ARBOGA - DARENTH

OPERATING INSTRUCTIONS

SWARF CRUSHER

TYPE KB10

Customer: .....

Order No.: .....

Manufacturing No.: .....

Delivery date: .....

ARBOGA-DARENTH AB

Box 1022, SE-732 27 ARBOGA, Sweden, Tel +46 (0)589 - 610 200, Fax +46 (0)589 - 610 210

E-mail: info@arbogadarenth.se

Content

Foreword

ARBOGA-DARENTH Swarf Crushers guarantee good design, quality components and skilled labour plus years of experience in swarf handling and swarf crushing. All these abilities have been used to design a product with high reliability and long service life. We are convinced that your experiences will confirm your choice of ARBOGA-DARENTH Swarf Crusher.

Length of life and reliability can, as with any machine tool, be prolonged with correct installation and correct maintenance. It pays off to follow our advice for maintenance.

This maintenance manual consists of instructions for your new ARBOGA-DARENTH Swarf Crusher. It also contains greasing instructions, spare parts list with exploded view and a simple schedule for trouble-shooting.

ARBOGA-DARENTH Swarf Crushers are normally used in swarf handling systems which we design, sell and install.

All Swarf Crushers which leave our works are checked and do not need any additional maintenance other than stated in this manual.

For orders of spare parts and if you want to contact our engineers please find our phone number and address at the front page of this instruction.

Guarantee

All products from ARBOGA-DARENTH are guaranteed free from any fault in material and labour during a period of one year. One year consists of 365 calendar days or 1800 hours which ever occurs first. The guarantee period for our products starts the day the equipment is sent to the client and continues during one year as earlier described. This is due if our maintenance and control recommendations are followed.

The guarantee is not valid for incorrect erection, misuse, incorrect maintenance or if maintenance is not made due to our recommendations and accepted industry practice.

During the guarantee period and after written notice to us, we guarantee that all parts manufactured in our plant which are faulty regarding material or labour shall be replaced. We give no further guarantee either written or verbal for costs except material and man labour.

This guarantee or other guarantees from us do not cover:

1. Damage after the guarantee period is ended.

2. Damage caused by chemical reactions or wear due to the detail has been submitted to external influences.

3. Equipment damaged at delivery or by accidents.

4. Damage through misuse, incorrect use or feeding of the crusher or if recommended maintenance is not followed.

5. Damage to equipment which have been repaired or changed by others than by the one who has been acknowledged as our sole representative.

6. Wear parts.

The capacity depends on volume/weight of material, size and shape of the chips. The capacity and residual humidity data specified in our order confirmation are valid for your crusher.

Warnings

It is imperative for the reasons of safety to read these warnings and understand them in detail. If you not understand them, you must consult ARBOGA-DARENTH AB.

1. The owner of this equipment is responsible to install and operate the crusher in conformance with applicable federal, state and local regulations and to instruct the operating and maintenance personnel in safe operating procedures.

2. Never inspect, adjust, maintain or remove any material from the crusher or feed the hopper while the feeder arm is turning.

3. Electrically lock the motor and mechanically prevent it from rotating during maintenance or inspection. If you do not understand how to do this contact ARBOGA-DARENTH AB.

4. Before attempting to clear a clogged or jammed hopper or crusher chamber, or perform any inspection or maintenance, the motor and the master control must be de-energised and locked-out and fuses removed so that the crusher cannot be accidentally started.

5. Never, under any conditions, should any stick, rod or similar device be inserted into the hopper or discharge opening while the crusher motor is energised or the feeder arm is turning.

6. Never, under any conditions, should any person reach or look inside of the hopper or discharge opening while the crusher motor is energised or the feeder arm is turning.

7. Never, under any circumstances, walk or stand on the feeder arm unless the motor is de-energised and the feeder arm is locked in place. If the feeder arm were to turn, it could cause injury or death.

8. Never, under any circumstances, use this crusher for any purpose other than specified above. Do not make any changes or additions to the crusher, hopper, discharge opening, guards, base plate or drive motor unless approved by ARBOGA-DARENTH AB.

9. If your crusher was purchased as used equipment, make sure it is used for the original intended use and that requisite guards and interlocks are installed to latest regulations.

10. Never feed combustibles, explosives, drosses, petrochemicals or dust producing materials into the crusher. The crusher should be well ventilated to remove dust concentrations. Failure to comply with this warning can cause fire or explosions resulting in injury or death.

11. Every employee who operates or supervises the operation or maintenance of this crusher should read in detail and understand this warning.

12. This warning should be posted on the company bulletin board or on a wall that is accessible to and used for the purpose of posting company employee data.

Safety regulations

- Electrical installations have to be done by qualified personnel only.
- At connection of voltage feed as well as at service and maintenance work on the crusher the circuit breaker must be off.
- Test the emergency stop at installation and always when maintenance and service have been done.
- The crusher must not be operated with the covers removed.
- Protective goggles must be used for work around the crusher.
- Materials able to crush are all types of steel swarf, aluminium alloys and brass alloys, if any other material please ask ARBOGA-DARENTH.
- The data sheet from the coolant supplier must be studied as parts from coolant can cause allergic reactions.

