ARBOGA - DARENTH

OPERATING INSTRUCTIONS

SWARF CRUSHER

TYPE KB30

Customer: .....

Order No.: .....

Manufacturing No.: .....

Delivery date: .....

ARBOGA-DARENTH AB

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E-mail: info@arbogadarenth.se

KB30-0505

144306(00)

2010-01-01

Contents

Declaration of conformity

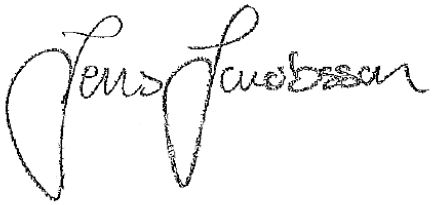
We, AB Ph. Nederman & Co., declare under our sole responsibility that the Nederman product KB30 with accessories to which this declaration relates, are in conformity with the following:

Directives
2006/95/EC, 2006/42/EC, 2004/108/EC
Standards
EN ISO 12100-1, EN ISO 12100-2, EN 60204-1

The product manager, Jens Jacobsson, is responsible for the technical documentation.

CE

AB Ph. Nederman & Co.
P.O. Box 602
SE-251 06 Helsingborg



Jens Jacobsson, Product Manager
Helsingborg, Sweden, 2010-01-01

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 and spare parts list for your new ARBOGA-DARENTH Swarf Crusher. It also contains greasing instructions, 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 KB30

