the hopper:

Screenbox: Check the safety switch by starting the granulator and then unscrewing the break screw (A) on the bottom of the belt guard, as described in chapter 5.2. The granulator should have stopped before you are able to open the screenbox.



Hopper: Open the hopper as described in chapter 5.2, but close and lock the screenbox. Check the safety switch to the hopper by starting the granulator. It should not be possible to start the granulator until the hopper is lowered and the break screws are screwed in.

6.3 Cleaning

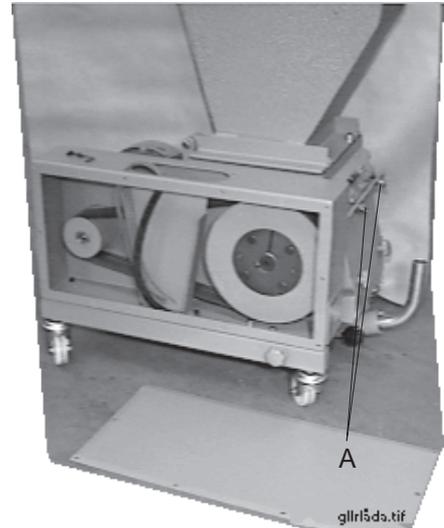


Always take great care when handling the knives since they are very sharp and can cause personal injury.

1. Open the hopper and screenbox as described in chapter 5.2.
2. Clean the hopper, flaps, screen and screenbox and granule bin.
3. Clean the cutter-housing and inside the stand.
4. Replace all parts in reverse order.

NOTE: When mounting the screenbox the link screws' nuts (A) must be tightened quite hard to avoid only one of the link screws taking the whole load.

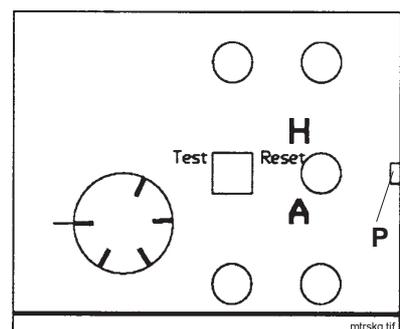
Note: Steps 2 - 4 should be carried out every time the machine is cleaned, or at least once every 300 hours.



6.4 Trouble-shooting

6.4.1 If the granulator does not start

- Check that the safety switches' break screws are turned fully clockwise. It is not possible to start the granulator unless the break screws are screwed in.
- Check that the emergency stop is not activated. It can be reset by turning the button in the direction of the arrow.
- The bimetal relay F1 in the electrical cabinet, according to the diagram opposite, is released if you press stop or overload the granulator. This is indicated by the small green rectangular pin (P), which sticks up above the surface of the bimetal relay. When you reset by pressing the "Reset" button, the pin (P) is pushed back in so that it is level with the surface of the bimetal relay.



NOTE: Set the main circuit-breaker to position "0" when cleaning the granulator. Empty the granulator of all material before restarting it.

7. Servicing

All servicing work should be carried out by a qualified service engineer and in the order described, to prevent personal injury or damage to machinery.

7.1 Changing the knives

When changing the knives, also check for any wear to the screen. For safety reasons, this should be replaced when the holes in the screen become drop-shaped.



Always take great care when handling the knives since they are very sharp and can cause personal injury. Use protective gloves!

7.1.1 Changing the fixed and rotating knives

For safety reasons, damaged screws *must* be replaced.

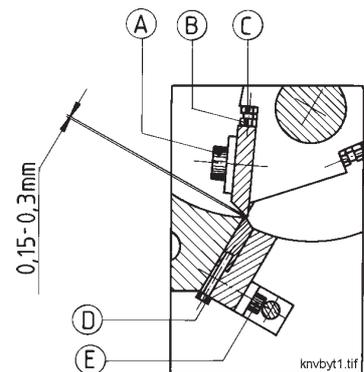
- Open the screenbox as described in chapter 5.2.

Disassembling the rotating knives (C):

1. Remove the fastening screws (A) and washers (H).

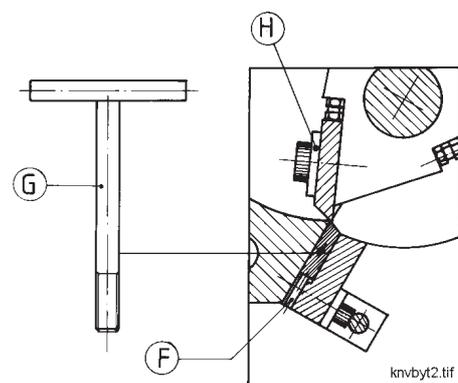
Disassembling the fixed knives:

1. Loosen screws (E), 5 on each long side and 2 on the short side opposite the belt guard, total 12 pieces.
2. Remove the screws (D), 2 on each fixed knife.
3. Loosen the stop screws (F), 2 on each fixed knife.
4. Screw the special extractor (G) (in the tool kit) into the threaded hole on the knife end and pull out the knife.



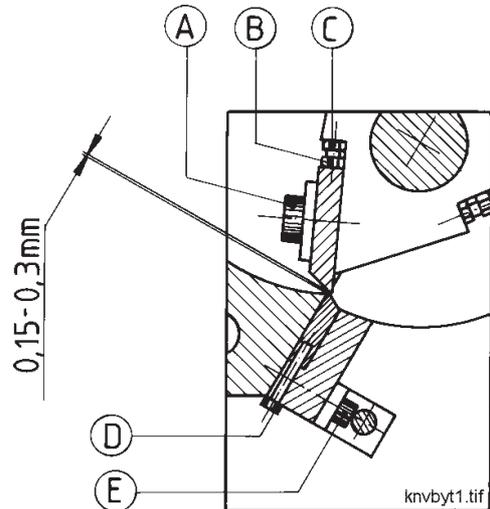
Assembling the lower fixed knife:

1. Check that the knives and the grooves for the knives are free from plastic waste, grease, etc.
2. Place the lower fixed knife in position.
3. Adjust the lower fixed knife to its forward position using the adjusting screws (F). NOTE: These screws should only support the rear edge of the knife and should not be tightened so much that the knife bends.
4. Tighten the 5 screws (E) (in the diagram above) along the lower long side with a torque of 20 Nm.
5. Screw in and tighten the screws (D).



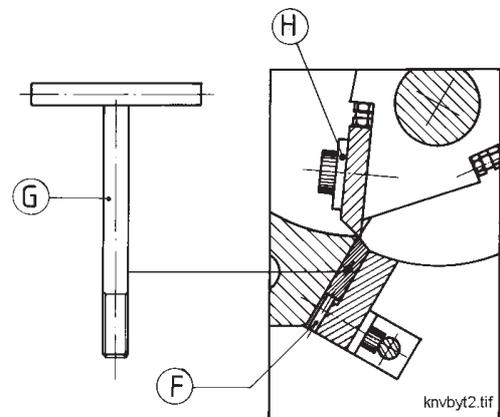
Assembling the rotating knives

1. Clean the cutter's knife location and place a rotating knife in the knife location.
2. Fasten the screws (A) together with the washers (H) and tighten gently.
3. Adjust the knife using the setting screws (B) to give the correct amount of play, 0.15-0.30 mm between the fixed and rotating knives. Check using the feeler gauge included in the tool kit.
4. When the correct amount of play has been obtained, tighten the screws (A) with a torque of 200 Nm.
5. Tighten the counter nut.
6. Re-check the amount of play.