WARNING!
The floor around the crusher might get slippery from coolant getting outside the machine.

Swarf crusher KB10

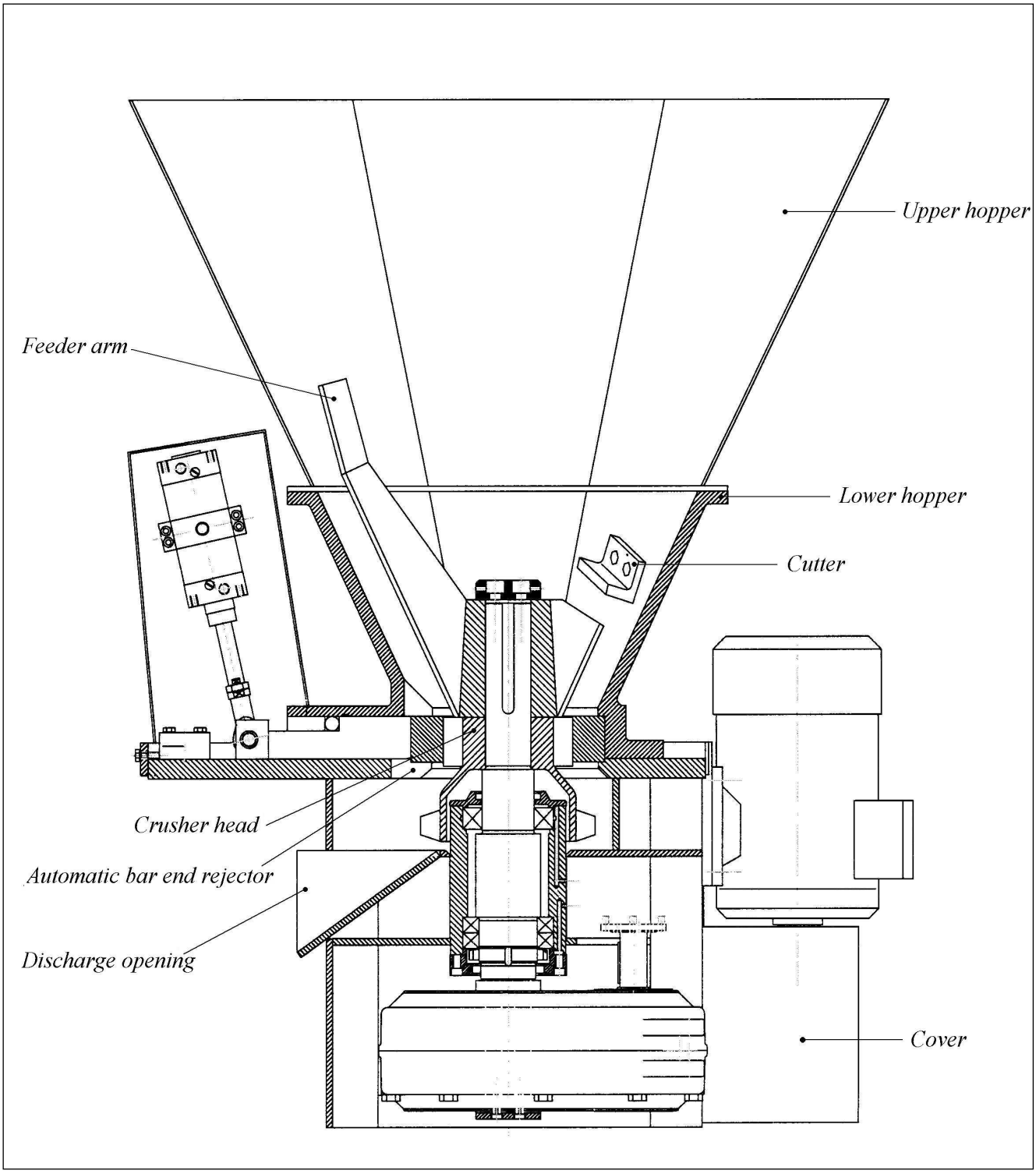


Figure 1

Working method

The swarf is fed into the upper hopper (a) of the crusher. On the sides of the lower hopper are bolted angled cutters (b). On top of the revolving shaft there is a feeding arm (c) with hard-welded cutters. On the shaft there is a rotating crusher head (d) and an outer stationary crusher ring (e). The swarf is broken up in short pieces. The swarf is fed successively down through the crusher chamber, where the fine crushing takes place in the lower part. After completed crushing the swarf is discharged through a chute in the frame. It is important that the hopper always is well filled up, otherwise it can happen that long swarf can go through the crushing tools. To prevent solid parts getting jammed in the crusher it is equipped with bar end rejector (f).

