MANUAL
CD-2442

MNL-00101

⚠ **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This manual is out-of-date and is provided only for its technical information, data and capacities.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containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.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 2442 granulators.

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 in Sweden.

2. Technical specifications

2.1 Dimensions

See chapter 10, Layout.

2.2 Data

Serial Number _____

Motor power ..... _____

Blower type ..... _____

V-belts ..... _____

Voltage ..... _____

Rotating knives ..... _____

Fixed knives ..... _____

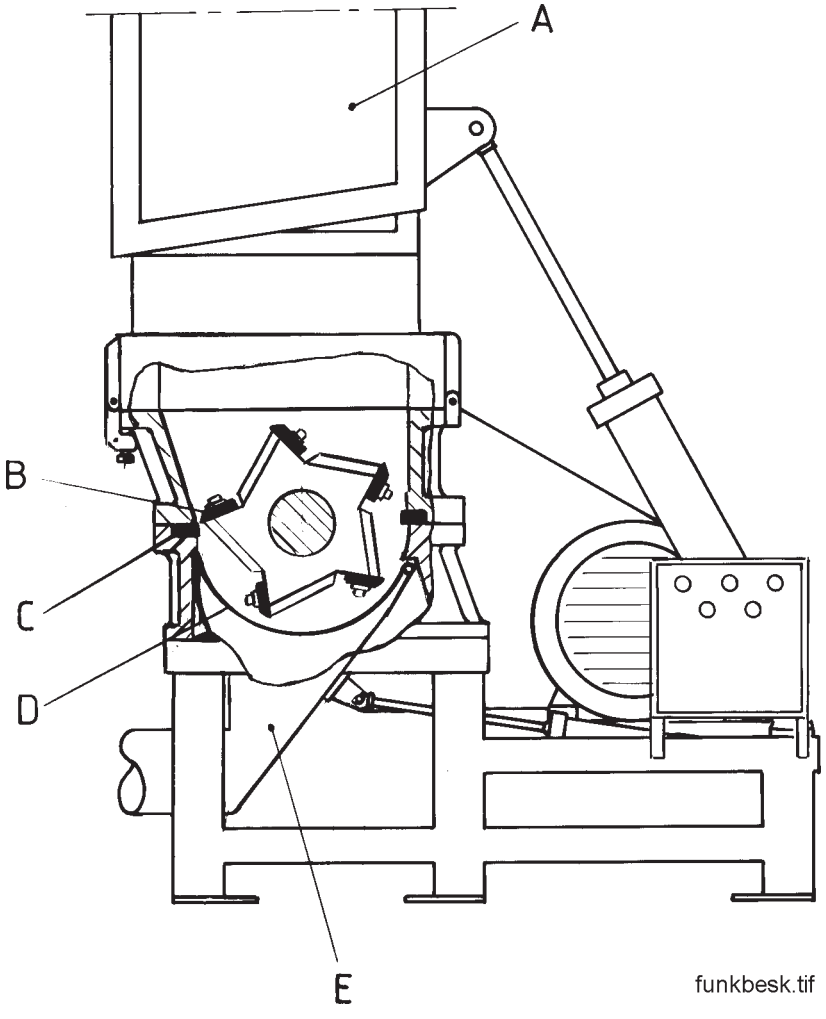
Screen ..... _____

Weight ..... =3900 kg

3. Functional description

3.1 Overview

The Granulator 2442 is designed for grinding different types of plastic waste. 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. The screen is available in various hole sizes depending on the required degree of coarseness of the granulate. The granulated material is then collected in the screenbox (E). The granulator is fitted with a suction blower which sucks the granulate out of the granule bin. The screen and screen box are designed to be opened and removed easily for cleaning. 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 control panel by 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 3 safety switches. The switches are located as follows:

- 1 by the hopper's hinge side
- 1 by one of the hopper's locking clamps
- 1 by the screenbox

The system is designed so that you have to release the locking screws to the screenbox to be able to open it. The screenbox is opened and closed using a pneumatic piston. On a separate telescopic rod — fitted parallel to the pneumatic cylinder — is a limit switch, which is actuated when the screenbox begins to lower and makes it impossible to start or operate the granulator when the screenbox is open.

The hopper must be lowered and locked with the locking clamps before the granulator can be operated. The safety switch by the hinge side is actuated when the hopper begins to open and makes it impossible to start or operate the granulator when the hopper is open.

The safety switch by the right locking clamp makes it impossible to start or operate the granulator until this locking clamp has been tightened.
NOTE: All locking clamps must be tightened.

4. Safety regulations

4.1 Overview

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

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

- **When granulating pipes and long objects, these should be shorter than the hopper so that the chain flaps can fall back into place. If the pipe is longer than the hopper, the granulated material sprays back out of the machine and can cause eye injuries.**
- **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 screenbox and hopper are locked.**

4.2 Sound level

- Equivalent continuous A-weighted acoustic pressure level 2442 = 84.8 dBA

  Value measured 1 m from the front surface of the machine and 1.6 m above the surface of the floor during idling.

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

- When the granulator can be opened - after connecting electricity and air - the rust preventive should be carefully cleaned from the parts which are not painted or rustproof.
- Adjust the vibration absorbers so that the granulator is at the correct level on the floor.

5.2 Electrical connection

The granulator should be connected up by an authorised electrician.

- Check that the locking clamps to the hopper and screenbox are completely tightened.
- Connect the granulator to the mains supply and the air supply. See Electrical scheme, chapter 9.

Check the granulator motor's rotation direction:

- 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).
- Press in the "START" push-button.
- Check that the belts' rotation direction is consistent with the arrow on the belt guard.

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.

5.3 Connecting to air supply

Connect the machine to filtered compressed air:

- 0.6—0.8 MPa / 6—8 kg/cm^2.

5.4 Opening and closing the hopper and screenbox

5.4.1 Overview

The granulator is operated partly electrically, partly pneumatically:

- electrically from the control panel on the electrical cabinet, mounted on a separate stand.
- pneumatically from the control panel on the right-side of the granulator.

5.4.2 Opening

Hopper

Diagram 1

1. Check that there are no loose objects in the hopper.
2. Loosen the locking clamps (4) using the screws (5).

Diagram 2

3. Set the Screenbox/Hopper knob (7) to "Hopper".
4. Set the "Open/Close" knob (8) to "Open".
5. Simultaneously press both switches (9) to pressurise the air system.

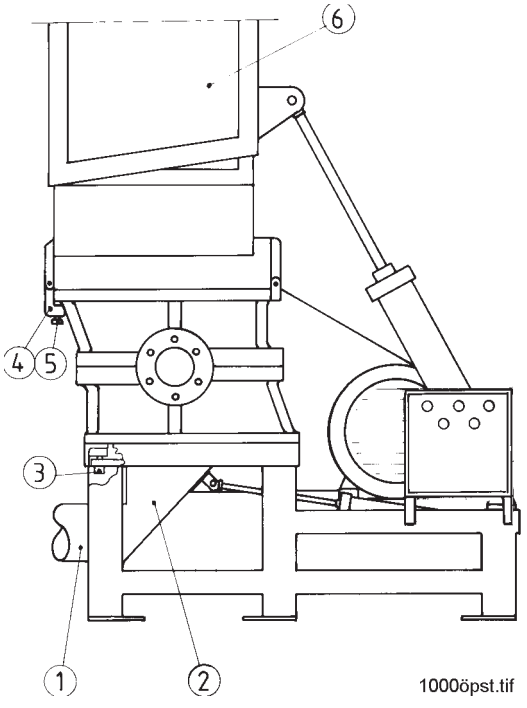


Diagram 1

Screenbox

Diagram 1

1. Loosen the blower connection and pull out the pipe (1).
2. Release the screws (3).

Diagram 2

3. Set the Screenbox/Hopper knob (7) to "Screenbox".
4. Set the "Open/Close" knob (8) to "Open".

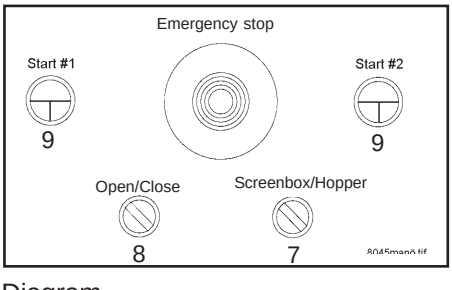


Diagram 2

5. Simultaneously press both switches (9) to pressurise the air system.
6. The screen can now be lifted out for cleaning or changing size.

5.4.3 Closing

Hopper

Diagram 1

1. Check that there are no loose objects in the hopper.

Diagram 2

2. Set the Screenbox/Hopper knob (7) to "Hopper".
4. Set the "Open/Close" knob (8) to "Close".
5. Simultaneously press both switches (9) to pressurise the air system.

Diagram 1

5. Tighten the locking clamps (4) using the screws (5).

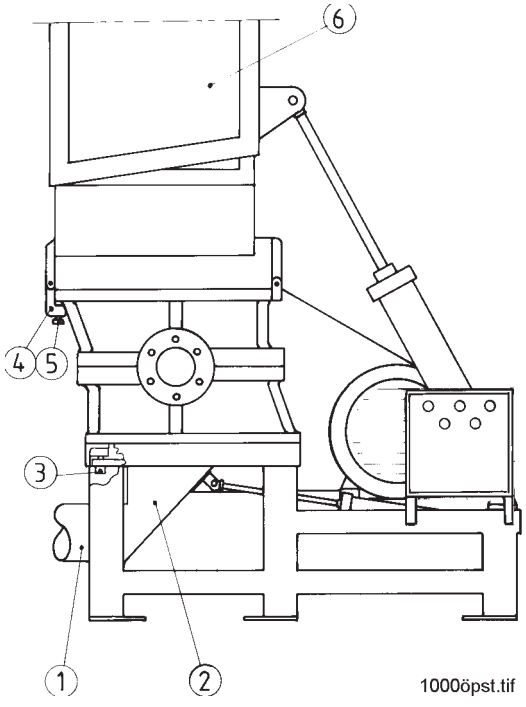


Diagram 1

Screenbox

Diagram 2

1. Fit the screen.
2. Set the Screenbox/Hopper knob (7) to "Screenbox".
3. Set the "Open/Close" knob (8) to "Close".
4. Simultaneously press both switches (9) to pressurise the air system.
5. Lock the screenbox with the screws (3).