Assembling the upper fixed knife

7. Push the upper fixed knife into its groove.
8. Turn the cutter so that the rotating knife's cutting edge comes exactly in front of the upper fixed knife's cutting edge.
9. Adjust the fixed knife using the setting screws (D) and (F). By tightening screws (F) the knife is moved *towards* the cutter's centre. By tightening screws (D) the knife is moved *away from* the cutter's centre.



10. Tighten the 5 screws (E) along the upper long side, and the two that were loosened on one short side.
11. Check that screws (D) and (F) by the upper fixed knife are not loose. However, they should not be tightened too much.
12. Rotate the rotor and replace the other rotating knives according to steps 1 - 5 above.
13. Using a feeler gauge, check that the distance between the fixed and rotating knives is correct. The distance should not be less than 0.15 mm.

Granulator fitted with a third fixed knife:

See instructions in chapter 11.

7.2 Sharpening the knives



Always take great care when sharpening the knives since they are very sharp and can cause personal injury.

7.2.1 Overview

NOTE: Use the services of a skilled person when re-sharpening the knives and only sharpen the edges marked with the special sign! (see diagram under 7.2.2 and 7.2.3)

The knives must be sharpened so that the correct grinding angles are obtained, otherwise the granulator will not operate effectively with lightly cutting knives.

During sharpening, the knife must be cooled the whole time with plenty of water and must definitely not burn or start blueing on the edge since this means that the knife lacks durability and stability. If this occurs, the knife cannot be repaired by further grinding down or grinding away of the blued or burnt colour. The tempered knife may have deep deformations with possible cracking as a consequence.

The following instructions apply only if you are using CONAIR MARTIN's sharpening fixture 79. The sharpening fixture is intended for use in a surface grinding machine and should be fixed on a magnetic board.

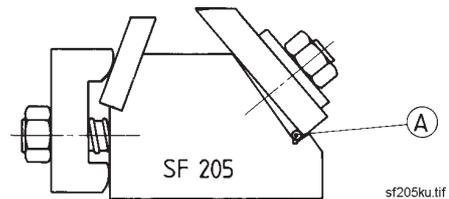
7.2.2 Sharpening the fixed and rotating knives

Fixed knives:

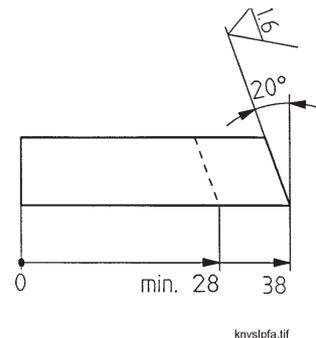
Regarding the third fixed knife, see chapter 11.

NOTE: Only the surfaces marked with the special sign should be sharpened. The specified measurements apply when sharpening the knives.

- The fixed knives are fastened as shown in the adjacent figure, left part, and the cutting angle is sharpened at 20°.



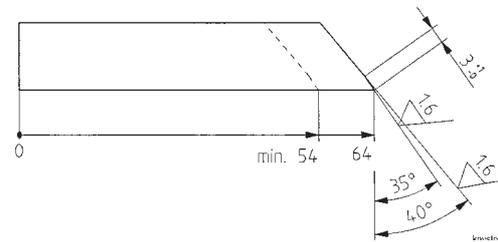
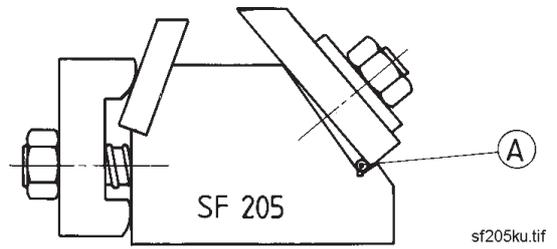
- The knives can be sharpened only as much as is shown in the adjacent figure. After that, they are worn out and should be replaced by new ones in order for the granulation to be effective.



Rotating knives:

NOTE: All rotating knives should be sharpened equally so that the cutter does not become unbalanced.

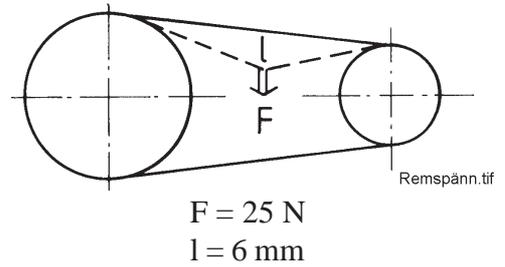
- The rotating knife is fastened with the stirrup (A) under the lower part of the knife, as shown in the adjacent figure, right part. Ball washers should be used when tightening. In this position the relief angle is sharpened.
- Loosen the screws and remove the stirrup (A), fasten the knife again. In this position the cutting angle is sharpened.
- The knives can be sharpened only as much as is shown in the adjacent figure. After that, they are worn out and should be replaced by new ones in order for the granulation to be effective.



7.3 Inspecting and adjusting the belts

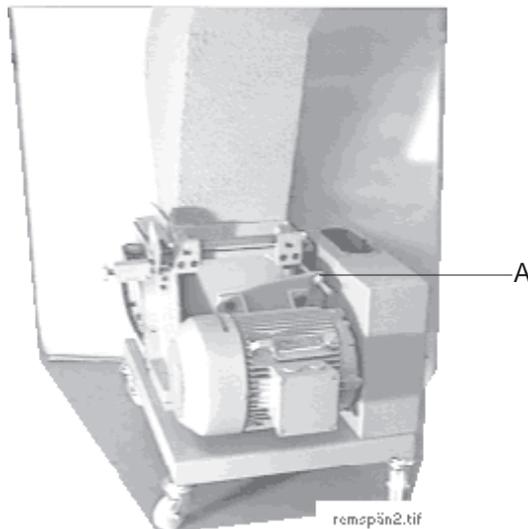
The V-belts must be inspected after 30 hours' operation.

- Loosen and remove the outer plate on the belt guard.
- Load one of the V-belts between the rotor pulley and the motor pulley with 25 N in the middle of and at a right angle to the belt. Measure the deflection and adjust the distance between the pulleys as necessary until the tension is correct. The V-belt should stretch 6 mm.



Adjusting:

- Tension the belt by screwing on the flange nuts (A).



7.4 Lubrication

The bearing is delivered filled with grease. The bearing is maintenance-free and needs no further lubrication.

7.5 Rotor pulley, assembling/disassembling

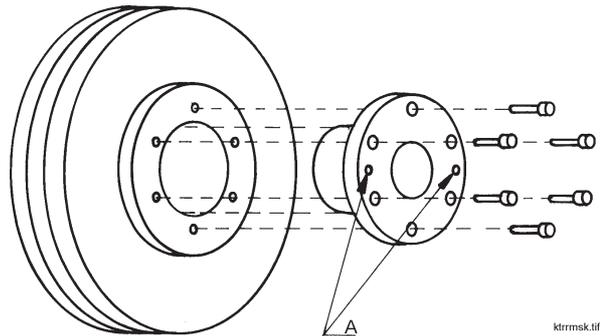
7.5.1 Rotor pulley

Disassembling

1. Loosen all screws a few turns.
2. Unscrew two of the screws.
3. Lubricate both screws and screw them into the disassembling holes (A).
4. Tighten both disassembling screws alternately until the flange bushing comes loose from the hub and the unit sits freely on the axle.
5. Lift the whole unit from the axle.