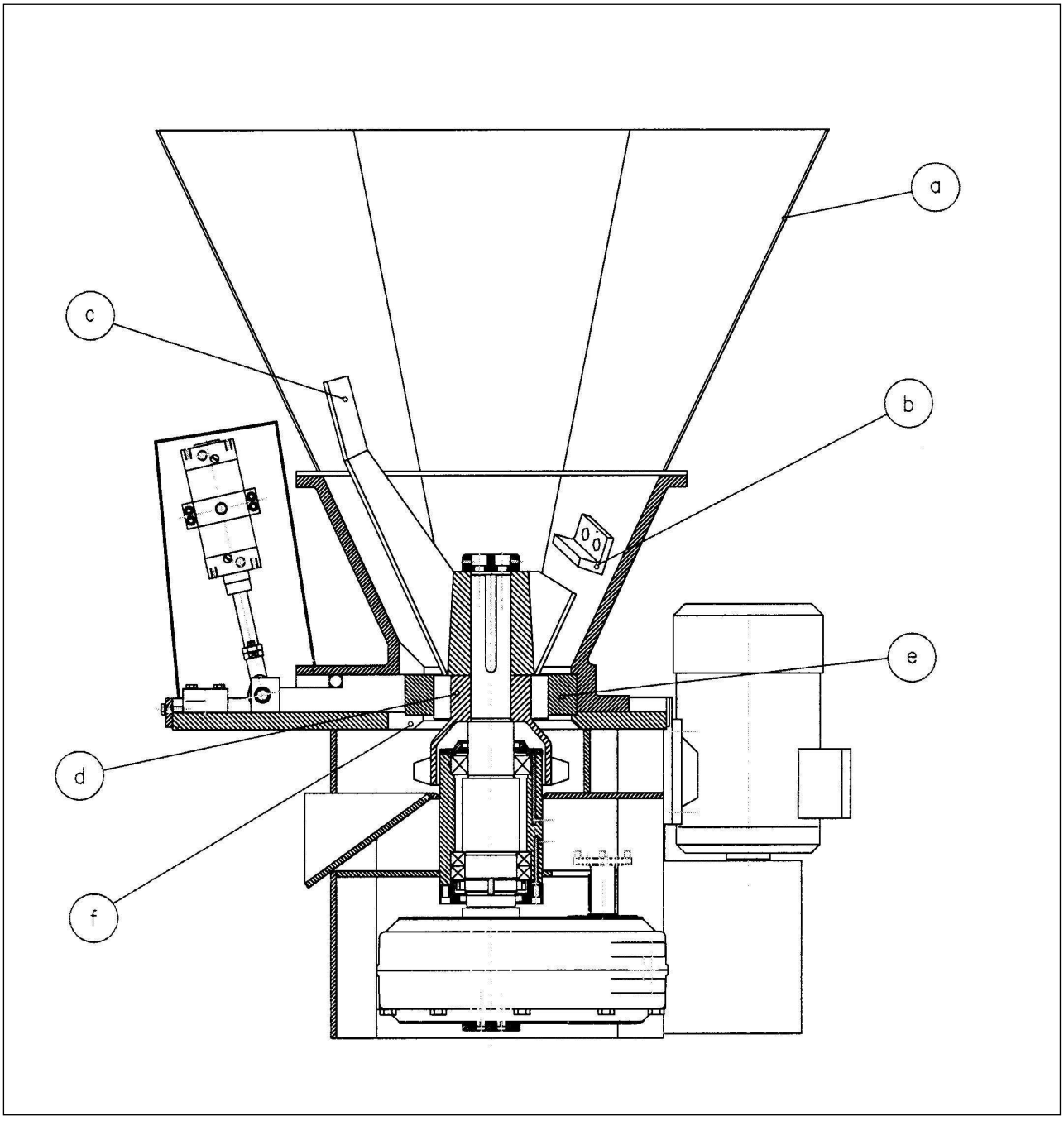


Figure 2

Lifting instruction

Lift the crusher by crane. Remove the upper hopper and place eye bolts (M12) in the lower hopper.

Fix the crusher with anchor bolts M12.