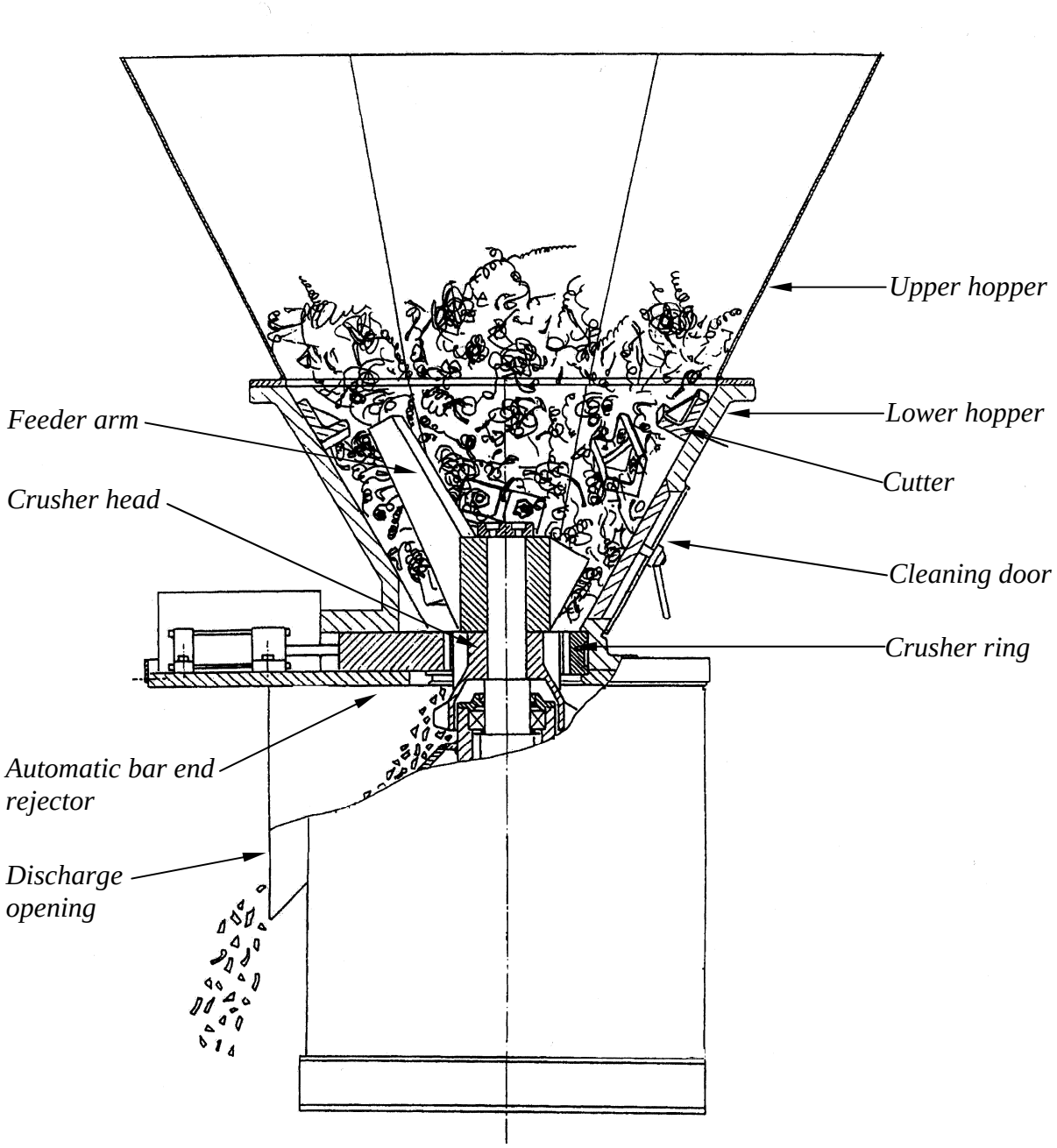


Figure 1

Working method

The swarf is fed into the hopper (a) to the upper part of the crusher. On the sides of the conical 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).