Assembling

1. Clean and degrease the contact surfaces carefully.
2. Place the "flange bushing" in the hub so that the bolt holes line up with each other.
3. Lubricate the screws. Mount all screws without tightening them completely.
4. If a key is used, it should be placed in the key way before the "flange bushing" is fitted in. Check that there is sufficient play over the key.
5. Fit the hub with the "flange bushing" on the axle.
6. Tighten the screws alternately until approximately half the torque has been reached ($49/2=24.5\text{Nm}$).
7. Tap lightly between the axle and the bolts on the "flange bushing". Use a block of wood or plastic to protect against damage.
8. Continue to alternately bolt and tighten the screws once or twice until the correct torque has been reached, i.e. 49 Nm.



8. Spare parts list

8.1 Overview

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8.2 Ordering spare parts

Only use spare parts from CONAIR MARTIN when replacing machine parts. Orders should go to the representative in the country where the machine was purchased.

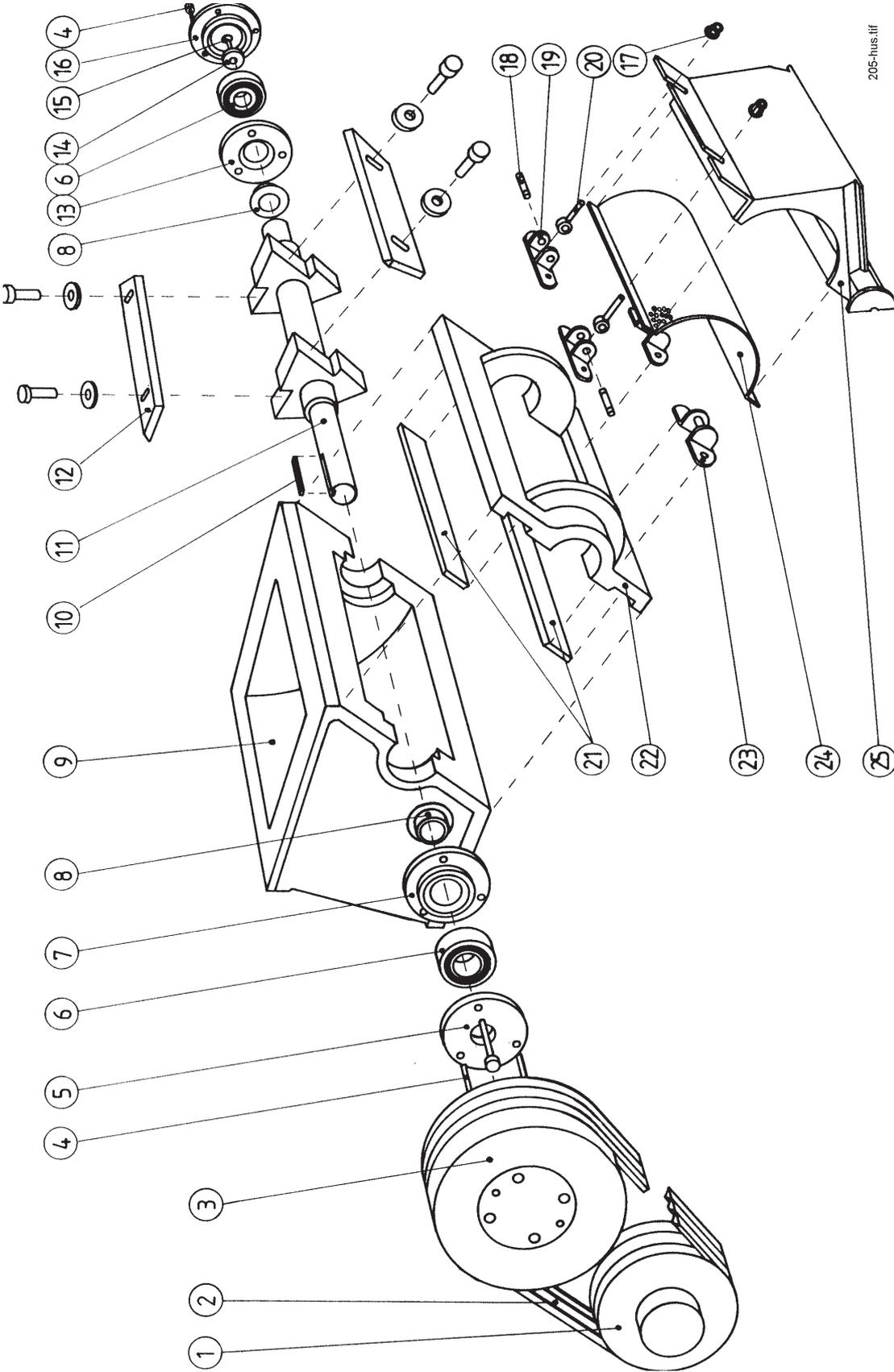
When ordering, the following should be specified:

- machine designation, as specified on the machine plate
- serial number, as specified on the machine plate
- article number, as specified in the spare parts list
- quantity, as specified in this spare parts list.

8.1.1 79, Cutter housing, all models

Pos	Qty.	Part no.	Pos	Qty.	Part no.	Pos	Qty.	Part no.
1	1	9-30172	10	1	9-50082	19	2	4-02411
2	3	9-30075	11	1	2-14198	20	2	9-50066
3	1	9-90017	12	3	3-08107	21	2	4-08108
4	6	9-40054	13	1	4-02406	22	1	2-02534
5	1	4-02403	14	1	4-02408	23	2	4-02409
6	2	9-60034	15	1	9-40139	24	1	3-02414
7	1	4-02405	16	1	4-02404	25	1	2-07660
8	2	4-02407	17	2	9-40158	(25	1	2-15797
9	1	2-02534	18	2	4-02412)	for	79)