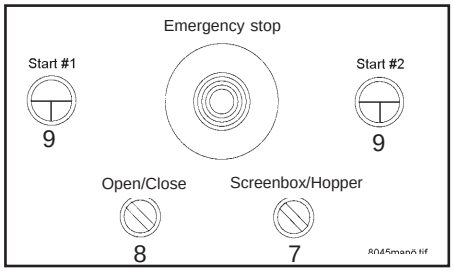


Diagram 2

Diagram 1

6. Connect the blower system to the pipe (1) with the quick-coupling loop.

6. Operation and daily maintenance

6.1 Starting and stopping

The start and stop functions are controlled by a push-button on the control panel.

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.

6.2 Inspection

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

6.2.1 Inspection after first start

Two hours after starting the granulator for the first time, check:

- the amount of play between the fixed and rotating knives
- that the knives' fastening bolts are tightened with the correct torque
- that the setting screws bear against the back of the knives
- that the counter nuts are tightened.

6.2.1 Daily inspection

- **Flaps in the hopper**. Check the flaps for damage. Damaged parts should be replaced immediately to prevent bits of the flaps from falling into the cutter housing and damaging the knives.
- **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. To re-start the machine, press “START”.

6.2.2 Weekly inspection

- **Cables**. Check all cabling in the machine for wear or damage. For reasons of personal protection, damaged parts should be replaced immediately.
- **Safety switches**. There are 3 safety switches, 1 for the screenbox, 1 for one of the hopper's locking clamps, and 1 for the hopper:

Screenbox: Open the screenbox as described in chapter 5.4.2, but close and lock the hopper as described in chapter 5.4.3. It should not be possible to start the granulator until the screenbox is closed and the locking screws are tightened.

Hopper: Open the hopper as described in chapter 5.4.2, but close and lock the screenbox as described in chapter 5.4.3. It should not be possible to start the granulator until the hopper is lowered, the locking hooks are fastened and the locking screws are tightened.

Locking clamps: Open the locking clamp, while the hopper and screenbox are closed and locked. It should not be possible to start the granulator until the locking clamps are fastened and the locking screws are tightened.

6.3 Cleaning

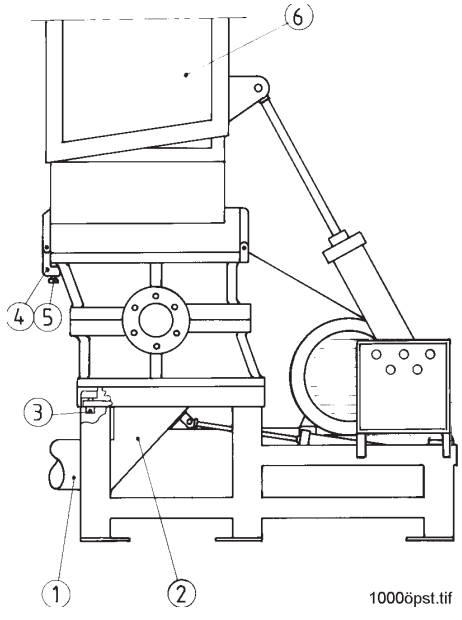
Always take great care when handling the knives since they are very sharp and can cause personal injury.

1. Open, as described in chapter 5.4.

   The granulator is now ready for cleaning.

2. Clean the hopper, flaps, screen and screenbox and granule bin.
3. Clean the cutter-housing.
4. Replace all parts in reverse order.

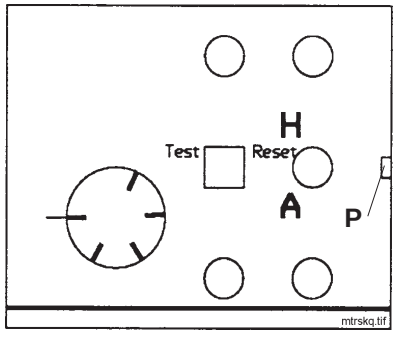
   Note: Cleaning should be carried out every time there is a change of material or colour, or at least once every 300 hours.



6.4 Trouble-shooting

6.4.1 If the granulator does not start

- Check that the emergency stop is not activated. It can be reset by turning the button in the direction of the arrow.
- Check that the locking clamps are completely tightened.
- Check that the break disks which actuate the safety switches are not damaged or have been dislodged from their position.
- 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 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!

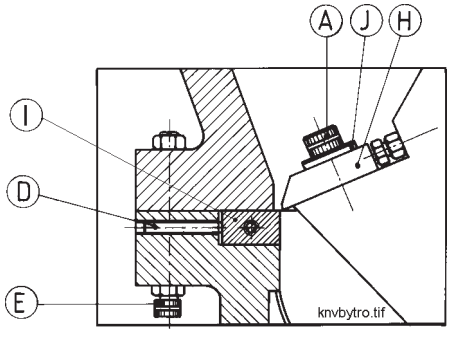
7.1.1 Disassembling the fixed and rotating knives

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

Every fourth time the knives are changed, the fastening screws should be replaced.

Disassembling the rotating knives :

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

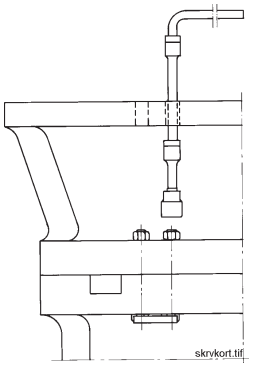


Disassembling the fixed knives (B)

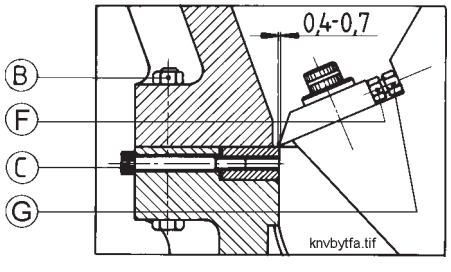
For granulators with a third fixed knife:
See chapter 11.1.1

Open the granulator as described in chapter 5.4.

1. Open the small covers on the flywheel's protective hood.



2. Turn the rotor so that the hole in the flywheel is right in front of the hole in the protective hood. The fixed knives' gables should be visible and be accessible for the special knife extractor included in the tool-kit.
2. Loosen the 12 nuts (B) along each long side and 4 along each short side, the latter using the tool as shown in the middle diagram.
3. Remove the setting screws (C).
4. Loosen the stop screws (D).
5. Screw in the two lift screws (E) on each long side until they touch the bottom.

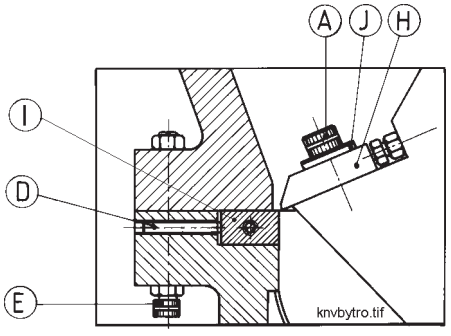


6. Then reduce the pressure on the cutter housing's upper part by tightening the screws (E) a further ˚ turn.
7. Pull out the knife using the special extractor included in the tool-kit.

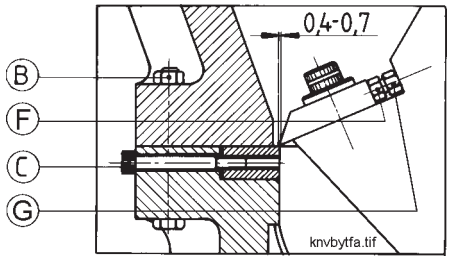
7.1.2 Assembling the fixed and rotating knives

Assembling the forward fixed knife.

For granulators with a third fixed knife:
See chapter 11.3



1. Check that the surfaces where the knives are to be set are free from plastic waste, etc.
2. Push the forward knife (I) into position (through the protective hood and flywheel).
3. Screw in the stop screws (D). Both of the outer screws are tightened so that the knife reaches its forward position, while the other (5 pcs) are screwed in until they only come into contact with the rear edge of the knife.



4. Check that the knife is straight and is not under tension.
5. Screw in the setting screws (C) and tighten using a torque of 90 Nm.
6. Unscrew both of the lift screws (E), located on the long side where a fixed knife is now fitted, until the cutter housing's upper part comes to bear against its lower part. **NOTE:** Carefully check that it is clean between both halves of the cutter housing, otherwise the bearing location can become damaged.

Assembling the rotating and rear fixed knives

For *pre-set knives,* see chapter 11.2

1. Clean the cutter's knife location and place two rotating knives in line in the knife location together with their retaining rulers (J). Tighten gently using the fastening screws (A)
2. Adjust the knives using the setting screws (F) to give the correct amount of play, 0.4 - 0.7 mm, between the rotating knives and the forward fixed knife (I).
3. Tighten the screws using a torque of 600 Nm.
4. Tighten the counter nuts (G).
5. Check the knife play again.

NOTE: The torque used for tightening the rotating knives' fastening screws should be checked after running the granulator for one shift after changing the knives.

Assembling the rear fixed knives

1. Put the rear fixed knives into position (through the protective hood and flywheel).
2. Turn the cutter so that the fitted knife pair are in front of the rear fixed knives' cutting edge.
3. Adjust the rear fixed knives using the setting screws (C) and (D) on this side to give the correct amount of play, 0.4 - 0.7 mm.

4. Unscrew both lift screws (E) on this side. Carefully check that it is clean between both halves of the cutter housing.
5. Tighten the 32 nuts (B) using a torque of 220 Nm.
6. Assemble the other four pairs of knives in the same way as for the first pair.
7. Check the amount of play once more.

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.

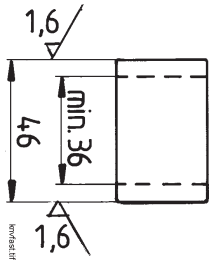
The following instructions apply only if you are using CONAIR MARTIN's sharpening fixture 2442. The sharpening fixture is intended for use in a surface grinding machine and should be fixed on a magnetic board.

7.2.2 Sharpening the fixed 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.

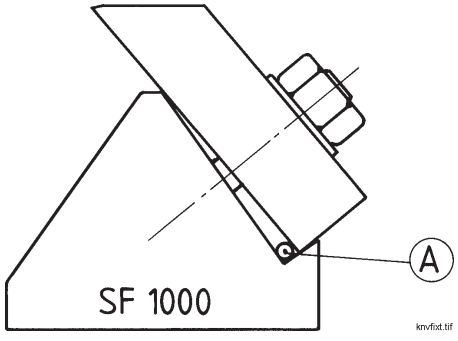
- The fixed knives are fixed directly on the surface-grinding machine's magnetic table and sharpened on two sides as shown in the diagram opposite. In this way, 4 edges can be used before the knives must be sharpened again.
- The knives can be sharpened only as much as is shown in the adjacent figure. After that, they are worn out and should be replaced by new ones in order for the granulation to be effective.