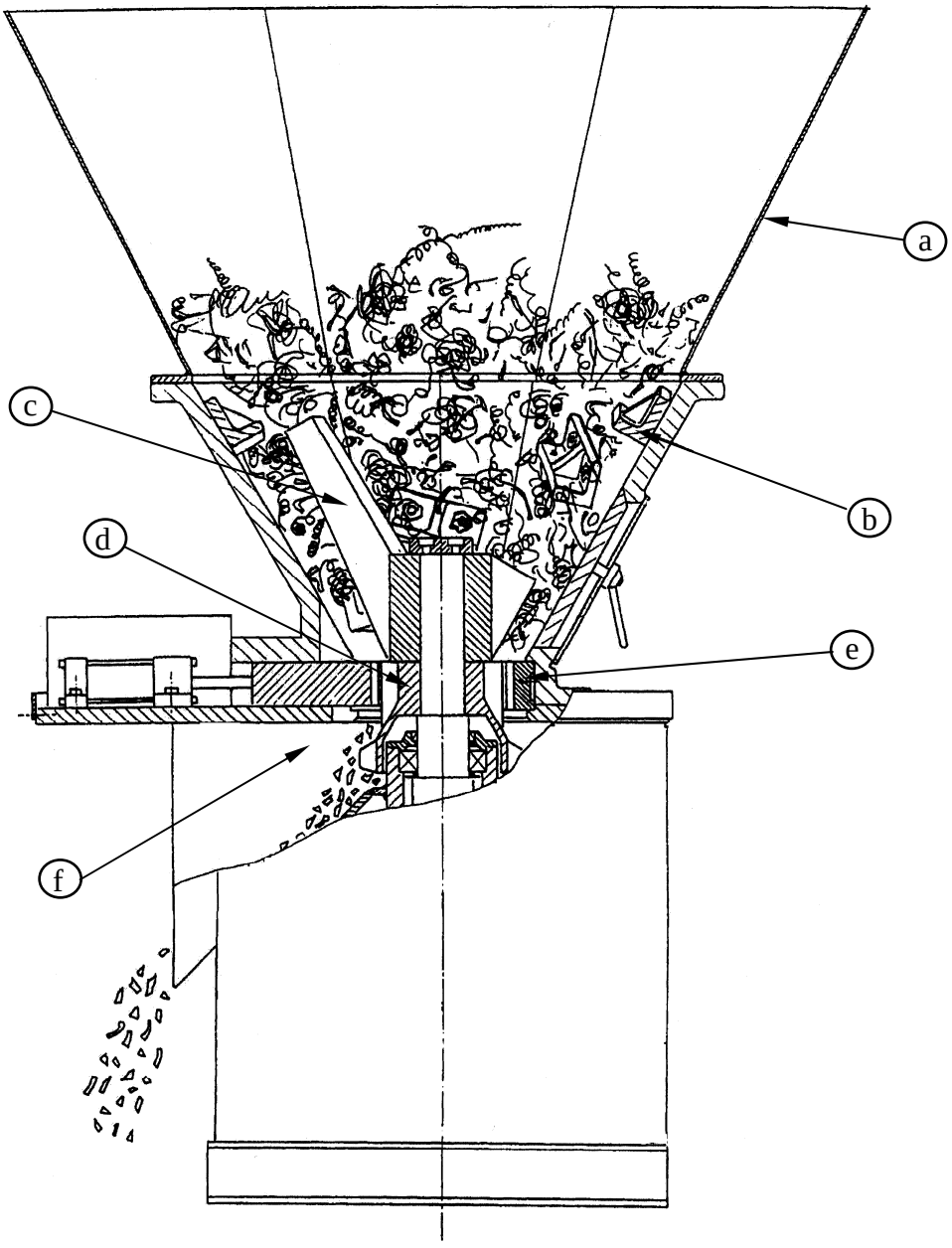


Figure 2

Lifting instruction

Lift the crusher by crane. Remove the upper hopper and place eye bolts (M24) in the lower hopper.

Fix the crusher with anchor bolts M20.

