

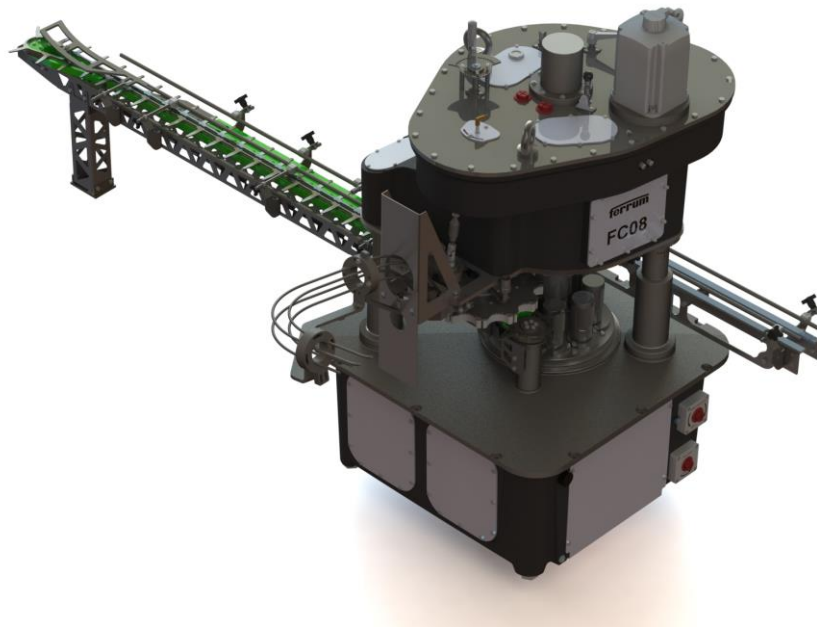
OPERATING INSTRUCTIONS

CAN SEAMING MACHINE FC08

C10-904800 Blue Marble, Indianapolis IN, USA

19.03.2021

OPI-CAS-KH-FC08-EN / 1.0.0



Versions

Version	Date	Change
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1 Important information

1.1 Overview

This chapter contains basic information regarding the correct use of these operating instructions.

1.2 Manufacturer and contact address

Ferrum Packaging Ltd.	Tel. service:	+41 (0)62 889 12 51
Canning Technology	Fax:	+41 (0)62 889 12 55
Industriestrasse 11	24h hotline:	+41 (0)62 889 13 00
CH-5503 Schafisheim	E-mail service:	canning.service@ferrum.net

1.3 Target groups

Unless otherwise stated, these operating instructions are intended for operating companies and users who are responsible for the installation, operation and maintenance of the can seamer. The following persons are meant in particular:

Function	Tasks and responsibilities
Service technicians from Ferrum Packaging Ltd.	Responsible for commissioning, assembly and disassembly of the can seamer, settings adjustments, test runs as well as modification for various can formats. The Ferrum Packaging Ltd. service technician is also responsible for regular service work on the can seamer.
Production manager/operations manager	Responsible for labor organization and coordination of diverse duties and tasks, as well as for materials and persons. The production manager/operations manager may also be responsible for health and safety.
Safety officer	Responsible for monitoring operational safety. The safety officer has the necessary experience and training in the area of health and safety.
Industrial mechanic	Personnel with sufficient competency (training and/or qualifications) to perform small repairs, assembly and disassembly work on the vacuum seamer. Using available change-over kits and with appropriate training by Ferrum Packaging Ltd., an industrial mechanic may convert the can seamer to other can formats.
Industrial electrician	Personnel with training as electrician and sufficient competency to fix electrical problems – always in consultation with a Ferrum Packaging Ltd. specialist.
Maintenance personnel	Personnel with sufficient competency (training and/or qualifications) to perform regular maintenance work as well as associated work, such as changing an oil filter. The maintenance personnel is also responsible for cleaning the can seamer.
Operating personnel	Personnel with sufficient competency (training and/or qualifications) to operate the can seamer during production. The operating personnel should be adequately trained to be able to recognize and eliminate the most common faults with the vacuum seamer and then restart production.

Function	Tasks and responsibilities
Visitors	Visitors are not allowed to be in the area of the can seamers by themselves and must always be accompanied by authorized personnel.

1.4 Obligation to read



NOTE

As operator (operating company) and user of the can seamer, you and all persons who work with or on the can seamer are required to read and understand these operating instructions, in particular the chapter "Safety". This is necessary to ensure safe operation, maintenance, repairs, modifications and commissioning of the can seamer.

- Ferrum Packaging Ltd. or its representatives are not liable for personal injury or material damages that result from not observing these operating instructions.

If you have any questions or concerns, please contact a specialist at Ferrum Packaging Ltd..

1.5 What to do if a problem arises

For problems that cannot be solved using these operating instructions, please contact specialists from Ferrum Packaging Ltd.. In such situations, we ask to be given a precise description of the situation either by telephone or in writing.

1.6 Operating instructions

1.6.1 Validity of the specifications in these operating instructions

The specifications in these operating instructions relate to can seamers with the following type designations:

- FC08, No. C10-904800

Validity of the illustrations

Every can seamer has customer-specific characteristics. To demonstrate principles and interrelationships and provide overviews, these operating instructions contain illustrations that are completely correct in principle but may deviate in detail from type FC08, No. C10-904800 can seamers. Please note that these illustrations are for information only and are not binding.

Conventions

For the sake of simplicity, the difference between body (can without end) and can will be ignored in these operating instructions. The term "can" will be used as a collective term.

For the seaming machine, the term can seamer will be used. OP is the accepted abbreviation for seaming operations, i.e. OP 1 and OP 2.

1.6.2 Symbols in the operating instructions

Symbol	Meaning
■	For lists

1.6.3 Contents and purpose of the operating instructions

These operating instructions contain the information required by the operating company and user regarding installation, operation and maintenance. The purpose of the instructions is to assist you in using the can seamer safely and efficiently.

No instructions are provided for adjustments and repairs that go beyond normal equipping and maintenance.

1.6.4 Using the operating instructions

The following table provides an overview of how the different sections of these operating instructions are to be used and how to find information quickly.

Section	Location	Comment
Table of contents	Start of the operating instructions	
Subheading	Entire operating instructions	Short summary of the corresponding paragraph.
Reference	Entire operating instructions	Refers to other pages or chapters.
PDF function	Digital version of the operating instructions	Using the "search" command, you can look for key words. Clicking on a chapter in the bookmark list or in the table of contents allows you to jump directly to the desired page.

1.6.5 Location of the operating instructions

The operating instructions are to be supplied to persons who are responsible for operating and monitoring the can seamer.

The operating instructions must always be available to these persons at their workstations.

2 Safety

2.1 Overview

This is a general chapter on safety for all operating instructions of Ferrum Packaging Ltd.. This chapter contains the general safety regulations that must be observed during installation, operation and tool change-over as well as maintenance and service. Read this chapter carefully before performing any work on the can seamer.

2.2 Basic principle

The can seamer left the Ferrum Packaging Ltd. factory in sound condition and ensures a high level of technical safety. Incorrect operation or unintended use will endanger:

- Your life
- Your health
- Machines and equipment

2.3 Safety and operating information in these operating instructions

These operating instructions provide safety instructions regarding dangerous situations. This will help you to use the can seamer safely.

Operational information will help you to use the can seamer efficiently.

The information is labeled using symbols, signal words and signal colors.

Please observe the following safety and operational instructions:

Danger notices



DANGER

Danger notices indicate immediate danger with high risks that will result in death or serious physical injury if not prevented.

The danger notices describe the

- type and source of the danger
- consequences when measures are not performed
- measures for protecting against the danger

Warning notices



WARNING

Warning notices indicate possible danger with moderate risks that could result in death or (serious) physical injury if not prevented.

The warning notices describe the

- type and source of the danger
- consequences when measures are not performed
- measures for protecting against the danger

Caution notices



CAUTION

Caution notices indicate danger with low risks that could result in light or mild physical injury if not prevented.

The caution notices describe the

- type and source of the danger
- consequences when measures are not performed
- measures for protecting against the danger

Material damage notices



DAMAGE TO EQUIPMENT

Material damage notices indicate situations that could result in damage to equipment when the described safety precautions are not performed.

Notes with additional information



NOTE

In these sections, useful and important additional information is provided.

2.4 Safety signs

The following tables provide information regarding the prohibition, warning and mandatory signs used by Ferrum Packaging Ltd. on the can seamer and in these operating instructions.

2.4.1 Prohibition signs

Prohibition signs	Meaning	Location of the prohibition sign
	General prohibition signs.	
	Do not reach into this machine/part.	
	Do not stand on the surface.	

2.4.2 Warning signs

Warning signs	Meaning	Location of the warning sign
	General warning signs.	
	Danger of hands being crushed.	Infeed table

Warning signs	Meaning	Location of the warning sign
	Danger of hands being injured by rotating gears.	
	Danger of being drawn in by the belt drive.	
	Danger of being cut on the hands by sharp edges or pointy parts.	
	Danger of head injuries caused by overhead objects.	
	Danger of being drawn in by rotating parts.	
	Suspended load.	
	Heavy load.	
	High voltage, electricity, electric shock.	Terminal box
	Hot surfaces.	
	Corrosive substances.	
	Hazards substances.	
	Dangerous substances, in particular CO ₂ .	
	Falling objects	
	Danger of falling	
	Environmentally hazardous substances.	

2.4.3 Mandatory signs

Mandatory signs	Meaning	Location of the mandatory sign
	Wear protective goggles.	Guard doors
	Wear protective gloves.	Guard doors
	Wear helmet.	
	Wear safety shoes.	
	Read information in the operating instructions.	
	Lift with two persons.	
	Wear hearing protection.	Guard doors
	Wear tight-fitting clothing.	

2.5 Personnel trainings

Personnel	Training
Production manager/operations manager	■ Product-specific training.
Safety officer	■ Training in the area of health and safety. ■ The safety officer knows the accident prevention regulations, first aid measures as well as the local rescue services.
Industrial mechanic	■ Technical specialist with product-specific training. ■ Basic mechanical and electrical training. ■ Advanced mechanical knowledge and appropriate work experience.
Industrial electrician	■ Technical specialist with product-specific training. ■ Basic electrical training. ■ Advanced electrical knowledge and appropriate work experience.
Maintenance personnel	■ Technical specialist with product-specific training. ■ Basic mechanical and electrical training and work experience.
Operating personnel	■ Persons who have been authorized by the production manager/operations manager and have been instructed regarding operation and handling of the can seamer. ■ The operating personnel must be capable of recognizing and avoiding possible hazards. ■ The operating personnel must be familiar with accident prevention regulations, first aid measures as well as the local rescue services.

2.6 Responsibilities of the personnel

Personnel	Qualifications
Production manager/operations manager	■ Product-specific training ■ Leadership experience ■ Responsible for ensuring that all tasks within the factory and relating to the can seamer are clearly defined. ■ Ensures that persons who work with or on the can seamer have read and understood the operating instructions, in particular the chapter on safety. ■ Is responsible for ensuring that only authorized and qualified personnel work with or on the can seamer. ■ Is responsible for ensuring that the personnel undergo regular (ongoing) training. ■ Is responsible for ensuring that the condition of the can seamer and its spare parts are inspected regularly, either by the production manager/operations manager personally or by other qualified personnel.
Safety officer	■ Is responsible for ensuring that the local safety regulations and the safety regulations in the operating instructions are observed. ■ Is responsible for ensuring that the personnel who work with or on the can seamer are familiar with the local and product-specific safety regulations. ■ Organizes first aid courses for the personnel. ■ Inspects the functioning of the safety devices of the can seamer in regular intervals.
Industrial mechanic Industrial electrician Maintenance personnel	■ Ensures that the safety devices are always functional during all work. ■ Only performs work for which he or she has been authorized and trained. ■ Always works according to the safety regulations described in the operating instructions. ■ Wears protective equipment where prescribed. ■ Uses Ferrum Packaging Ltd. original parts exclusively for modifications and works according to the information and instructions in these operating manual.
Operating personnel	■ Ensures that the safety devices are always functional during all work. ■ Only performs work for which he or she has been authorized and trained. ■ Always works according to the safety regulations described in the operating instructions. ■ Wears protective equipment where prescribed.

2.7 Protective equipment



NOTE



Wear protective equipment

When working on the can seamer, wear:

- Safety shoes
- Tight-fitting, sturdy clothing



When working on running can seamer, wear additionally:

- Hearing protection



When working in the interior of the can seamer, wear additionally:

- Protective goggles
- Protective gloves
- Protective helmet during adjustments and change-over



2.8 Safety devices



DANGER



Rotating can seamer parts.

If the safety devices and equipment are bypassed, the rotating can seamer parts can cause severe physical injury or death.

- It is strictly prohibited to bypass safety devices.
- Stop the can seamer for maintenance and adjustments and secure it against being switched back on.
- When the can seamer is running, stay away from the infeed chain at the infeed table and from the can discharge.
- Do not reach into the inside of the can seamer when the machine is running or when it has not been stopped and secured.
- Check the function of the safety devices regularly.

The can seamer is equipped with the following safety devices:

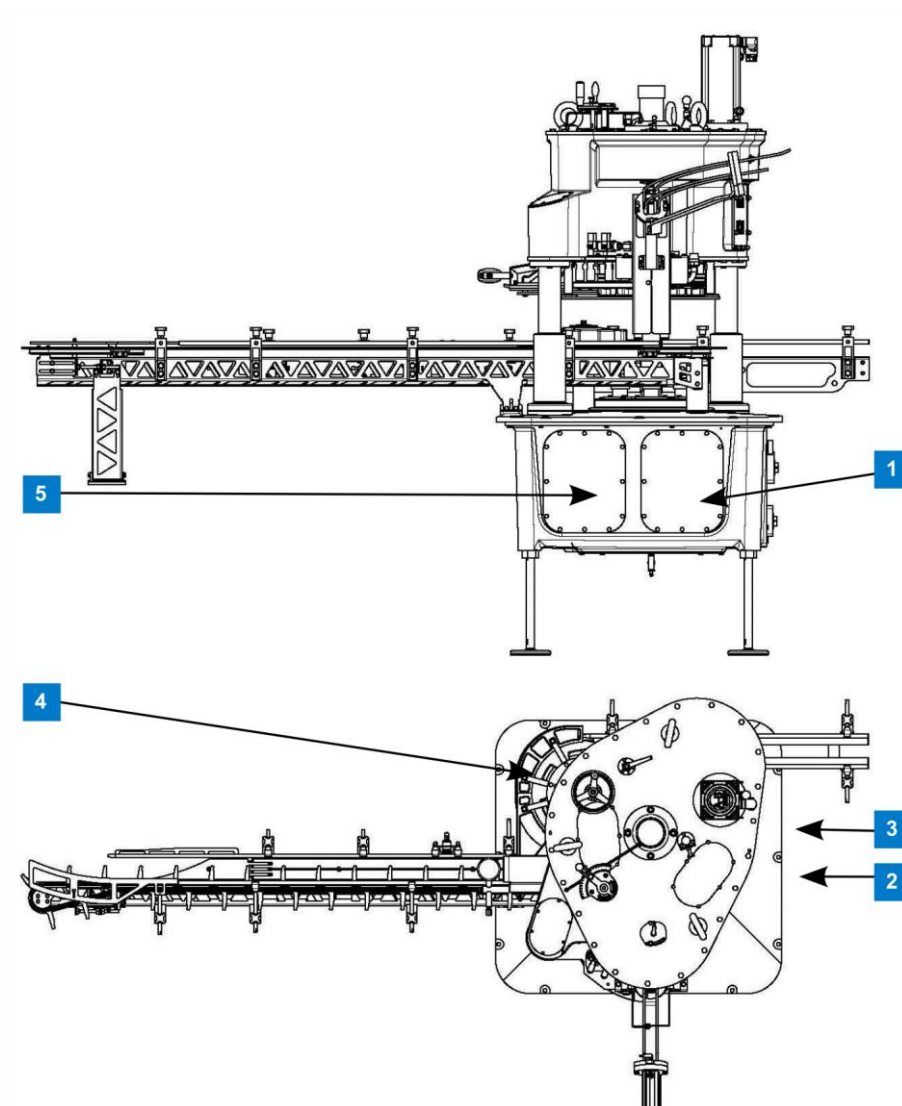


Fig. 1: Safety devices

- 1 Safety clutch filler drive (optional)
- 2 Safety clutch drive can discharge
- 3 Air treatment unit (option)
- 4 Oil treatment unit
- 5 Safety clutch, chain drive
- 6 Lock pin, height adjustment

2.9 Safety marks

The can seamer has the following safety marks. They point out dangerous situations and must always be observed.

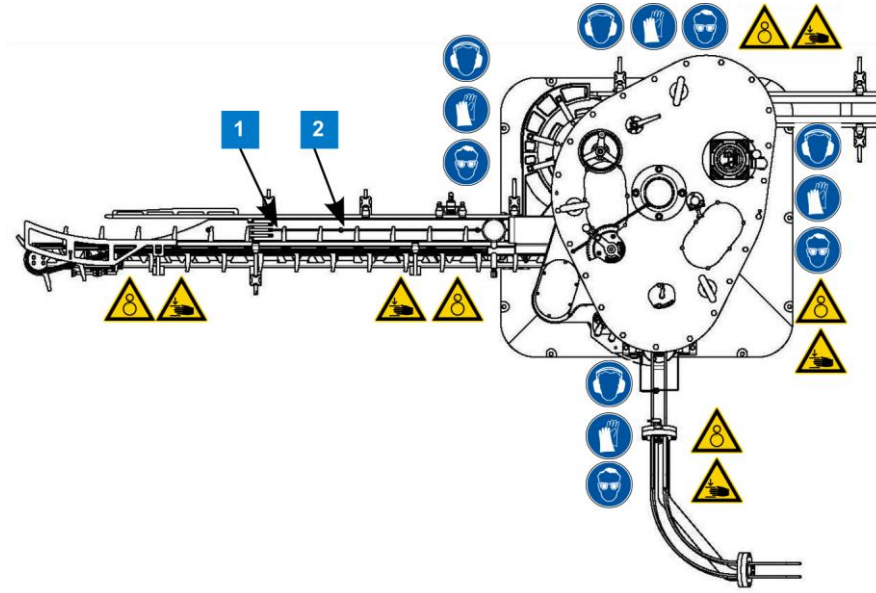


Fig. 2: Safety marks

- 1 Infeed chain
- 2 Transport belt

Please pay attention to the meaning of the safety marks and to the hazard prevention measures.

Regularly check that the safety marks are in place.

2.10 Control stations

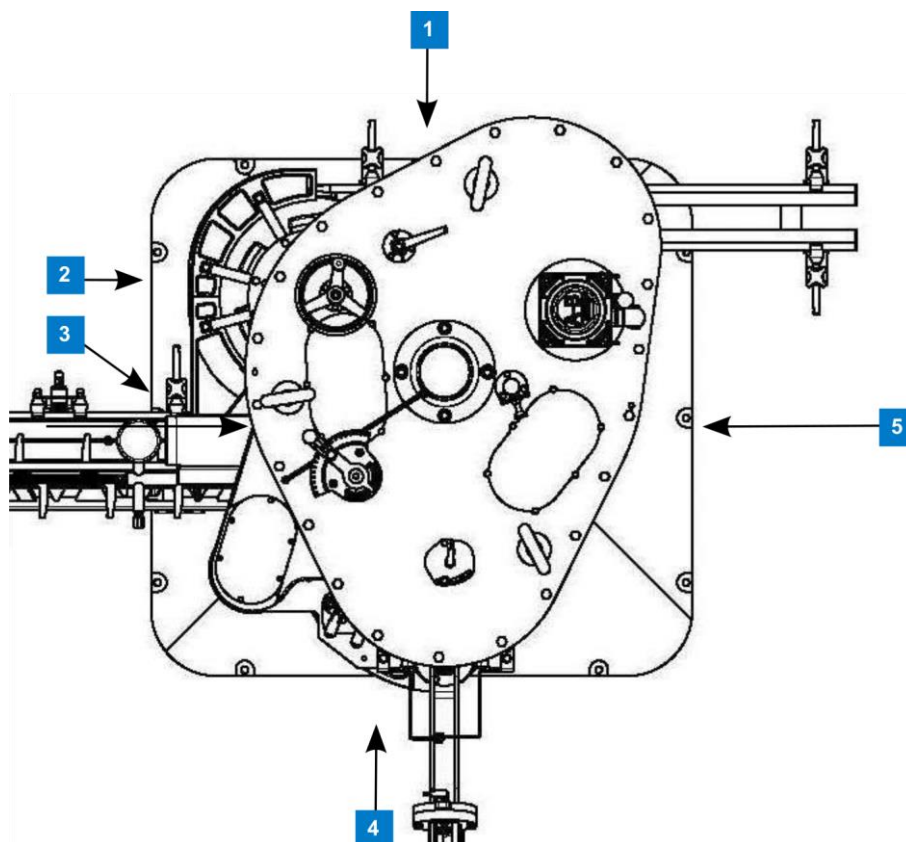


Fig. 3: Control panels

- 1 Back operating side
- 2 Left operating side
- 3 Filler drive (optional)
- 4 Front operating side
- 5 Right operating side

2.11 Accident prevention

Protect yourself against accidents

- Wear protective equipment in hazardous zones.
- Never reach into a running can seamer.
- Wear additional protective equipment when using cleaning agents (see Chapter "Cleaning" in the operating instructions of the can seamer).
- Always observe the safety regulations described in this chapter.

2.12 Special hazardous zones

When operating the can seamer, pay special attention to the following hazardous zones:

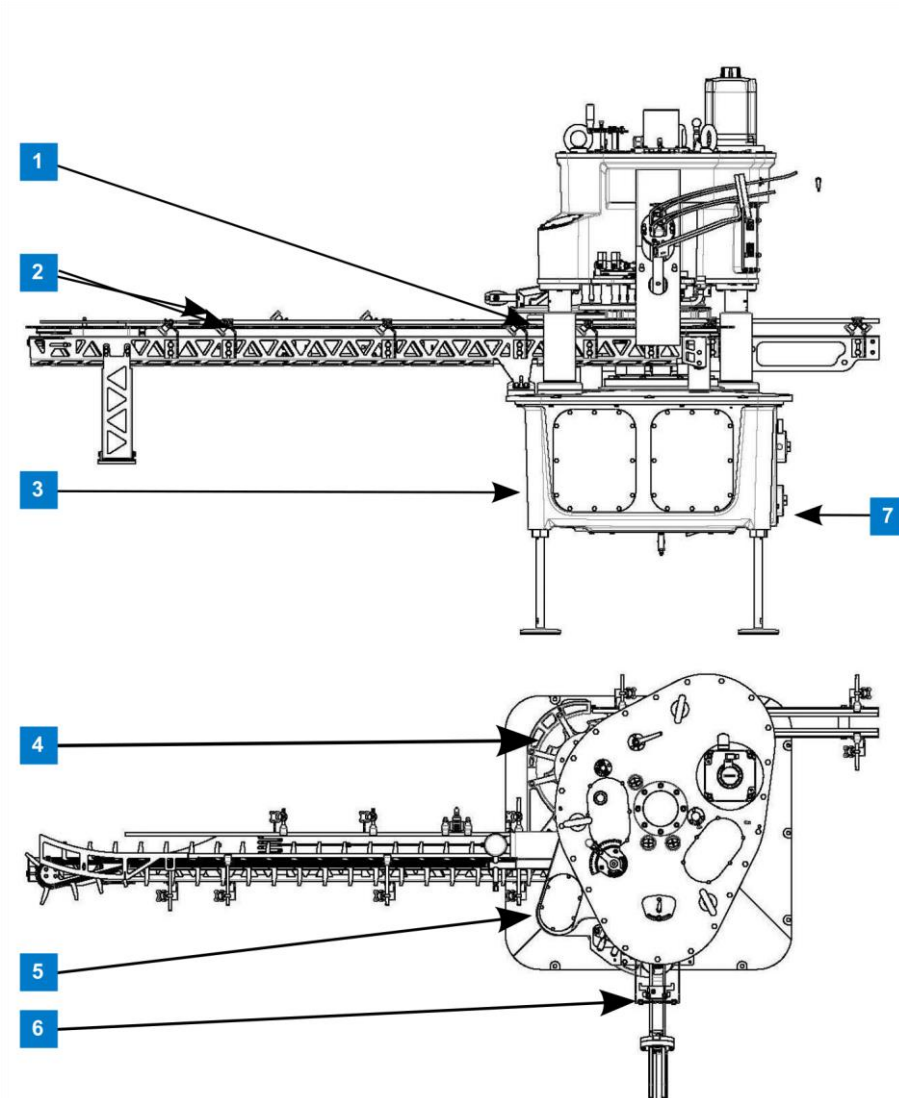


Fig. 4: Special hazardous zones

- 1 Height adjustment
- 2 Infeed track, infeed chain
- 3 Machine lower part
- 4 Damaged cans
- 5 Can seamer interior
- 6 End feed
- 7 Manual drive

Use caution around the hazardous zones described in this chapter, in particular when performing the following activities:

- Operation of the can seamer.
- Cleaning, maintenance and repair of the can seamer.