Weight 900 kg

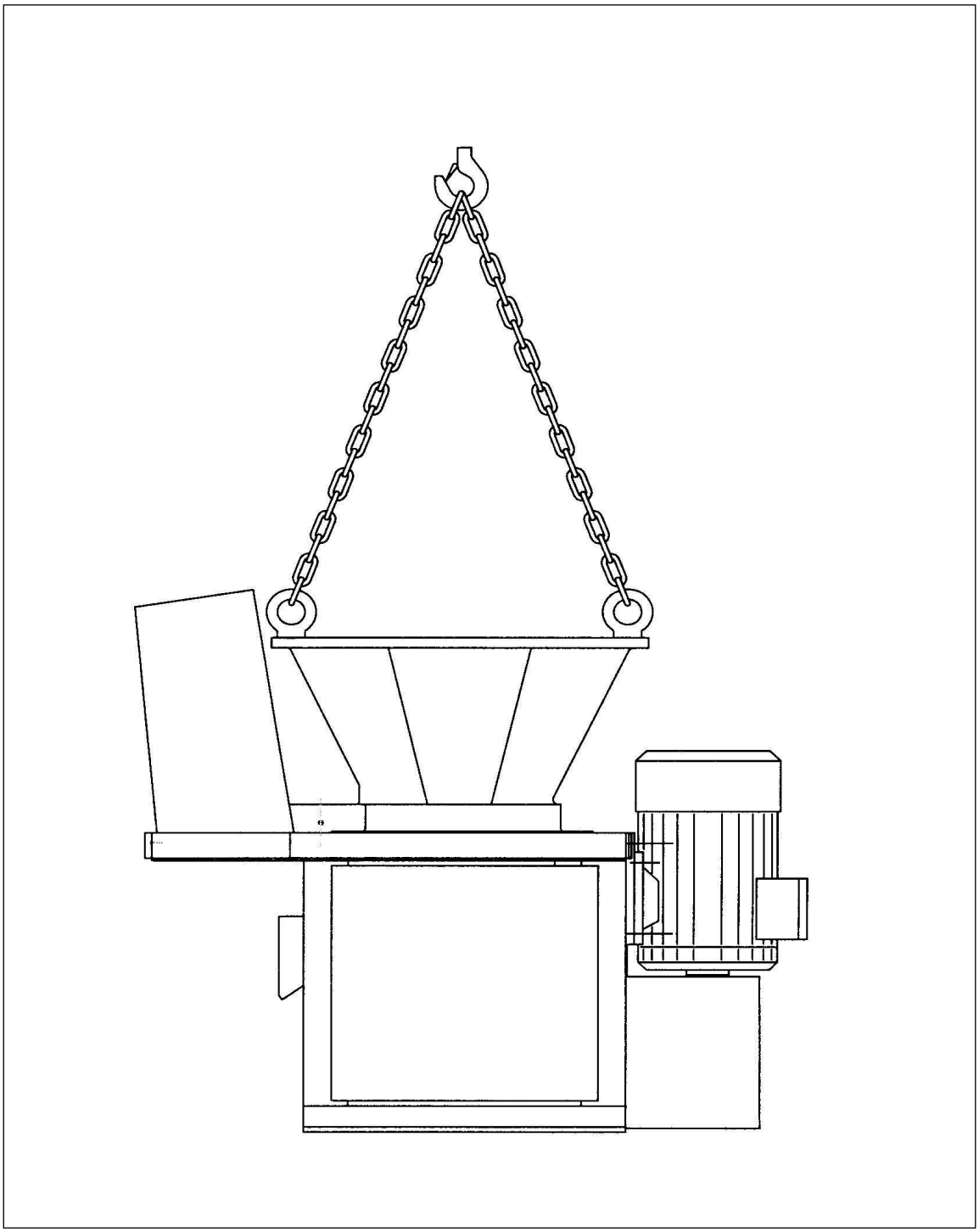


Figure 3

Installation

Figure 4 shows the main dimensions of the crusher. No specific foundations are required. The crusher must however be bolted down.