Weight 4500 kg

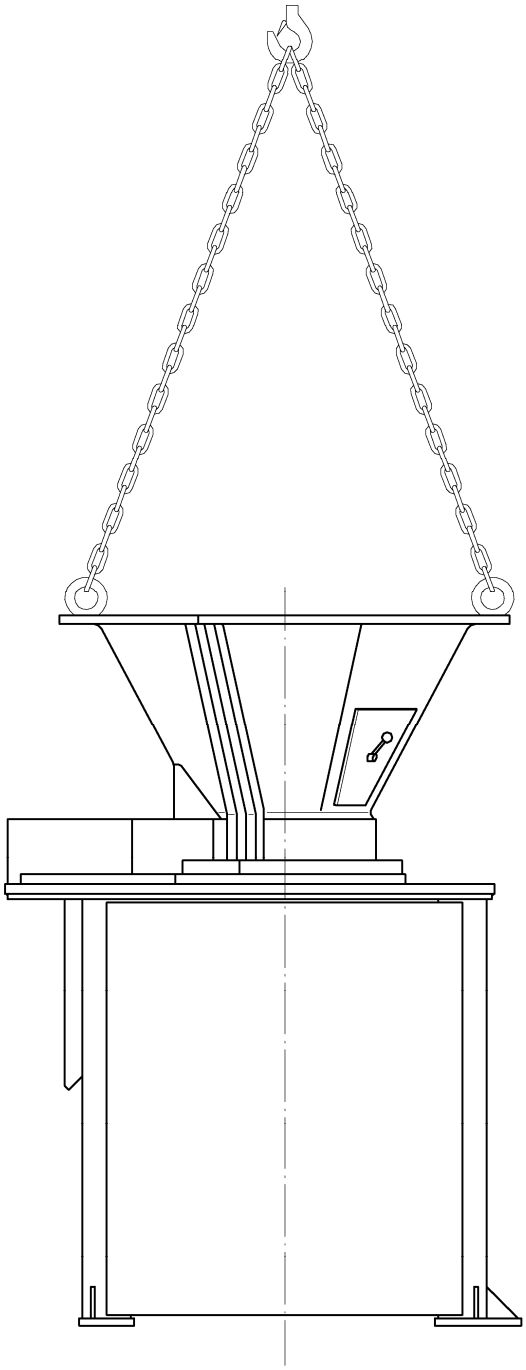


Figure 3

Installation

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

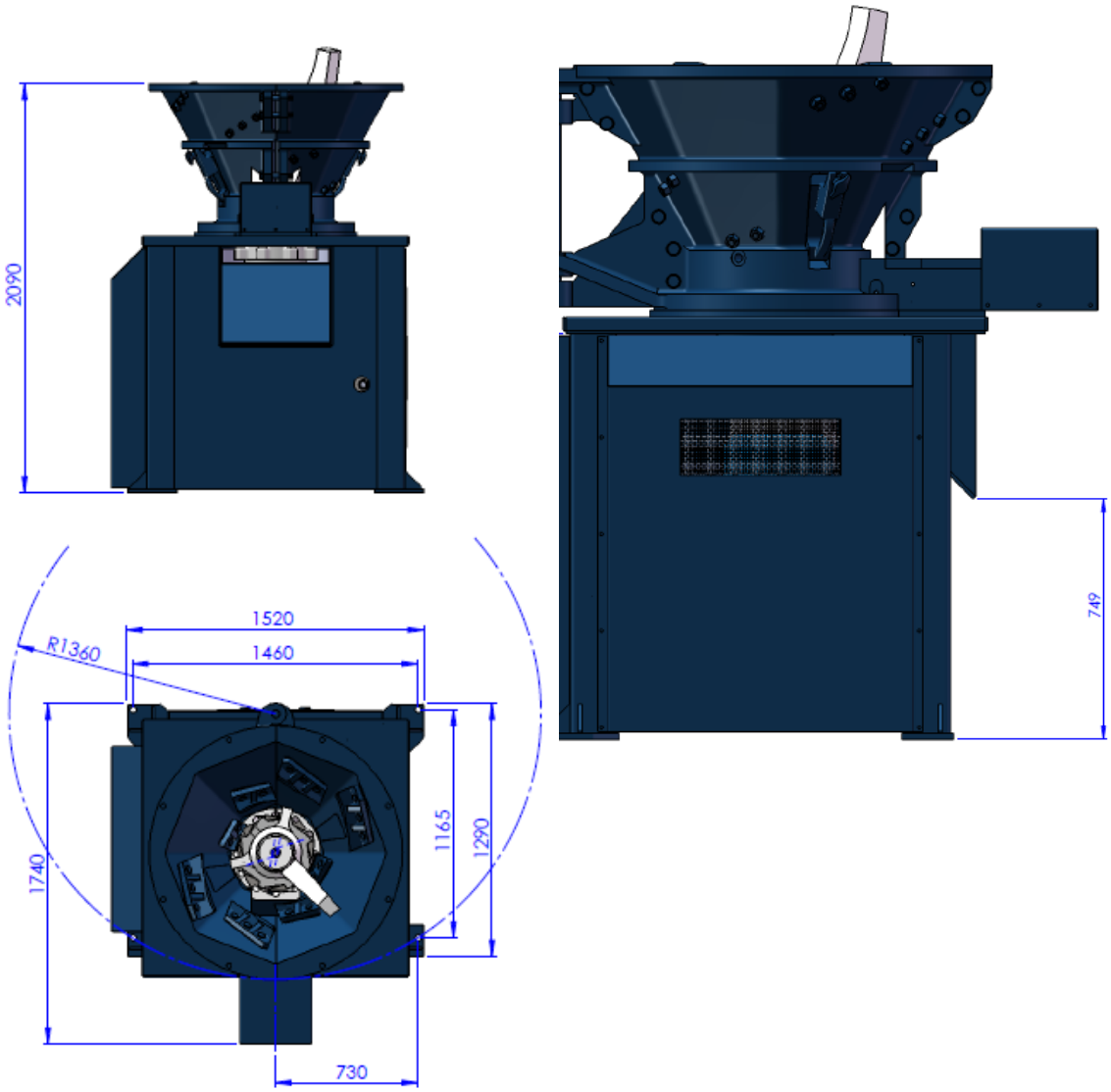


Figure 4

Assembly instructions

Cutter

1. Turn off 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 16 Pos 8)
8. Turn the crusher arm around and check that it is clear from the cutters, 1-5 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 the circuit breaker.
2. Remove the upper hopper.
3. Disassemble the washer on the shaft holding the crusher arm.
4. Place 2 eye bolts in the crusher arm.
5. Lift the crusher arm.
6. Place the new crusher arm on the shaft, when changing to a new arm, clean the hole.
7. Turn the crusher arm around and check that it is clear from the cutters, 1-2 mm is a suitable distance between crusher arm and cutters.
8. Re-assemble the washer.
9. Re-assemble the upper hopper.
10. Turn on the circuit breaker.

Crusher ring and crusher head

1. Turn off the circuit breaker.
2. Remove the upper hopper.
3. Disassemble the washer on the shaft holding the crusher arm.
4. Place 2 eye bolts 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 with a new packing 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, if not grind it.
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, when changing to a new arm, clean the hole.
18. Turn the crusher arm around and check that it is clear from the cutters, 1-2 mm is a suitable distance between crusher arm and cutters.
19. Re-assemble the upper hopper.
20. Turn on the circuit breaker.

Slip clutch

CAUTION!
Before any work on the crusher and the clutch, the main switch must be switched off so that the crusher cannot be started.

The slip clutch on the pulley of the gear is to eliminate the risks of damage to the crusher if exceptional high peak loads occur, i.e. objects that cannot be crushed entering the hopper together with the swarf.

Slip clutch setting