Inform yourself about the causes and consequences of hazards as well as how to avoid them by reading the section "Residual risks".

2.13 Residual risks

The hazardous zones of the can seamer harbor residual risks that cannot be successfully avoided by design or with protective equipment.

To avoid the residual risks, perform the measures that are described in these safety instructions.



DANGER



Infeed track, infeed chain

Reaching into the infeed chain when the can seamer is running will lead to serious hand and arm injury. These limbs can also be pulled in by the running infeed chain.



- When the can seamer is running, stay away from the infeed table and from the infeed chain.
- Stop the can seamer for adjustments at the infeed table and secure it against being switched back on.
- Wear protective gloves.



DANGER



Can seamer interior

Rotating can seamer parts

If the safety devices and equipment are bypassed, the rotating can seamer parts can cause severe physical injury or death.

- It is strictly prohibited to bypass safety devices.
- Stop the can seamer for maintenance and adjustments and secure it against being switched back on.
- When the can seamer is running, stay away from the infeed chain at the infeed table and from the can discharge.
- Do not reach into the inside of the can seamer when the machine is running or when it has not been stopped and secured.
- Check the function of the safety devices regularly.



DANGER



Terminal box

Live parts in the terminal box

Touching live parts in the terminal box can lead to serious physical injury or death when the safety regulations are not observed.

- Even when the main switch has been switched off, some parts remain live in the terminal box.
- Check that there is no voltage at the electrical lines on the terminal box of the can seamer.
- The terminal box may only be opened by trained electricians.
- Only trained electricians may connect the can seamer. Observe technical connection data.
- Observe local regulations regarding energy supply. The electrical system is designed according to European safety standards.


WARNING

End feed magazine
Feed screws and retaining knife

When the can seamer is running or in jog mode, there is a risk of injury at the end feed at the quickly rotating feed screw and at the quickly moving retaining knife.

- Safety devices may not be bypassed.
- Keep away from the end feed.


WARNING

CO₂
Toxic substances

The can seamer can optionally be equipped with a CO₂ gassing device. When the guard doors are opened quickly, CO₂ can be inhaled. The critical values for CO₂ are with regard to MAC = 0.5%. MAC = Maximum Allowable Concentration for 8h exposure. Harm results immediately starting at > 5% CO₂ in inhaled air.

- Open the guard doors slowly and carefully.
- Do not breathe in when opening the guard doors.
- Wear a gas dosimeter.
- Gas emissions must be discharged according to the local regulations.
- Installing an optional gas warning device on site is recommended.


CAUTION

Damaged cans
Sharp edges on damaged cans

Sharp edges on damaged cans can lead to cuts on the hands when the can seamer is being cleaned out.

- When cleaning damaged cans out of the can seamer, wear protective gloves and sturdy work clothes.



CAUTION



Can seamer interior

Sharp edges in the can seamer interior

Sharp edges on the guard doors, end guide plate, center part rotor and upper part of can seamer can cause head injuries or cuts when work is performed on the can seamer.

- Wear a helmet when working in the can seamer interior.



CAUTION



Height adjustment

Can seamer upper part and belt drive

If the can seamer upper part is let down quickly and carelessly, hands and fingers can be crushed in the can seamer interior.

- Before making a height adjustment, ensure that no persons are in the hazardous zones (above the can seamer, can seamer interior).



CAUTION

Splashes of water, cleaning agents or product

Contact with splashes of water, cleaning agents or product

If the safety devices are not used properly while cleaning the can seamer, areas of skin, such as hands, arms, face, etc. may come into contact with cleaning or disinfecting agents and cause irritation.

During removal of damaged containers from the can seamer, product splashes may occur if the safety devices are not used properly. This can cause eye injuries.



- To remove damaged cans or clean the can seamer, wear protective goggles.
- If something does splash into an eye, rinse out the eye for several minutes with running water whilst holding the eyelid open. If the symptoms persist, contact a physician.



- When cleaning the can seamer, wear protective gloves.
- Wash your hands before breaks and when you finish work.
- If you swallow something, rinse out the mouth and drink plenty of water. If the symptoms persist, contact a physician.
- The protective measures will vary depending on the product. It is therefore highly recommended that you inform yourself about the cleaning or disinfecting agents that are used, by reading the safety data sheets.

2.14 General safety regulations and responsibilities

In general, the following safety regulations and responsibilities apply when working with or on the can seamer:

- The generally accepted rules for work safety are to be observed. Additionally, the locally applicable regulations regarding work safety and accident prevention are to be observed.
- The can seamer may only be used in a sound and clean condition.
- It is forbidden to remove, modify, bridge or bypass any safety device.
- It is forbidden to modify the can seamer.
- Only Ferrum Packaging Ltd. or persons who have been authorized by Ferrum Packaging Ltd. are authorized to overhaul the can seamer.
- Faults or damages are to be reported to the operating company immediately.
- Original Ferrum Packaging Ltd. spare parts must be used during repairs.
- Only persons who have been authorized by the operating company may be in the area of the can seamer. These persons must be informed of the residual risks and protected against these risks.
- All safety devices are to be inspected regularly and properly maintained by the operating company.
- For users with insufficient language skills, the operating company has to translate the applicable operating instructions for the work to be performed, as well as safety regulations and the safety-relevant information. This applies especially to all persons who do not come from the region where the can seamer is located.
- Every user is responsible for his or her own health.
- After every repair, the user has to perform a test run to ensure that the can seamer is in perfect working order.

Guarantee claims

If damage results to persons, material objects, the environment and/or assets because these operating instructions have not been followed, whether purposefully or unintentionally, Ferrum Packaging Ltd. is without fault and all guarantee claims are rejected. This also applies to any consequences resulting from the damages.

3 Product description

3.1 Overview

This chapter contains important information for identification and use of the can seamer, such as labeling, application and technical data.

3.2 Intended use

The can seamer may only be used to seam round cans that contain liquid products. No product may protrude over the edge of the can.

Intended use according to the operating instructions of the can seamer includes

- Only trained personnel are allowed to operate and handle the machine.
- The can seamer may only be operated after installation in the production line and with the corresponding protective equipment in accordance with local standards.
- All safety and operational instructions have to be observed.
- All safety regulations have to be observed.
- The can seamer has to be cleaned as specified in the can seamer operating instructions.
- The maintenance instructions have to be followed.

Foreseeable misuse

Every use beyond the intended use is considered as misuse.

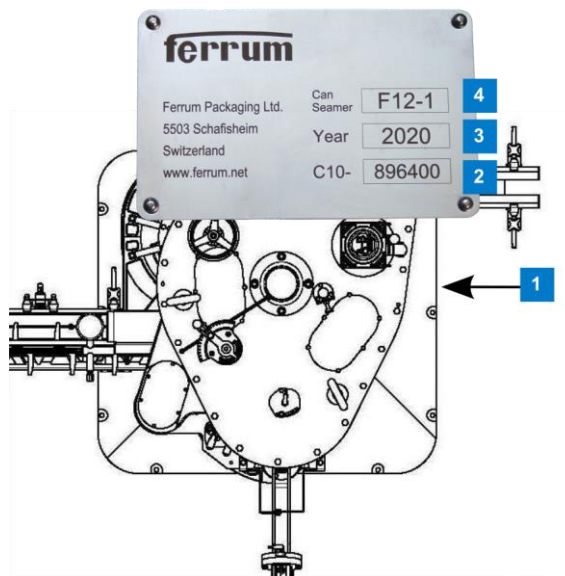
Personal injury or material damage

Misuse of the can seamer can lead to personal injury and damage, especially:

- Using cleaning agents that have not been approved by Ferrum Packaging Ltd..
- Operating the can seamer when cleaning solution residues are left in the can seamer.
- Processing products that the can seamer was not designed for.

Ferrum Packaging Ltd. and its representatives are not liable for damage resulting from unintended use of the can seamer.

3.3 Labeling



- 1 Placement of rating plate
- 2 Machine number
- 3 Year of manufacture
- 4 Machine type

Fig. 5: Rating plate

Location

The rating plate is located on the upper part of the can seamer.

The rating plate contains the following specifications:

- Manufacturer address
- Machine identification: Machine type, machine number, year of manufacture

3.4 Limits of use

The can seamer is designed for the following limits of use:

Temperature	15-40 °C / 59-104 °F
Relative air humidity	10-90 %

3.5 Scope of delivery

The can seamer is supplied ready for installation with all necessary components and operating instructions, as listed in the included part list.

The following is not included in the scope of delivery:

- Supply lines for electrical, pneumatic and hydraulic supply
- Lifting gear and means of transport

3.6 Declaration of incorporation

The declaration of incorporation is delivered with the machine.

3.7 Technical data

General data

Capacity	330-1000 cans/min
Cleaning speed	-
Number of seaming stations	8
Number of end feed magazines	1
Sound pressure level	max. 77 dBA
Sound power level	max. 80 dBA
Can dimensions Diameter Height (standard)	53-73 mm 88-250 mm
Chain pitch	95.3 mm
Can feed height	-
Net weight	2,600 kg
Spring deflection at the lifting station	0.6 mm

Electrical data

Supply voltage	480/277 V
Type of electrical system	3PH, N, PE
Mains frequency	60 Hz
Control voltage	24 VDC
Power, main drive	8.2 kW
Motor speeds	Infinitely variable

Oil lubrication

Can seamer lubrication	Centralized oil lubrication
Oil tank capacity	15 liters
Max. oil consumption of the machine	max. 2 liters/750 h
Approved oil types for centralized oil lubrication	Cassida Fluid CR100 Optimol Optileb GT100 Lubcon Turmosynth 100 GV Rivolta F.L. 125 Bel-Ray No-Tox Synthetic Gear Oil 100 Lubriplate SFGO Ultra 100

Compressed air

Pressure	4.5-6 bar
Consumption	1.5 Nm ³ /h
Quality	Dry, oil-free
Connection dimension	for hose Ø12

Gassing

CO2 operating pressure for gassing	-
Consumption	tbd

4 Design and function

4.1 Overview

This chapter describes the design and function of the can seamer, and provides an overview of its main components.

4.2 Can seamer design

The cans are sealed by rotating the can at the seaming stations in the can seamer and gassed or steamed if necessary. The seaming chucks and base plates are driven.

The filler's superordinate PLC controls and monitors the can seamer.

Upper part

The upper part of the can seamer housing is made of grey cast iron. The gears, knock-out pad and seaming cam are centrally lubricated with oil.

Lower part

The supporting stand of the can seamer is a box-shaped, finned cast design and provides high dynamic stability and smooth operation, even for high capacities. The gears, bearings and lifting cam are centrally lubricated with oil.

All components necessary for lubrication and maintenance are located around the supporting stand underneath the rust-free cover.

Manual drive for slow motion

There is a manual drive for slowly rotating the can seamer during adjustments. The manual drive is a hex output shaft that is operated with a hex socket wrench.

4.3 Layout of the can seamer

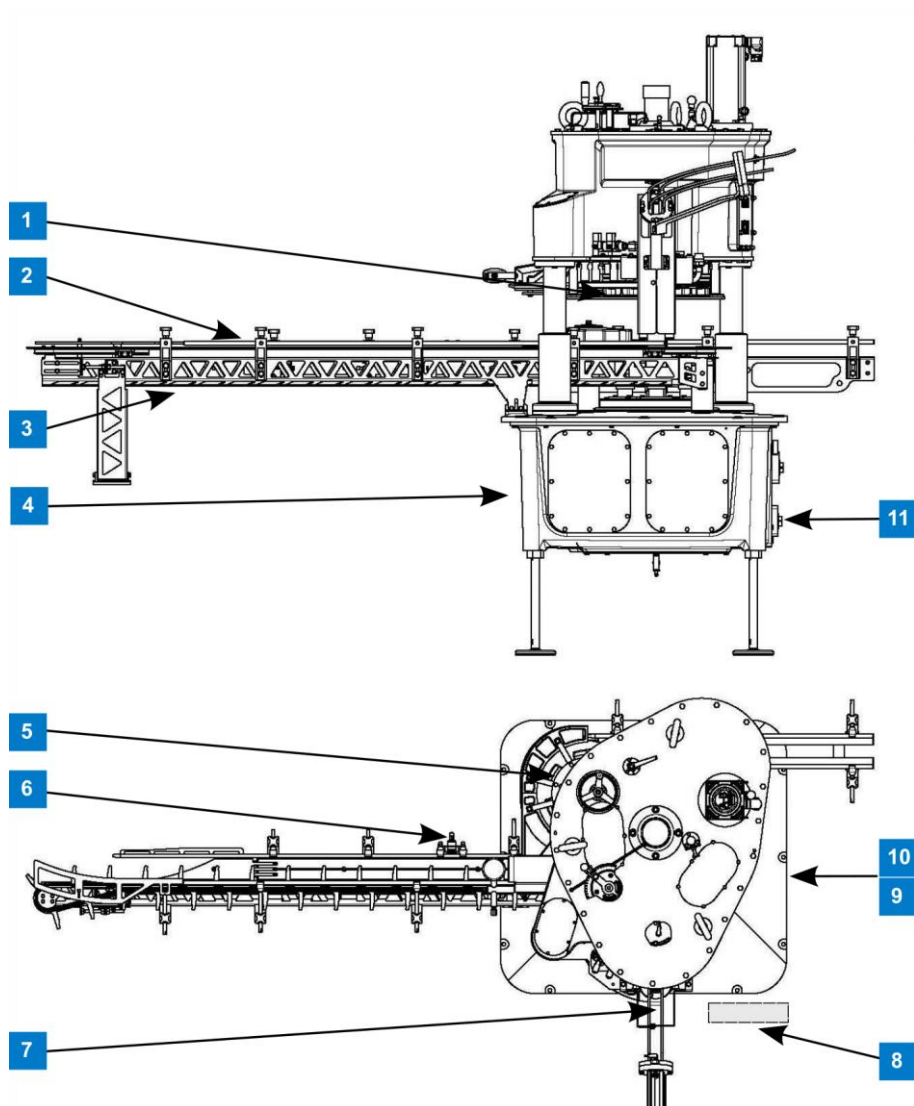


Fig. 6: Can seamer design

- 1 Can/End-feed turret
- 2 Infeed chain
- 3 Infeed table
- 4 Discharge turret
- 5 Can sensor
- 6 End feed magazine
- 7 Terminal box (on the filler casing)
- 8 Oil treatment unit
- 9 Air treatment unit (option)
- 10 Manual drive



Fig. 7: Can seamer interior

- 1 Seaming lever
- 2 Seaming rolls
- 3 Lifting station with base plate
- 4 Center part rotor
- 5 Upper part of can seamer

4.4 Functional principle

The cans are provided with ends in the can seamer and seamed in two seaming operations. During this process the can and end rotate while the seaming roll forms the seal.

4.4.1 First seaming operation (OP 1): 1st OP seam

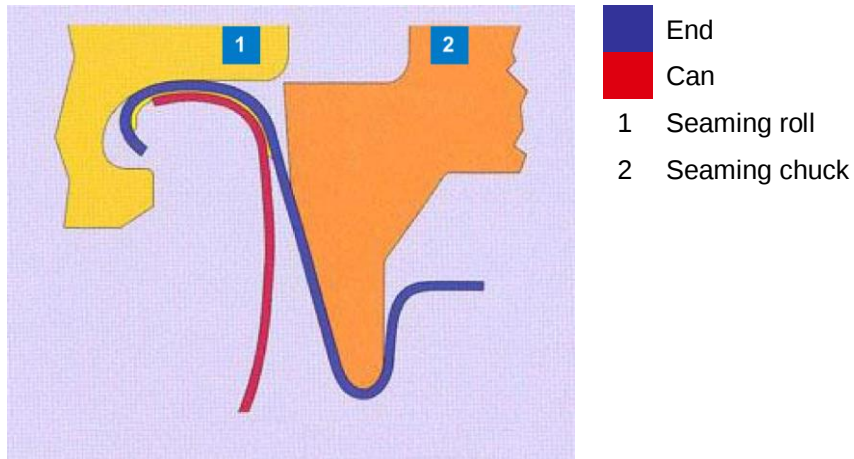


Fig. 8: First start of the OP 1 seaming procedure © BCME

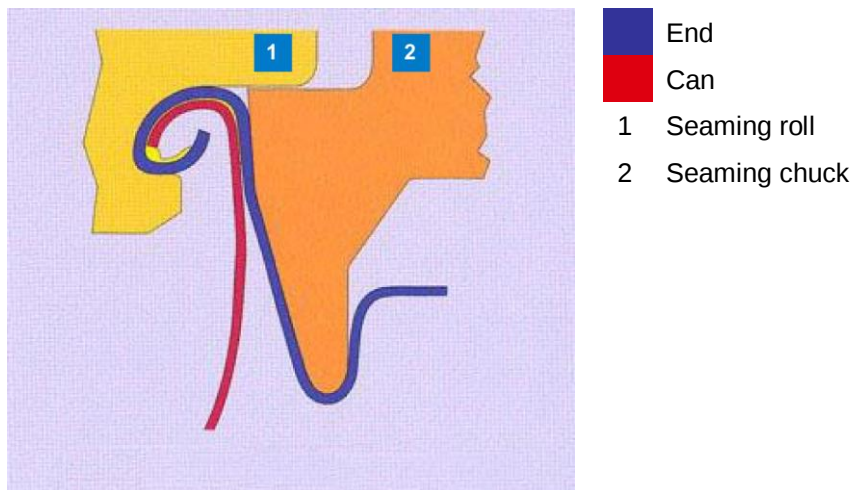


Fig. 9: Partially formed seam OP 1 © BCME

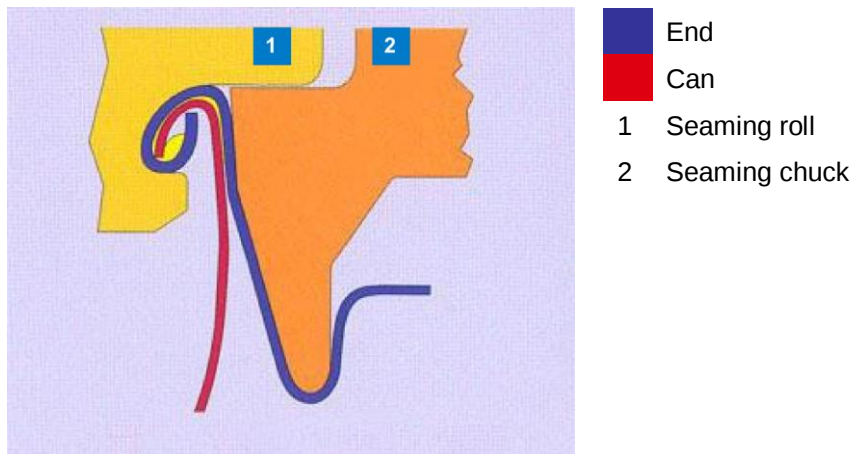


Fig. 10: First completely formed seam OP 1 @ BCME

OP 1 procedure

While the can and end are rotating, the seaming roll presses against the cut edge, causing the can curl and cut edge to form the 1st OP seam.

4.4.2

Second seaming operation (OP 2): 2nd OP seam

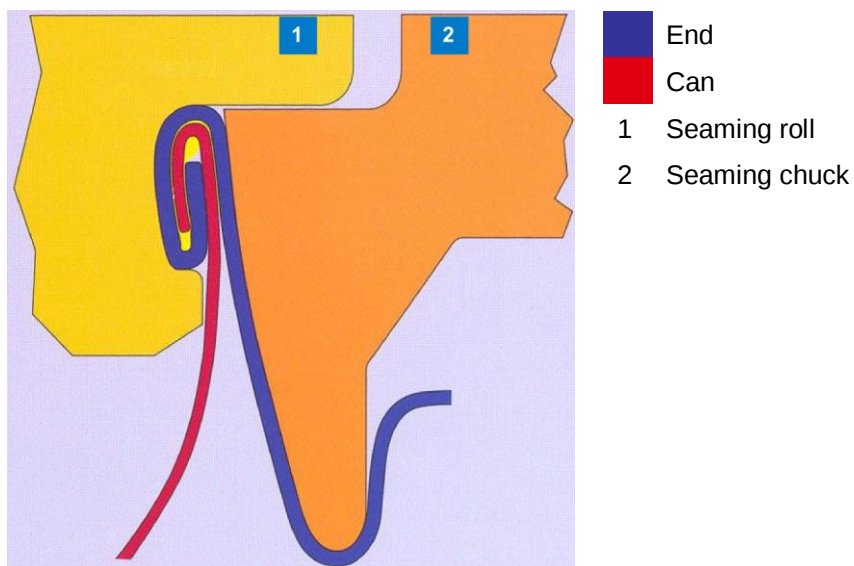


Fig. 11: Second seaming operation, OP 2 @ BCME

OP 2 procedure

While the can and end are rotating, the seaming roll presses against the cut edge, causing the can curl and cut edge to form the 2nd OP seam. A tight seal is formed between can and end.

4.5 Process

Can feeding

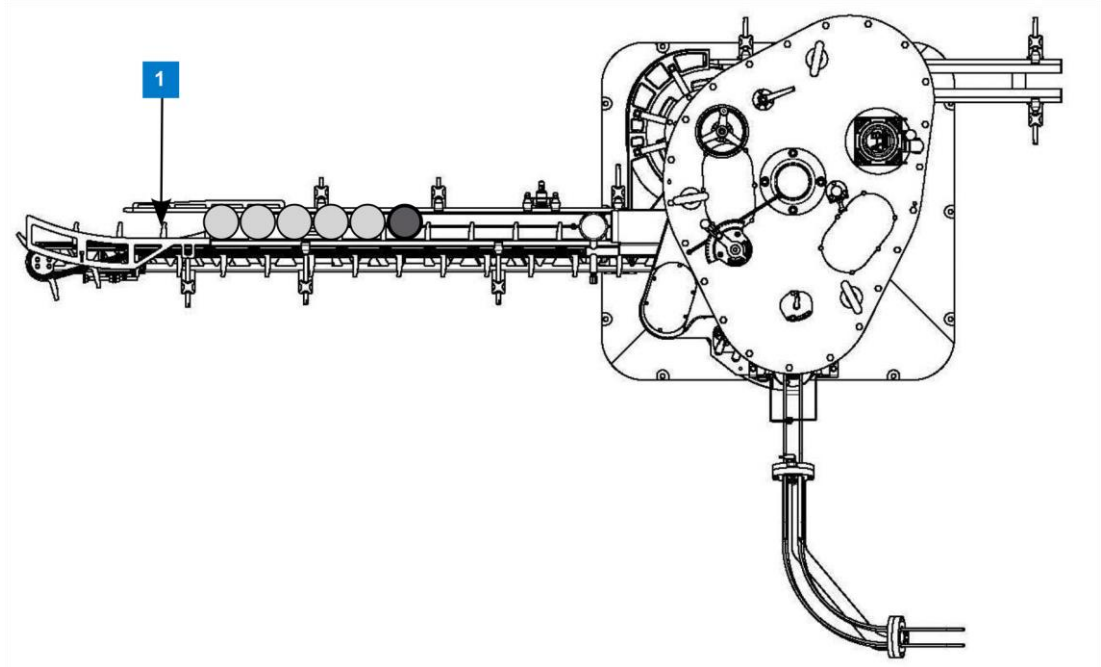


Fig. 12: Can feeding

1 Infeed chain

The cans to be seamed are transferred through the filler to the infeed chain.