7.2.3 Sharpening the rotating knives

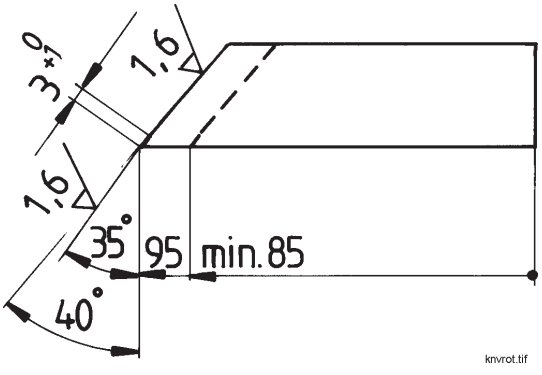
NOTE: All rotating knives should be sharpened equally so that the cutter does not become unbalanced.

- The rotating knife is fastened with the stirrup (A) under the lower part of the knife, as shown in the adjacent figure. Ball washers should be used when tightening. In this position the secondary relief angle, 40^0, is sharpened.



- Loosen the screws and remove the stirrup, fasten the knife again. In this position the cutting angle, 35^0, 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 and friction coupling

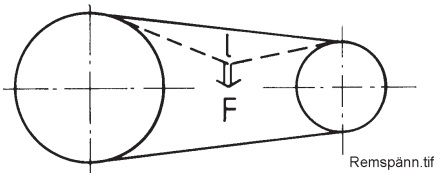
Belts:

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

WARNING! Be careful not to get caught between the pulleys and belts during the following steps.

- Unscrew the belt guard (= left gable) from the granulator.

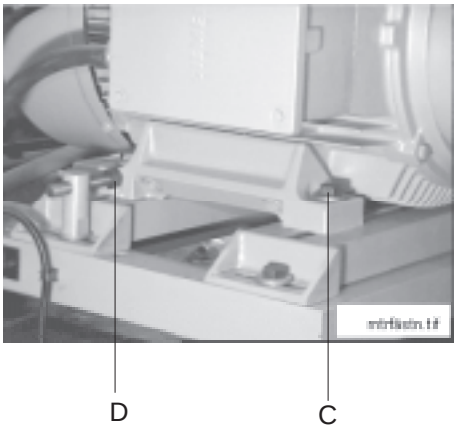
- Load one of the V-belts between the rotor pulley and the motor pulley with 75 N in the middle of and at a right angle to the belt. Measure the deflection and adjust the distance between the pulleys as necessary until the tension is correct. The V-belt should stretch 12 mm.



F = 75 N; l = 12 mm

Adjusting the belt tension:

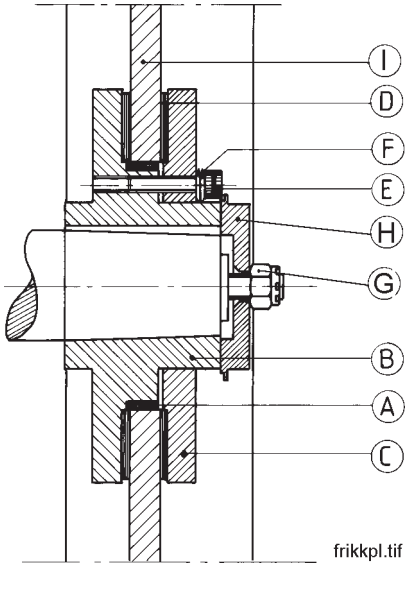
- Partially loosen the four screws (C) which fasten the motor to the two motor rulers.
- Adjust the belt tension using the screws (D), one on each side of the motor, until the correct belt tension (see above) has been obtained.
- Tighten the screws (C) using a torque of 400 Nm.



Friction coupling:

The friction coupling in the rotor pulley's hub is intended to protect against overloading and reduce the chance of damage if foreign objects are inserted by mistake into the granulator. When delivered, the friction couplings are set to transmit the required turning moment for normal grinding. To compensate for any wear of the spring-loaded friction lining which transmits the turning moment, it may be necessary to re-tighten the twelve socket-head screws located on the outside of the coupling. The screws should be tightened with a torque of 20 Nm.

For granulators with a 110 kw motor, a torque of 35 Nm should be used.



7.4 Lubrication

7.4.1 Cutter housing

CONAIR MARTIN recommends the following for lubrication of bearings.

Bearing: SKF 23220 CC/C3

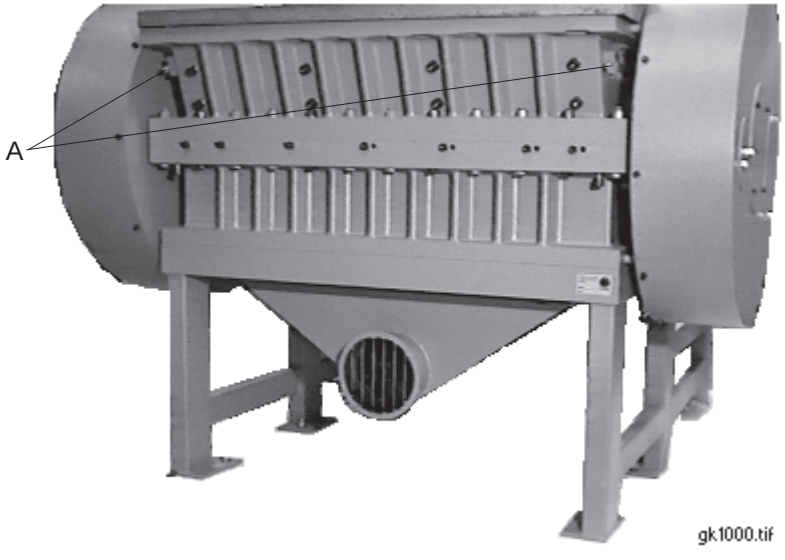
Lubricant: When delivered, the machine is filled with Spheerol APS 2 from Castrol. Other suitable lubricants are:

- SKF; SKF65B
- BP; BP Grease XRB2-EP
- Chevron; Industrial Grease Heavy
- ESSO; Beacon 2, Beacon 3
- Gulf; Gulfcrown Grease FF 2 E
- Mobil; Mobilux Grease 2
- Nynäs; FL3-42HFF
- OK; Oktosol Grease EP2
- Shell; Shell Alvania 3
- Texaco; Regal Starfak Premium 3

Re-lubrication interval: 2442 hours of operation or each year.

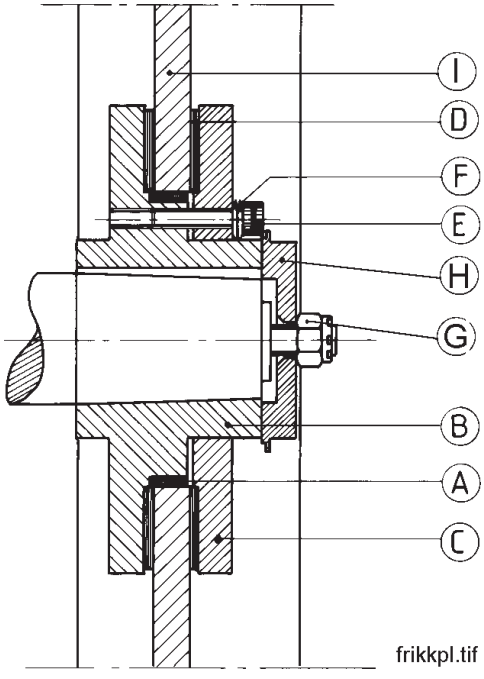
Grease quantity: Approx. 55 g/bearing.

Grease points: Grease nipples (A), one on each side, are shown in the figure below. If there is no flywheel on the right side, the grease nipple is located by the bearing housing.



7.5 Rotor pulley, changing the friction lining

7.5.1 Disassembling the rotor pulley:



1. Release the belt guard.
2. Release the castellated nut (G) after releasing the locking pin.
3. Release the disk (H).
4. Release the twelve screws (E) and washers (F) and pull off the expander washer (C).
5. Release the friction lining (D).
6. Lift away the pulley (I) using lifting equipment.

7.5.2 Changing the friction lining

1. Release the friction lining (A) and (D).
2. Clean and de-grease the surfaces on the pulley hub and pulley where the friction lining is to be placed.
3. Place the new lining (D) in position against the coupling hub (B).
4. Fit the new lining (A).

7.5.3 Assembling the rotor pulley:

1. Clean and de-grease all surfaces against which the friction lining will rest.
2. Lift the pulley (I) into place using lifting equipment. Carefully push the pulley into position making sure not to damage the friction lining (A).
3. Place the friction lining (D) against the pulley.
4. Fit the expander washer (C) and tighten with the twelve screws (E) and washers (F), using a torque of 20 Nm. Place a strong rubber band in a zigzag between the screws to secure them.
5. Fit the disk (H) and tighten securely using the castellated nut (G) with a torque of 700 Nm.
6. Lock the castellated nut using a split pin through the head and cutter spindle. Bend out the leg of the pin and bend it down against the expander washer.
7. Fit the belt guard.

To dismantle the pulley hub, contact CONAIR MARTIN's service personnel.

8. Spare parts list

8.1 Overview

The granulator is divided into the following modules:

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.