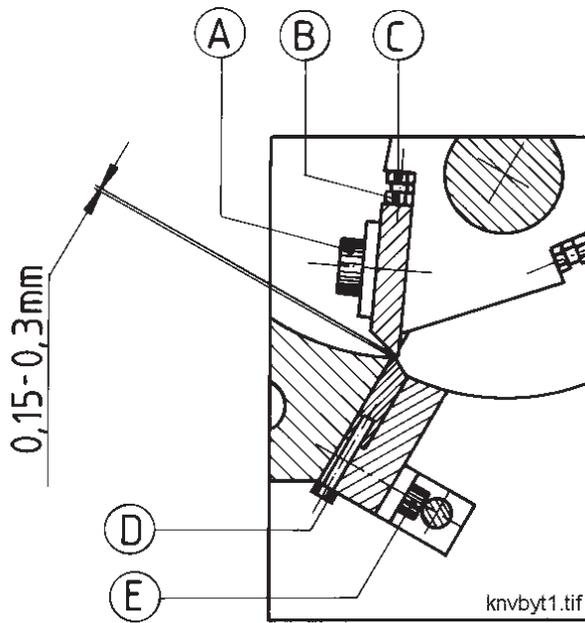
8.1.1 79, Cutter housing, all models



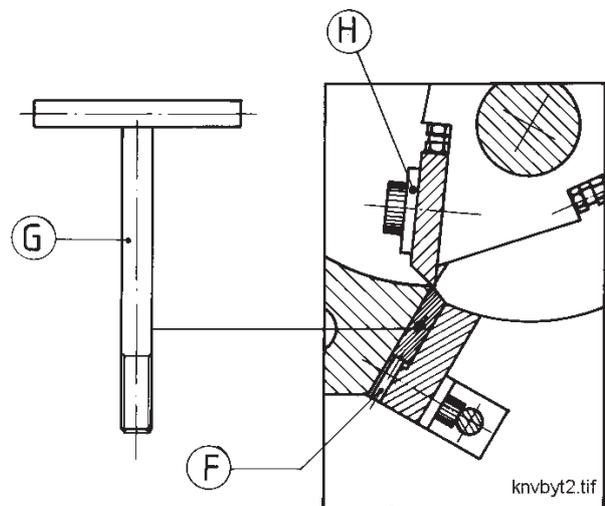
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CONAIR

8.1.1 Cutter housing, all models, continued



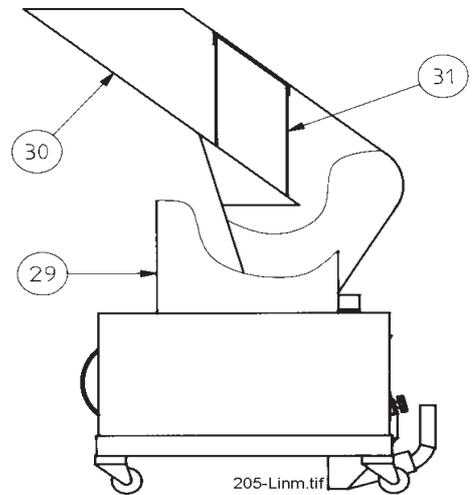
Pos	Qty.	Part no.
A	6	9-40165
B	6	9-40150
C	6	9-40203
D	4	9-40161
E	6	9-40140
E	8	9-40054
F	4	9-40160
G	1	4-02531
H	6	4-11835



8.1.4 79, Hopper

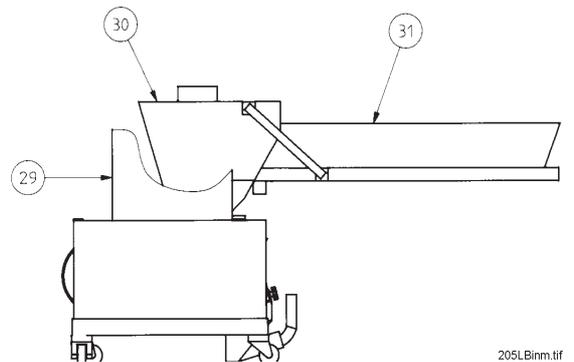
79

Pos.	Qty.	Part no.
29	1	9-11034
30	1	2-13737
31	1	3-13742



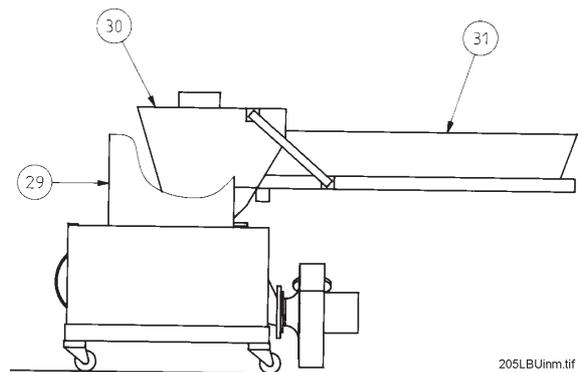
79

Pos.	Qty.	Part no.
29	1	9-11036-10
30	1	2-15799
31	1	9-10789



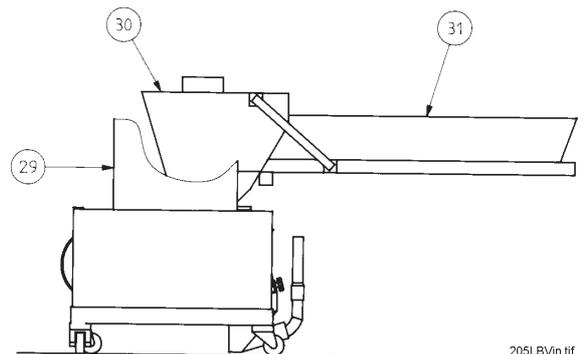
79

Pos.	Qty.	Part no.
29	1	9-11038
30	1	2-15799
31	1	9-10789



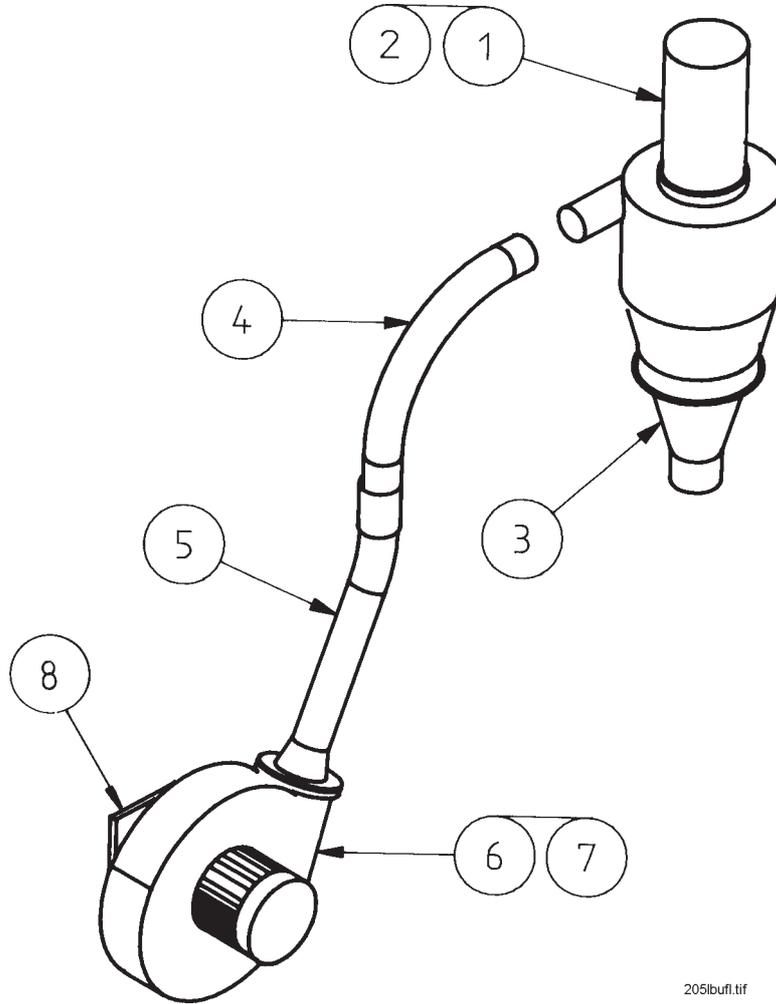
79

Pos.	Qty.	Part no.
29	1	9-11036-11
30	1	2-15799
31	1	9-10789



8.1.5

79, Blower F3 with cyclone AX-5



205buf1.tif

Pos.	Qty.	Part no.
1	1	2-10593
2	1	9-20480
3	1	3-17772
4	1	2-15838
5	1	2-15831
6	1	9-20485
7	1	4-15930
8	1	3-15795

8.1.6 Pause/pulse relay when emptying with air veyor

In those cases when emptying of the granule bin with an air veyor has been chosen, the pause/pulse relay should be cancelled to prevent a glut in the granule bin.