On delivery the clutch is set to slip at a certain current. Normal wear of the discs makes the slip clutch slip at a lower rate than the original setting. When this occurs it is necessary to adjust the slip clutch.

The adjustment should be done as follow:
1) Turn the time relay to 0.
2) Block the feeder arm in the hopper.
3) Tighten the clutch by tighten the screws. Be sure to tighten the screws equally.
   NB! The slip clutch must not be tightened too hard.
4) Check that the current is max 2 x normal current.
5) Remove the blockage of the feeder arm in the hopper.
6) Put the time relay back to normal position, i.e. 4 seconds.

Automatic bar end rejector

CAUTION!
Before any examination, at overload, the main switch must be turned off and locked so that the crusher can not start involuntarily while you are working with it.

If the crusher is overloaded, i.e. if solid parts are jammed in the lower tools, the electronic torque limiter switches off the motor. A hydraulic 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 until the protective motor switch shuts off. The object that has stopped the crusher should be removed before the protective motor switch is put back into operation. The electronic torque limiter has two (2) time delays, one for start 0.1–20 sec. (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 frame. Use ball bearing grease of good quality.
Greasing interval: every 6th month at 1-shift operation, 150-200 g grease per bearing.

2. Bar end rejector
Greasing of the bar end rejector is to be done through 4 nipples. These are situated on the crusher hopper, one on each side of the bar end rejector.
Greasing interval: every 14th day at 1-shift operation, 100-150 g grease per nipples.

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.

Hydraulic system

To run the bar end rejector the crusher is equipped with an electrically driven hydraulic unit.
The unit is pre-configured to operate with the crusher, delivering a working pressure of 100 bar.

Maintenance
Check the oil level in the hydraulic unit once a month. When filling, use hydraulic oil of good quality.