To prevent the contents of the can from being shaken, the can transfer to the infeed chain can be set exactly. For detailed information, see chapter "Set the infeed chain".

De-stacking ends

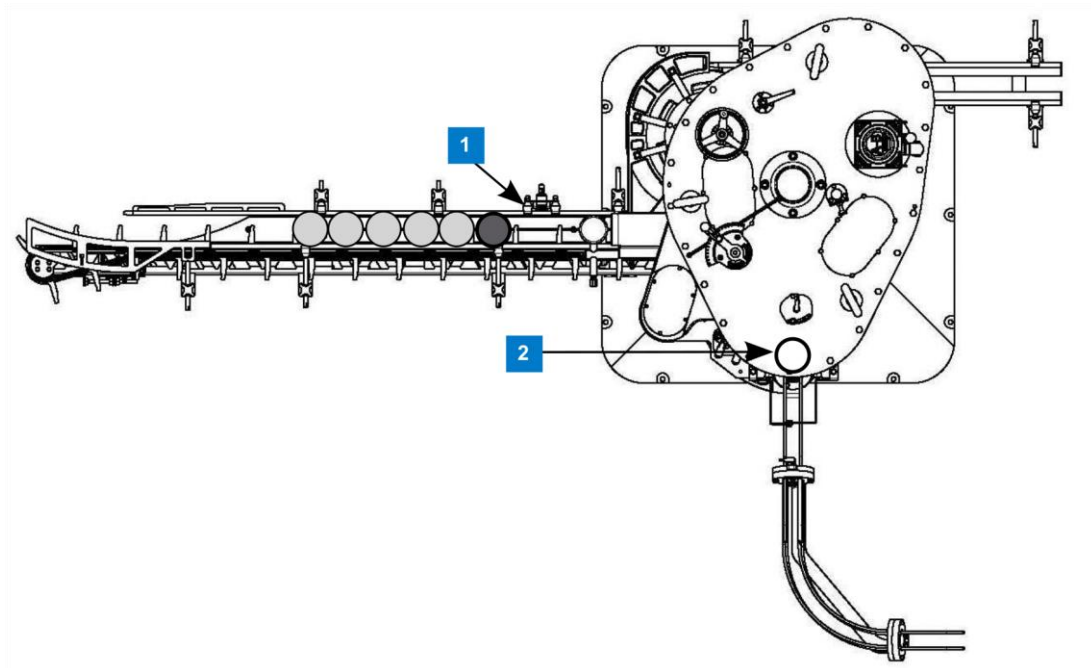


Fig. 13: De-stacking ends

- 1 Can sensor
- 2 End feed magazine / End stack

Once a can has passed through the can sensor, the pneumatic cylinder pulls the retaining knife back. This causes an end to be separated from the end stack by the feed screw. The end feed pushers at the can/end-feed turret transport the end through the end guide.

Bringing can and end together

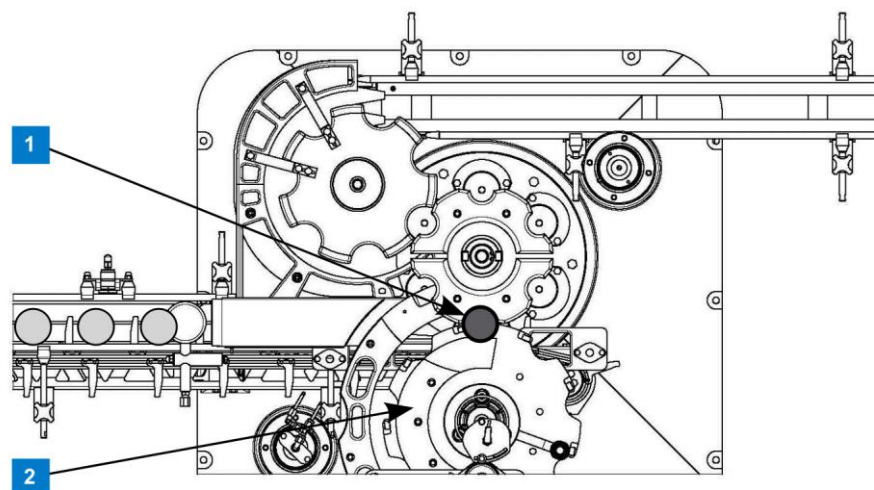


Fig. 14: Bringing can and end together

- 1 X-point
- 2 Can/End-feed turret

At the X-point, the can end is put on the can when the lifting station rises. Before the can and end are brought together under the seaming station, the headroom of the can can be gassed.

Seaming the can

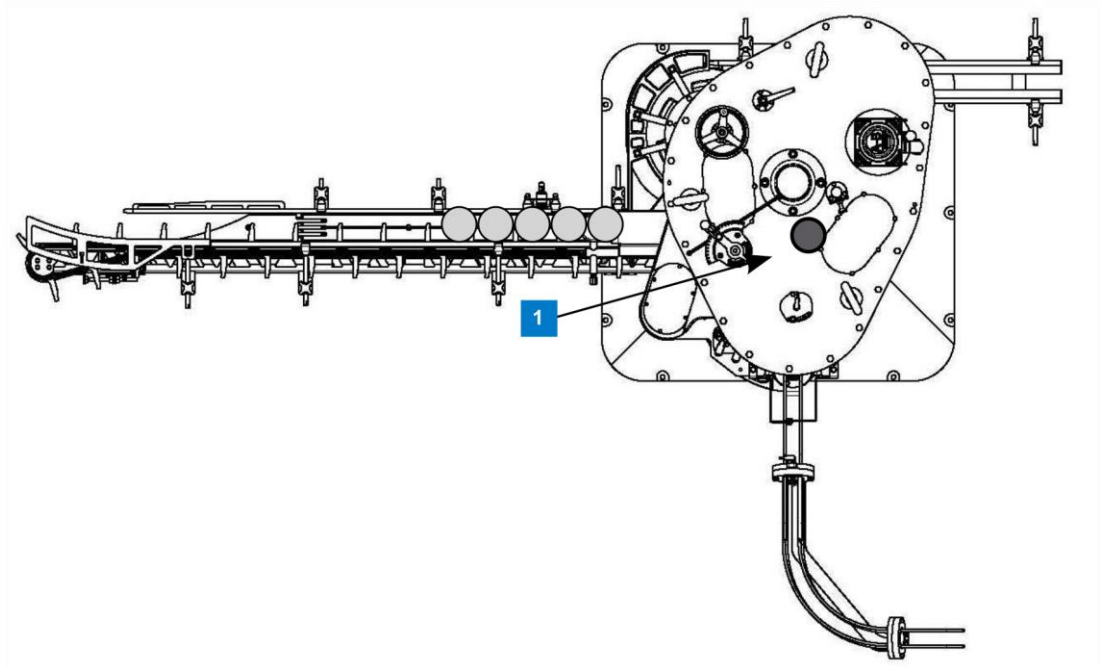


Fig. 15: Seaming the can

1 Can/End-feed turret

By precise centering with the can/end-feed turret, the can is lifted through the base plate right under the fed-in end. At the same time, the knock-out pad presses the end onto the can.

The can begins to rotate once it is clamped between the base plate and seaming chuck. The seaming rolls seam the can, as described in the section "Functional principle".

Transferring the can

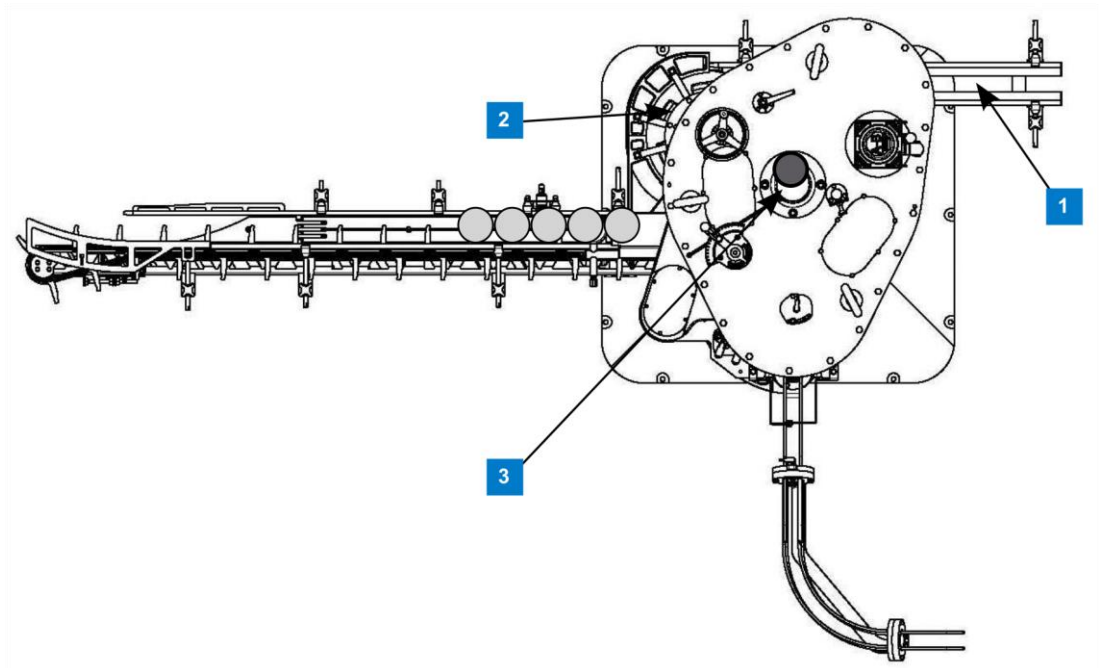


Fig. 16: Transferring the can

- 1 Can discharge
- 2 Discharge turret
- 3 Y-point

At the Y-point, the knock-out pad pushes the can away from the seaming chuck. At the same time, the discharge turret takes the hermetically sealed can from the can seamer and transports it onto the transport belt at the can discharge.

4.6 Can damage

If the can seamer is set correctly according to the chapter "Setup" and damage to the cans continues, this may have to do with the sliding properties of the cans in the following areas:

- Filler
- Can seamer transition
- Infeed table
- Base plate

This mobility depends on the material and, in particular, the coating of the cans. During production it is therefore necessary to lubricate the can transfer in the filler and can seamer with soap water with a concentration of 1.1 %.

Attempts with lower concentrations, as they are used for glass bottles, will lead to poor results.

4.7 Assemblies and components

4.7.1 Infeed table



- 1 Can sensor
- 2 Infeed chain
- 3 Bubble breaker

Fig. 17: Infeed table

On the infeed table, the can seamer takes the filled, open cans from the filler. The cans are taken by the infeed chain and transported into the can seamer interior.

If the chain drive is overloaded or blocked, the safety clutch in the gearbox of the chain drive disengages. This activates a sensor that stops the can seamer.

Before the cans enter the can seamer interior, they pass through the following components:

Bubble breaker (optional)

When beverages are filled up in the filler, foam forms in the open cans. The bubble breaker reduces this foam until it is flush with the upper edge of the open can. The height of the bubble breaker can be adjusted.



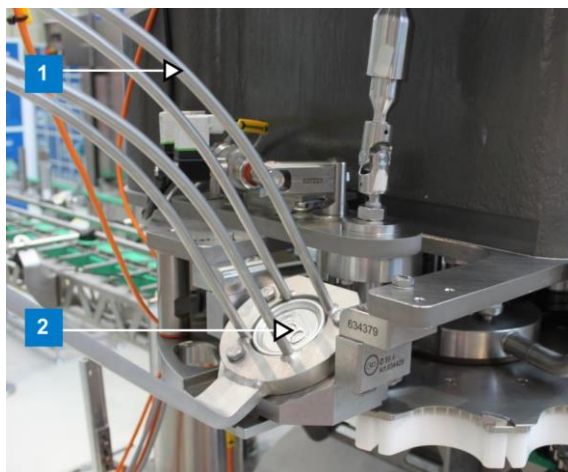
NOTE

After the machine is switched off, the bubble breaker needs to be checked for gas leakage.

Can sensor

When the can sensor is passed, the end release is triggered.

4.7.2 End feed magazine



- 1 End feed hopper
- 2 End shaft

Fig. 18: End feed magazine

The supply of ends is stacked in the end feed. The ends are fed into the end feed by their own weight.

If the end stack level falls below the end feed magazine sensor, a normal stop of the machine is triggered.

If the end stack level falls below the end shortage sensor, the can seamer reduces the speed and the can blocker at the filler inlet is activated.

After ends have been refilled and the corresponding fault on the control panel has been acknowledged, the machine can be restarted.



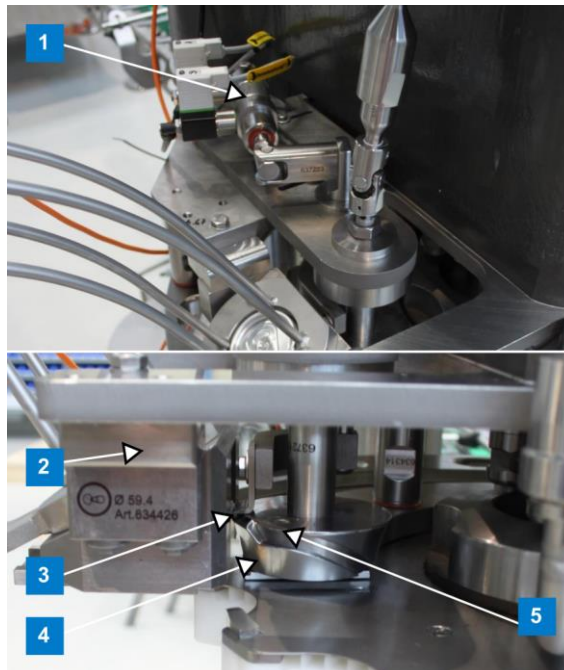
NOTE

The maximum heights of the end stacks above the feed screw depend on the end diameter. These are:

Aluminum Ø max. 70 mm: 800 mm

Steel Ø max. 70 mm: 400 mm

4.7.3 End feed and can/end feed turret



- 1 Pneumatic cylinder
- 2 End feed magazine ring
- 3 Retaining knife
- 4 Feed screw
- 5 Separator knife

Fig. 19: End feed



- 1 Can/end-feed turret

Fig. 20: Can/end-feed turret

The feed screw individually separates the ends from the end feed magazine. The can/end-feed turret transports the ends to the machine center. The can/end-feed turret guides the cans during the transfer from the infeed chain to the lifting station.

The pneumatic cylinder holds back the ends in the end feed magazine if, during the rising edge of the cycle signal, the can sensor signals that no can is present. To do this, it pushes the retaining knife between the feed screw and the end stack.

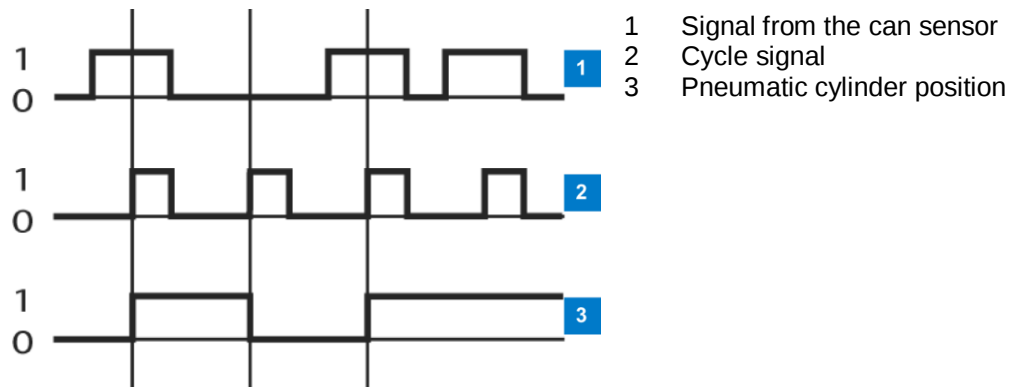


Fig. 21: Signal characteristics for the end feed

Signal	Retaining knife position
0	Home position, retaining knife extended
1	Retaining knife retracted

As soon as the can sensor signals the presence of a can during the rising edge of the cycle signal, the pneumatic cylinder retracts the retaining knife, separating the bottommost end. The cycle signal is generated by the pulse generator on the drive shaft of the feed screw.

4.7.4 Lifting station with base plate



- 1 Seaming roll
- 2 Seaming chuck
- 3 Base plate
- 4 Lifting station
- 5 Center part rotor

Fig. 22: Lifting stations

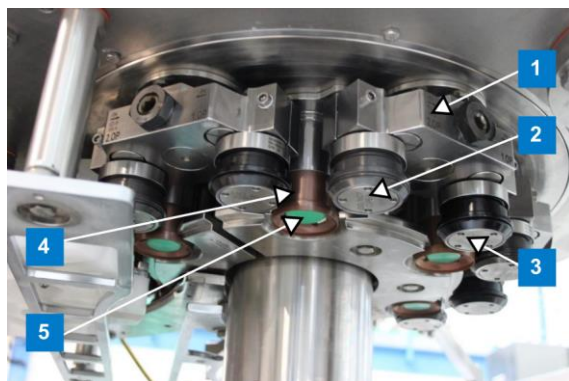
The rotating lifting station presses the can and end against the seaming chuck during the seaming operation. During this process the can and end are clamped, spring-loaded, between base plate and seaming chuck.

Before the first seaming operation, the lifting stations lift the cans; after the second seaming operation they lower the sealed cans back down. The lifting cam controls this lifting motion.

The pressing force of the base plates can be set.

The lifting stations are mounted in the center part rotor and are driven synchronously to the seaming chucks.

4.7.5 Seaming chuck and seaming rolls



- 1 Seaming lever
- 2 OP 2 seaming roll
- 3 OP 1 seaming roll
- 4 Seaming chuck
- 5 Knock-out pad

Fig. 23: Seaming chucks and seaming rolls

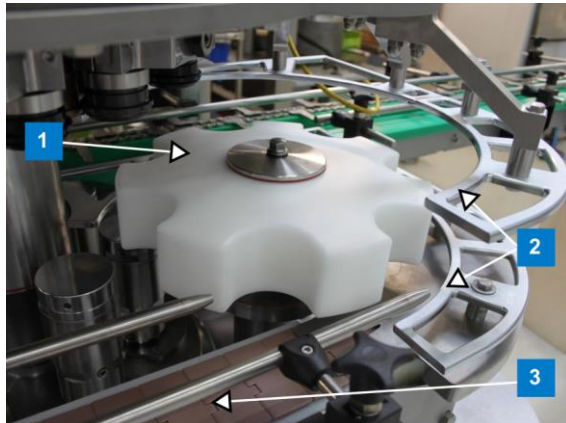
The can is seamed in the seaming chuck. During this process the seaming levers press the seaming rolls against the rotating cut edges of the can and the end and form them to a seam in two seaming operations.

The seaming cam controls the motion of the seaming levers. The position of the seaming roll is adjustable.

Knock-out pads push out the seamed cans from the seaming chucks. The knock-out/knock-out cam controls the motion of the knock-out pad.

The seaming chucks are mounted in the upper part rotor and are driven synchronously to the lifting stations.

4.7.6 Discharge turret



- 1 Discharge turret
- 2 Can infeed/outfeed guides
- 3 Can discharge

Fig. 24: Discharge turret

The can infeed/outfeed guide guides the seamed cans away from the lowered lifting stations. The discharge turret takes the cans and transports them to the can discharge.

Components

- Can infeed/outfeed guide
- Discharge turret

4.7.7 Filler and seamer connection

Filler and seamer are connected by an electric shaft. They are synchronized electronically.

4.7.8 Main drive



1 Motor main drive

Fig. 25: Main drive

The main drive powers the transport elements, the end feed as well as the rotors.

Additional components

- Center part rotor and upper part rotor drive
- Infeed chain drive
- Can/end-feed turret drive
- End feed drive
- Discharge turret drive
- Infeed chain safety clutch

The transport speed or speed of the rotors can be adjusted.

4.7.9 Manual drive for adjustments (manual slow motion)



1 Manual drive

Fig. 26: Manual drive



DAMAGE TO EQUIPMENT

Filler

The seamer can be moved forward or backward using the manual drive. Filler types with mechanical fill valves must not, however, rotate backwards.

- If the filler must not rotate backwards: To enable backward movement of the seamer, the filler drive coupling must be disengaged temporarily.
- If the filler can rotate backwards: The filler drive coupling remains engaged. If the corresponding enable signal is issued by the filler control desk, backward motion of the seamer is enabled.

Turning with manual drive allows for accurate positioning when adjusting settings or performing inspections. The can seamer can be turned forward or backward using the manual drive.

4.7.10 Height adjustment

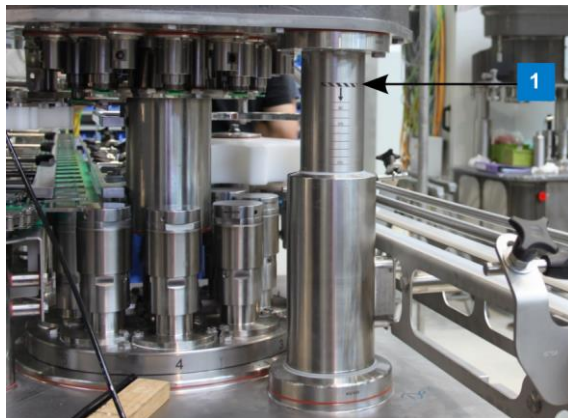


DAMAGE TO EQUIPMENT

Height range on the can seamer column

The can seamer can be damaged if the marked range is exceeded upwards or downwards.

- Always keep an eye on the marks on the can seamer column when moving upwards or downwards.
- Do not cross the marks.



- 1 Mark for lowest position of the can seamer upper part

Fig. 27: Height range on can seamer column

For different can heights, the distance between base plate and seaming chuck must be adjusted using the electrically driven height adjustment.

To do this, the can seamer upper part must be moved vertically together with the seaming chucks.

The can seamer columns support and guide the can seamer upper part.

The height adjustment is initiated, controlled and monitored by the superordinate control.

For additional information please refer to the operating instructions of the production line manufacturer.

4.7.11 Air treatment unit

The pneumatic drives and the air overpressure unit of different machine components are supplied with compressed air via the air treatment unit.