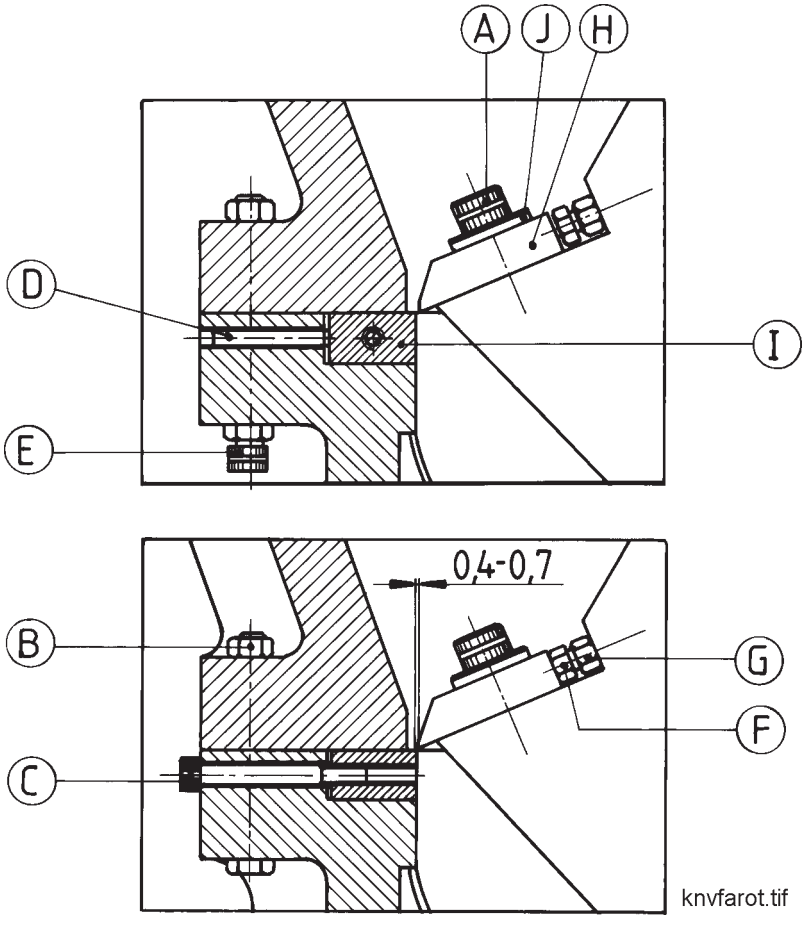
8.1.1 2442: table

Pos.	Qty.	Part no.	Pos.	Qty.	Part no.	Pos.	Qty.	Part no.
1	1	9-20547	31	1	1-06271	58	1	9-20544
2	1	4-13290	32	1	3-07371	59	1	9-20545
3	1	9-20548	33	1	3-10008	60	1	4-10162
4	4	4-04203	34	1	2-04776	61	1	4-13288
5	3	3-04192	35	1	4-02339	62	1	9-20550
6	1	3-10144	36	1	4-14453	63	1	see chapt. 9
7	1	9-10573	37	1	3-14560	64	2	2-03274
8	1	3-13003	44	1	4-03036	65a	1	9-30034*
9	1	3-10142	45a	1	LS10000102	65b	1	9-60689**
10	1	3-10143	45b	1	LS10000103	66	1	4-02143
11	1	4-06960	46	1	9-10570	67	2	3-03275
15	1	3-06058	47	1	9-10627	68	9	9-30029
21	1	9-20549	48	1	3-03012	69	4	4-07155
22	1	2-06448	49	1	4-11392	71	1	9-10473
24	1	4-02149	51	1	2-12743	75	1	3-16544
25	7	9-60010	52	1	3-09751	76	1	9-60057
26	1	2-02222	53	1	2-03022	77	1	2-23213
27	2	9-60009	54	1	2-10153	78	1	3-20648
28	1	3-10041	55	1	4-10150	79	1	2-16493
29	1	3-07370	56	1	9-20542	80a	1	3-23098***
30	1	4-08095	57	1	9-20543	80b	1	3-23099****

*	= 75 kw
**	= 110 kw
***	= Friction coupling
****	= Friction coupling M
45a	= 220 VAC
45b	= 110 VAC

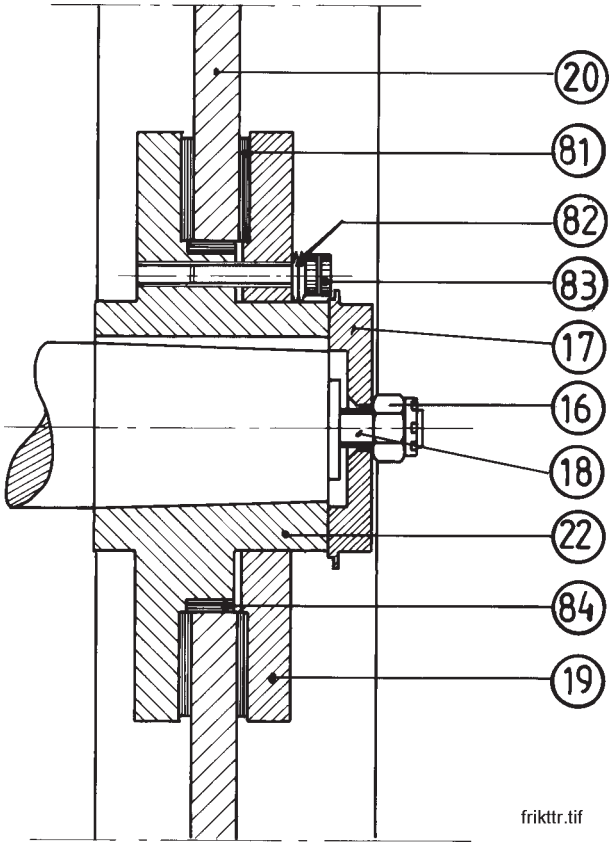
8.1.1 2442: diagram

8.1.2 2442: knives, fixed & rotating



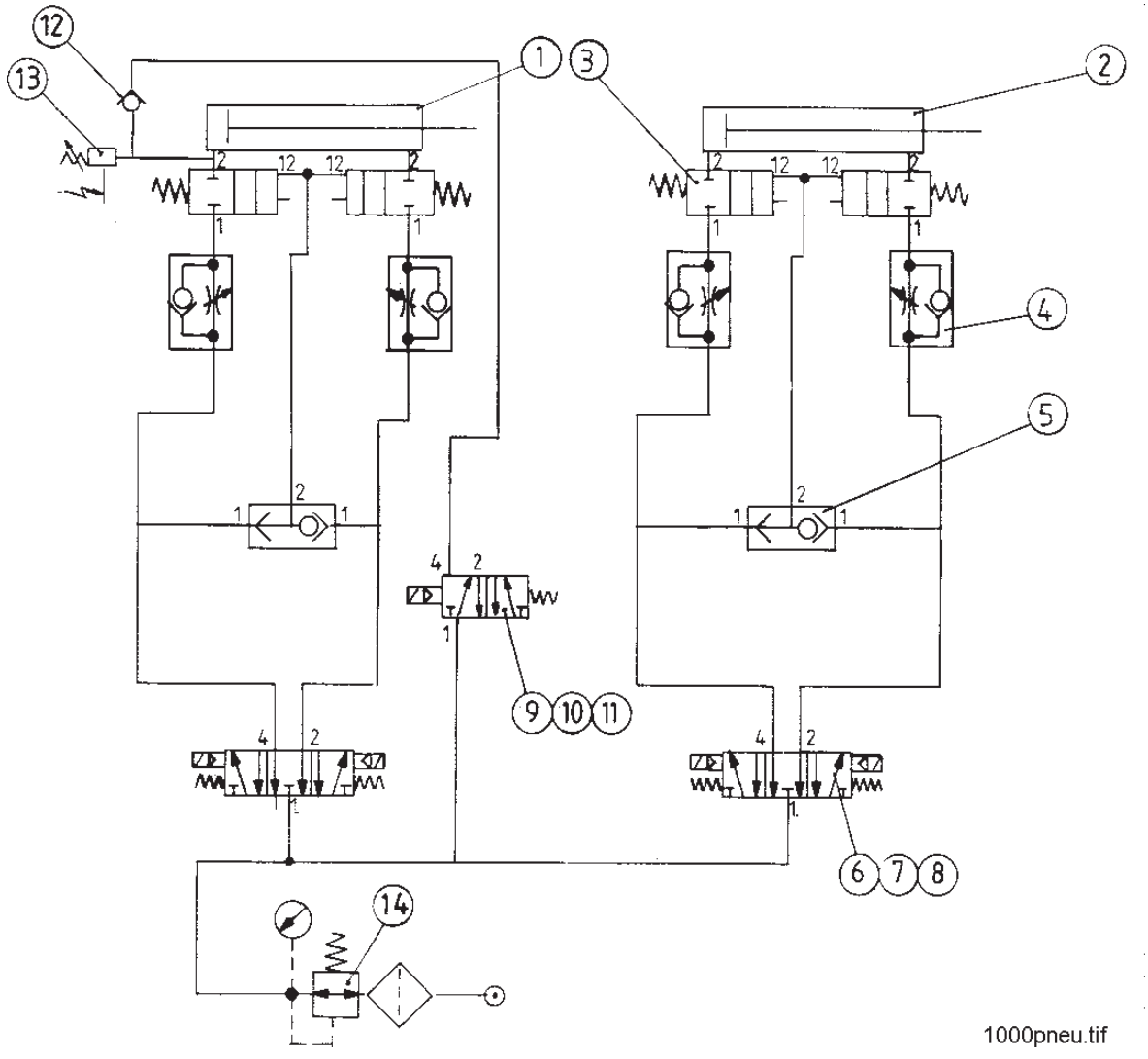
Pos.	Qty.	Part no.
A	40	9-40072
B	32	9-40189
C	14	9-40085
D	14	9-40081
E	4	4-02388
F	40	4-02393
	40	4-14780*
G	40	9-40182
H	10	3-08111
	10	3-16724*
I	2	3-08109
J	40	4-01063
*	Pre-set	

8 .1.3 Friction coupling, rotor pulley



Pos.	Qty.	Part no.
16	1	9-40089
17a	1	3-06058*
17b	1	4-12744**
18	1	4-02087
19	1	2-06449
20	1	9-30038
81	2	9-50127
82a	36	9-40087*
82b	72	9-40087**
83	12	9-40266
84	1	9-50146
*	= 75 kw	
**	= 110 kw	