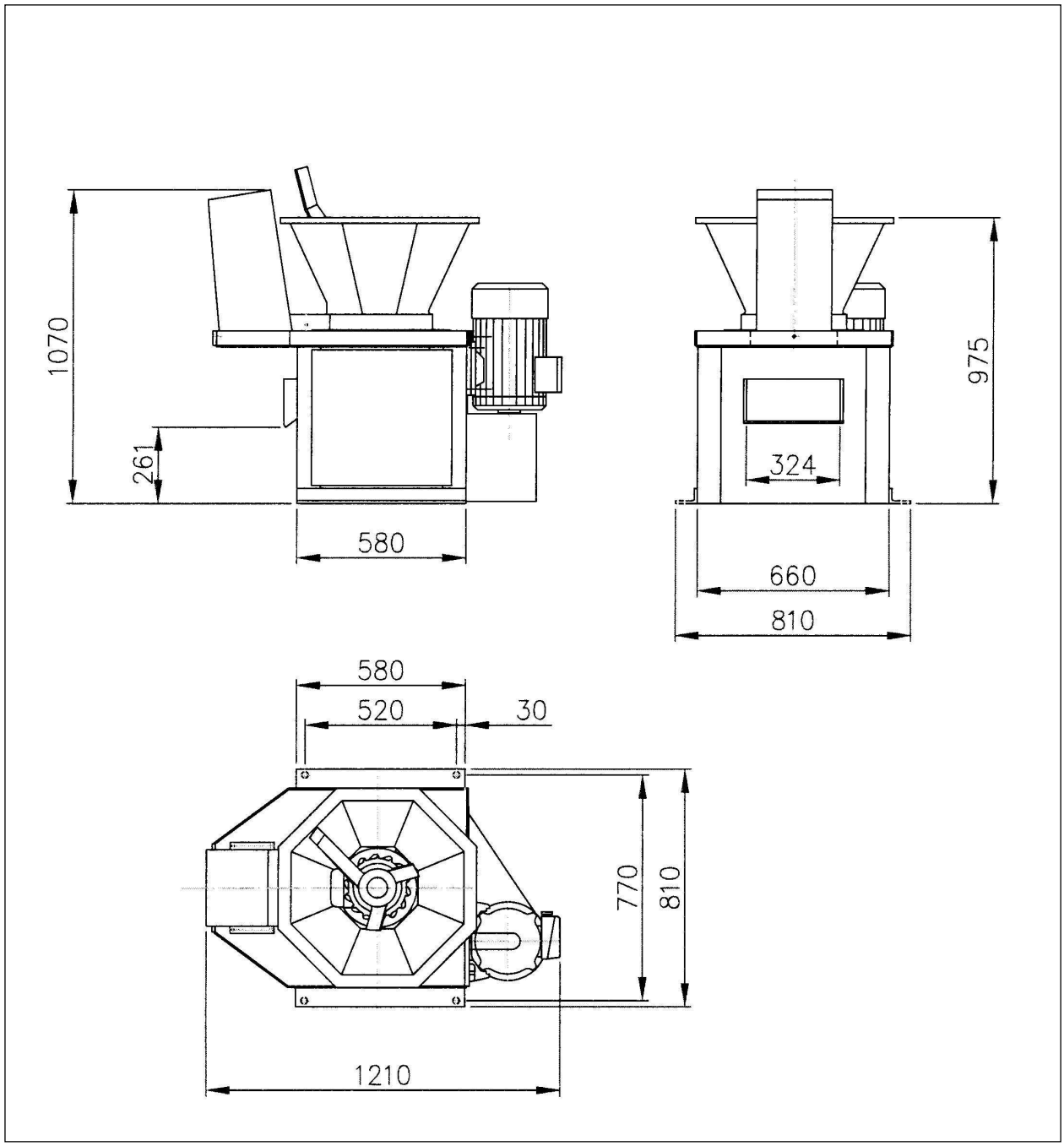


Figure 4

Assembly instructions

Cutter

1. Turn off and lock the circuit breaker.
2. Remove the upper hopper.
3. Unscrew one cutter from the outside of the hopper.
4. Re-assemble the corresponding new cutter.
5. Turn the crusher arm around so that the other cutters are free.
6. Remove the other cutters and replace them with new.
7. Be careful to re-assemble the corresponding cutter in its correct place. (See page 15, Pos 1-4)
8. Turn the crusher arm around and check that it is clear from the cutters, 2-3 mm is a suitable distance between crusher arm and cutters.
9. Re-assemble the upper hopper.
10. Turn on the circuit breaker.

Crusher arm

1. Turn off and lock the circuit breaker.
2. Remove the upper hopper.
3. Disassemble the washer on the shaft holding the crusher arm.
4. Place 2 eye bolts (M16) in the crusher arm.
5. Lift the crusher arm.
6. Place the new crusher arm on the shaft.
7. Re-assemble the washer.
8. Turn the crusher arm around and check that it is clear from the cutters, 2-3 mm is a suitable distance between crusher arm and cutters.
9. Re-assemble the upper hopper.
10. Turn on the circuit breaker.

Crusher ring and crusher head

1. Turn off and lock the circuit breaker.
2. Remove the upper hopper.
3. Disassemble the washer on the shaft holding the crusher arm.
4. Place 2 eye bolts (M16) in the crusher arm.
5. Lift the crusher arm.
6. Remove the lower hopper.
7. Lift the crusher ring.
8. Remove the segment from the bar end rejector.
9. Lift the crusher head.
10. Place the new crusher head on the shaft.
11. Assemble the new segment in the bar end rejector.
12. Place the new crusher ring in the groove.
13. Secure the crusher ring with the key.
14. Check that the crusher head revolves.
15. Re-assemble the lower crusher hopper and tighten with silicone packing.
16. Put the keys in the shaft and the crusher head.
17. Re-assemble the crusher arm on the shaft.
18. Turn the crusher arm around and check that it is clear from the cutters, 2-3 mm is a suitable distance between crusher arm and cutters.
19. Adjust the segment and check that it is clear from the crusher head, 2-3 mm is a suitable distance.
20. Re-assemble the upper hopper.
21. Turn on the circuit breaker.

Automatic bar end rejector

If the crusher is overloaded, i.e. if solid parts are jammed in the lower tools, a rotation sensor switches off the motor. A pneumatic cylinder pulls one segment of the crusher ring back and the crusher reverses for about 3 secs. Solid parts and swarf can then pass through the crushing tools. After reversing the crusher starts automatically. If an uncrushable solid part drops down into the hopper, the reversing action is repeated 4 times in succession until the protective motor switch shuts off. The crusher stops and alarm sounds. When alarm is given you must examine what has stopped the crusher.