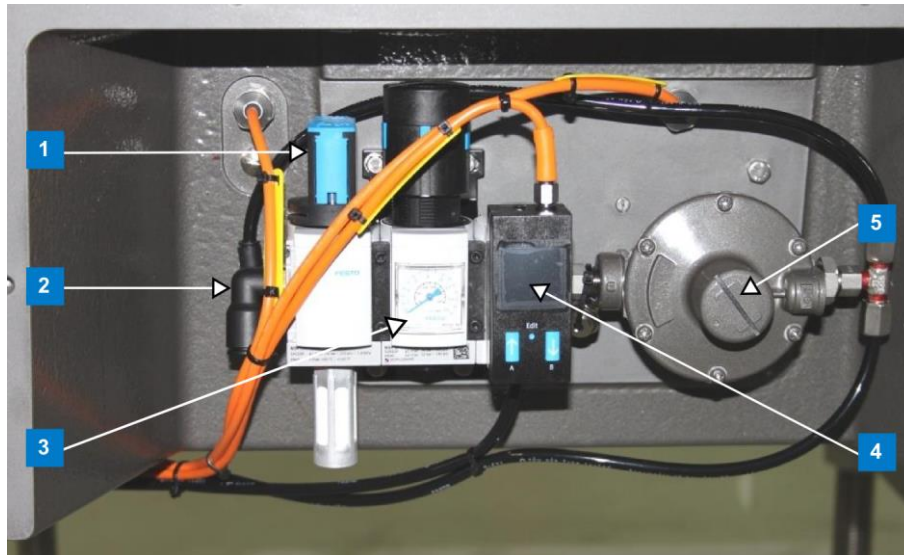


Fig. 28: Air treatment unit

- 1 Lockout/Tagout shut-off valve with ventilation
- 2 Compressed air inlet
- 3 Maintenance unit with pressure gauge
- 4 Electronic pressure sensor with display
- 5 Pressure reducer

Pneumatic scheme

You can find the pneumatic scheme in the appendix.

Compressed-air connection

To connect the compressed air, see the chapter "Set up and connections", section "Connections".

The main compressed air line is connected to the hose connection for hose interior diameter 8 mm upstream of the shut-off valve; the air pressure should remain above **6.0 bar**.

Water separator and pressure reducing valve are attached to the can seamer as a conditioning assembly.

The air pressure is monitored by a pressure sensor. If the air pressure drops below **5.5 bar**, the display at the pressure sensor lights up red and a fault is signaled. The fault can only be acknowledged after the air pressure rises above **6.0 bar**. Then the display at the pressure sensor switches to green.

The pressure reducing valve is set to just above **6.0 bar** at the factor.

Air overpressure unit

The air overpressure unit generates a constant overpressure in all gears and gear housings of the can seamer, preventing fluids from penetrating into the machine.

The pressure is set at the factory at the air treatment assembly and may not be modified.

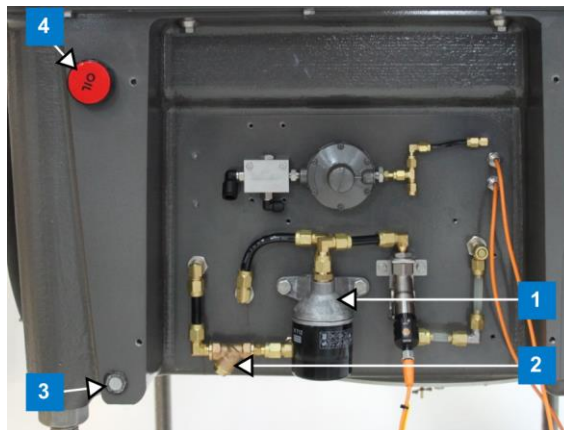
**NOTE**

The compressed air must never be disconnected, as the can seamer operates using air overpressure.

After turning off the can seamer, the compressed air supply must be ensured for at least four hours to prevent negative pressure in the machine and to prevent penetration of condensation.

4.7.12 Oil treatment unit

All gear meshing and bearings in the upper, center and lower part of the can seamer and the lifting, knock-out and seaming cams are continuously and automatically lubricated with a centralized oil lubrication.



- 1 Oil filter (fine)
- 2 Oil filter (coarse)
- 3 Oil level display
- 4 Oil filling nozzle

Fig. 29: Oil treatment unit

Hydraulic scheme

You can find the hydraulic scheme in the appendix.

Centralized oil lubrication

The oil pump works speed-dependently. The oil flow is monitored by a flow sensor, which is controlled by the higher-level control system.

The oil is constantly cleaned by a coarse and a fine filter.

Approved oil types

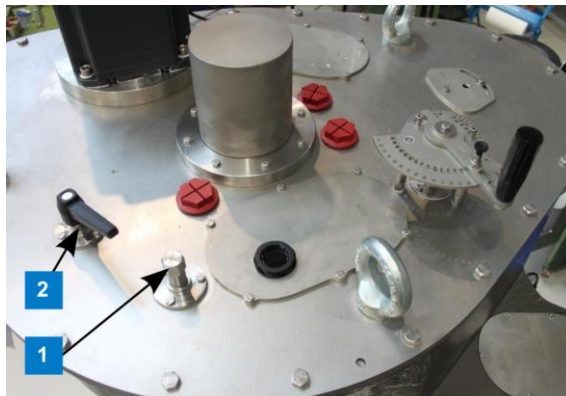
The following table lists the approved oil types. Occasional contact with foodstuffs is possible.

Oil types	
Food-safe oils	Cassida Fluid CR100 Optimol Optileb GT100 Lubcon Turmosynth 100 GV Rivolta F.L. 125 Bel-Ray No-Tox Synthetic Gear Oil 100 Lubriplate SFGO Ultra 100

4.7.13 Seaming roll lubrication

The seaming rolls are maintenance-free.

4.7.14 Disengageable seaming cam



- 1 Clamp SW 22
- 2 Disengageable lever

Fig. 30: Disengageable seaming cam

The disengageable seaming cam can be disengaged for the OP 1 seaming test. For additional information, see chapter "Settings", section "Seaming test OP 1/Disengaging the OP 2 seaming cam".

4.7.15 Quick-set cam

The machine is equipped with a quick-set cam.

Function and conversion

The seaming roll gap of the 2nd operation is varied by a small offset of the curve in the horizontal plane by an eccentric. The 1st operation is influenced only insignificantly by this.

Adjustment only takes minutes, and is completed with a few simple steps on the top side of the can seamer. A clamping screw is loosened, the desired position is indexed on a scale with a handle, and the clamping screw is retightened.

The positions on the scale need to be determined in advance by seaming trials. The adjustment mechanism has basically no play and hysteresis.

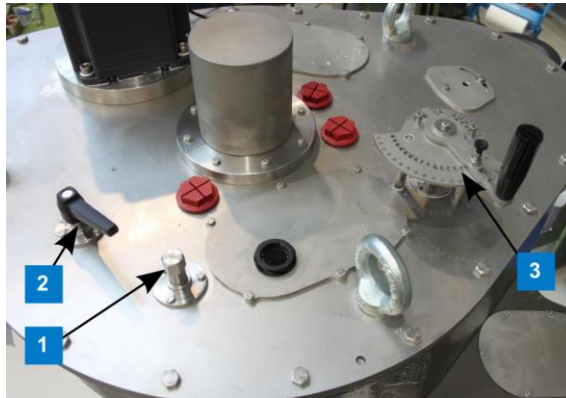
The nominal gap of the seaming roll to the seaming chuck can be varied by about **0.34 mm**. The effective gap depends on the stiffness of the can seamer and the seam parameters.



NOTE

The basic setting (specifying the seam thickness) is done at the factory by Ferrum AG. The definitive determined values on the scale disk are provided by Ferrum.

Controls



- 1 Clamp SW 22
- 2 Disengageable lever
- 3 Seaming cam setting

Fig. 31: Quick-set cam controls

For easier installation and maintenance, the controls of the quick-set cam are attached to spring-loaded, movable bolts. After maintenance it may be possible that not all controls lock into their operational position automatically. Markings on the bolts – labeled "flush mount" – indicate whether the bolts are in their operational positions. If this is not the case, turning the controls can cause them to lock into place. It may be necessary to temporarily remove the M5 shoulder screws for unrestricted rotation during seaming cam adjustment until the control locks into place. The M5 shoulder screws must then be reattached in the same positions.

Settings

For additional information, see chapter "Settings", sections "Setting the quick-set cam" and "Changing over the quick-set cam".

4.8**Control**

You will find information on the control in the separate electrical documentation.

5 Displays and controls

5.1 Overview

This chapter describes all controls (control stations, switches, buttons) and optionally a detailed description of the control panel and its functions.

5.2 Electric cabinet

The electric cabinet for the filler and seamer is manufactured in its entirety by the filler supplier.



NOTE

For information on the electric cabinet, please refer to the operating instructions from the filler supplier.

5.3 Control desk

The control desk for the filler and seamer is manufactured in its entirety by the filler supplier and can be found near the front of the filler.



NOTE

For information on the control desk, please refer to the operating instructions from the filler supplier.

5.4 Control ON / OFF (Control voltage switch)

Located on filler control desk.

5.5 Drive ON/OFF

Press drive ON to start the seamer. This is only possible when no faults are present. Drive OFF is used to stop the seamer. The main drive can be switched on and off at the filler control desk.

5.6 Selection of operating modes

Most manual interventions involving process, cleaning and auxiliary operations are performed on the filler control desk.



NOTE

For information on the selection of operating modes, please refer to the operating instructions from the filler supplier.

5.7 Selection of speed and speed display

All operational messages, notices, malfunction signals and process reports are displayed on the filler control desk.



NOTE

For information on the selection of speed/display, please refer to the operating instructions from the filler supplier.

6 Settings

6.1 Overview

This chapter contains all information required for adjusting the transport elements, the end feed, the seaming roll, the knock-out pads, and for adjusting the height of the can seamer for other can heights.

6.2 Safety regulations

Target group

Setting adjustments may only be made by specialized technicians with product-specific training who have received basic training in mechanical and electrical work and who have appropriate vocational experience.



READ THE OPERATING INSTRUCTIONS



This chapter, the chapter "Safety", as well as all other chapters in this operating manual that are referred to, have to be read and fully understood by all persons who make setting adjustments at the can seamer.



WARNING



Unintentionally switching the can seamer on

If the can seamer is switched on unintentionally, rotating can seamer parts can cause serious physical injury or death.

- Never reach inside the machine when the can seamer is running.
- Always stop the can seamer before performing any work on it.
- Take measures to prevent the can seamer from being switched on unintentionally.
- When working on the can seamer, secure it so that no person or situation can effect changes to the can seamer while you are away from it.
- Before starting settings adjustment and maintenance tasks, padlock the main switch against being switched back on.

6.3 Sequence for adjusting settings

To correctly set up the components of the can seamer and match them to each other, the following sequence has to be adhered to for settings adjustments. The corresponding work instructions can be found in the chapters "Settings" and "Operation".

No.	Adjustment	Chapter	Subchapter
1.	Shut off the can seamer and secure it against being switched back on.	Operation	Switching off the can seamer
2.	Open the guard doors.	Operation	Opening the guard door
3.	Disengage filler drive.	Settings	Synchronization
4.	Install the setting gauge.	Settings	Setting gauge
5.	Align the setting gauge to X-point.	Settings	Setting gauge
6.	Set the can guides.	Settings	Setting the can guides and end guides
7.	Set the can/end-feed turret.	Settings	Setting the can/end-feed turret
8.	Set the infeed chain.	Settings	Setting the infeed chain
9.	Align the setting gauge to Y-point.	Settings	Setting gauge
10.	Set the discharge turret.	Settings	Setting the discharge turret
11.	Remove the setting gauge.	Settings	Setting gauge
12.	Set the knock-out pads and if necessary also the knock-out cams.	Settings	Setting the knock-out pads
13.	Set the can height.	Settings	Setting the can height
14.	Set the base plate pressure.	Settings	Setting the base plate pressure
15.	Engage filler drive.	Settings	Synchronization

6.4 Setting gauge

6.4.1 Installing the setting gauge

To configure the basic settings of the can seamer, a setting gauge is installed at seaming station no.1. To do so, the setting gauge is installed in place of the seaming chuck. A suitable setting gauge is supplied for each can format.

The setting gauge consists of two parts, a mandrel and an aluminium sleeve. The mandrel is inserted into the aluminium sleeve. To install the setting gauge, place the sleeve on the base plate. Raise the mandrel and screw it onto the seaming chuck shaft.

The installed setting gauge ensures that all transport elements have been correctly adjusted. The gauge is always positioned at the X-point or Y-point.

Requirements

- The can seamer is in setup mode and thus secured against being switched on again.
- The filler is disengaged.

Location

- Easily accessible area in front of the OP 1 mark.
- If parts for cleaning are in the way, they can be removed (clamp closures). Warning: Do not lose the seal!

Auxiliaries

- Setting gauge, consisting of mandrel and aluminium sleeve
- Seaming chuck wrench
- Plastic hammer

Adjustments

1. Remove the knock-out pad as described in the “Replacing the knock-out pads” section.

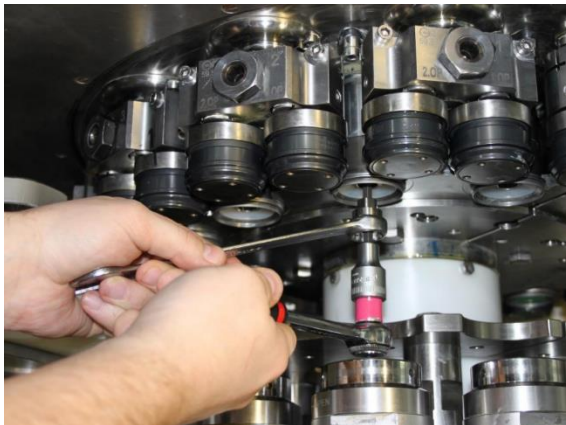


Fig. 32: Removing the knock-out pad

2. If not yet removed, loosen the seaming chuck: Insert the seaming chuck wrench into the four bore holes and loosen the seaming chuck by hammering lightly against the handle of the wrench (right-hand thread).

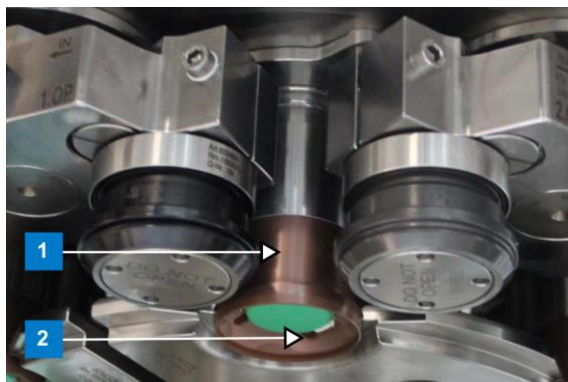


Fig. 33: Seaming chuck

- 1 Seaming chuck
- 2 Bore hole for seaming chuck wrench

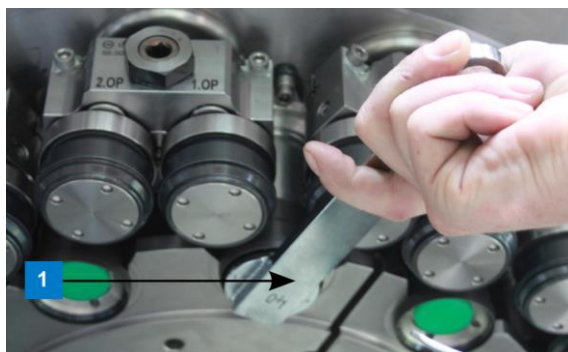


Fig. 34: Seaming chuck wrench

- 1 Seaming chuck wrench

3. Insert the mandrel in the aluminium sleeve and place it on the base plate of seaming station no.1.

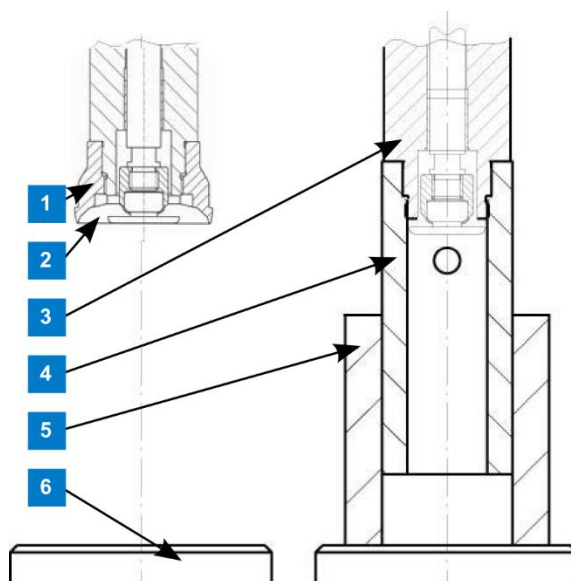


Fig. 35: Setting gauge

- 1 Seaming chuck
- 2 Bore hole for seaming chuck wrench
- 3 Seaming chuck shaft
- 4 Mandrel
- 5 Aluminium sleeve
- 6 Base plate

4. Screw the mandrel onto the seaming chuck shaft.

The setting gauge is aligned with the X-point/Y-point when the X-mark/Y-mark on the scale ring matches up with the X/Y-point mark.



DAMAGE TO EQUIPMENT

Setting gauge

An installed setting gauge can damage the can guides or the bearings of the seaming chuck shafts when the rotor is rotating. Rotate the rotor carefully toward the centre of the machine when the setting gauge is installed.

- Do not leave the machine unattended when the setting gauge is installed.



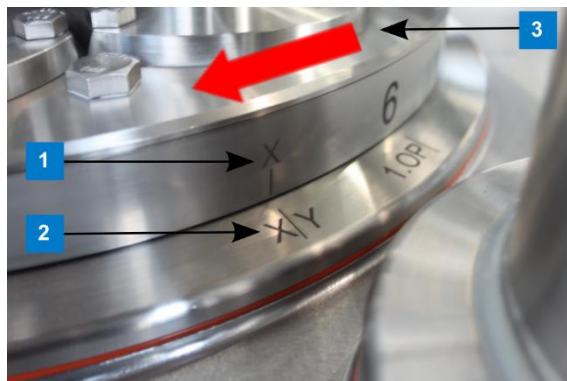
DAMAGE TO EQUIPMENT

Filler

If a filler is driven by the seamer, the filler drive must be disengaged, otherwise reverse rotation might damage the filling valves.

Adjustments

1. Carefully rotate the centre part rotor clockwise (backwards) using the manual drive until the X or Y-mark on the scale ring matches up with the X/Y point mark. When rotating the centre part rotor, monitor the setting gauge and adjacent can guides to avoid a collision.



- 1 Mark on the scale ring
- 2 X/Y-point mark
- 3 Centre part rotor

Fig. 36: Centre part rotor

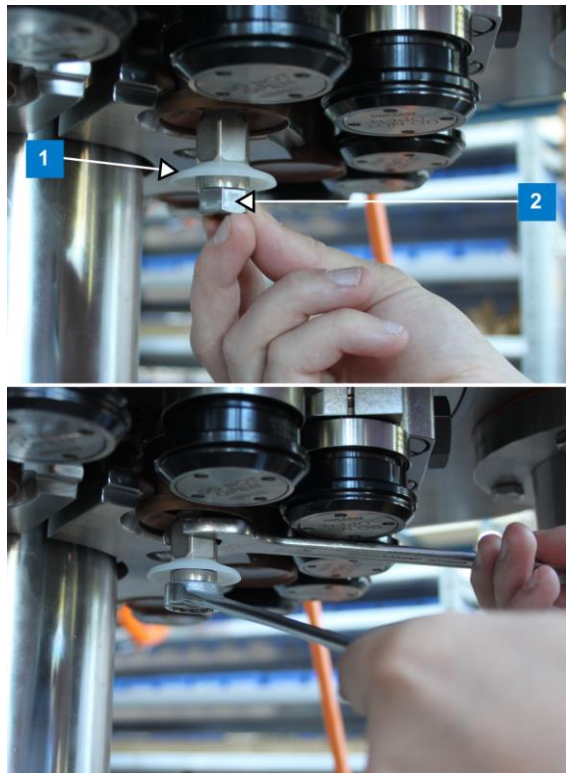


NOTE

The can seamer is ready for the other transport elements to be adjusted.

6.4.2 Removing the setting gauge

1. Dismount and remove the mandrel.
2. Lightly grease the seaming chuck with the assembly paste supplied and screw it in by hand.
3. Tighten the seaming chuck with two light hammer blows on the seaming chuck wrench (right-hand thread).
4. Mount the knock-out pad as described in the “Replacing the knock-out pads” section.



- 1 Knock-out pad
- 2 Wrench extension

Fig. 37: Mounting the knock-out pad

5. Loosen the knock-out auxiliary cam and re-install it rotated by 180°.

6.5 Marks on the can seamer

6.5.1 X-point mark

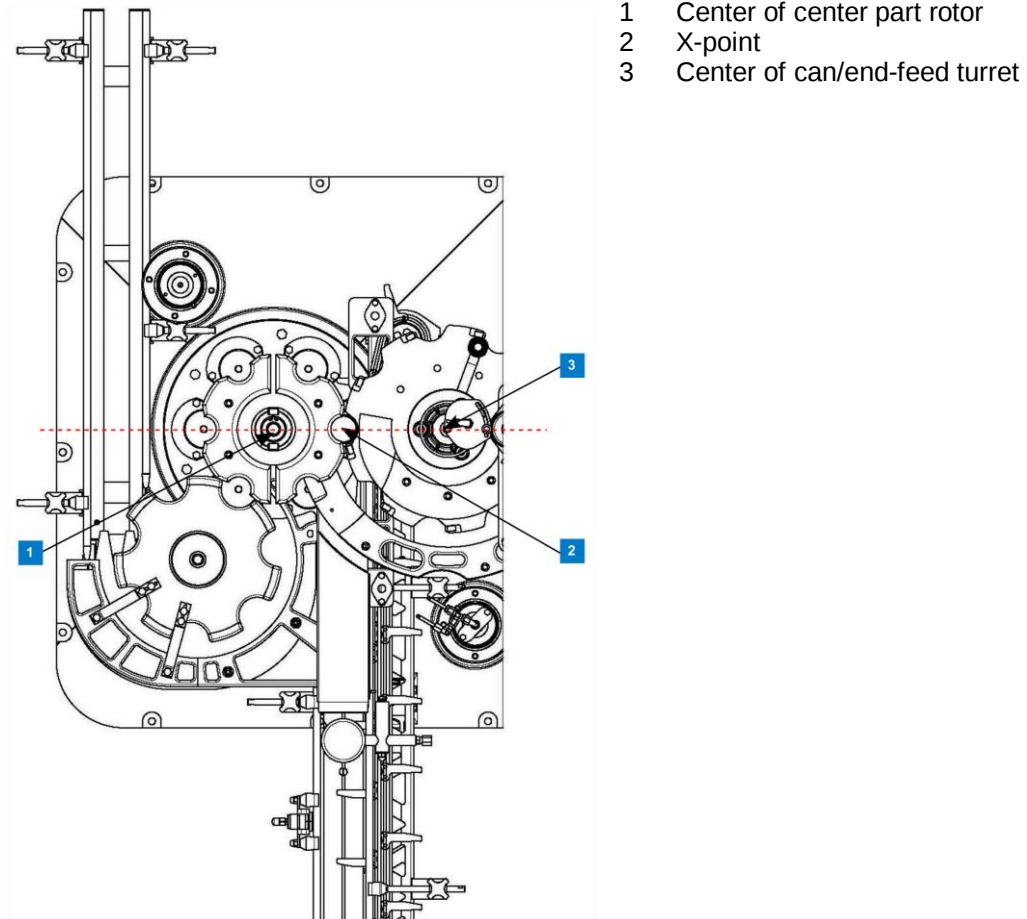


Fig. 38: X-point

Location

The X-point is indicated by the mark on the center part rotor.