8.1.4 2442: Pneumatic

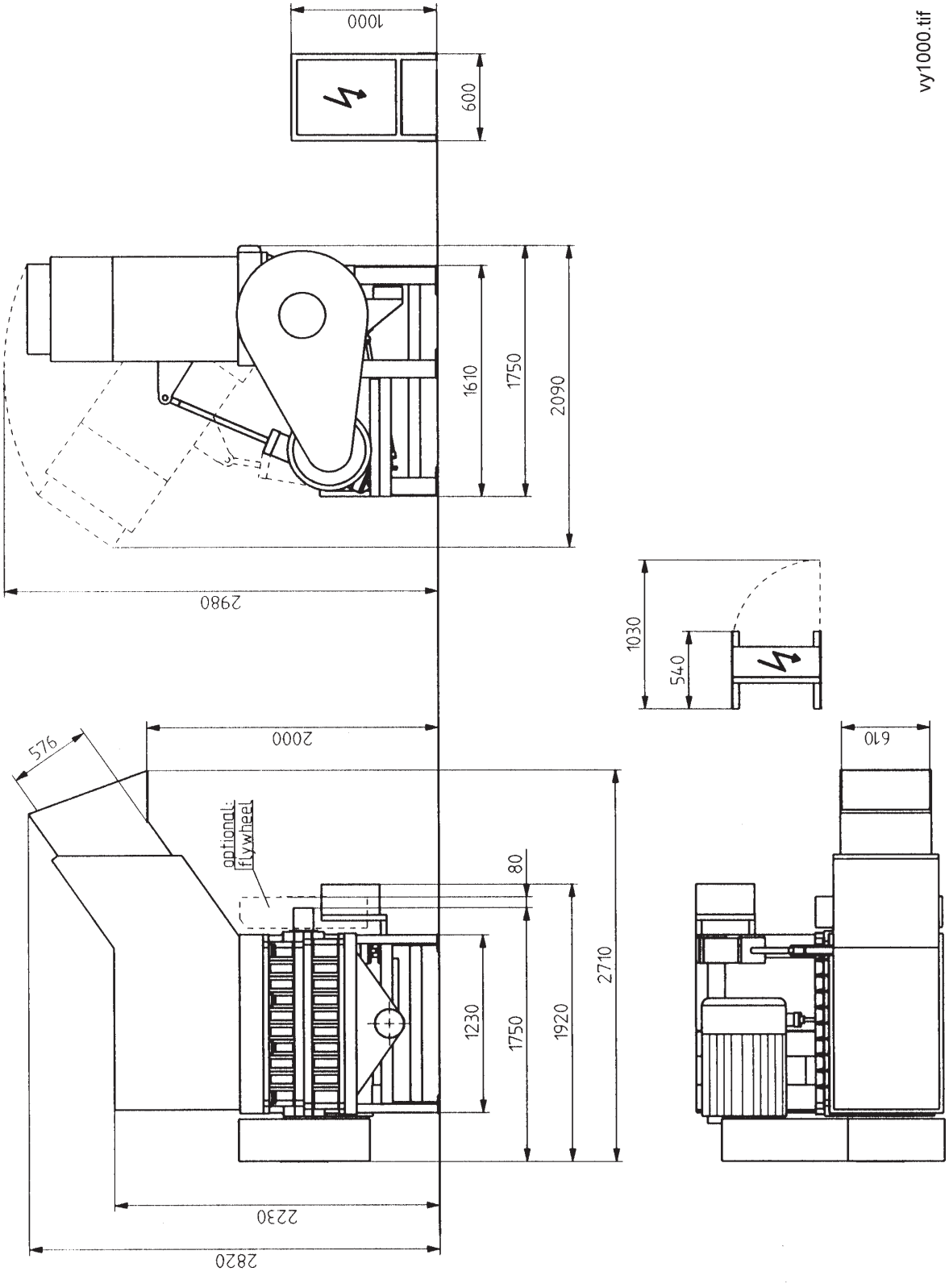


Pos.	Qty.	Part no.	Pos.	Qty.	Part no.
1	1	9-20547	8b	2	9-20691**
2	1	9-20542	9	1	9-20684
3	4	9-20448	10a	1	9-20685*
4	4	9-20447	10b	1	9-20690**
5	2	9-20449	11a	1	9-20686*
6	2	9-20682	11b	1	9-20691**
7a	2	9-20685*	12	1	9-20687
7b	2	9-20690**	13	1	9-20689
8a	2	9-20686*	14	1	9-20242

* = 220VAC
** = 110VAC

9. Electrical scheme

10. Layout


vy1000.tif
1000
600
1610
1750
2090
2980
1030
540
610
576
2000
optional:
flywheel
80
1230
1750
1920
2710
2230
2820

11. Options

11.1 Overview

The following options are described:

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.

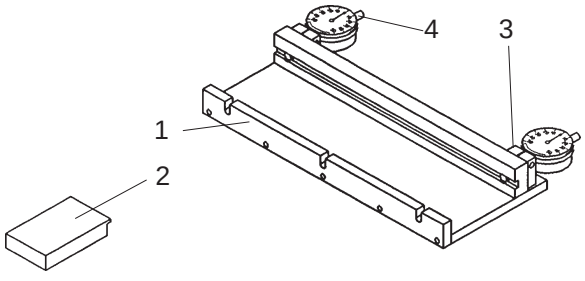
When ordering, the following should be specified:

- 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.

11.2 2442: Knife, pre-set

The basic setting of the knife fixture (1) is done using the knife gauge (2).

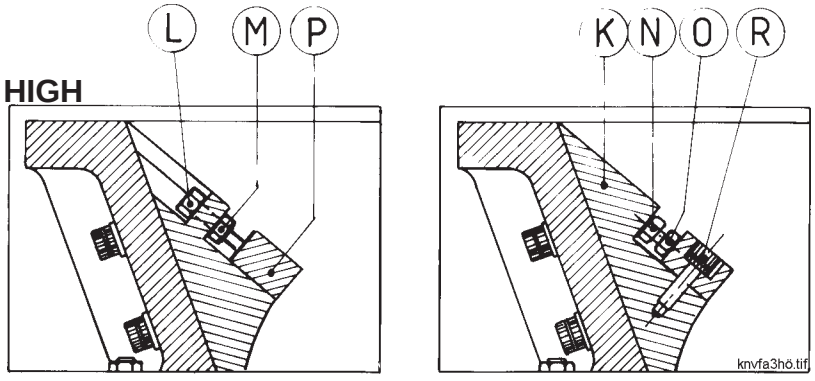
- Reset the thread indicator (4).
- Place the knife in the knife fixture. Adjust the outer setting screws so that the thread indicator shows "0".
- Then adjust one of the setting screws in the middle as long as the indicator moves. Then adjust the setting screw back until the thread indicator shows "0" again. Repeat with the other middle setting screw.
- The knife can now be placed in the cutter against the welded setting screws and tightened with a torque of 600 Nm.
- If less knife play is required, for example 0.3 mm, the knife is set to +20 (scale to the right) in the knife fixture.



Pos.	Qty.	Part no.
1	1	3-15602
2	1	3-15608
3	2	4-15607
4	2	9-70129

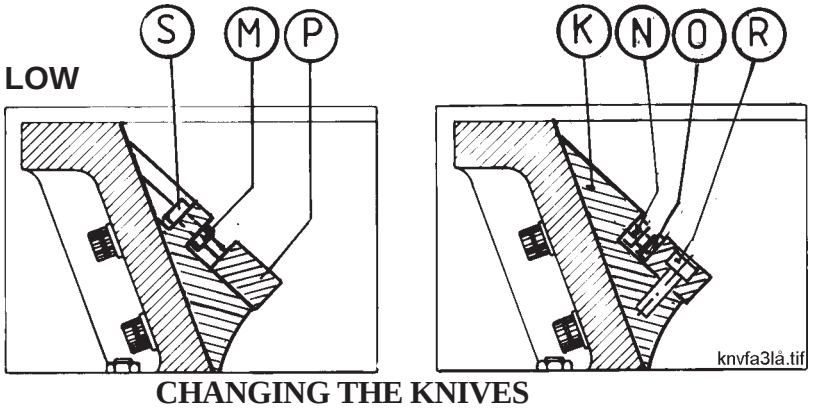
11.3 2442: Third fixed knife

HIGH



Pos.	Qty.	Part no.
K	1	2-06571
L	4	9-40485
M	4	9-40189
N	4	9-40068
O	4	9-40189
P	1	3-08112
R	9	9-40177

LOW



Pos.	Qty.	Part no.
K	1	2-14209
M	4	9-40189
N	4	9-40068
O	4	9-40189
P	1	3-08112
R	9	9-40177
S	4	9-40593

CHANGING THE KNIVES

Disassembling

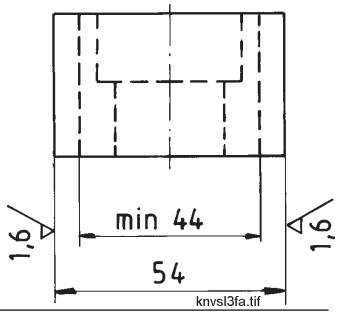
1. Remove the screws (R).
2. Loosen the nuts (M).
3. Loosen the screws (L).
4. Release the knife.

Assembling

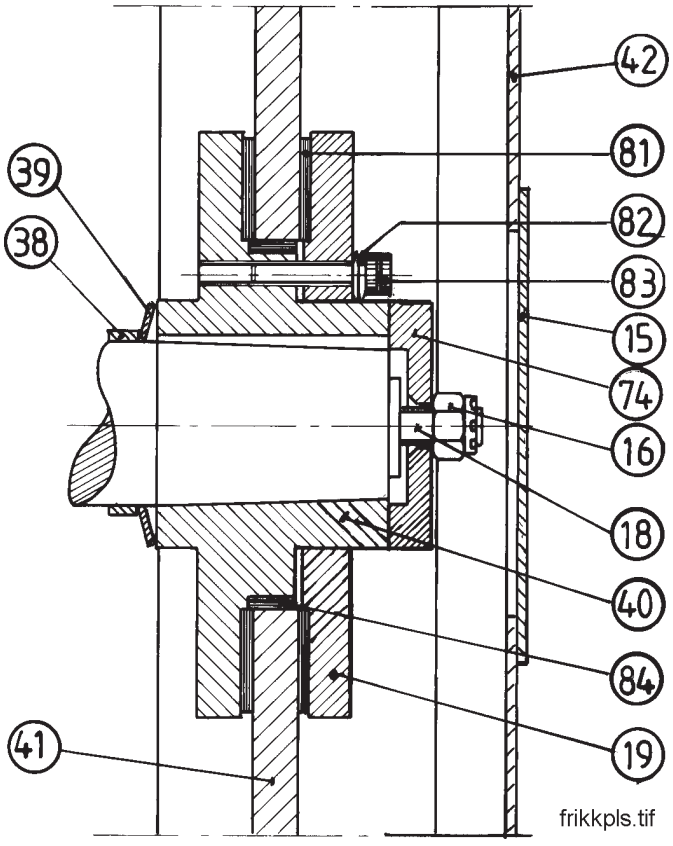
1. Check that the surfaces where the knives are to be placed are free from plastic waste, etc.
2. Place the knife (P) in its holder.
3. Gently tighten the screws (R).
4. Screw the setting screw (L) in the knife (P) with the locking nut (M) loose on the setting screw.
5. Adjust to get the correct amount of knife play, 0.3 - 0.7 mm, with the setting screws (N) and (L) between the third fixed knife and the rotating knives.
6. Tighten the screws (R) with a torque of 220 Nm.
7. Lock screw (N) with nut (O).
8. Lock screw (L)/(S) with nut (M).
9. Check that the screw head on screw (L)/(S) bears against the plane.

SHARPENING THE THIRD FIXED KNIFE

- The third fixed knife is fastened directly on the surface grinding machine's magnetic board and sharpened. The knife can be turned so that two edges can be used before resharpening.
- 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.