When delivered, the relay is preset as follows:

$$T1 = \text{range } 1 - 10 \text{ m}$$

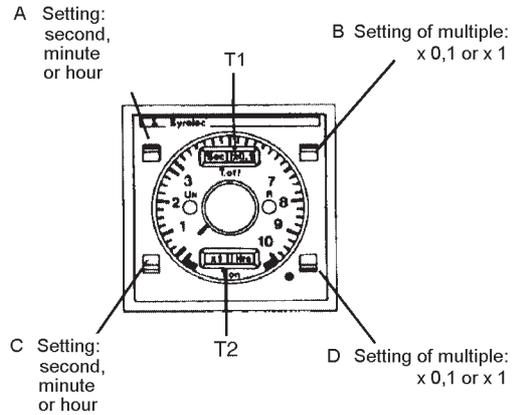
$$T2 = \text{range } 6 - 60 \text{ s}$$

where

Pause time T_1 (the time the air veyor is idle) is selected using switches (A) and (B). Then the time is set using the handwheel $T_{\text{off}} = T_1$.

Delay time interval T_2 (the time the air veyor is working) is selected using switches (C) and (D). Then the time is set using the handwheel $T_{\text{on}} = T_2$.

TIMER SETTING:



9. Electrical scheme

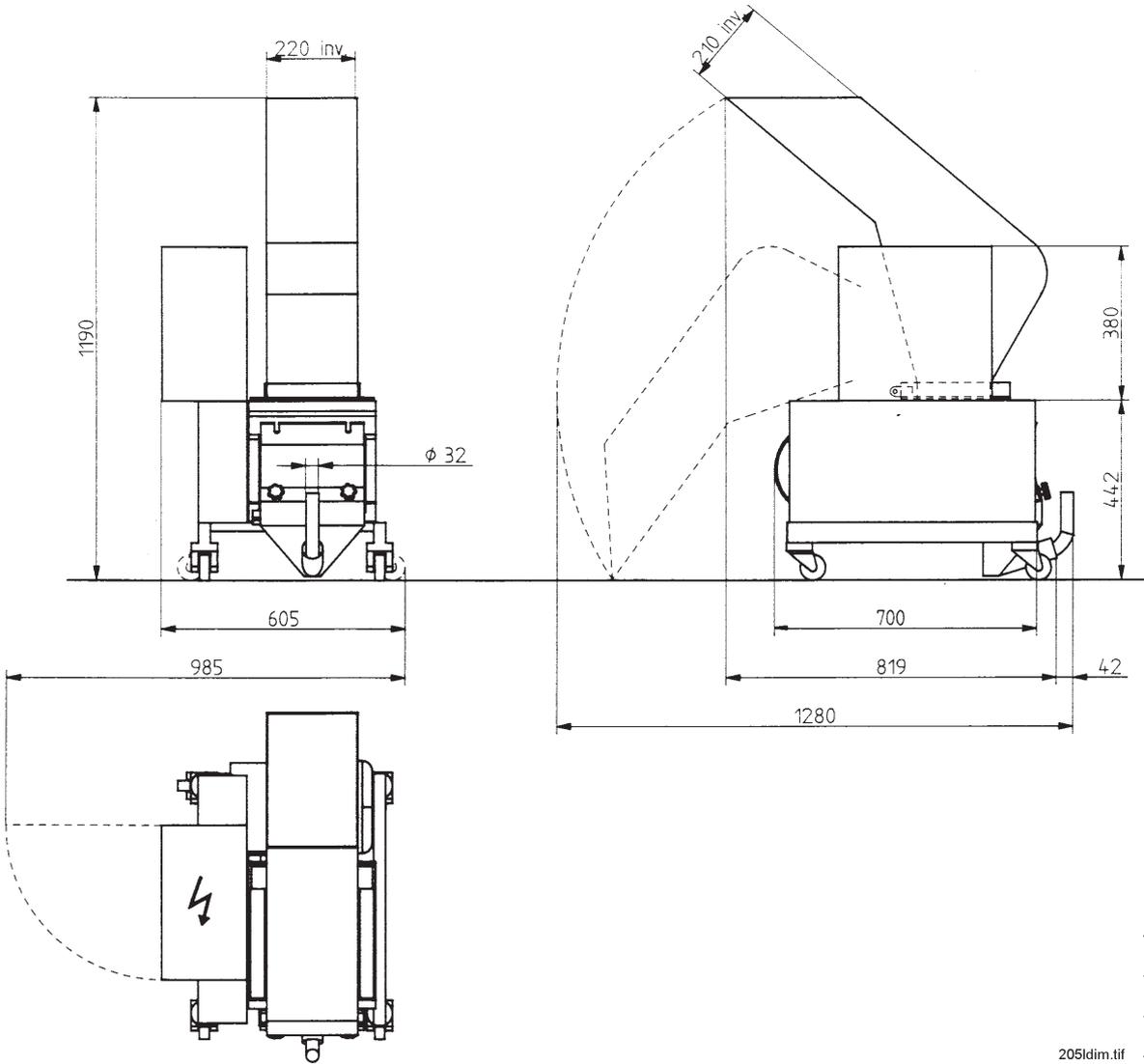
10. Layout

10.1 Dimensions

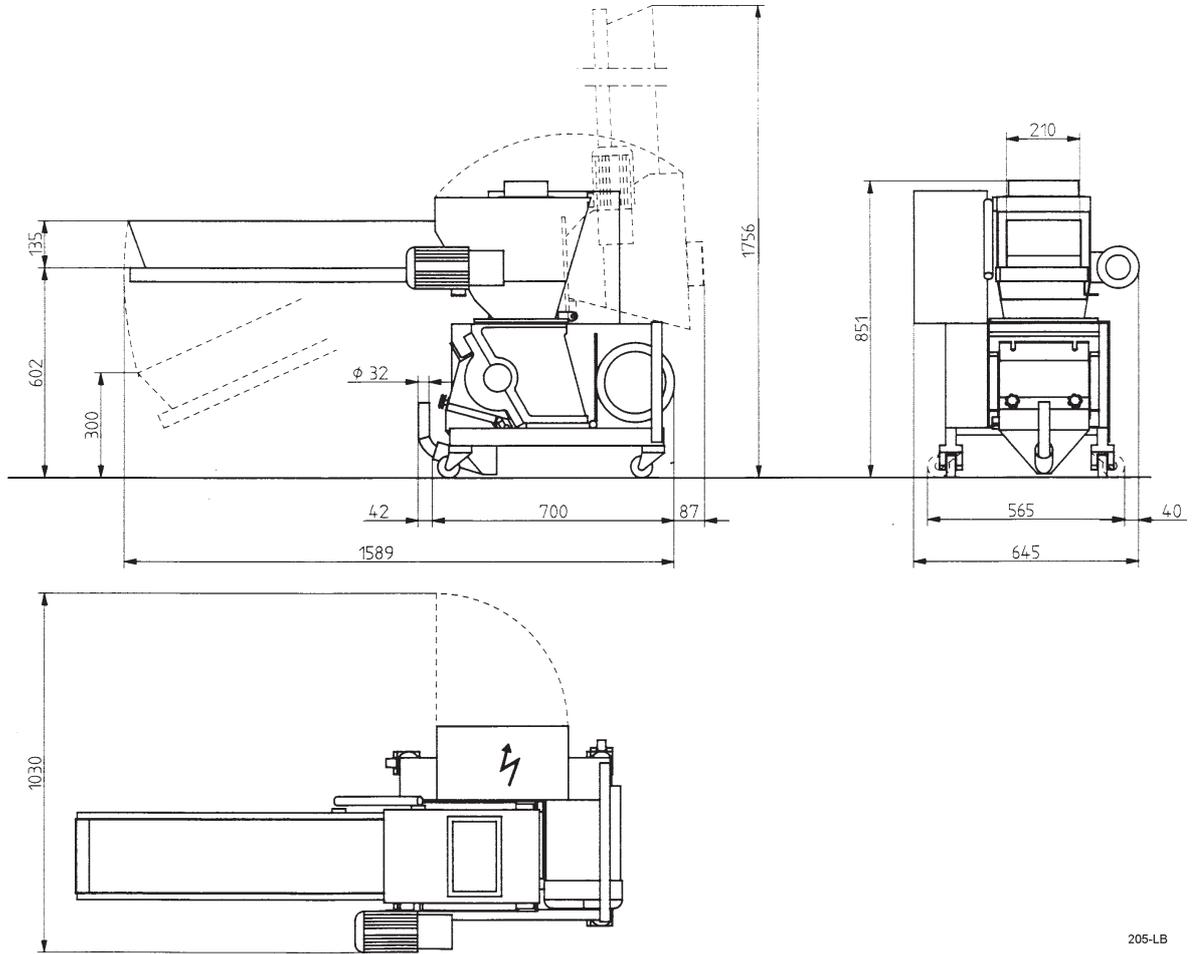
Page

10.1.1 79 28
10.1.2 79 29
10.1.3 79 30
10.1.4 79 31

10.1.1 79

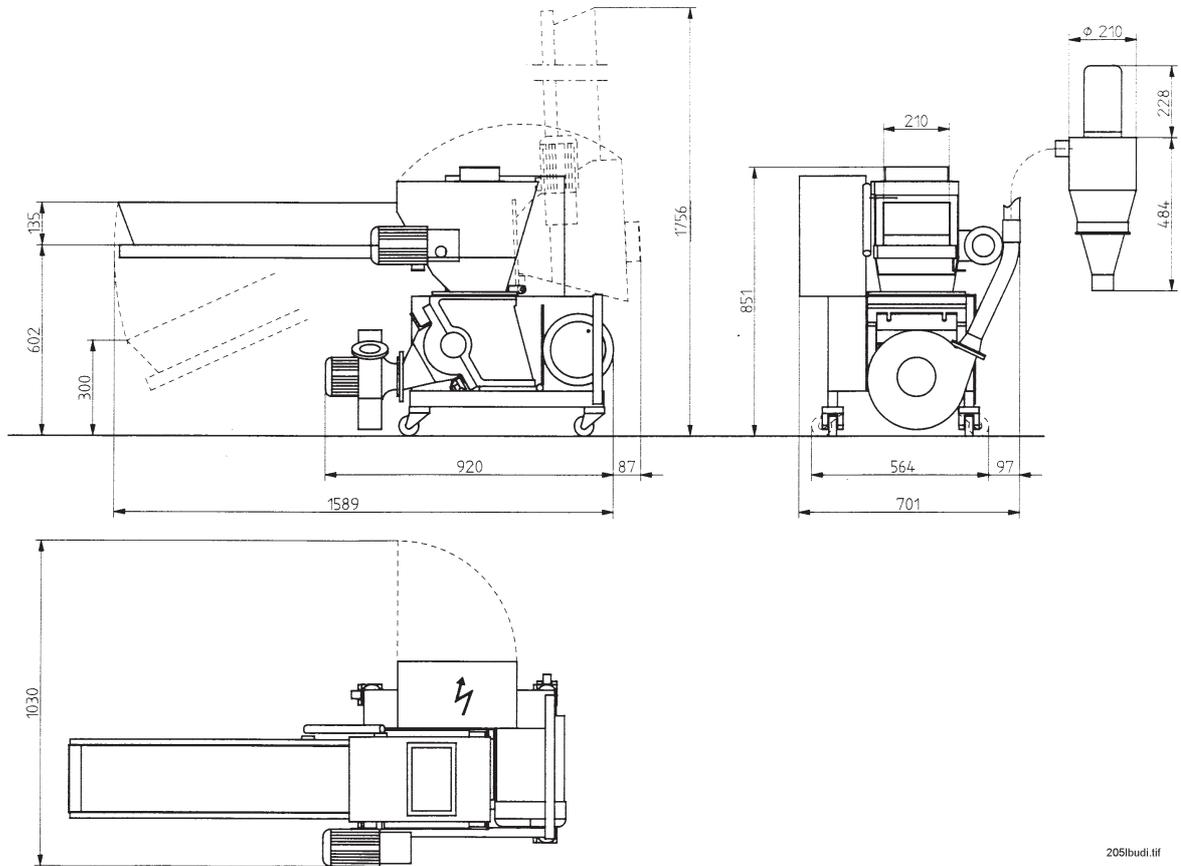


10.1.2 79



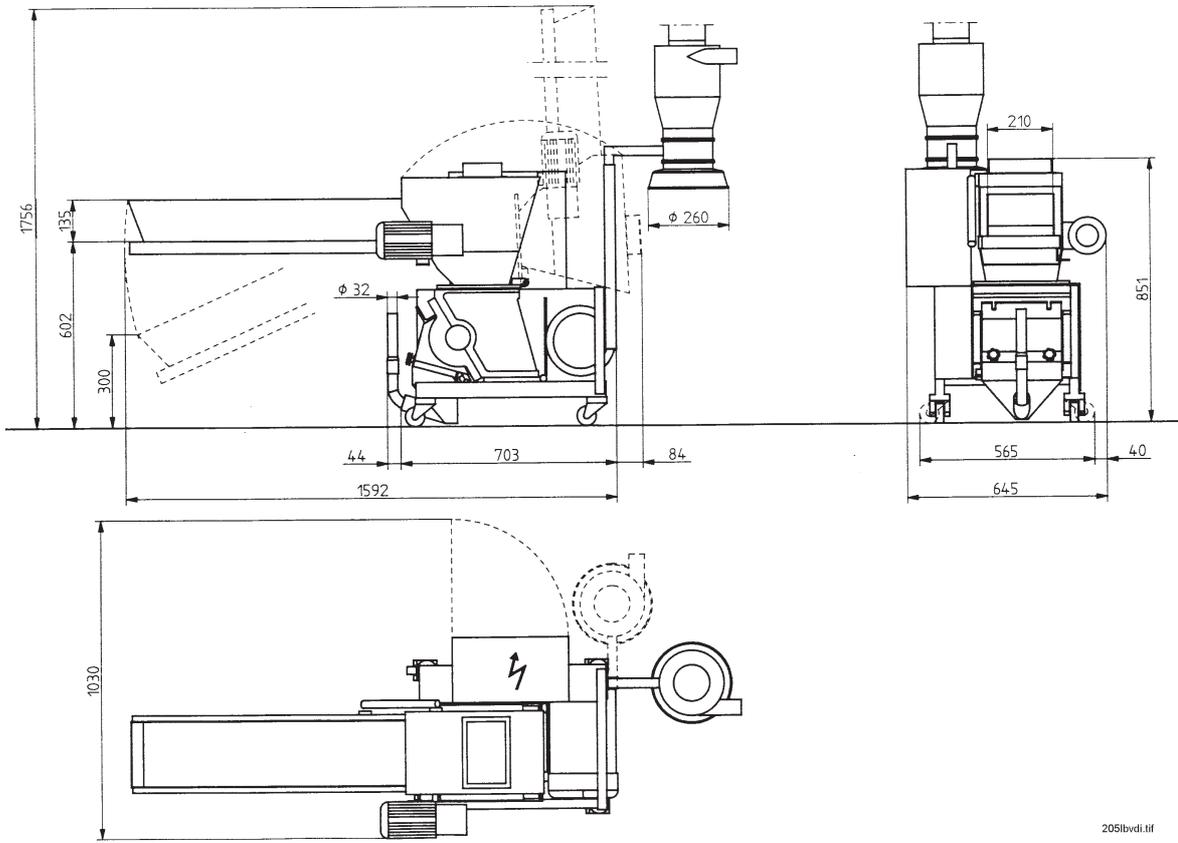
205-LB

10.1.3 79



205ibudi.tif

10.1.4 79



205lbvdi.tif

11. Options

11.1 Overview