Spare parts list

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

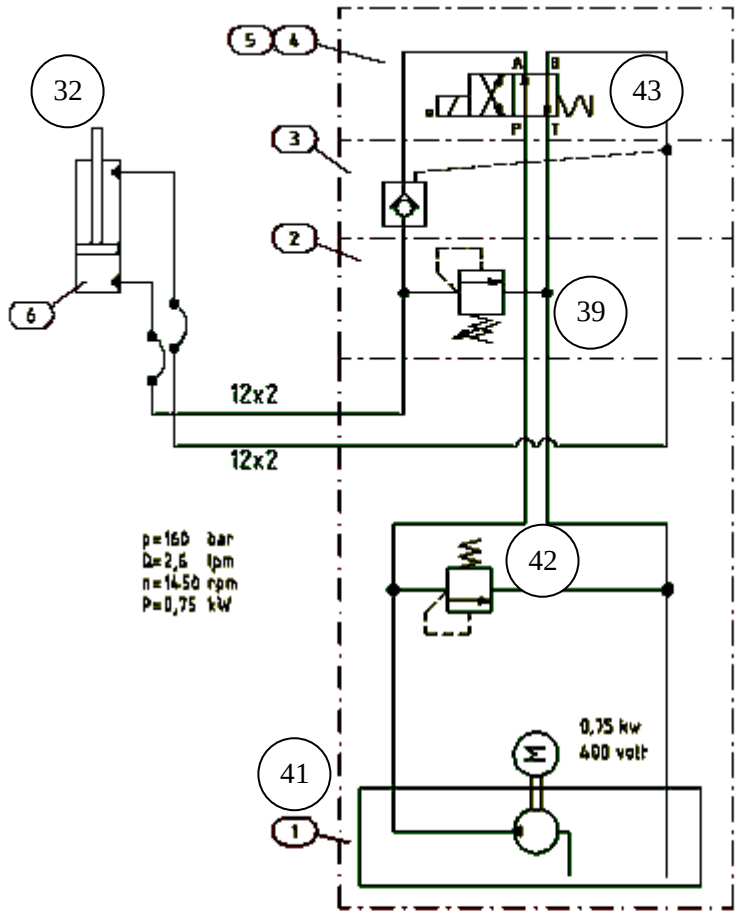
- Type
- Serial number
- Designation
- Article number

Pos	Article No.	Designation	Qty	Unit
1	2Sg 200L-4	Motor 30kw		Pce
2	3SPB-280	Pulley		Pce
3	9702513	Tapered bushing 3020-55		Pce
4	J125-STAG	Adjusting screw		Pce
5	SEW-FA127	Rubber bushing	4 pcs	Set
6	SPB-3150	V-belt	4 pcs	Set
7	KB49-171	Feeder arm		Pce
8	See page 16	Cutters for hopper		
9	KB49-92	Washer		Pce
10	KB49-6040-23	Crusher ring		Pce
11	KB49-165	Crusher head		Pce
12	KB30-204	Upper bearing cover		Pce
13	BA 170 200 15	Sealing (upper)		Pce
14	24034 CC/W33	Upper bearing		Pce
15	KB30-412	Spacer ring		Pce
16	KM 28	Shaft nut		Pce
17	MB 28	Lock washer		Pce
18	BA 160 125 12	Sealing (lower)		Pce
19	KB30-409-1	Pulley / Fly wheel		Pce
20	KB30-410	Washer		Pce
20	KB30-411	Spacer bush		Pce
21	KB30-409-2	Slip clutch, complete excl fly wheel		Pce
22	KB30-409-2-D	Disc for slip clutch	2 pcs	Set
23	KB30-301	Washer		Pce
24	J125	Gear unit		Pce
25	KB30-413	Washer		Pce
26	95235	Rotation sensor M12 DC PNP		Pce
27	KB30-205	Lower bearing cover		Pce
28	32228/DF	Lower bearing	2 pcs	Set
29	KB30-102	Main shaft		Pce
30	KB30-302	Sealing ring		Pce
31	KB49-6040-11	Channel		Pce
32	80/36-100 MS2 N PU PU OG	Hydraulic cylinder		Pce
33	KB49-6040-34	Peg for hydraulic cylinder		Pce
34	KB49-6040-25	Segment		Pce
35	KB49-6040-30	Cover		Pce
36	KB49-6040-14	Lower hopper		Pce
37	KB49-1331	Door		Pce
38	KB49-1332	Knob		Pce

Spare parts list (cont.)