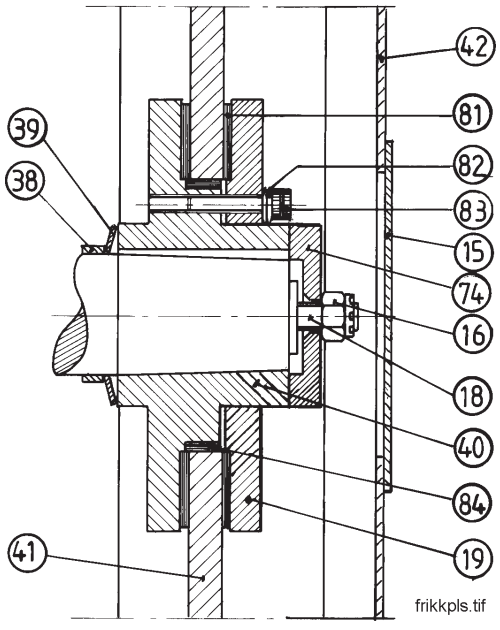
11.4 2442: Flywheel



Pos.	Qty.	Part no.
15	1	3-06058
16	1	9-40089
18	1	4-02087
19	1	2-06449
38	1	4-04738
39	1	4-04772
40	1	3-06500
41	1	9-30066
42	1	4-07591
81	2	9-50127
82	36	9-40087
83	12	9-40266
84	1	9-50146

Flywheel, changing the friction lining

Disassembling the flywheel



1. Release the flywheel cover (42).
2. Release the castellated nut (16) after the locking pin has been released.
3. Release the disk (19).
4. Release the twelve screws (83) and washers (82) and pull off the expander washer (19).
5. Release the friction lining (81).
6. Lift away the flywheel (41) using lifting equipment.

Changing the friction lining

1. Release the friction lining (84) and (81).
2. Clean and de-grease the surfaces on the pulley hub and the pulley where the friction lining is to be placed.
3. Place the new lining (81) in position against the coupling hub (40).
4. Assemble the new lining (84).

Assembling the flywheel

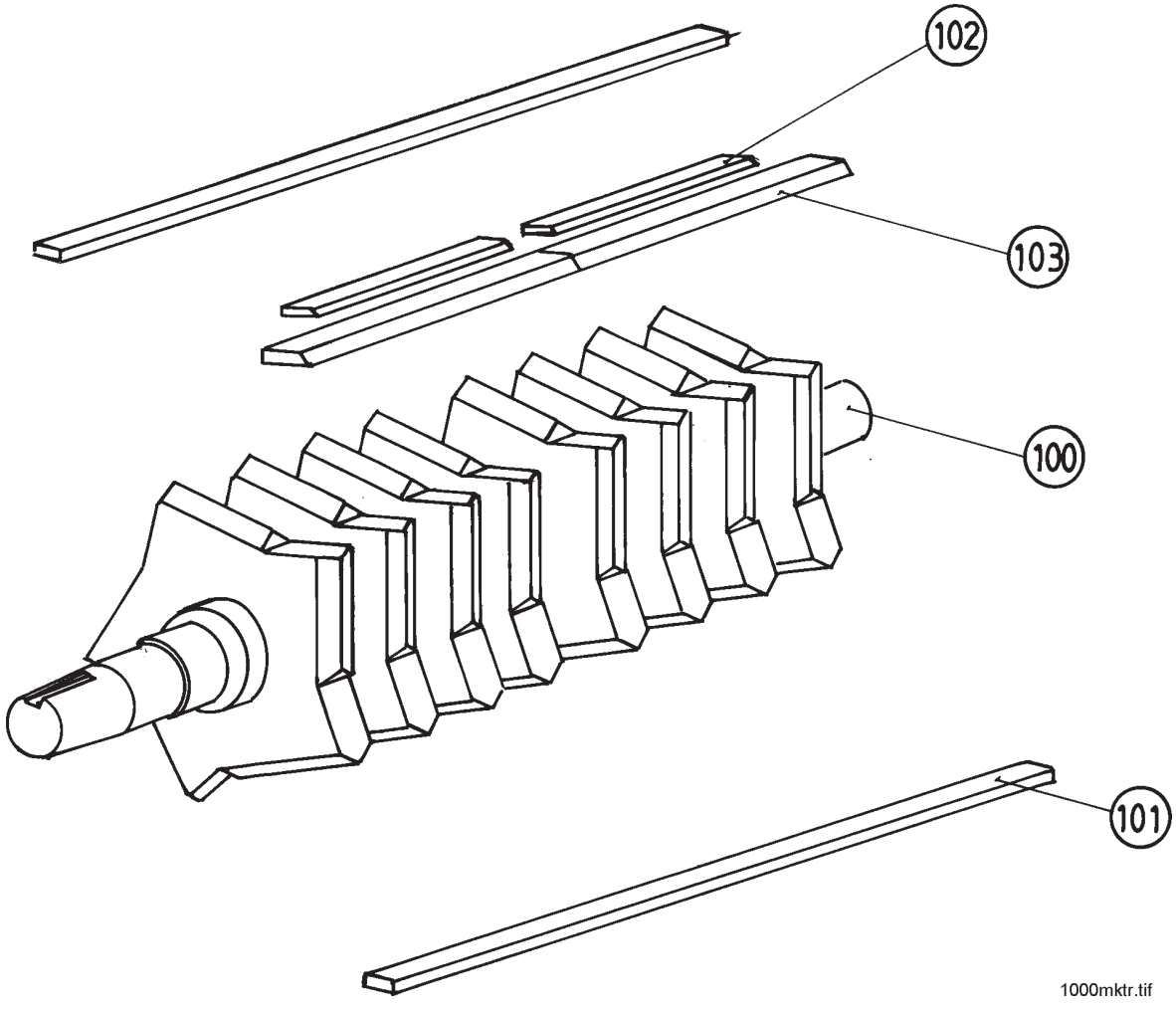
1. Clean and de-grease all surfaces against which the friction lining will rest.
2. Lift the pulley into place using lifting equipment. Carefully guide the pulley into position so that the friction lining (84) does not get damaged.
3. Place the friction lining (81) against the expander washer (19).
4. Fit the expander washer (19) and tighten securely using the twelve screws (83) with washers (82). Tighten using a torque of 20 Nm. Place a strong rubber band in a zigzag between the screws to secure them.
5. Fit the disk (74) and tighten securely using the castellated nut (16) with a torque of 700 Nm.
6. Lock the castellated nut using a split pin through the head and cutter spindle. Bend out the leg of the pin and bend it down against the expander washer.
7. Fit the flywheel cover (42).

To dismantle the flywheel hub, contact CONAIR MARTIN's service personnel.

Adjusting the friction lining:

Adjustments should be carried out as described in chapter 7:3.

11.5 M-rotor: table/diagram



Pos.	Qty.	Part no.
100	1	1-06442
101	2	3-08109
102	10	3-04197
103	10	3-08111

11.6 M-rotor: Knives, fixed/rotating, changing/sharpening

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.

11.6.1 Changing 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!

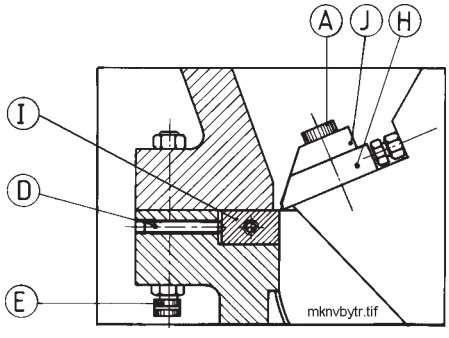
11.6.2 Disassembling the fixed and rotating knives

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

Every fourth time the knives are changed, the fastening screws should be replaced.

Disassembling the rotating knives

1. Remove fastening screws (A) and retaining ruler (J).

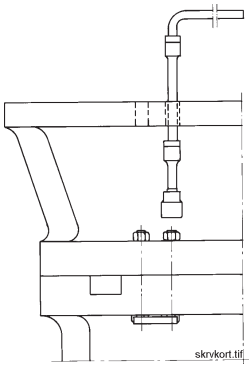


Disassembling the fixed knives (B)

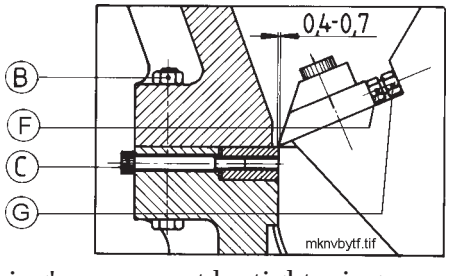
For granulators with a third fixed knife: See chapter 11.1.1

Open the granulator as described in chapter 5.4.

1. Open the small covers on the flywheel's protective hood.
2. Turn the rotor so that the hole in the flywheel is directly in front of the hole in the protective hood. The fixed knives' gables should be visible and be accessible for the special knife extractor included in the tool-kit.

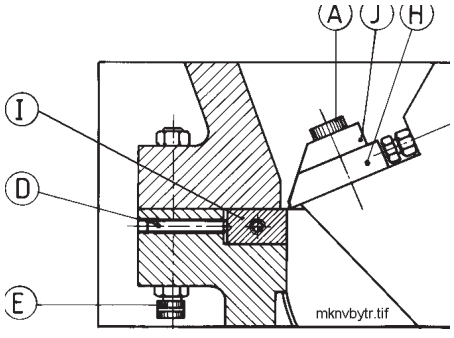


2. Loosen the 12 nuts (B) along each long side and 4 along each short side, the latter using the tool as shown in the middle diagram.
3. Remove the setting screws (C).
4. Loosen the stop screws (D).
5. Screw in the two lift screws (E) on each long side until they touch the bottom.



6. Then reduce the pressure on the cutter housing's upper part by tightening the screws (E) a further ˚ turn.
7. Pull out the knife using the special extractor included in the tool-kit.

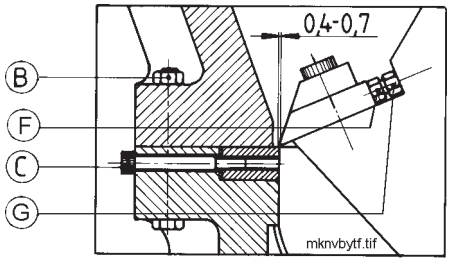
11.6.3 Assembling the fixed and rotating knives



Assembling the forward fixed knife.

For granulators with a third fixed knife: See chapter 11.3

1. Check that the surfaces where the knives are to be set are free from plastic waste, etc.
2. Push the forward knife (I) into position (through the protective hood and flywheel).
3. Screw in the stop screws (D). Both of the outer screws are tightened so that the knife reaches its forward position, while the other (5 pcs) are screwed in until they just come into contact with the back edge of the knife.



4. Screw in the setting screws (C) and tighten using a torque of 90 Nm.
5. Check that the knife is straight and is not under tension.