The following transfers take place at the X-point (can seamer center):

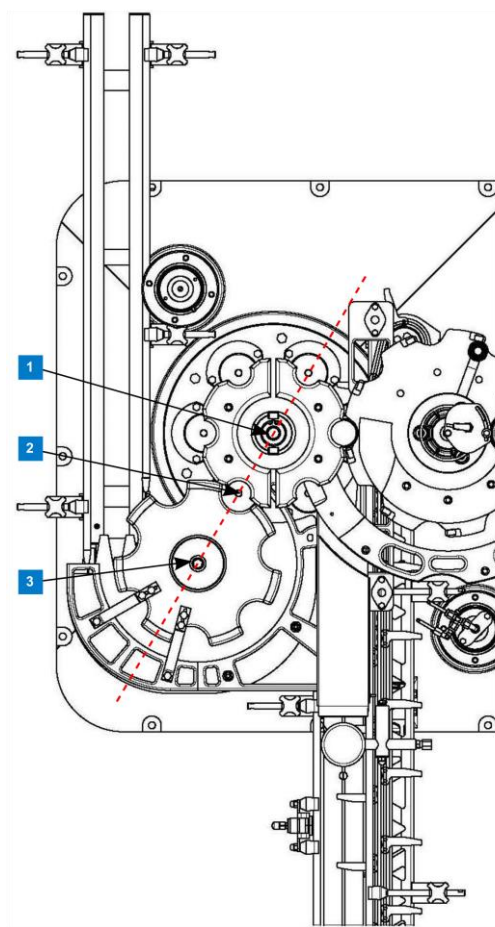
- The cans are transferred from the infeed chain to the lifting stations.
- The ends are transferred from the end feed turret to the cans.
- The knock-down cam supports bringing the can and end together.

Adjustments

The basic settings of the can seamer are always configured by means of the setting gauge, which is aligned to the X-point or Y-point.

For alignment of the setting gauge at seaming station No. 1 to the can seamer center, an X-point mark has been engraved on the center part rotor.

6.5.2 Y-point mark (can discharge)



- 1 Center of center part rotor
- 2 Y-point (can discharge)
- 3 Center of discharge turret

Fig. 39: Y-point, can discharge

Location

The Y-point is indicated by the mark on the center part rotor.

The following transfers take place at the Y-point (can discharge):

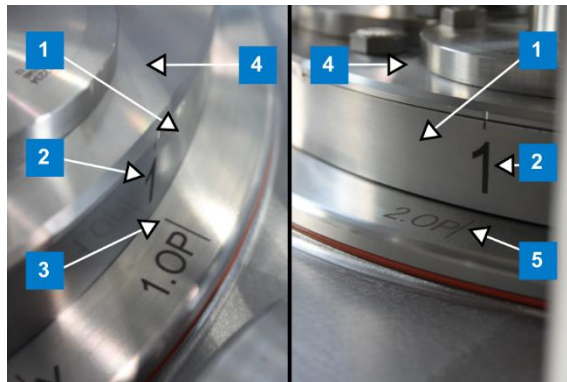
- The discharge turret takes the can from the lifting station.
- The knock-out cam supports the can during descent.

Adjustments

The basic settings of the can seamer are always configured by means of the setting gauge, which is aligned to the X-point or Y-point.

For alignment of the setting gauge at seaming station No. 1 to the Y-point, a Y-point mark has been engraved on the center part rotor.

6.5.3 Other marks



- 1 Scale ring
- 2 Lifting station numbers
- 3 1. OP mark
- 4 Centre part rotor
- 5 2. OP mark

Fig. 40: Other marks

Adjustments

Marks on the centre part rotor are of help when:

- aligning the transport elements to each other
- checking the settings
- re-aligning the transport elements at positions set previously.

On the centre part rotor, the following marks can be found in addition to the X-point/Y-point mark:

- **Lifting station numbers**
On the scale ring, there is a number and a mark for each lifting station.
If this mark is aligned with the OP 1 or OP 2 mark, the seaming rolls can be set or removed in the marked station.
- **1. OP 1 mark**
To adjust the seaming rolls for OP 1 (1st OP seaming rolls) or the base plate pressure, or to install or remove the seaming rolls for OP 2 (2nd OP seaming rolls), align the respective lifting station number with the OP 1 mark.
- **2. OP 2 mark**
To adjust the seaming rolls for the OP 2 (2nd OP seaming rolls), or to install/remove the seaming rolls for OP 1 (1st OP seaming rolls), align the respective lifting station number with the OP 2 mark.
- **S mark**
To remove a lifting station, align the respective lifting station number with the S mark.
- **P mark**
To adjust or remove an ejector pad, align the respective lifting station number with the P mark.

6.6 Preparations for adjustments



DANGER



Rotating can seamer parts

If the safety devices and equipment are bypassed, the rotating can seamer parts can cause severe physical injury or death.

- It is strictly prohibited to bypass safety devices.
- Stop the can seamer for maintenance and adjustments and secure it against being switched back on.
- When the can seamer is running, stay away from the infeed chain at the infeed table and from the can discharge.
- Do not reach into the inside of the can seamer when the machine is running or when it has not been stopped and secured.
- Check the function of the safety devices regularly.

Perform the following tasks prior to starting any setting adjustments on the can seamer:

- Stop the can seamer and secure it against being switched back on.
- If there are still cans on the infeed table or inside the guards, remove them.
- Clean the can seamer (chapter "Foam cleaning") to remove all dirt.
- Empty the end feed magazine and extended end feed magazine.

6.7 Adjusting the can guides

The can guides have been correctly set when the cans run through smoothly and without getting stuck.

Auxiliaries

- Tool kit
- Setting gauge

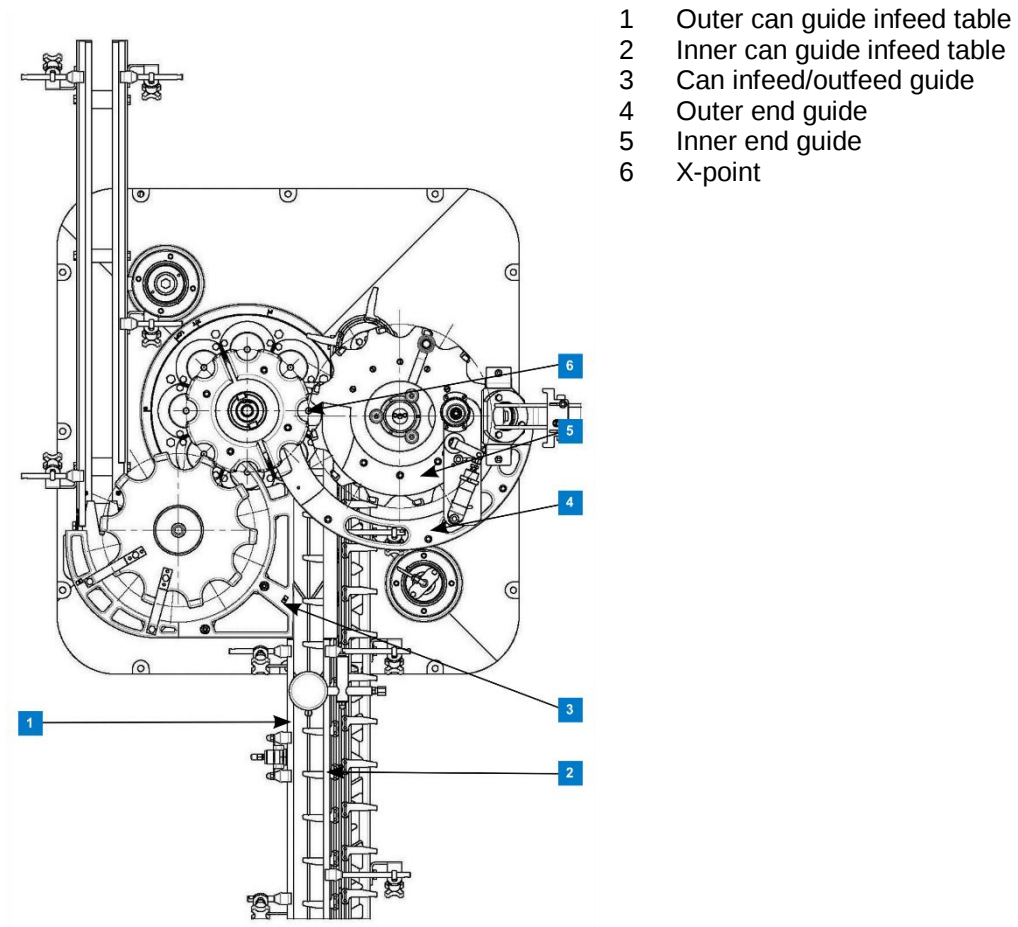


Fig. 41: Can guides and end guides

Adjustments

Adjust the can guides in the following order:

- **Outer can guide infeed table**
Align the outer can guide infeed table without play to the X-point using the setting gauge.
- **Can infeed/can outfeed guide**
Align the can infeed/can outfeed guide without play to the X-point using the setting gauge.
- **Inner can guide infeed table**
Align the inner can guide infeed table using the outer can guide infeed table.

6.7.1 Setting can infeed/outfeed guide

The can infeed/outfeed guide has been set when there is no play in the can path for both setting gauges. Perform the setting as in the following illustration.

Auxiliaries

- Tool kit
- Setting gauge with can diameter
- Setting gauge with can diameter + 0.5 mm

Adjustments

1. The can infeed/outfeed guide is gradually set to no play using the setting gauge along the can and end paths. The two setting gauges are positioned one after the other as in the following figure.

The play at each setting point is given in mm in the illustration.

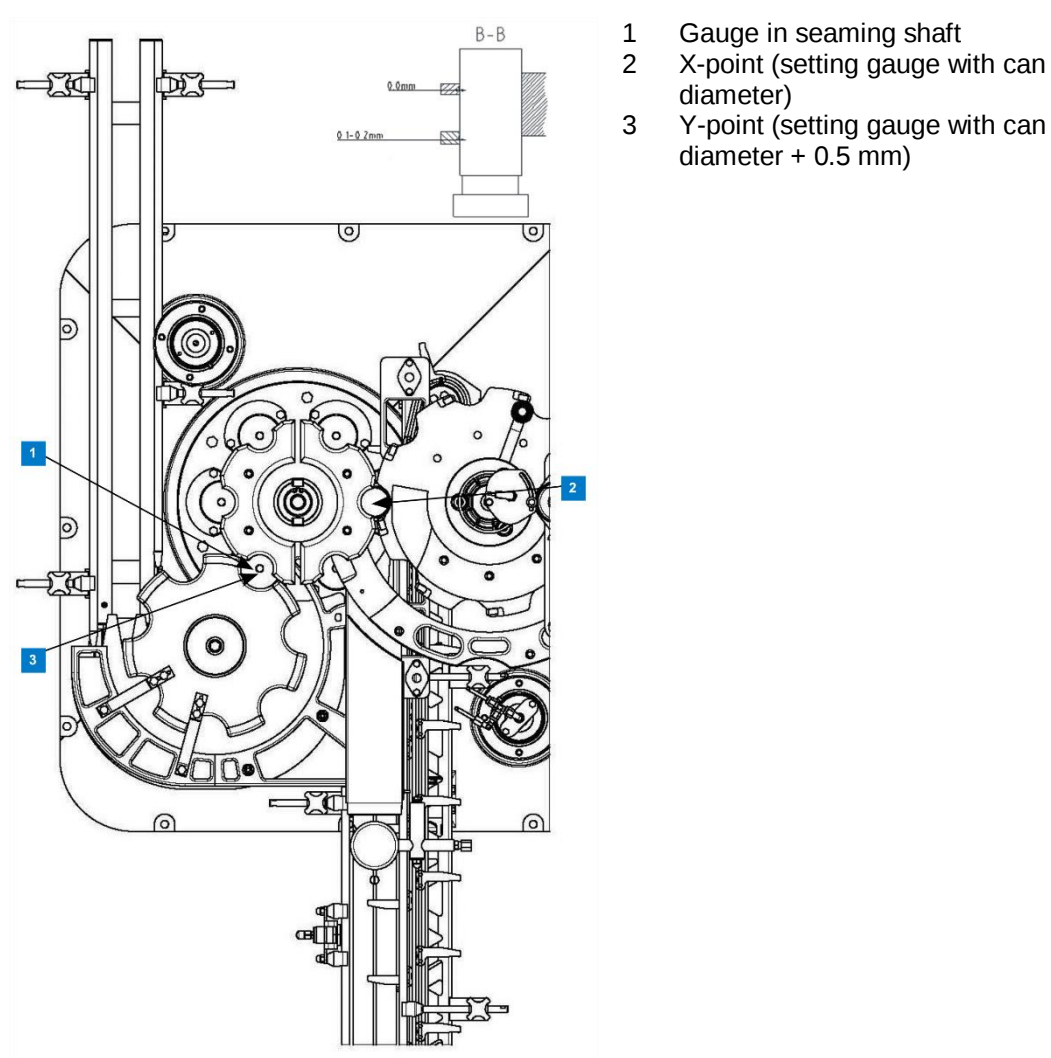


Fig. 42: Adjusting the can infeed/can outfeed guide

6.8 Setting the can/end-feed turret

The can/end-feed turret has been correctly set when its pockets are aligned to the setting gauge on the X-point.

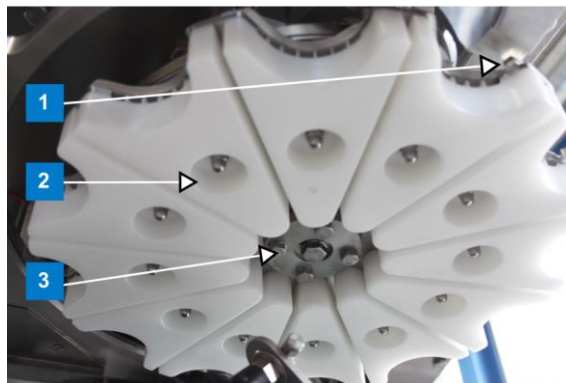
Requirements

- Installed setting gauge is aligned with the X-point.

Auxiliaries

- Wrench

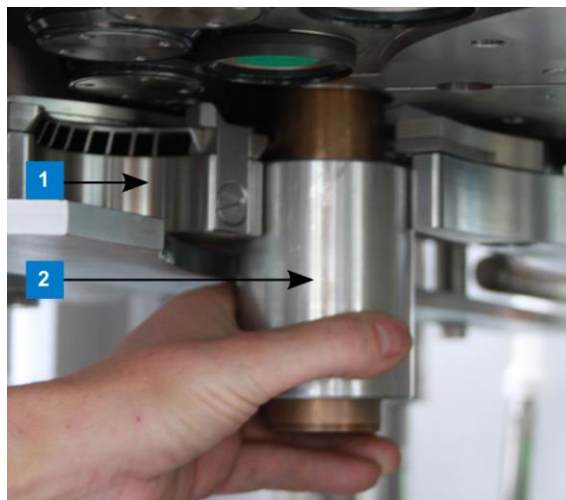
Adjustments



- 1 End feed pusher
- 2 Can/End-feed turret
- 3 Screw

Fig. 43: Loosening the can/end-feed turret

1. Loosen four screws at the can/end-feed turret.
It has to be possible to rotate the can/end-feed turret manually without rotating the center part rotor.
2. Centrally align a pocket of the can/end-feed turret to the setting gauge at the X-point.
3. Bring the setting gauge exactly to the X-point by turning the center part rotor with the help of manual drive.
Check:
Mark on the scale ring is aligned with the X-point mark.



- 1 Can/End-feed turret pocket
- 2 Setting gauge at X-point

Fig. 44: Aligning the pocket

4. Once the pocket has been aligned, retighten the four screws at the can/end-feed turret.

6.9 Setting the infeed chain

The infeed chain has been correctly set if, at the X-point, there is 6-8 mm play between the setting gauge and the fingers of the infeed chain.

Location

- Sprocket at the end of the infeed guide.

Requirements

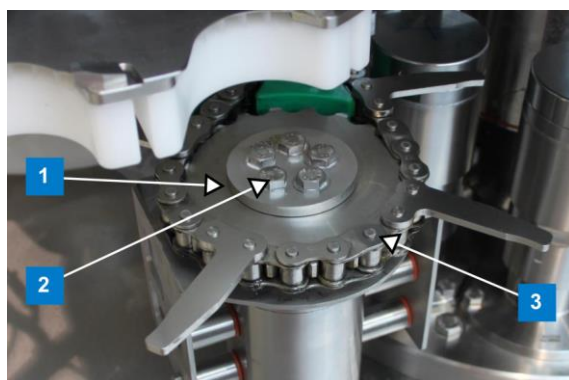
- Installed setting gauge is aligned with the X-point.

Auxiliaries

- Set of wrenches

Adjustments

1. Loosen the five screws at the sprocket of the infeed chain.
It has to be possible to move the infeed chain manually without rotating the center part rotor.



- 1 Sprocket
- 2 Screw
- 3 Infeed chain

Fig. 45: Sprocket of the infeed chain



DANGER



Infeed track, infeed chain

Reaching into the infeed chain when the can seamer is running will lead to serious hand and arm injury. Limbs can be pulled in by the running infeed chain.



- When the can seamer is running, stay away from the infeed table and from the infeed chain.
- Stop the can seamer for adjustments at the infeed table and secure it against being switched back on.
- Wear protective gloves.



2. Move the infeed chain by hand until the play between the setting gauge and the finger of the infeed chain amounts to 6-8 mm at the X-point (machine center).

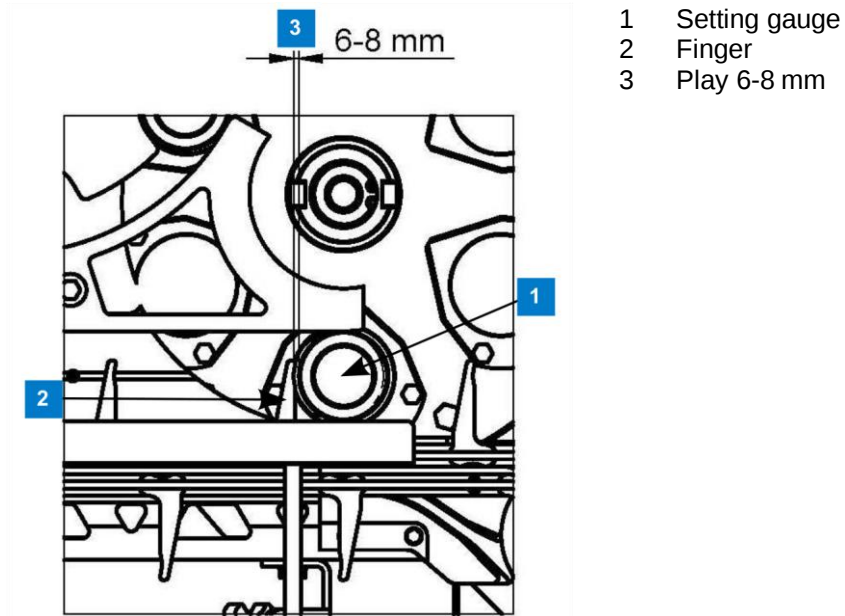


Fig. 46: Play between finger and setting gauge

3. After the play has been correctly set, tighten the five screws at the sprocket of the in-feed chain again.



NOTE

In the first week after commissioning, the chain tension must be checked, as the run-in phase can cause the chain to lengthen. You can increase the tension at the redirection at the filler transition on the infeed table, see chapter "Adjusting the chain tensioner".

6.10 Adjusting the chain tensioner

Location

- Redirect at filler discharge on the infeed table

Auxiliaries

- Chain tensioner
- Wrench set
- Tape measure

Adjustments



DANGER



Infeed track, infeed chain

Reaching into the infeed chain while the can seamer is running will cause very serious injuries to the hand and arm. Limbs can be pulled in by the running infeed chain.



- When the can seamer is running, stay away from the infeed table and from the infeed chain.
- Stop the can seamer if you need to make adjustments on the infeed table and secure it against being switched back on.
- Wear protective gloves.

1. Loosen the lock screws on the right and left.

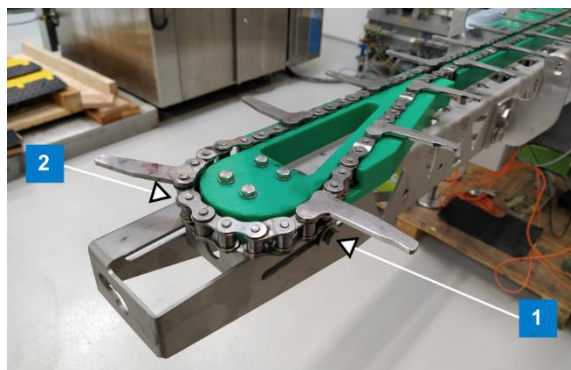


Fig. 47: Loosening the lock screws

- 1 Lock screw right
- 2 Lock screw left

2. Mount chain tensioner.

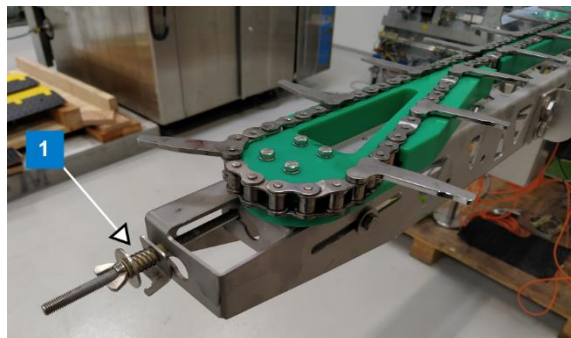
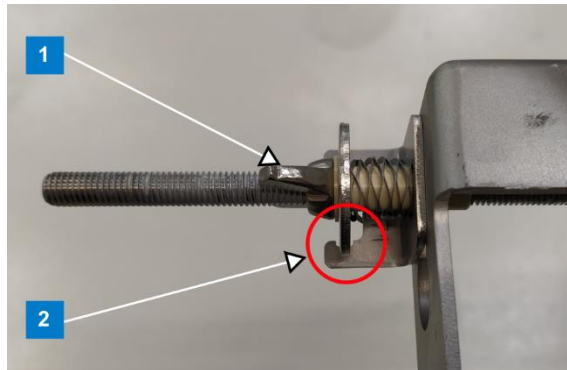


Fig. 48: Mounting the chain tensioner

- 1 Chain tensioner

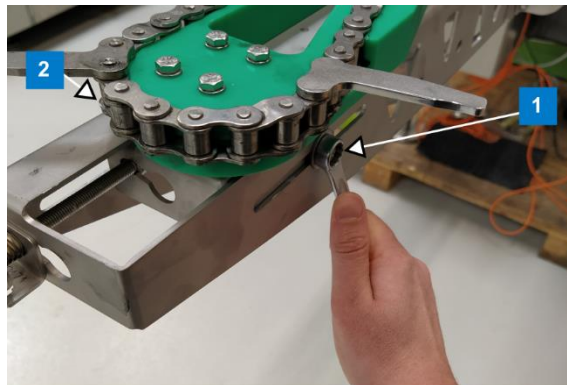
3. Tighten the winged nut until the washer is within the mark.



- 1 Winged nut
2 Washer within the mark

Fig. 49: Adjusting the chain tension

4. Tighten the lock screws on the right and left.



- 1 Lock screw right
2 Lock screw left

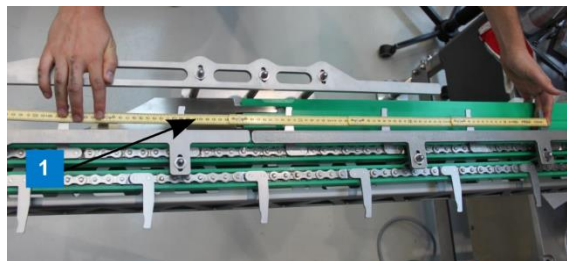
Fig. 50: Tightening the lock screws

5. Remove the chain tensioner.

Check whether the infeed chain is overstretched.

The infeed chain is overstretched and must be replaced if:

- at a chain pitch greater than 135 mm, the length of the infeed chain over five fingers is more than 2 mm longer than five times the chain pitch.
- at a chain pitch less than 135 mm, the length of the infeed chain over 10 fingers is more than 2 mm longer than 10 times the chain pitch.