CAUTION!
Before examination, the main switch must be turned off and locked so that the crusher can not start involuntarily while you are working with it. The rotation sensor has two (2) time delays, one for start 0.1–20 secs. (allows start with overload) and one for reaction time to avoid reversing with short peak loads.

Greasing

1. Crusher shaft bearings
Greasing is to be done through 2 nipples. These are situated on the tube which surrounds the shaft. To reach these nipples the side plate has to be removed.
Use ball bearing grease of good quality (eg Statoil Uniway LI62 or similar).

Greasing interval: every 6th month at 1-shift operation, 100-150 g grease per bearing.

2. Bar end rejector
Greasing of the bar end rejector is to be done through one nipple which is situated on the crusher hopper on the side of the bar end rejector.
Greasing interval: every 14th day at 1-shift operation, 100-150 g grease.

3. Gear
The gear manufacturer’s specifications are to be followed, see enclosure.

CAUTION! It is important for the correct function of the crusher that the hopper maintains a constant level of swarf. Otherwise long swarf may pass directly through the tools without being crushed.

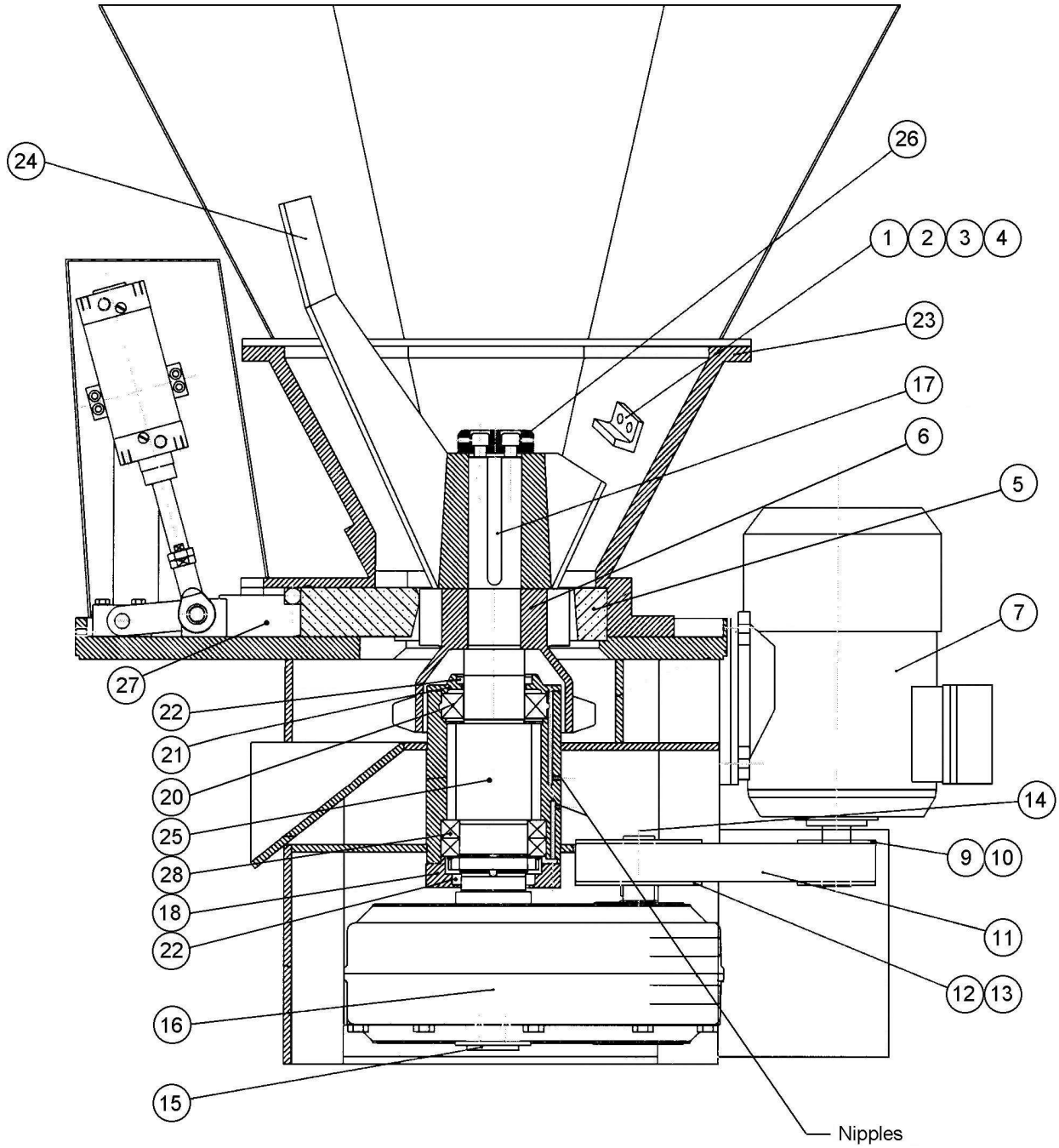
Spare parts list

NB! When ordering spare parts, please specify the following data:

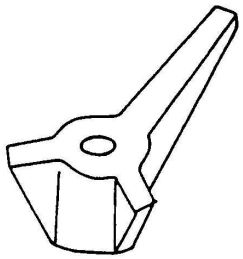
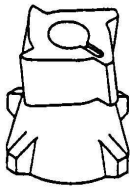
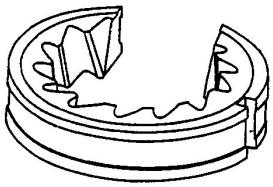
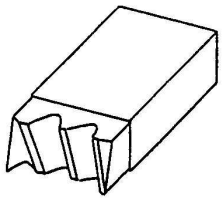
- Type
- Serial number
- Designation
- Article number

Pos	Article No.	Designation	Qty	Unit
1-4	901116	Cutter set for hopper	8	Pcs
1	921117	Cutter IV	2	Pcs
2	921116	Cutter III	2	Pcs
3	921115	Cutter II	2	Pcs
4	921114	Cutter I	2	Pcs
5	921120 921112	Coarse crusher ring Fine crucher ring	1 1	Pce Pce
6	903205 921121	Coarse crusher head Fine crusher head	1 1	Pce Pce
7	96108	Motor 7,5kW 380V 50Hz	1	Pce
9	9702408	Pulley	1	Pce
10	9702514	Bushing	1	Pce
11	9702308	V-belt	1	Pce
12	9702409	Pulley	1	Pce
13	9702515	Bushing	1	Pce
14	95235	Rotation sensor	1	Pce
15	943216	Washer	1	Pce
16	96404	Gear unit	1	Pce
17	970381811	Key	1	Pce
18	941215	Bearing cover	1	Pce
20	970116	Bearing	1	Pce
21	941217	Bearing cover	1	Pce
22	970703	Sealing	2	Pcs
23	903202	Hopper	1	Pce
24	901107	Feeder arm	1	Pce
25	943200	Shaft	1	Pce
26	941101	Washer	1	Pce
27	901206	Segment	1	Pce
28	970106	Bearing	2	Pcs

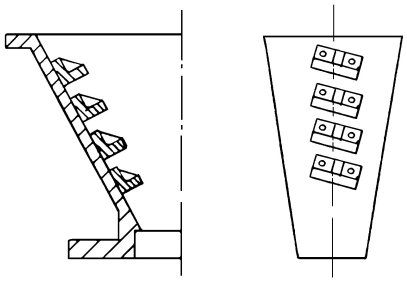
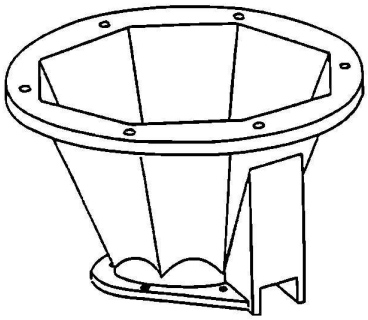
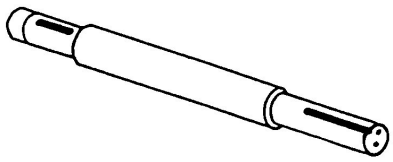
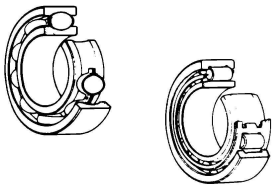
Drawing - spare parts



Spare parts that should be stocked

Pos	Article No.	Denomination	Qty	
24	901107	Feeder arm	1 pce	
6	903205 921121	Coarse crusher head Fine crusher head	1 pce 1 pce	
5	921120 921112	Grovkrossring Finkrossring	1 pce 1 pce	
27	901206	Segment	1 pce	