Spare-parts list for M-knives:

Pos.	Qty.	Part no.
A	40	9-40437
B	32	9-40189
C	14	9-40085
D	14	9-40081
E	4	4-02388
F	40	4-02393
G	40	9-40182

6. Unscrew both of the lift screws (E), located on the long side where a fixed knife is now fitted, until the cutter housing's upper part comes to bear against its lower part. **NOTE:** Carefully check that it is clean between both halves of the cutter housing, otherwise the bearing location can become damaged.

Assembling the rotating and rear fixed knives

For *pre-set knives,* see chapter 11.2

1. Clean the cutter's knife location and place two rotating knives in line in the knife location together with their retaining rulers (J). Tighten gently using the fastening screws (A)
2. Adjust the knives using the setting screws (F) to give the correct amount of play, 0.4 - 0.7 mm between the rotating knives and the forward fixed knife (I).
3. Tighten the screws using a torque of 600 Nm.
4. Tighten the counter nuts (G).
5. Check the knife play again.

NOTE: The torque used for tightening the rotating knives' fastening screws should be checked after running the granulator for one shift after changing the knives.

Assembling the rear fixed knives

1. Put the rear fixed knives into position (through the protective hood and flywheel).
2. Turn the cutter so that the fitted pair of knives are in front of the rear fixed knives' cutting edge.
3. Adjust the rear fixed knives using the setting screws (C) and (D) on this side to give the correct amount of play, 0.4 - 0.7 mm.
4. Unscrew both lift screws (E) on this side. Carefully check that it is clean between both halves of the cutter housing.
5. Tighten the 32 nuts (B) using a torque of 220 Nm.
6. Assemble the other four pairs of knives in the same way as for the first pair.
7. Check the amount of play once more.

11.6.4 Sharpening the knives

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

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.

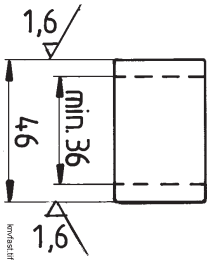
During sharpening, the knife must be cooled the whole time with plenty of water and must definitely not burn or start blueing on the edge since this means that the knife lacks durability and stability. If this occurs, the knife cannot be repaired by further grinding down or grinding away of the blued 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 2442. The sharpening fixture is intended for use in a surface grinding machine and should be fixed on a magnetic board.

11.6.5 Sharpening the 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.

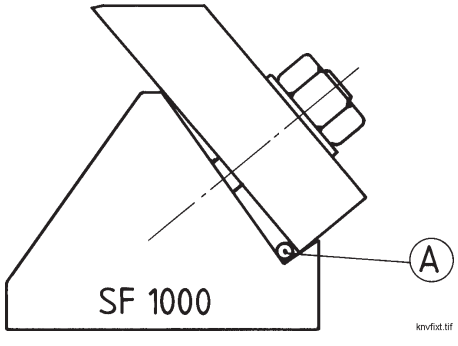


- The fixed knives are fixed directly on the surface-grinding machine's magnetic board and sharpened on two sides as shown in the diagram opposite. In this way, 4 edges can be used before the knives must be sharpened again.
- The knives can be sharpened only as much as is shown in the adjacent figure. After that, they are worn out and should be replaced by new ones in order for the granulation to be effective.

11.6.6 Sharpening the rotating knives

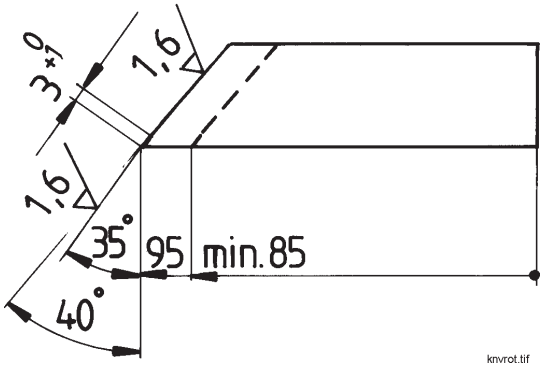
NOTE: All rotating knives should be sharpened equally so that the cutter does not become unbalanced.

- The rotating knife is fastened with the stirrup (A) under the lower part of the knife, as shown in the adjacent figure. Ball washers should be used when tightening. In this position the secondary relief angle, 40^0, is sharpened.

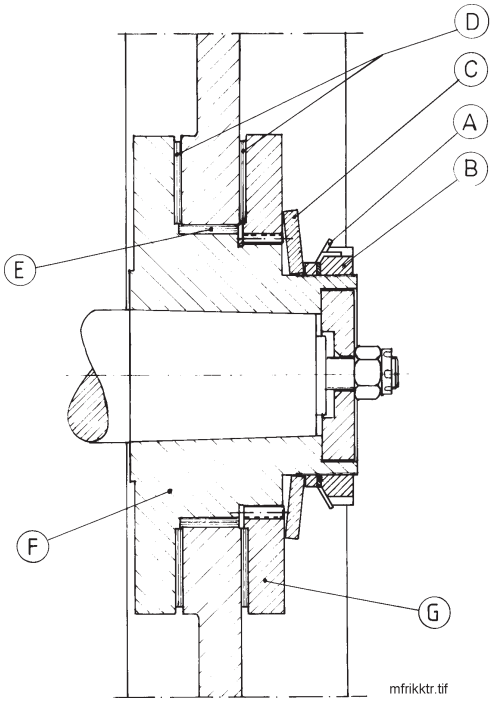


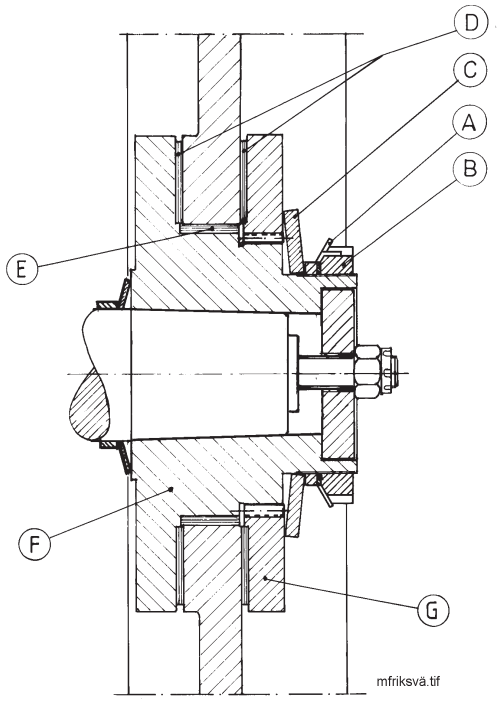
- Loosen the screws and remove the stirrup, fasten the knife again. In this position the cutting angle, 35^0, is sharpened.

- 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.



11.7 M-rotor: Friction coupling rotor pulley and flywheel, adjusting





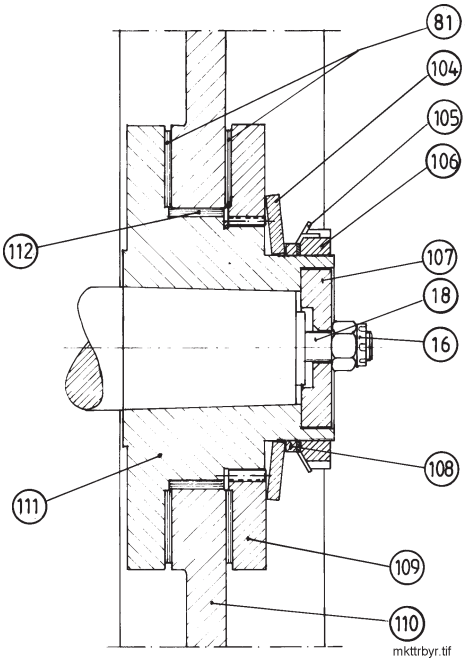
The rotor pulley's and flywheel's hubs are fitted with friction couplings which protect against overloading and reduce the risk of damage if foreign objects are inserted into the granulator by mistake. When delivered, the friction couplings are set to transmit the required turning moment for normal grinding.

When the spring-loaded friction lining — which transmits the turning moment — starts to become worn, it should be re-adjusted as follows:

1. Release the locking washer (A).
2. Loosen and unscrew the locking nut (B) until there is no load on the spring washer (C).
3. Check the friction lining (D). The minimum thickness should not be less than 3.5 mm. If the thickness is 3.5 mm or less, the lining should be replaced.
4. Screw the locking nut back in again until it comes into contact with the locking washer (A) and spring washer (C).
5. Tighten the locking nut 1.5 turns using the special key included with the machine.
6. Lock the locking nut (B) with the locking washer (A).

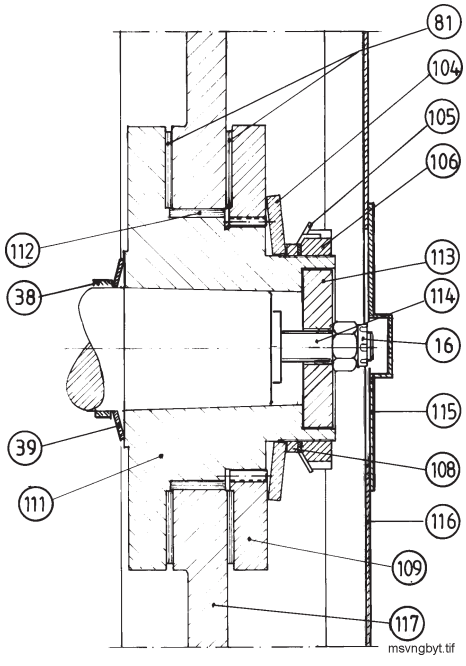
11.8 M-rotor: Friction coupling rotor pulley and flywheel, spare parts list

Rotor pulley:



Pos.	Qty.	Part no.
16	1	9-40089
18	1	4-02087
81	2	9-50127
104	1	3-04450
105	1	9-50131
106	1	9-50130
107	1	4-04451
108	1	4-09722
109	1	3-04449
110	1	9-30096
111	1	2-04448
112	1	9-50132

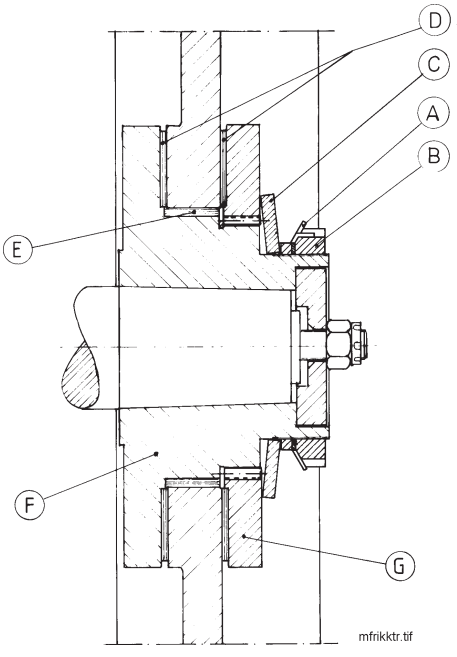
Flywheel:



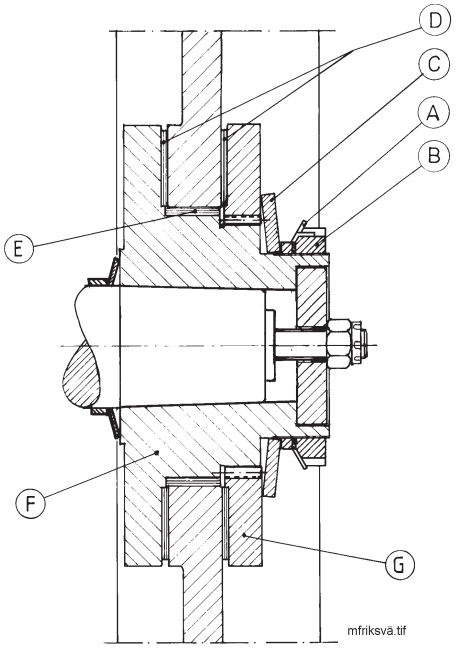
Pos.	Qty.	Part no.
16	1	9-40089
38	1	4-04738
39	1	4-04772
81	2	9-50127
104	1	3-04450
105	1	9-50131
106	1	9-50130
108	1	4-09722
109	1	3-04449
111	1	2-04448
112	1	9-50132
113	1	4-04775
114	1	4-04774
115	1	3-02382
116	1	4-07590
117	1	9-30095

11.9 M-rotor: Friction coupling rotor pulley and flywheel, changing

Rotor pulley:



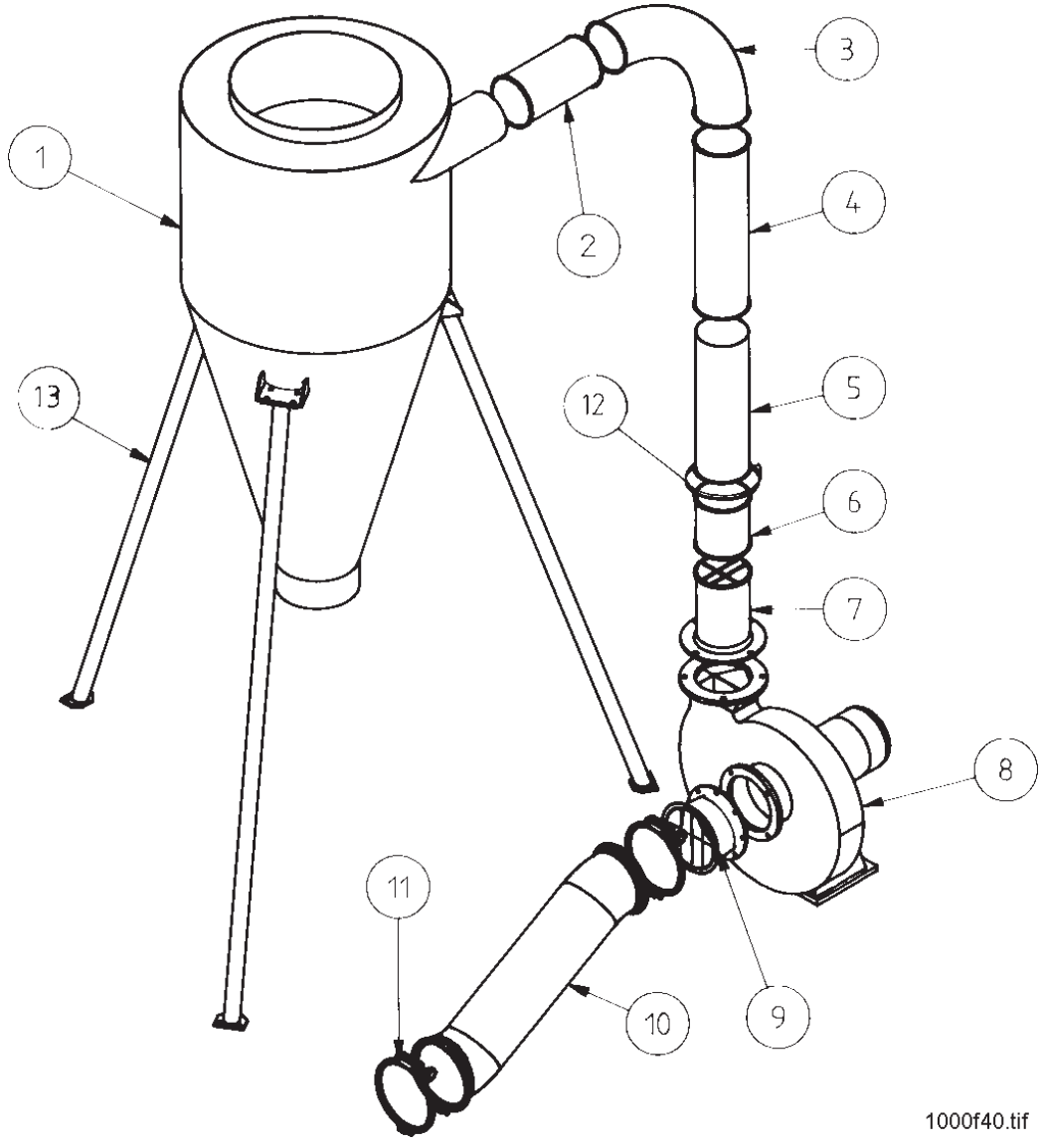
Flywheel:



Changing the friction coupling:

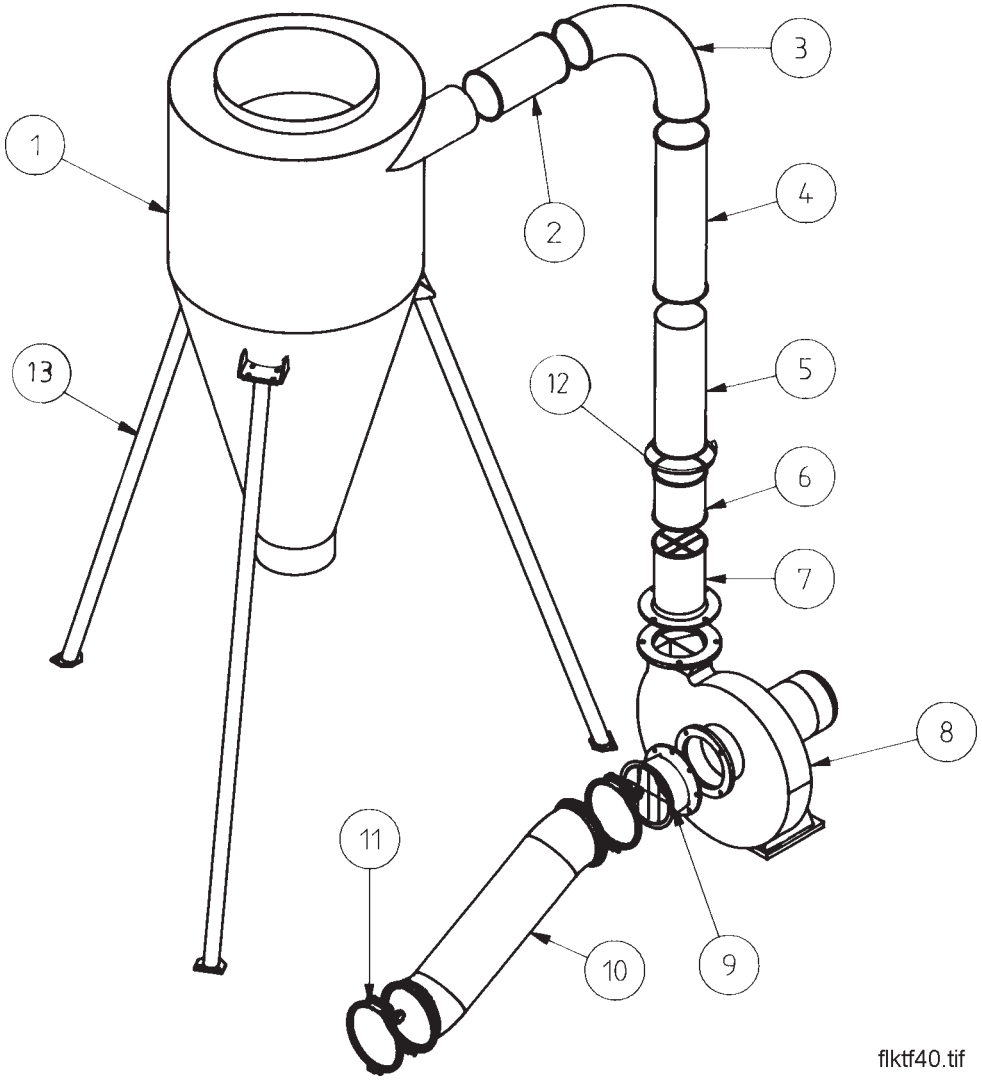
1. Release the locking washer (A).
2. Release the locking nut (B), locking washer (A), spring washer (C) and expander washer (G).
3. Release the rotor pulley/flywheel pulley using suitable lifting equipment.
4. Release the friction lining and clean the surfaces where the new lining is to be placed.
5. Fit the new friction lining as described in the spare parts list on page 11:12.
6. Carefully fit the rotor pulley/flywheel pulley using suitable lifting equipment so that the friction lining does not get damaged.
7. Fit the expander washer (G), spring washer (C), locking washer (A) and locking nut (B).
8. Screw in the locking nut (B) until it comes into contact with the locking washer (A) and spring washer (C).
9. Tighten the locking nut 1.5 turns using the special key included with the machine.
10. Lock the locking nut (B) with the locking washer (A).

11:10 2442: Blower system F 40 with cyclone AX 20



Pos.	Qty.	Part no.
1	1	2-03101
2	1	4-11767
3	1	4-11769
4	1	4-11766
5	1	9-20105
6	1	9-20197
7	1	4-08683
8	1	9-91343
9	1	4-08675
10	1	3-03268
11	2	2-12743
12	6	9-20107
13	3	4-00493

11.11 2442: Blower system HZS 18/45



Pos.	Qty.	Part no.
1	1	2-03101
2	1	4-11767
3	1	4-11769
4	1	4-11766
5	1	9-20105
6	1	9-20197
7	1	4-18754
8	1	9-20190
9	1	4-08675
10	1	3-03268
11	2	2-12743
12	6	9-20107
13	3	4-00493

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.