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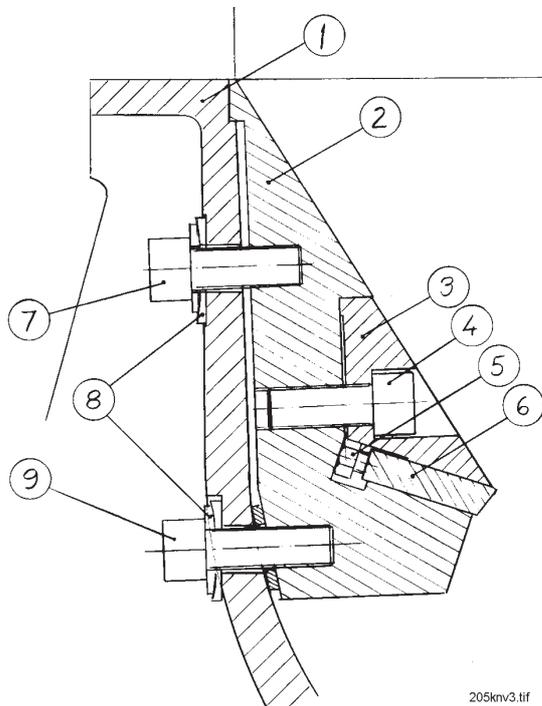
Ordering spare parts

Only use spare parts from CONAIR MARTIN when replacing machine parts. Orders should go to the representative in the country where the machine was purchased.

When ordering, the following should be specified:

- machine designation, as specified on the machine plate
- serial number, as specified on the machine plate
- article number, as specified in the spare parts list
- quantity, as specified in this spare parts list.

11.1.1 79, all models: Third fixed knife, disassembling/ assembling



Pos.	Qty.	Part no.
1	1	1-19022
2	1	2-17732
3	1	2-17733
4	2	9-40106
5	2	9-40302
6	1	3-19021
7	2	9-40075
8a	2	9-50086
8b	2	9-50214
9	2	9-40050

Disassembling

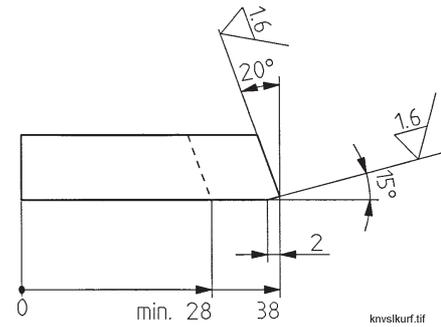
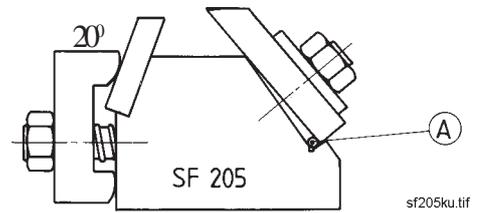
1. Unscrew the screws (4) and release the ruler (3).
2. Lift out the knife (6).

Assembling

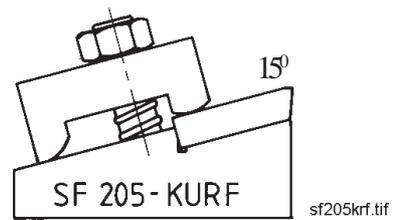
1. Clean any grease or plastic waste from the knife location.
2. Position the fixed knife (6) with the adjusting screw (5) and press against the rear edge.
3. Adjust to obtain the correct amount of play between the fixed and rotating knife using the adjusting screws (5).
4. Using a feeler gauge, check that the correct amount of play, 0.15 - 0.30 mm, has been obtained.
5. When the amount of play is correct, place the ruler (3) with the screws (4) on the knife and tighten with a torque of 100 Nm.

11.1.2 79, all models: Third fixed knife, sharpening

The third fixed knife is fastened in the left position in the 79 fixture and sharpened to its correct relief angle, 20° . See next diagram.



Then the knife is fastened in the 79 fixture and is sharpened to its correct cutting angle, 15° .
NOTE: Turn the knife so that the correct surface is sharpened.