- 1 Tape measure

Fig. 51: Measuring the infeed chain

6.11 Setting the discharge turret

The discharge turret has been correctly adjusted if the cans are transported away from the lifting stations undamaged.

Requirements

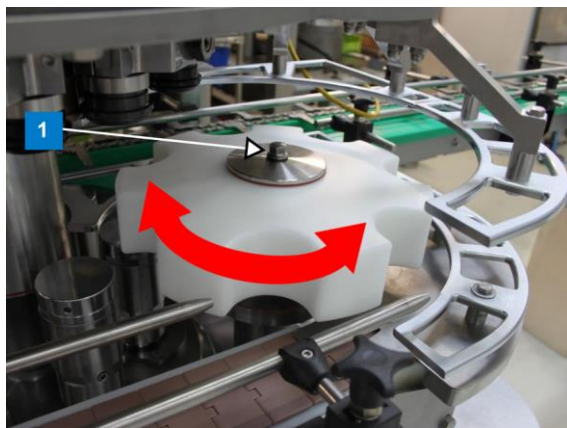
- Installed setting gauge is aligned with the Y-point.

Auxiliaries

- Wrench

Adjustments

1. Lightly loosen the hexagonal bolt in the middle of the discharge turret. Turn the discharge turret by hand until it snaps into place. Retighten screw.



- 1 Hexagonal bolt

Fig. 52: Setting the discharge turret

2. To check the can seamer, turn it with manual drive until the setting gauge installed at the 1st station is transferred to the discharge turret pocket and is aligned with the mark at the Y-point.



- 1 Upper can infeed/
outfeed guide
- 2 Discharge turret
- 3 Lower can infeed/
outfeed guide

Fig. 53: Checking the discharge turret

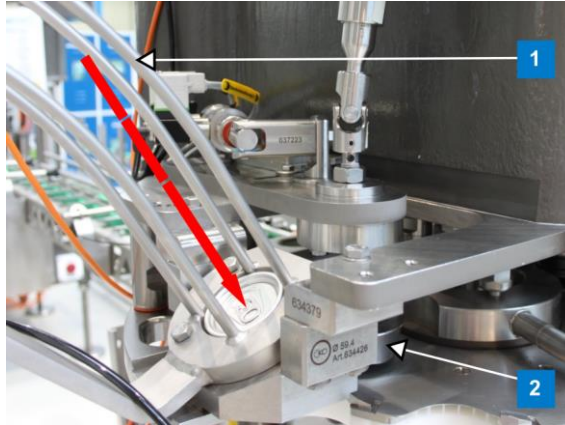


NOTE

The adjustments with installed setting gauge have been completed. For the rest of the adjustments, the setting gauge is replaced by the seaming chuck, as described in the chapter "Removing the setting gauge".

6.12 Setting the end feed

6.12.1 Maximum end stack height above feed screw



- 1 End feed magazine
- 2 Feed screw

Fig. 54: End feed magazine

For the end feed to function reliably, measures have to be taken to ensure that the end stack does not exceed a maximum height above the feed screw.

The maximum height designates the maximum end stack height above the feed screw.

Automatic and semi-automatic end feeds have to be equipped with a weight relief at this height at the latest. Suitable solutions include a pneumatic end brake or similar.

The gap for the weight relief must be configured in such a way that the end cannot rotate and arrive in the can seamer upside-down.



NOTE

The maximum heights of the end stacks above the feed screw depend on the end diameter. These are:

Alum. Ø max. 70 mm : 800 mm

Steel Ø max. 70 mm : 400 mm

Restrictions

The specifications are valid for a feed screw that has been precisely calibrated for a single can format. At the curl, the maximum diameter tolerance of the end is ± 0.3 mm.

The ends fed to the feed screw are not damaged. Deformations in the area of the curl diameter and the curl height are particularly critical.

Exceptions

If deviations either to the maximum end stack heights specified above or to the listed restrictions are necessary, please contact Ferrum Packaging Ltd. Customer Support.

6.12.2 Setting the position of the end support

The position of the end support is correctly set if the distance between the support and the end in the end guide is **0.7-0.8 mm**.

Requirements

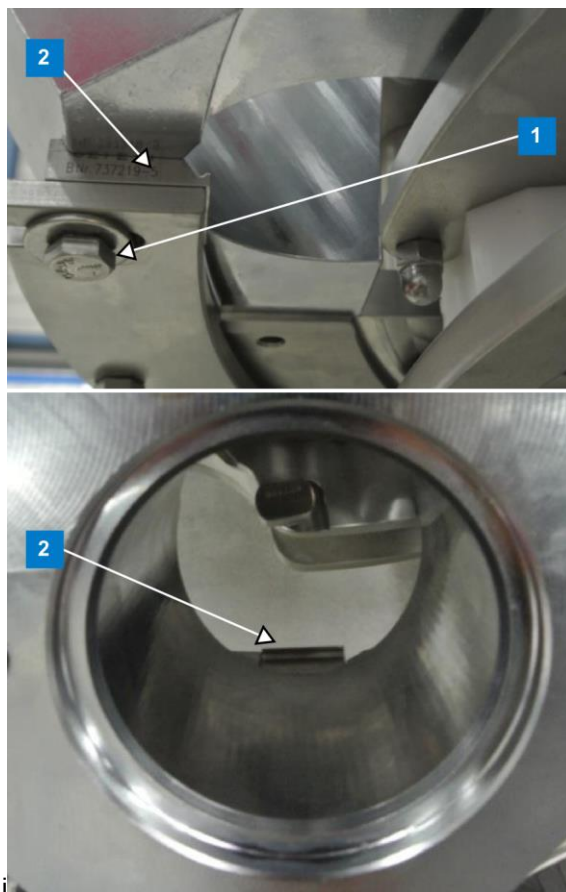
- The can/end-feed turret has been set.
- The infeed chain has been set.
- The end guide has been set.

Auxiliaries

- Tool kit
- Feeler gauge

Adjustments

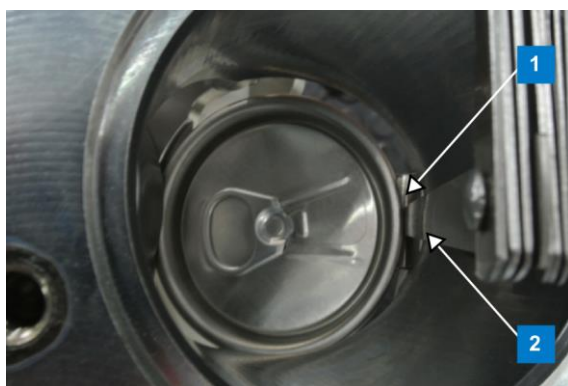
1. Loosen the hexagonal bolt on the end guide.



- 1 Hexagonal bolt
- 2 End support

Fig. 55: Hexagonal bolt end support

2. Set the end support so that the distance between the end support and the end in the end guide is 0.7-0.8 mm.
3. Retighten the hexagonal bolt once the distance is correct.



- 1 End support
- 2 Feeler gauge

Fig. 56: End support

6.12.3 Setting the distance of the feed screw

The distance of the feed screw has been set when the rear edge of the descent is 0-0.2 mm in front of the inner end guide.



Fig. 57: Feed screw

- 1 Rear edge
- 2 Inner end guide

Auxiliaries

- Tool kit
- Gauge

Adjustments

1. Loosen two screws.

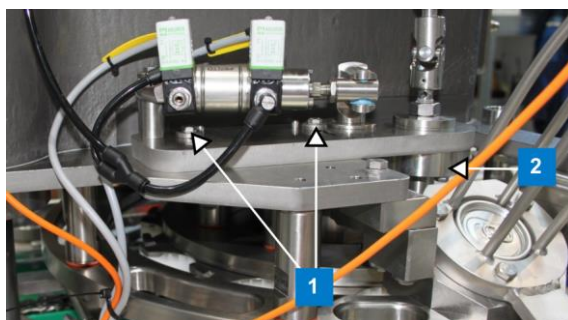


Fig. 58: Distance of the feed screw

- 1 Screws
- 2 Feed screw

2. Set the distance of the feed screw using the supplied gauge. The gauge is dependent on the can format and is preset at the factory.

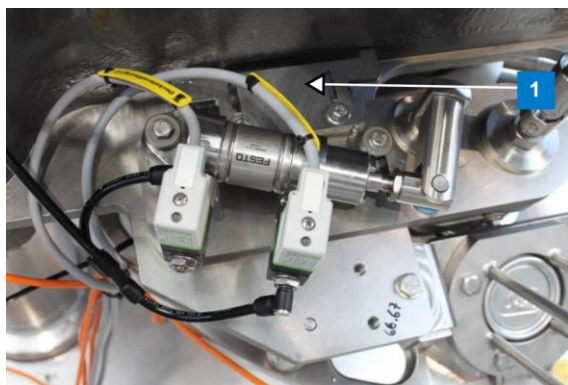


Fig. 59: Feed screw gauge

- 1 De-stacking
- 2 Gauge

3. Retighten the two screws.

6.12.4 Setting the height / position of the retaining knife

The height and position of the retaining knife has been set if the distance between the knife and the feed screw is **0.2 mm** and the knife sticks out **0.5 mm** over the feed screw edge.

Requirements

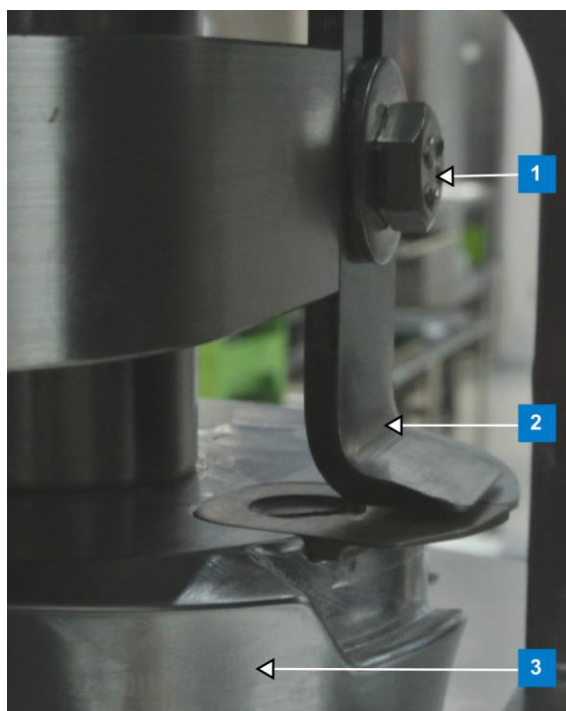
- Feed screw has been set.

Auxiliaries

- Tool kit
- Feeler gauge

Adjustments

1. Loosen the hexagonal bolt at the retaining knife.



- 1 Hexagonal bolt
- 2 Retaining knife
- 3 Feed screw

Fig. 60: Retaining knife

2. Set the height of the retaining knife so that the distance between the knife and the feed screw is 0.2 mm.

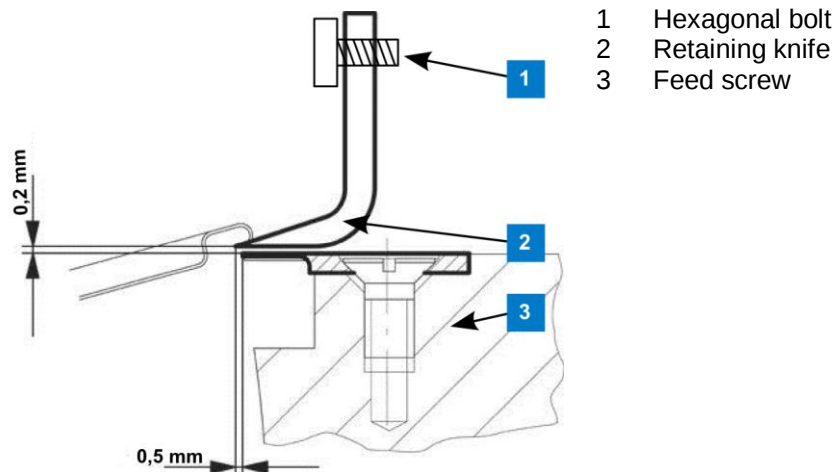


Fig. 61: Retaining knife

3. Check if the compressed air is on.
 4. Set the position of the retaining knife so that the knife sticks out **0.5 mm** over the feed screw edge.
 5. Retighten the hexagonal bolt of the retaining knife.
- The height and position of the retaining knife have been set.

6.12.5 Setting the end release

The can sensor signal is evaluated electronically by a microcontroller. The upcoming cycle and can signals are displayed visually by LEDs.

The end release has been correctly set if the LED at the cycle sensor lights up and the in-feed chain has transported a can in such a way that the can center and center of the can sensor match up.

Requirements

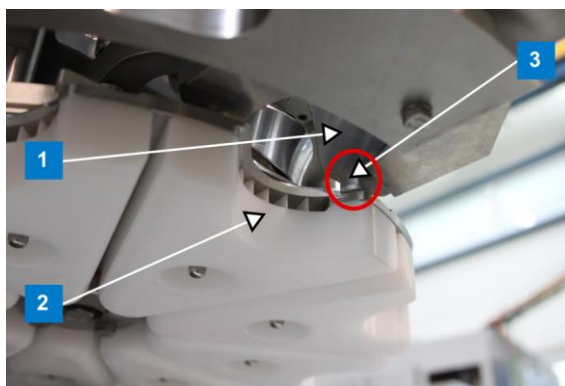
- The feed screw has been set.
- The retaining knife has been set.
- The infeed chain has been set.

Auxiliaries

- Can
- Tool kit

Adjustments

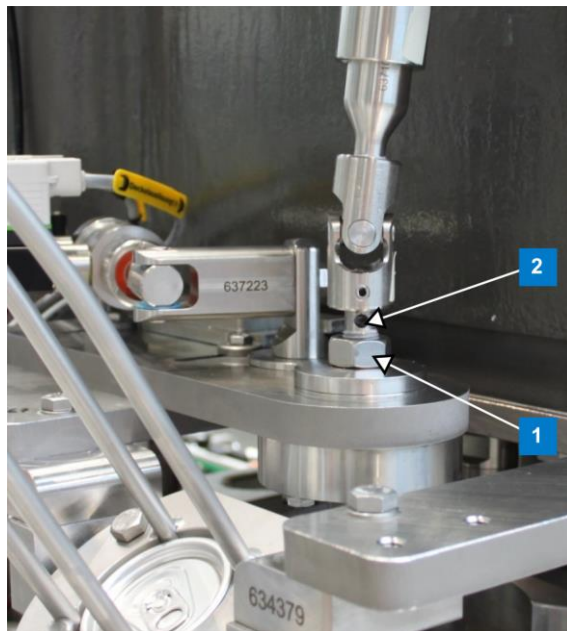
1. Rotate the can seamer until an end feed pusher is flush to the end feed magazine ring.



- 1 End feed magazine ring
- 2 Can/End-feed turret pocket
- 3 End feed pusher is flush with end feed magazine ring

Fig. 62: View of end feed magazine ring from below

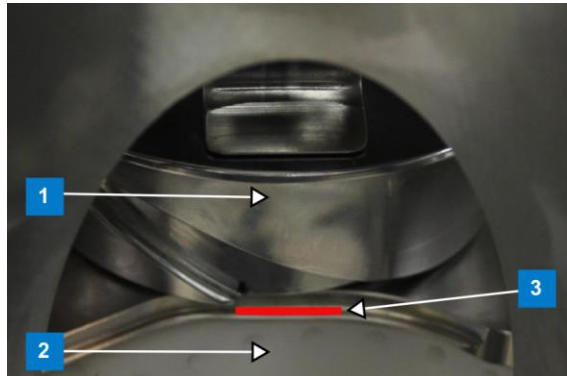
2. Loosen screw above the feed screw. To do this, counter at the hole for the punch so that the drive shaft is not rotated as well.



- 1 Screw
- 2 Bore hole for punch

Fig. 63: Feed screw

3. Turn the feed screw until the end falls onto the support surface marked in red. To do this, counter at the hole for the punch so that the drive shaft of the feed screw does not turn as well.

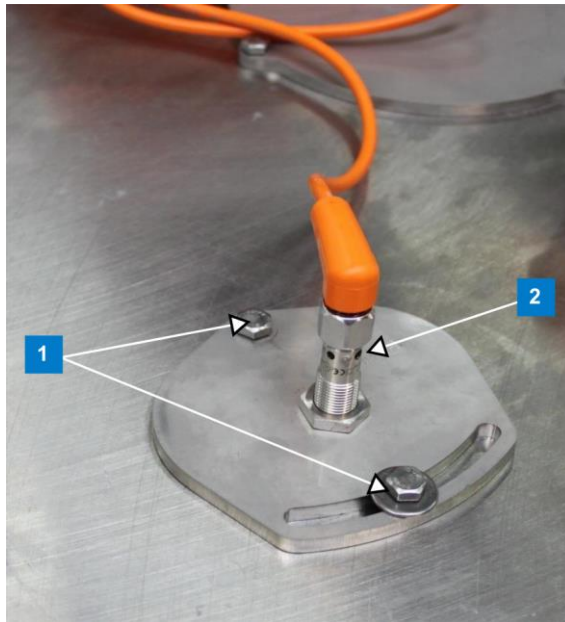


- 1 Feed screw
- 2 Can/End-feed turret
- 3 Support surface

Fig. 64: Marks on feed screw and end guide

4. Retighten the screw of the feed screw.
5. Move back machine until the separator knife is positioned just before the retaining knife.

6. Lightly loosen the screws and position the cycle sensor so that the LED lights up.



- 1 Screws
- 2 LED

Fig. 65: Cycle sensor on can seamer upper part

7. Tighten the screws.

Checking end feed / end release

Feed the cans at low power through the can seamer.

The pneumatic cylinder should only open when the separator knife has just passed the retaining knife.

When every can is seamed with one end each and no further ends have been stacked, the end feed and the end release have been set.

6.13 Replacing the seaming rolls

6.13.1 Removing the seaming rolls



NOTE

Can seamer with several can/end diameters.

For all information for converting the can seamer to other can/end formats, please refer to the separate operating instructions.

Location

- OP 1 seaming rolls: Lifting station aligned to the OP 2 mark.
- OP 2 seaming rolls: Lifting station aligned to the OP 1 mark.

Auxiliaries

- Set of wrenches

Work steps

1. For removal of the seaming roll OP 2: Rotate the can seamer in slow motion until the corresponding seaming station number is aligned with the OP 1 mark.
For removal of the seaming roll OP 1: Rotate the can seamer in slow motion until the corresponding seaming station number is aligned with the OP 2 mark.

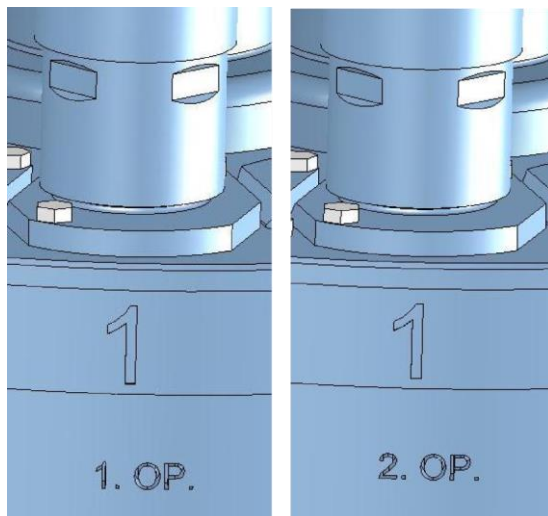


Fig. 66: Marks on the center part rotor

2. Loosen the clamping screw for the seaming roll pin.

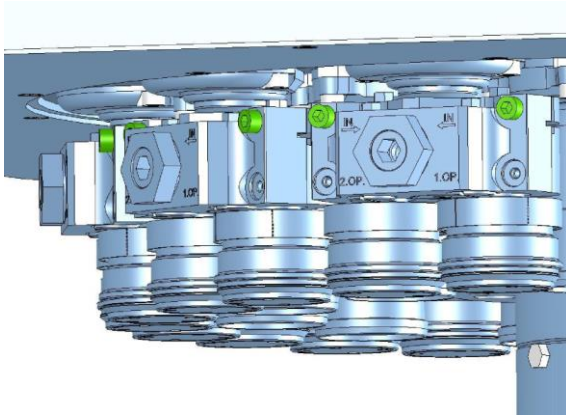


Fig. 67: Loosening the clamping screw

3. Rotate the seaming roll until the middle continuous mark on the upper seaming roll edge points in the direction of the center of the height adjustment screw.

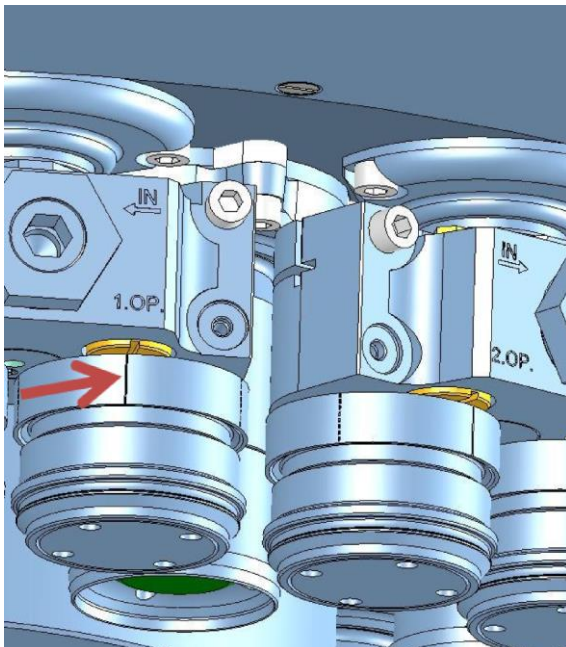


Fig. 68: OP 1 seaming roll mark

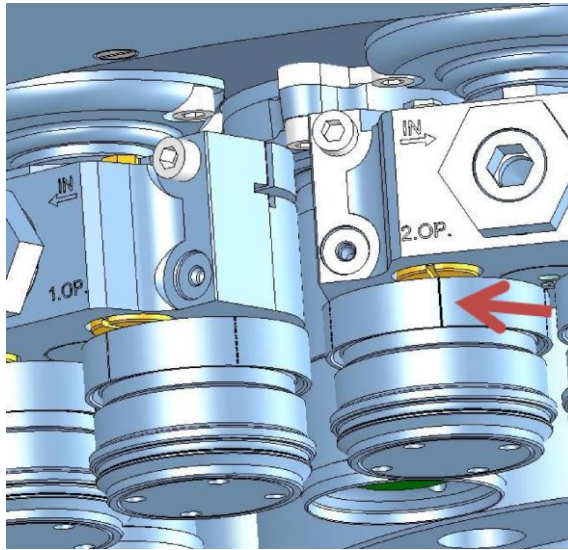


Fig. 69: OP 2 seaming roll mark

4. Remove the seaming roll.



NOTE

Oil can escape during removal.

- Have a cloth ready in order to capture the oil.