Pos	Article No.	Designation	Qty	Unit
39	970517	Ball valve	1	Pce
40	970518	Filter-regulator (Pnuematic Units only)	1	Pce
41	970501	Hydraulic unit	1	Pce
42	970519	Overflow valve	1	Pce
43	970520	Hydraulic valve	1	Pce

Hydraulic diagram



Control Voltage 24 V /
Manöverspänning 24 V DC

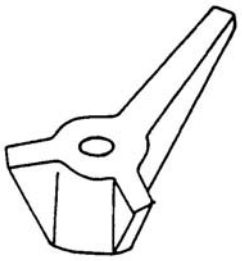
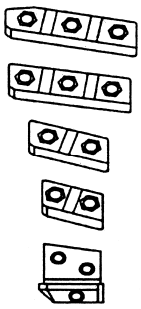
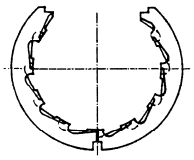
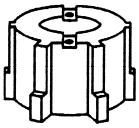
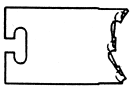
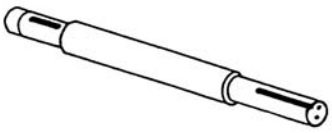
Tank Volume - 5 L /
Tankvolym - 5 L

Pos	Ant.	Benämning	
6	1	Cylinder	Cylinder
5	1	Ekontakt	Pressure Gauge with Electrical Connection
4	1	Riktningsventil	Directional Valve
3	1	Hydraullås	Hydraulic Lock
2	1	Tryckbegränsningsventil	Pressure Limitation Valve
1	1	Aggregat	Hydraulic Unit

Hydraulic Unit KB20/KB30

Drawing – spare parts

Spare parts that should be stocked

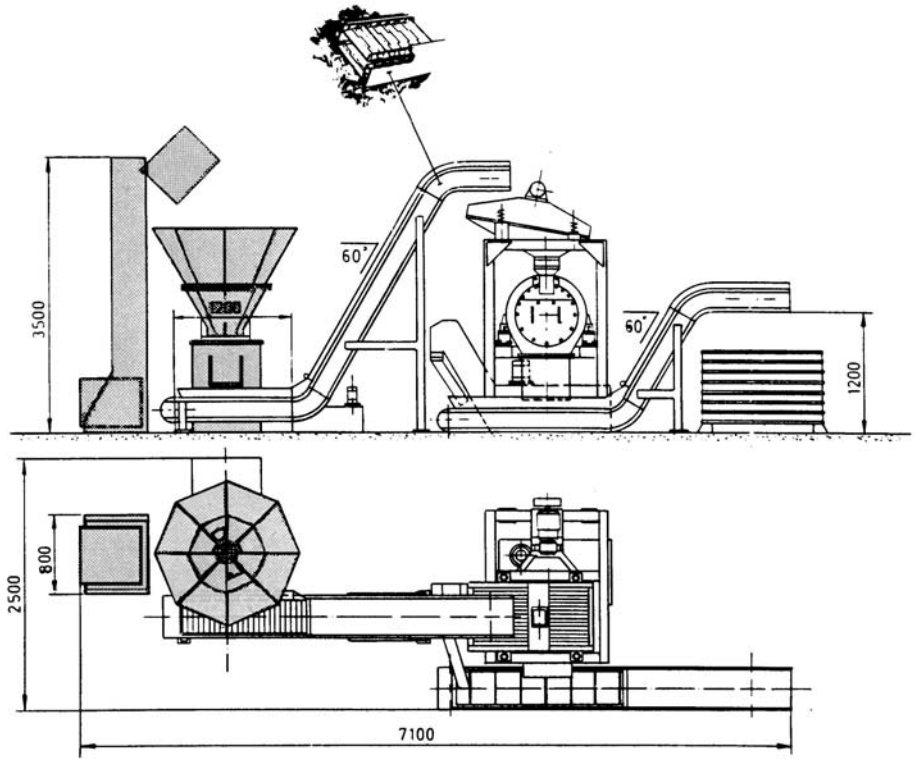
Pos	Article No.	Designation	Qty	
7	KB49-171	Feeder arm	1 pce	
8	KB49-1341 KB49-1342 KB49-1343 KB49-1344 KB49-1345	Cutters for hopper	2 pcs 1 pce 2 pcs 2 pcs 1 pce	
10	KB49-6040-23	Crusher ring	1 pce	
11	KB49-165	Fine crusher head	1 pce	
34	KB49-6040-25	Segment	1 pce	
29	KB30-102	Main shaft	1 pce	
13	BA 170 200 15	Sealing (upper)	1 pce	
14	24034 CC/W33	Upper bearing	1 pce	
18	BA 140 110 12	Sealing (lower)	1 pce	
28	32228/DF	Lower bearing	2 pcs	