Spare parts that should be stocked

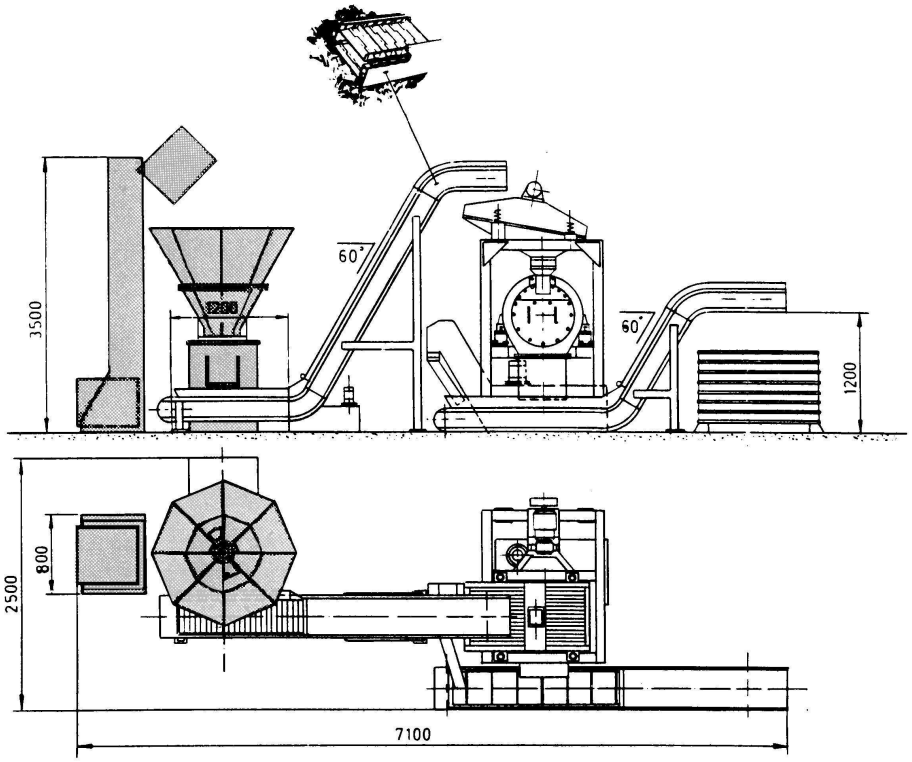
Pos	Article No.	Designation	Qty	
1-4	901116	Cutters for hopper	1 set	
1	921117	Cutter IV	2 pcs	
2	921116	Cutter III	2 pcs	
3	921115	Cutter II	2 pcs	
4	921114	Cutter I	2 pcs	
23	903202	Hopper	1 pce	
25	943200	Shaft	1 pce	
20	970116	Bearing	1 pce	
28	970106	Bearing	2 pcs	
22	970703	Bushing	2 pcs	

Trouble-shooting

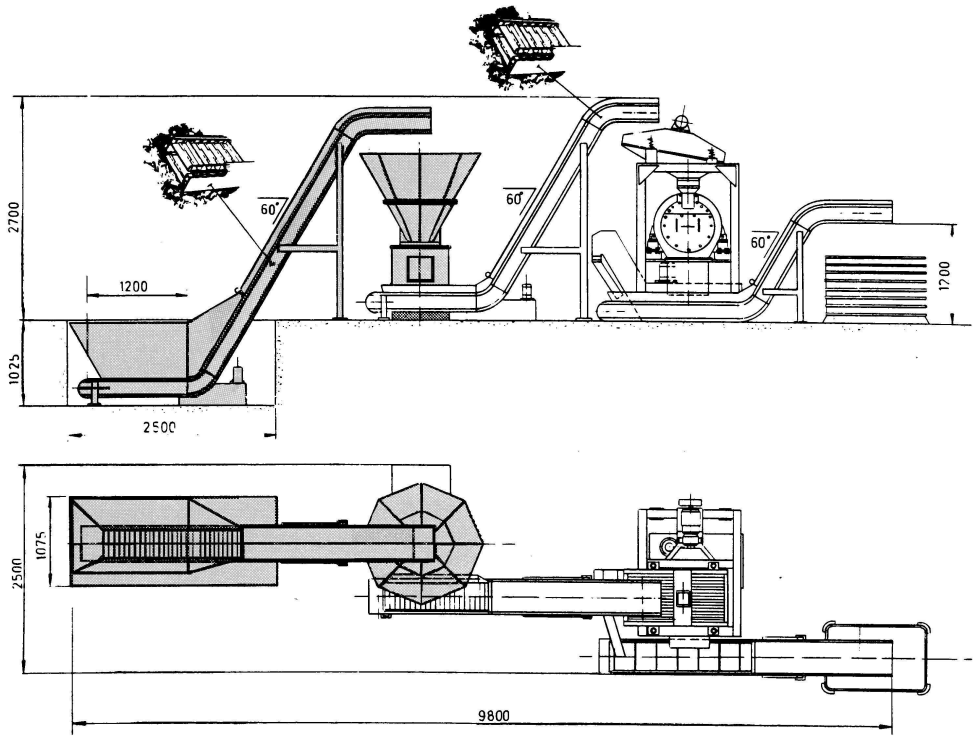
This trouble-shooting schedule only serves as a guide to probable reasons for faults. As mentioned earlier correct maintenance is the best insurance against the development of defects.

Problem	Symptom	Action
The crusher does not start.	Electrical fault.	Check the fuses and the torque limiters.
The motor starts but the feeder arm stands still.	V-belt broken.	Exchange V-belt.
The motor reverses and shuts off.	Large pieces have fallen down in the hopper and blocked the feeder arm.	Remove the pieces. **NB!** Cut the main power before working in the hopper.
Poor crushing effect, i.e. long swarf in the output.	Worn down crushing tools (crusher head, crusher ring), wrong type of crushing tools regarding the type of swarf. The crusher hopper is not filled enough.	Exchange the crushing tools. Always allow the hopper to be filled. **NB!** The crusher works best when the hopper is filled.
The bearing on the shaft over-heats.	Bad greasing.	Look in this manual for greasing instructions.

Exemples of erection



Skiphoist feeding



Conveyor feeding