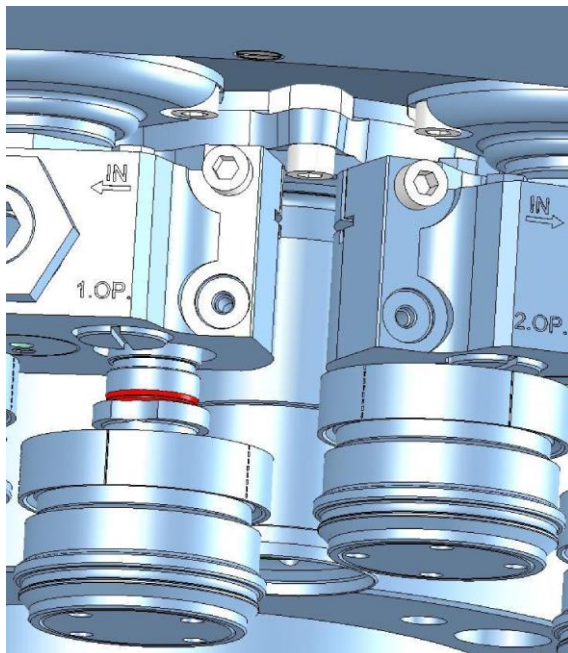


Fig. 70: Removing the OP 1 seaming roll

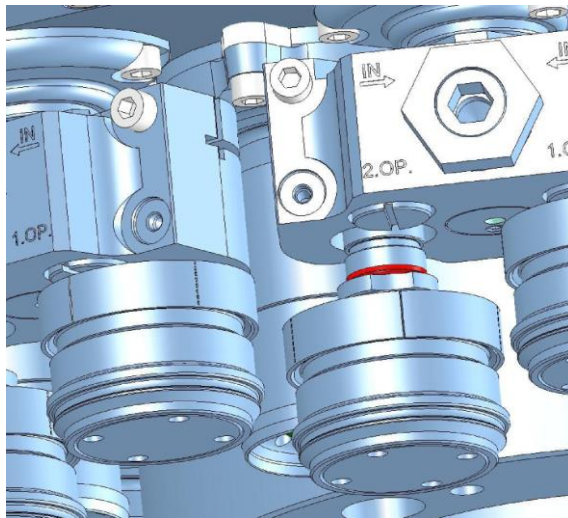


Fig. 71: Removing the OP 2 seaming roll

5. Repeat this procedure at the other seaming stations.

6.13.2 Installing and presetting the seaming rolls

Location

- OP 1 seaming rolls: Lifting station aligned to the OP 2 mark.
- OP 2 seaming rolls: Lifting station aligned to the OP 1 mark.

Auxiliaries

- Set of wrenches

Work steps

1. Rotate the can seamer in slow motion until the lifting station number on the lower rotor is aligned with the OP 1 or OP 2 mark.

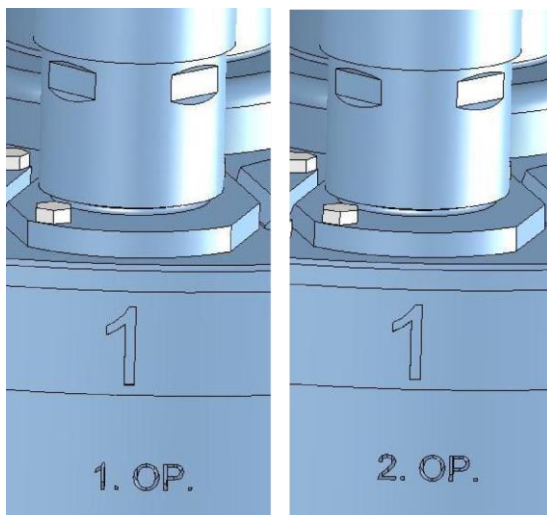


Fig. 72: Marks on the center part rotor

2. Turn the height adjustment screw upwards until it stops and then turn it back a $\frac{1}{4}$ of a rotation.

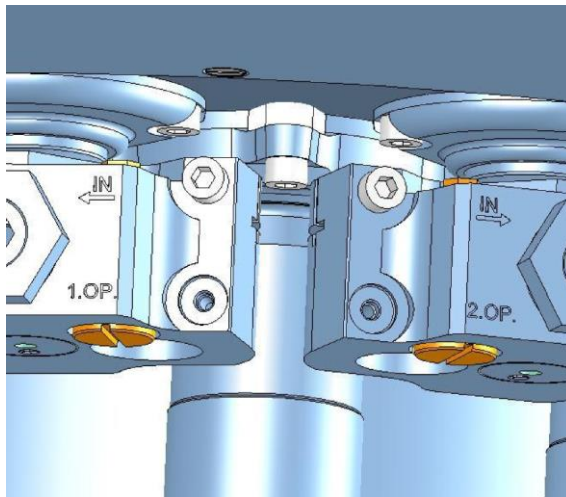


Fig. 73: Height adjustment screw for seaming rolls

3. Lightly oil the seaming roll pin (for approved oils, see the chapter "Technical data", section "Oil lubrication").
4. Insert the seaming roll in the seaming lever until the middle continuous mark on the upper seaming roll edge points in the direction of the center of the height adjustment screw.

Warning: Work carefully, so that the O-rings do not become damaged!

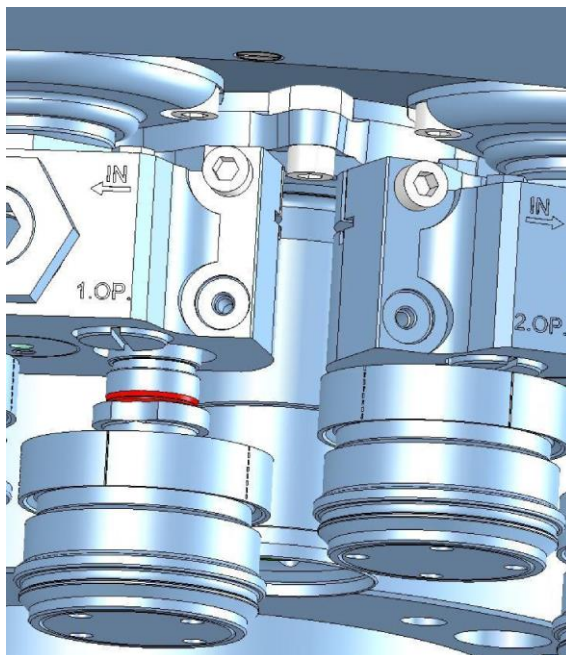


Fig. 74: Inserting the OP 1 seaming roll

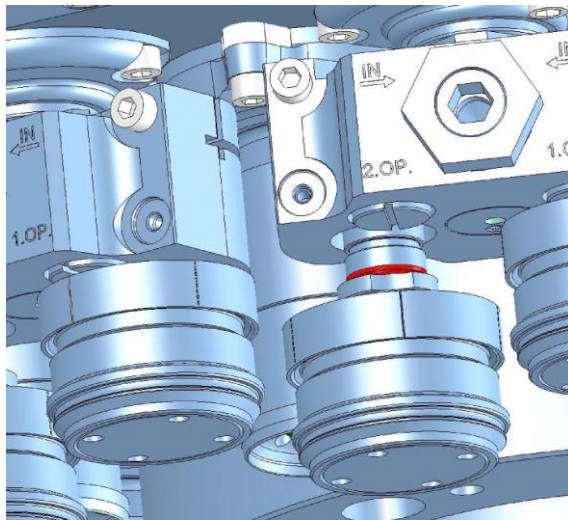


Fig. 75: Inserting the OP 2 seaming roll

5. Rotate the seaming roll in the IN arrow direction until the dashed mark is aligned with the edge of the seaming lever.

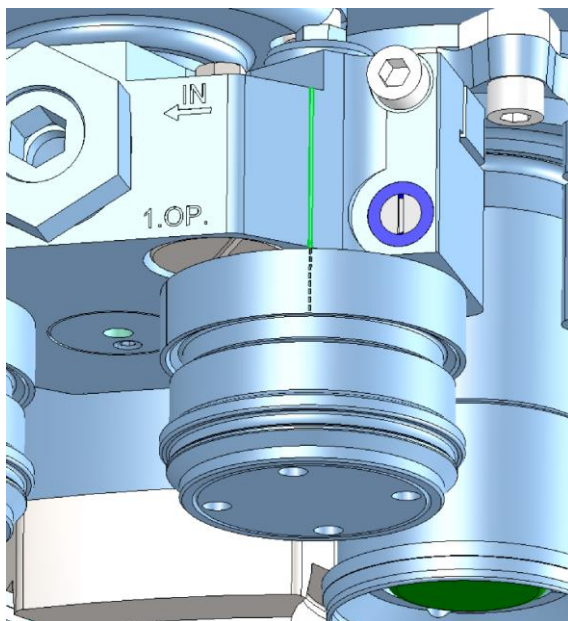


Fig. 76: Presetting the OP 1 seaming rolls

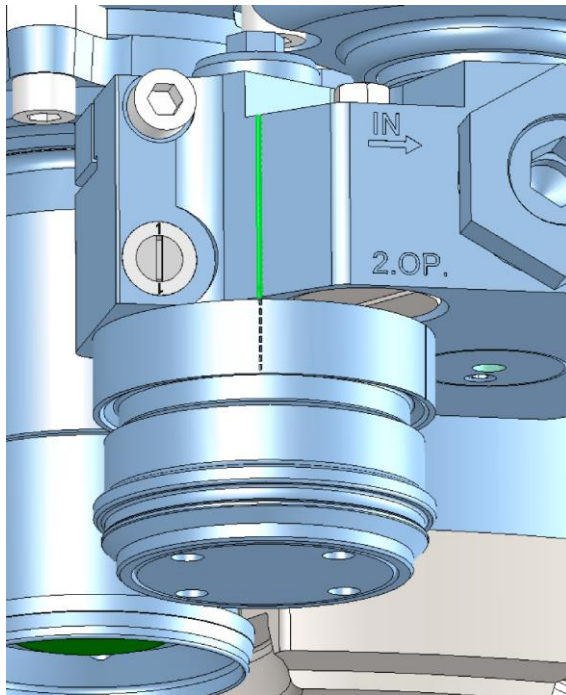


Fig. 77: Presetting the OP 2 seaming rolls

6. Tighten the clamping screw for the seaming roll pin.

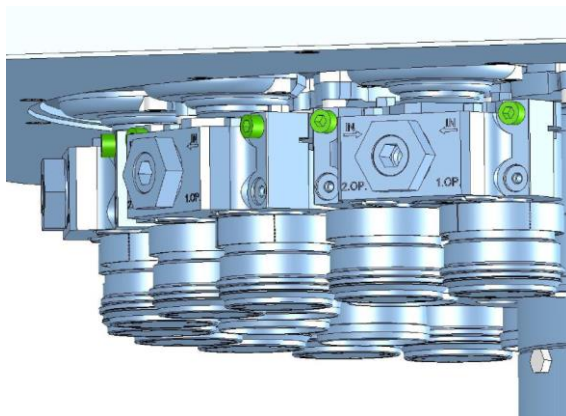


Fig. 78: Tightening the clamping screw

7. Repeat this procedure at the other seaming stations.

6.13.3 Setting the seaming rolls

The seaming rolls are adjusted if:

- Seaming rolls are replaced.
- The can and end dimensions are changed
- Seam is deformed.

Location

OP 1 seaming rolls: Lifting station aligned to the OP 1 mark.

OP 2 seaming rolls: Lifting station aligned to the OP 2 mark.

Auxiliaries

- Set of wrenches
- Feeler gauge
- Dial gauge with stand

Work steps

1. Rotate the can seamer in slow motion until lifting station mark on the lower rotor is aligned with the mark OP 1 (for the OP 1 seaming rolls) or with mark OP 2 (for the OP 2 seaming rolls).

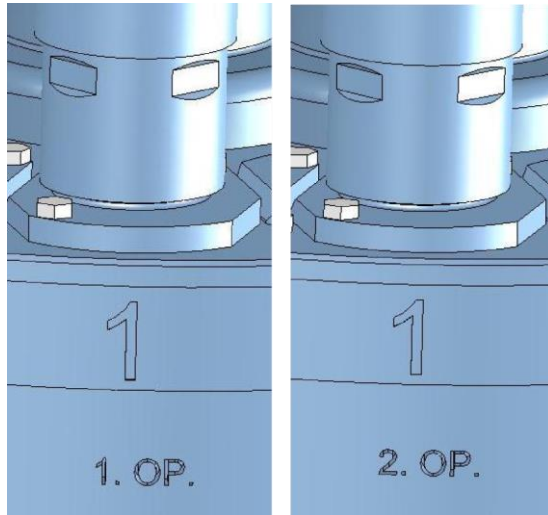


Fig. 79: Marks on the center part rotor

2. Slightly loosen the clamping screw.

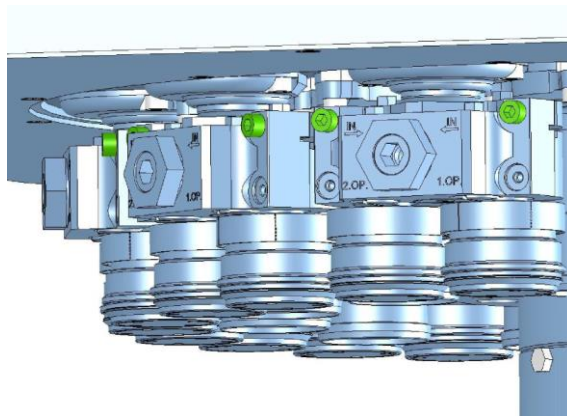


Fig. 80: Loosening the clamping screw

6.13.3.1 Setting the seam thickness

The seam thickness has been correctly set if the feeler gauge for OP 1 or OP 2 can be inserted between the seaming roll and seaming chuck without there being any play.

Requirement

- Seaming roll has been installed and preset.

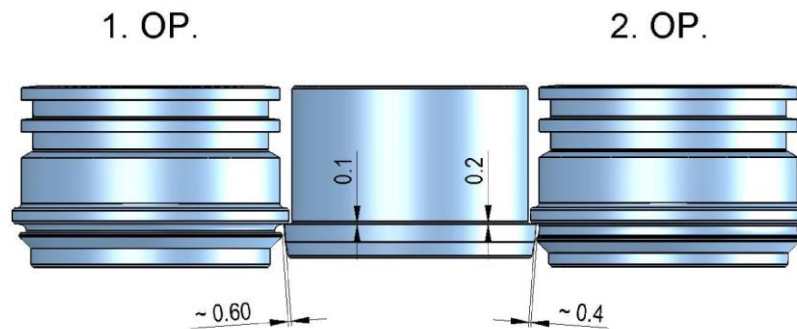


Fig. 81: Set play of seaming chuck/seaming roll

Work steps

1. Hold the feeler gauge for OP 1 and OP 2 between seaming chuck and lower edge of the seaming roll profile.

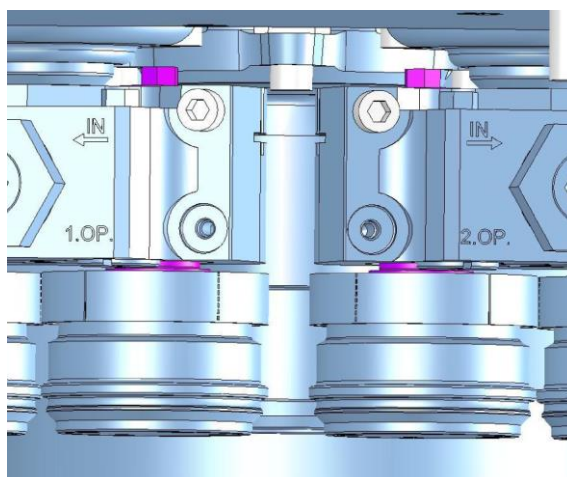


Fig. 82: Setting the seam thickness

2. Using the wrench, adjust the seaming roll at the seaming roll pin in the IN arrow direction to the feeler gauge. It must be able to move the feeler gauge without a lot of play.
3. Remove feeler gauge.
4. Repeat steps 1 to 3 at the other seaming rolls.

6.13.3.2 Setting the seaming roll height

The height of the seaming rolls has been set when the dial gauge shows the correct measurement.

Requirement

- The seam thickness has been set.

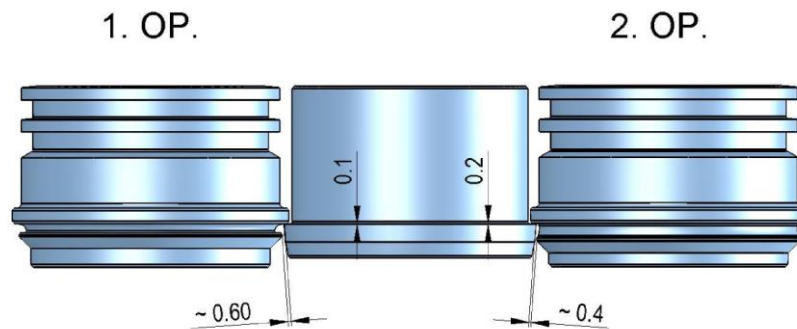


Fig. 83: Set play of seaming chuck/seaming roll

Work steps

1. Place the dial gauge on the base plate so that the button lies on the bottom of the seaming roll.
2. Carefully turn the height adjustment screw clockwise ("off" direction). At the same time, pull the roll downwards by hand and rotate it continuously back and forth, until there is a slight but noticeable resistance and the roll just touches the seaming chuck.

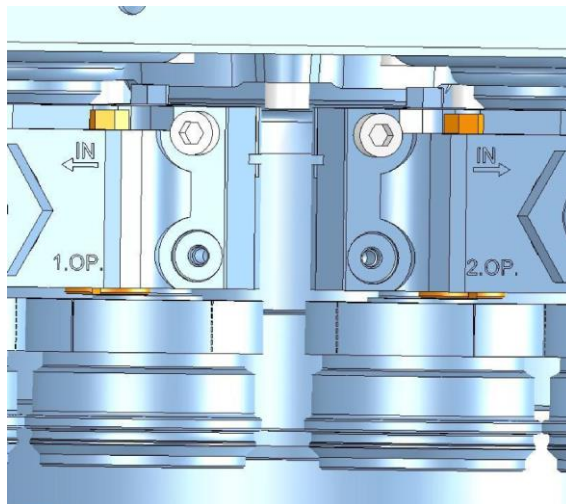


Fig. 84: Setting the seaming roll height

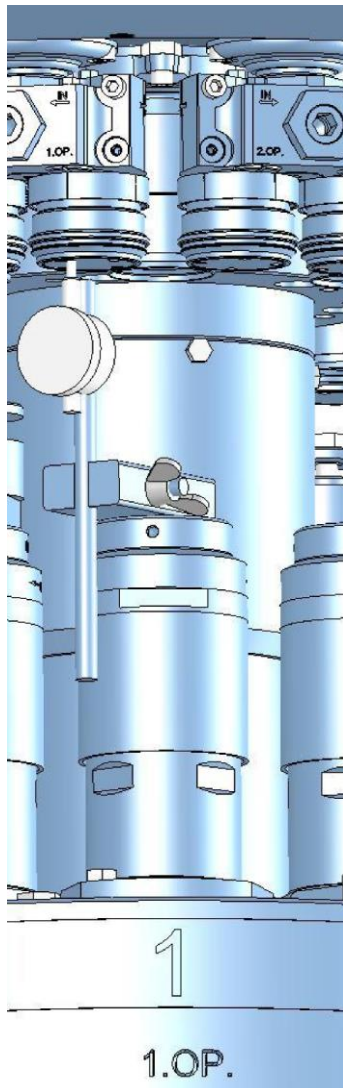


Fig. 85: Dial gauge

3. Set scale ring to 0.
4. Then turn the height adjustment screw counterclockwise ("up" direction) until the dial gauge shows 0.1 mm for OP 1 and 0.2 mm for OP 2.
5. Tighten the clamping screw.

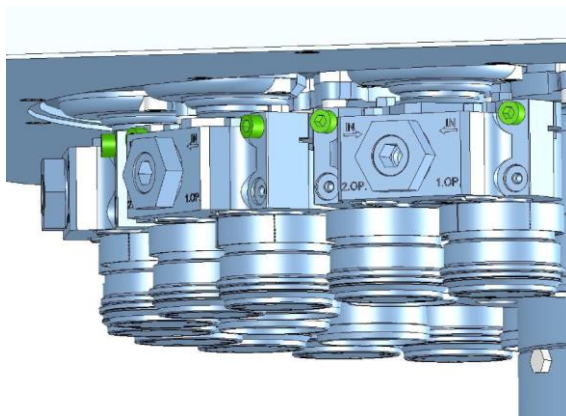


Fig. 86: Tightening the clamping screw

6. Make sure that the setting of the seam thickness has not been changed and the seaming roll remains in place when the seamer rotates further. Correct if necessary.
7. Repeat steps 1 to 6 at the other seaming rolls.

6.14 Seam monitoring

After the seaming rolls have been set, the seam thickness of OP 1 and OP 2 is measured. If necessary, the distance between the seaming roll and seaming chuck have to be readjusted. Production may only commence after the seam monitoring has been completed.

OP 1 seam

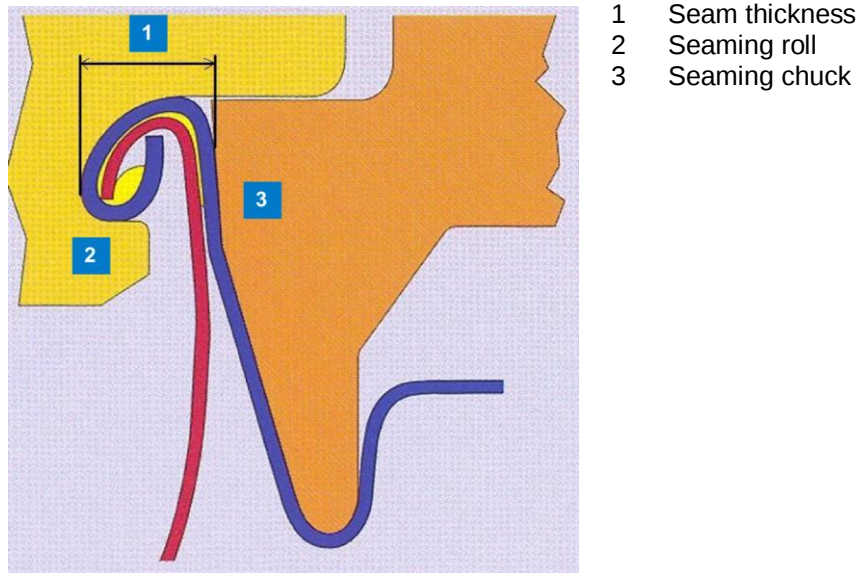


Fig. 87: OP 1 seam (© Beverage Can Makers Europe)

OP 2 seam

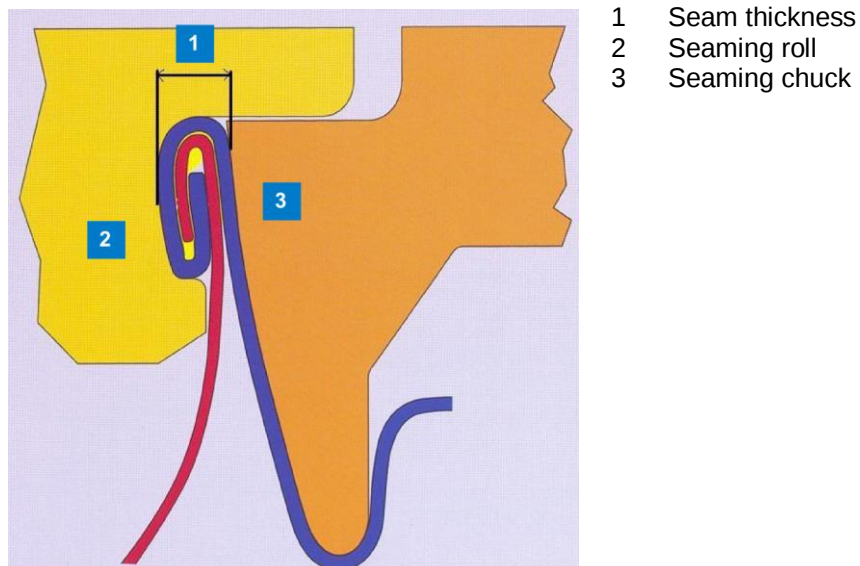


Fig. 88: OP 2 seam (© Beverage Can Makers Europe)

6.15 OP1 seaming test / disengaging the OP 2 seaming cam

To perform the seam monitoring of OP 1, the seaming cam segment for OP 2 can be disengaged at the seaming cam.