Trouble-shooting

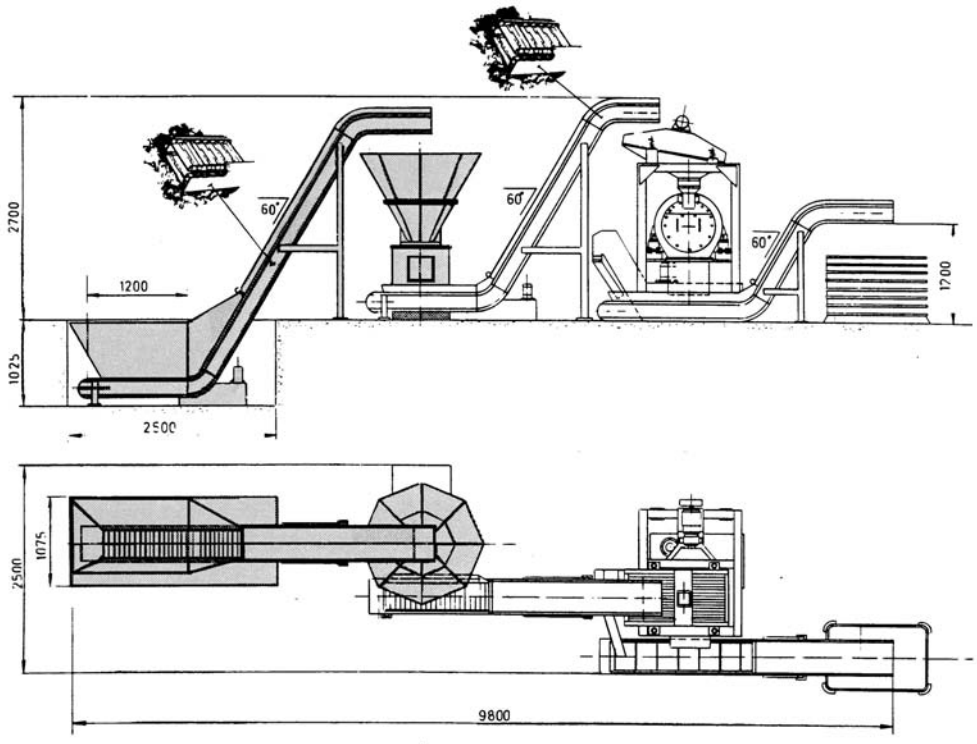
This trouble-shooting schedule only serves as a guide to probable reasons for faults. As mentioned earlier correct maintenance is the best insurance against the development of defects.

Problem	Symptom	Action
The crusher does not start.	Electrical fault. The segment is not in the right position (see indicator lamp).	Check the fuses and torque limiters. Check what has blocked the segment and remove.
The motor starts but the feeder arm stands still.	Incorrect set slip clutch or poorly tightened V-belts.	Set the slip clutch as per this manual or tighten the V-belts with the belt adjuster on the motor bracket.
The motor reverses several times until the protective motor switch shuts off.	Large pieces have fallen down in the hopper and blocked the feeder arm.	**NB!** Cut the main power before working in the hopper Remove the pieces.
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