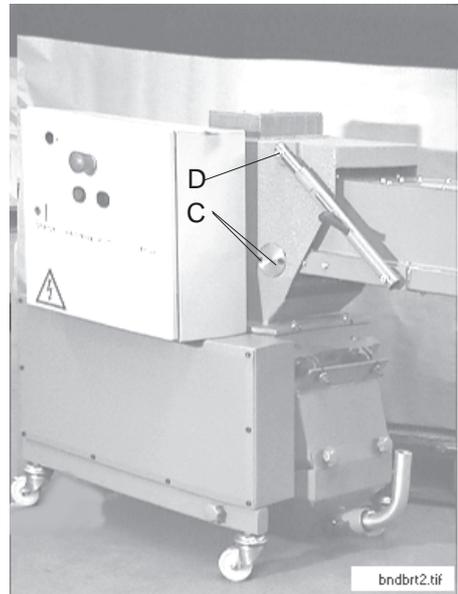


11.1.3 79, Hopper with band conveyor

Disassembling/Assembling the band conveyor

Disassembling

1. Release the fastening screw (A). This is done most easily by unscrewing the nut on the under side. The vibration absorber is then released.
2. Release the hood over the screw (B) and remove the screw.
3. Pull the worm-gear unit motor off the shaft.
4. Release the shaft gears by unscrewing the two screws (C) on each side of the hopper funnel.
5. Loosen the band conveyor's height setting by unscrewing the screw which fastens the height setting by the guide pin (D).
6. Release the shaft gears and move the band conveyor to the right so that the left shaft goes free from the hub. Turn the band conveyor to the right until the shaft end goes free from the hopper funnel. Move the band conveyor to the left until the motor shaft end goes free from the hopper funnel. The band conveyor can then be released.



12. Transporting and storing

12.1 Overview

Handling and transporting of the machinery should be carried out by specially trained personnel.

The machine is packed in weather-proof and partly shock-proof plastic sheeting. It is fixed with straps to a pallet for transportation.

12.1.1 Unpacking and checking

- Check that the machine has not been damaged in transit. Report any damage to the forwarder.
- Do not unpack the machine until it has been moved to its installation location.
- After unpacking, check that the delivery is complete by checking against the delivery note.

12.1.2 Lift and transport to installation location

For information about the machine's weight, refer to chapter 2, Technical data.

For information about the space required, refer to chapter 10, Layout.

The machine can be lifted and handled using a fork-lift truck.

12.1.3 Placing at the installation location

See chapter 5, Installation.

12.2 Storing

Normally, the machine is pre-packed for transport to the installation location where it is to be put into operation immediately. Therefore, it is only protected with rust-preventive oil.

12.2.1 Long-term storage

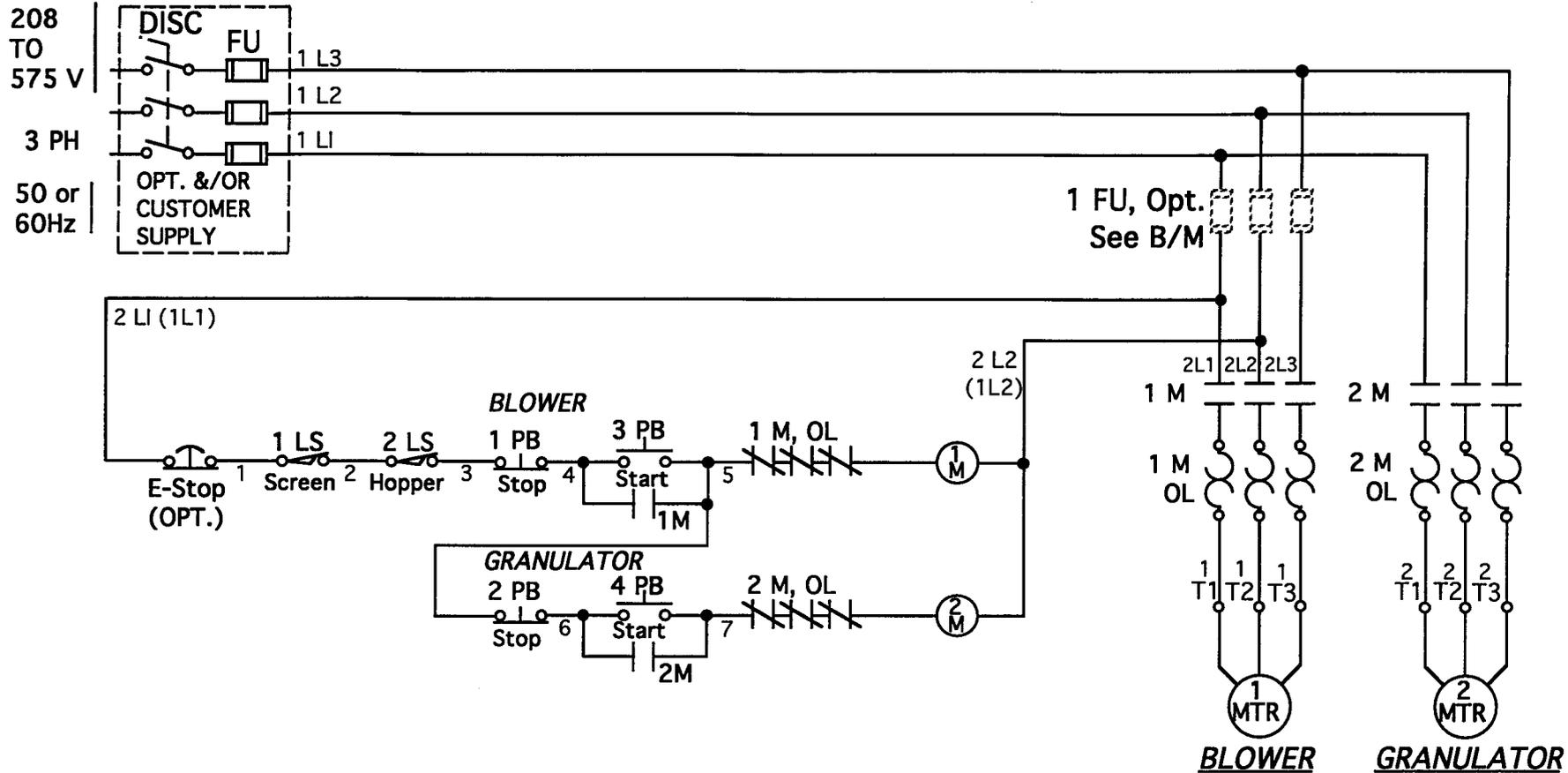
- The machine should be kept in a storage area with constant temperature and humidity.
- Before storing for a long time, the machine should be given a coating of long-term rust preventive, for example Castrol DWX 160 with durability 24 - 36 months in a suitable storage area.

12.2.3 Preservation

The machine is protected with rust-preventive oil Castrol DWX 22 on all surfaces which are not painted or rust-free.

12.2.4 Durability

The rust protection from the rust-preventive oil Castrol DWX 22 is effective for up to 12 months if the conditions described in 12.2.1 are fulfilled.



3	C	ADDED 50/60 HZ.	J.T.	06/06/96
2	B	UPDATE	J.T.	08/04/94
1	A	UPDATE	H.O.	02/05/94
REV NO.	LET.	DESCRIPTION	BY	DATE

**CONAIR
MARTIN**
Part of The Conair Group
MARTIN, MASSACHUSETTS

NAME				
ELEC. SCHEMATIC				
2 MTR, 208 Thru 575V, STD				
MACHINE SIZE CKM SERIES, CE/CK/CKB/CL-79, CT-1221, CT-1224				
DR. BY	DATE	CHK. BY	SCALE	
H.O.	12-21-92		NONE	
DWG NO.	C-201-00-0619			SHT. 1 OF 1