Location

- Upper part of can seamer



DANGER



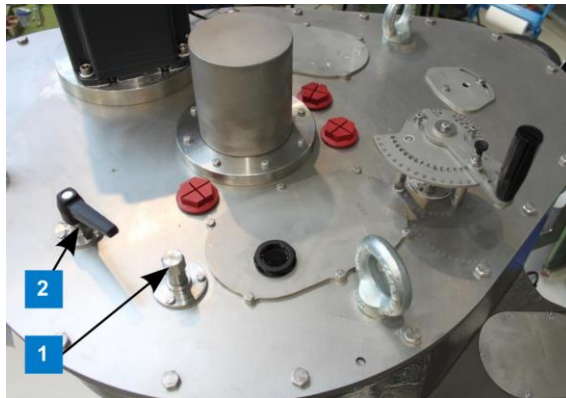
Danger of falling

Falling from the machine can lead to serious injury or death.

- Do not climb onto the machine without fall protection.
- Use suitable approved climbing aids for work at height.

Disengaging the OP 2 seaming cam

1. Loosen the clamp SW 22 by turning it counter-clockwise until it stops.



- 1 Clamp SW 22
- 2 Disengageable lever

Fig. 89: Disengageable seaming cam

2. Rotate disengageable lever to "Open" position.



Fig. 90: Disengageable lever

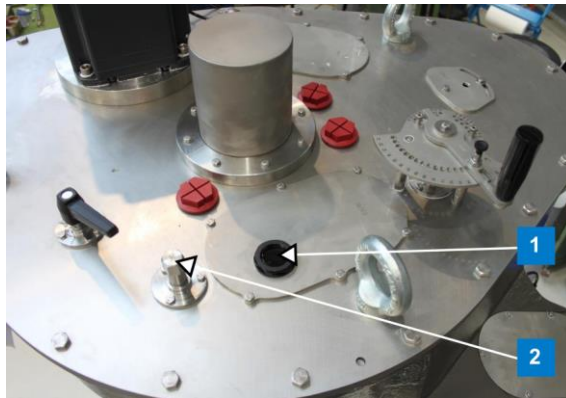


DAMAGE TO EQUIPMENT

Disengaged seaming cam

The machine must not be run at high speed and with disengaged seaming cam for longer than 2 minutes.

3. Block the seaming cam segment in reverse order again.
4. The LED on the position monitoring sensor lights up when the clamp SW 22 has been tightened to 40 Nm. Otherwise an error message is displayed.



- 1 Position monitoring sensor
- 2 Clamp SW 22

Fig. 91: Position monitoring sensor

6.16 Setting and changing over the quick-set cam

6.16.1 Setting the quick-set cam

The adjustment mechanism of the quick-set cam is accessible on the can seamer's upper part.



DANGER



Danger of falling

Falling from the machine can lead to serious injury or death.

- Do not climb onto the machine without fall protection.
- Use suitable approved climbing aids for work at height.

The following procedure is recommended for the basic setting.

Ferrum AG offers special training courses to provide in-depth knowledge of the correct seam setting.



DAMAGE TO EQUIPMENT

In order to prevent damage to the adjustment mechanism, it must be ensured each time the seaming cam is adjusted that the clamp SW 22 is released prior to adjustment and tightened again with 40 Nm after adjustment.

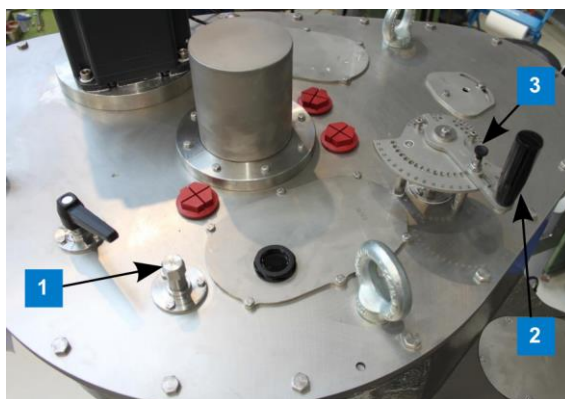
Requirement

- Can seamer is stopped.
- The M8 clamping screws of the seaming levers are sufficiently greased both on their threads and on the contact surfaces below the screw head.

Auxiliaries

- Tool kit
- Feeler gauge

Adjustments



- 1 Clamp SW 22
- 2 Handle
- 3 Locking pin

Fig. 92: Basic settings

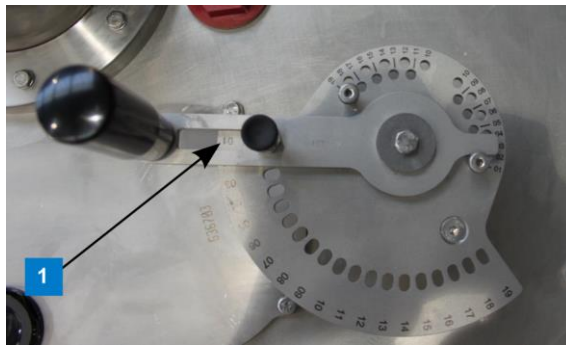
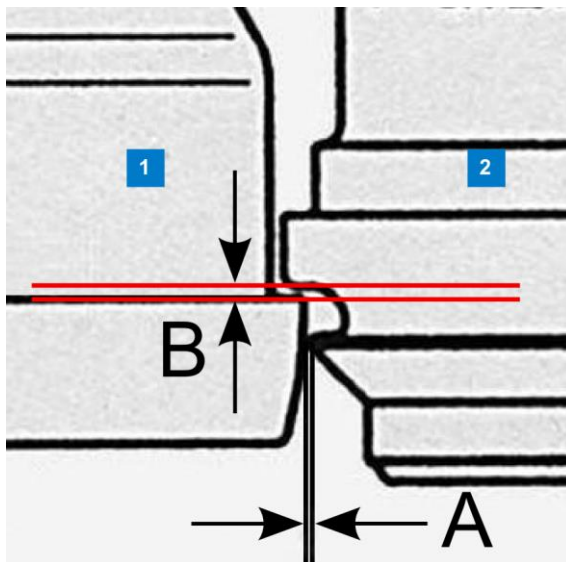


Fig. 93: Minimum position (position 1)

1 Minimum position

1. Release the clamp SW 22 by by two counter-clockwise turns.
2. Set seaming cam to position 10.
3. Set seaming rolls 1st OP to correct seaming roll height and seam thickness 1st OP.
4. Set seaming cam to position 1 (minimum position for smallest possible seam thickness).
5. Set seaming rolls 2nd OP to correct seaming roll height and seam thickness 2nd OP , working evenly and with feeler gauge 0.15 mm (A in figure below).



1 Seaming chuck
 2 Seaming roll

Fig. 94: Seaming roll - seaming chuck gap (OP 2)



DAMAGE TO EQUIPMENT

To avoid damaging the seaming equipment, the seaming chuck and seaming roll should not touch each other at minimum position 1.

If this should happen, all seaming rolls need to be readjusted according to the operating instructions.

6. Set seaming cam to position 10.
7. Starting from position 10, change seaming cam position in steps until the required seam thickness is reached.
8. Compare seam thicknesses of all stations. Repeat steps 1 to 7 if necessary.
9. Tighten clamp SW 22 to 40 Nm.



DAMAGE TO EQUIPMENT

The plant must not be started in production mode while the clamping is released. This is monitored by a sensor. If clamping is loosened even slightly, the sensor triggers a stop of the can seamer.

10. Limit the setting range with the limit stops (M5 shoulder screws).

Processing 2nd can type or 2nd sheet thickness



NOTE

When processing two different can materials or sheet thicknesses, repeat steps 1, 6, 7, 8 and 9 for the 2nd type until the necessary seam thickness has been also reached for these cans. To do this, remove the M5 shoulder screws for the adjustment limit.

11. The M5 shoulder screws can now be used as an adjustment aid. They serve as stops for the position of the respective can material or sheet thickness.
12. Check setting 1st OP according to operating instructions.

The quick-set cam is set.

6.16.2

Changing over the quick-set cam

The changeover between two different sheet thicknesses takes only a few minutes. The adjustment mechanism of the quick-set cam is accessible on the can seamer's upper part.



DANGER



Danger of falling

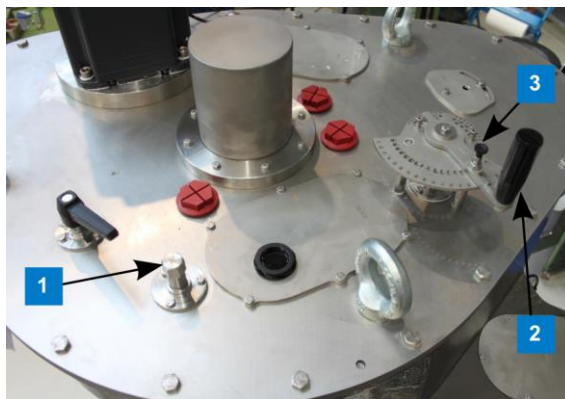
Falling from the machine can lead to serious injury or death.

- Do not climb onto the machine without fall protection.
- Use suitable approved climbing aids for work at height.

Requirements

- Can seamer is stopped.

Adjustments



- 1 Clamp SW 22
- 2 Handle
- 3 Locking pin

Fig. 95: Quick-set cam

1. When the can seamer is stopped, loosen the clamp SW 22.



NOTE

Release the clamp SW 22 by two counter-clockwise turns.

2. Lift the locking pin and use the handle to set the pin onto the desired position of the scale disk.
3. The locking pin latches into the new position.
4. Tighten clamp SW 22 clockwise to 40 Nm.



DAMAGE TO EQUIPMENT

In order to prevent damage to the adjustment mechanism, it must be ensured each time the seaming cam is adjusted that the clamp SW 22 is released prior to adjustment and tightened again with 40 Nm after adjustment.

The plant must not be started in production mode while the clamping is released.

This is monitored by a sensor. If clamping is loosened even slightly, the sensor triggers a stop of the can seamer.

5. Production mode can be started.
6. As a sample test, inspect the seam thickness of the first cans with a micrometer gauge. The seaming cam has been changed over.

6.17 Setting the base plate pressure

If the hardness or thickness of the can and end metal changes, the pressure with which the can is clamped during seaming has to be readjusted.

The base plate pressure has been correctly set when the spring deflection of the can has been set accordingly. (for spring deflection dimension, see technical data)

Location

- OP 1 mark

Auxiliaries

- Large fork wrench
- Tool kit
- Pressure gauge

Adjustments

1. Loosen the Allen screw on the outer surface of the lifting station.



1 Allen screw

Fig. 96: Lifting stations

2. Place the pressure gauge, with the support (depending on the seaming chuck diameter), on the base plate.



- 1 Base plate
- 2 Support
- 3 Pressure gauge

Fig. 97: Pressure gauge

3. Rotate the scale ring anticlockwise until the support touches the seaming chuck. The height of the pressure gauge can be adapted to the respective can height by placing a spacer between the pressure gauge and the base plate. As soon as the needle moves, this is defined as the zero position. Starting from the value displayed on the dial, the spring deflection can now be set.



- 1 Support
- 2 Pressure gauge
- 3 Base plate

Fig. 98: Pressure gauge

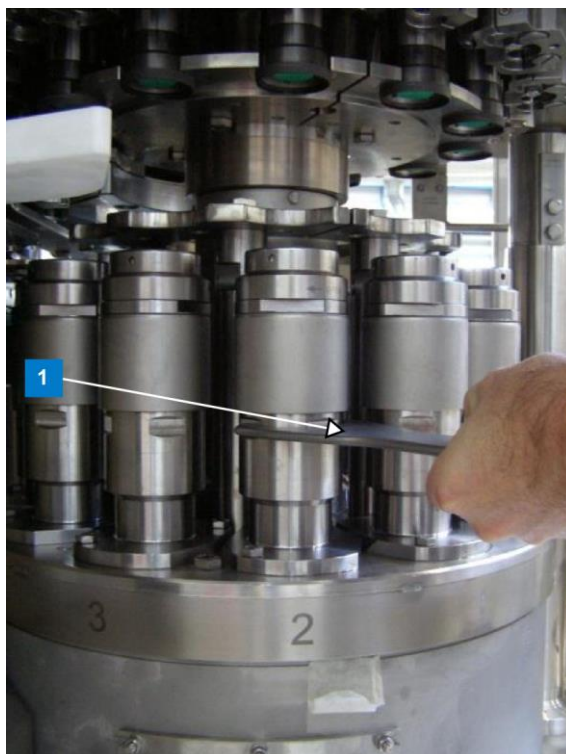
4. Rotate the scale ring counterclockwise, until the correct spring deflection is indicated.
 (for spring deflection dimension, see technical data)
 1 rotation = 1.00 mm
 1 tick mark = 0.10 mm



1 Scale ring

Fig. 99: Pressure gauge

5. Read the daN value from the gauge. $1 \text{ daN} = 1 \text{ kp} = 10 \text{ N}$
6. Rotate the adjusting nut downward (base plate pressure = weaker) or upward (base plate pressure = stronger), either by hand or by using a fork wrench. The adjusting nut has a right-hand thread.



1 Fork wrench

Fig. 100: Fork wrench

7. Tighten the Allen screw that was loosened earlier.
The base plate pressure has been set.



NOTE

This setting does not change the base plate height.

6.18 Exchanging and setting the knock-out pads

The knock-out pads (left-hand thread) have been set in the factory to the ends to be processed. If the shape of the end changes significantly (more than ± 0.6 mm) or if the knock-out pads are replaced, they must be set again.

After being converted to another end format, the knock-out pads must also be readjusted.

If the knock-out pads are faulty, meaning that the play between the end and the knock-out pads is too large, the knock-out pads must be replaced and the installation height must be checked and readjusted if necessary.

At the X-point (transfer end-can), the knock-out pad should lie on the end. Cans with end and pressing knock-out pad are lifted by the lifting cam to the seaming chuck.

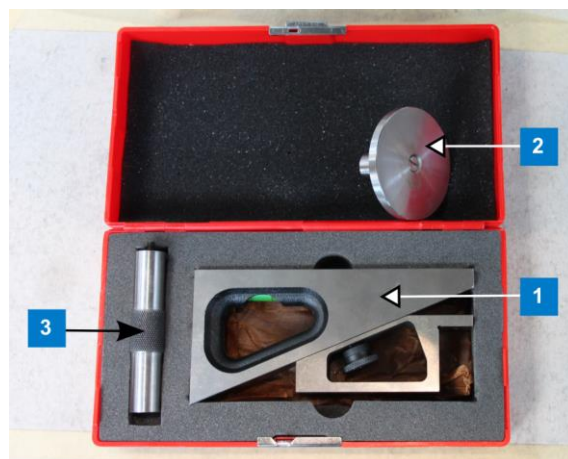
The supplied gauge must be set to the correct height (see Section “Setting the gauge” below).

Location

- Upper part of can seamer

Tools

- Tool kit
- Gauge
- Wrench extension



- 1 Lower part
- 2 Upper part
- 3 Extension piece for high cans

Fig. 101: Gauge



Fig. 102: Wrench extension

Preparations

- Screw together the upper and lower part of the gauge. Insert the extension piece when working on high cans.

Adjustments

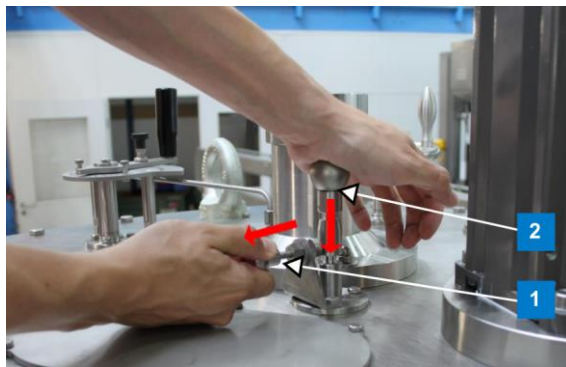


- 1 Lock pin
- 2 Rod
- 3 "Production" position
- 4 "Setting" position

Fig. 103: Upper part of can seamer

1. Positioning the rod

- a. Pull out lock pin.
- b. Push rod down.
- c. Secure rod in "Setting" position.



- 1 Lock pin
- 2 Rod

Fig. 104: Positioning the rod

2. Setting the gauge

Setting all knock-out pads after conversion

After being converted to another end format, all knock-out pads must be readjusted. To enable setting the gauge, the knock-out pad of seaming station 1 must first be set as follows:

- a. Turn the center part rotor until lifting station 1 matches up with the X-point mark.
- b. Insert the end (without can) by hand at the X-point – between the gassing turret and outer end guide.
The end must be retained by the knock-out pad without play, however, it must not be clamped. If necessary, readjust the knock-out pads (to do this, move the lifting station to the P mark).
- c. Check the ascent of the can along the entire length (until the can is in the seaming chuck) The can must be clamped, though still be capable of being rotated.
Seaming station 1 is now set.
- d. Turn the can seamer until lifting station 1 matches up with the P mark on the center part rotor.

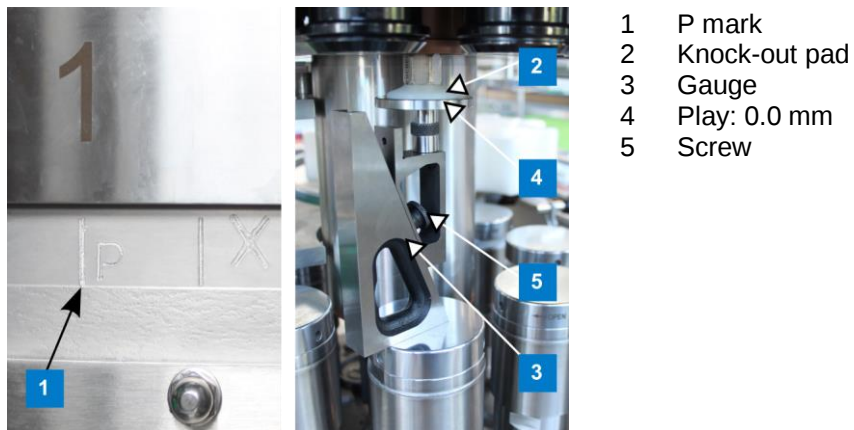


Fig. 105: Setting gauge seaming station 1

- e. Adjust the gauge to the lifting station.
- f. Set the gauge so that there is no play between the gauge and the knock-out pad.
- g. Tighten the screw.
The gauge is now set.

Setting individual knock-out pads

If individual knock-out pads need to be set, the gauge can be adjusted to a knock-out pad which has been set correctly.

- a. Turn the can seamer until the lifting station with the knock-out pad which has been set correctly matches up with the P mark on the center part rotor.

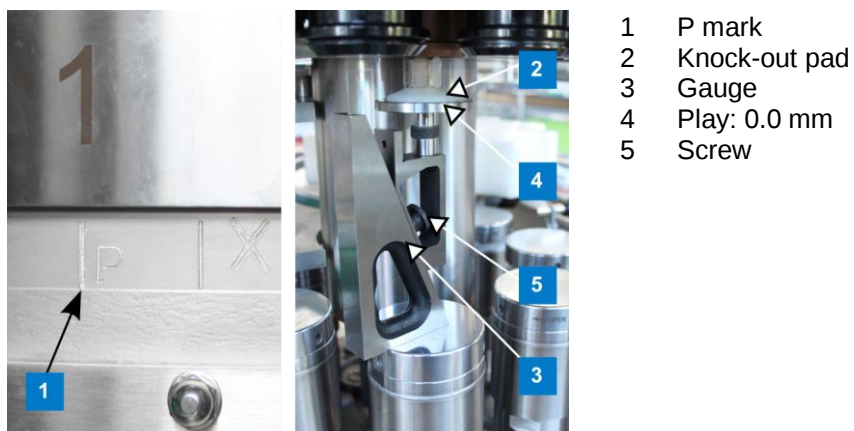
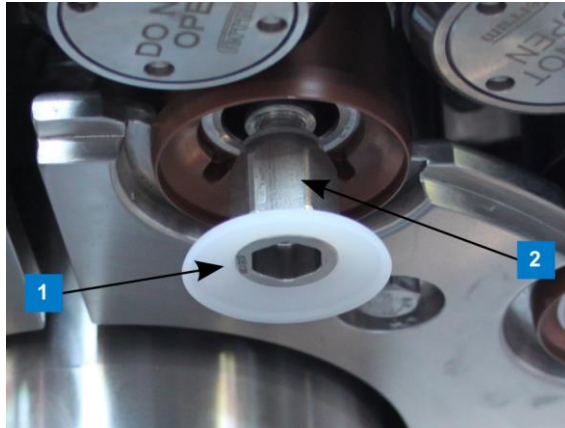


Fig. 106: Setting the gauge

- b. Adjust the gauge to the lifting station.
- c. Set the gauge so that there is no play between the gauge and the knock-out pad.
- d. Tighten the screw.
The gauge is now set.

3. Replacing the knock-out pads

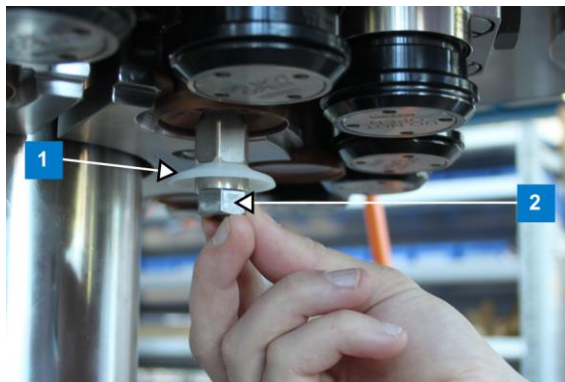
- a. Turn the can seamer until the knock-out pad to be replaced juts out of the seaming chuck at the lowest point and the P mark on the center part rotor lines up with the lifting station number.



- 1 Knock-out pad
- 2 Nut

Fig. 107: Replacing the knock-out pad

- b. Insert wrench extension.



- 1 Knock-out pad
- 2 Wrench extension

Fig. 108: Inserting wrench extension.

- c. Loosen the nut while holding it in place using a wrench extension.



Fig. 109: Loosening the nut

- d. Screw knock-out pad off and take out.
- e. Screw new knock-out pad in.
- f. Set the knock-out pad as described in the next step.

4. Setting the knock-out pads

Prerequisite:

- The lifting station number matches up with the P mark on the center part rotor
- The knock-out pad is unscrewed



- 1 Knock-out pad
- 2 Gauge

Fig. 110: Adjusting knock-out pad at the gauge

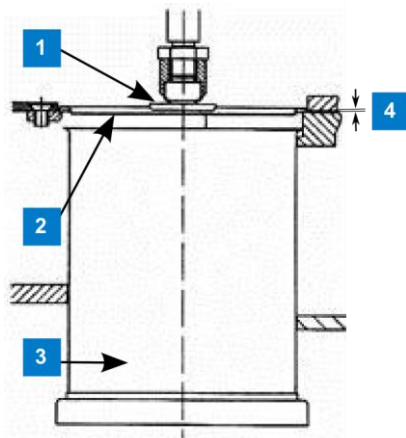
- a. Adjust the gauge to the lifting station.
- b. Adjust knock-out pad to the gauge.
The knock-out pad must be kept in contact with the gauge using slight pressure.
- c. Remove the gauge.
- d. Tighten the nut while holding it in place using a wrench extension.

5. Checking the height

NOTE

If all knockout pads have been readjusted – e.g. after a tool change – the height must only be checked after setting the first knockout pad.

The correct height of the knock-out pads is determined with an end in the end guide at the can infeed. When the knock-out pad reaches the lowest point of the knock-down cam, there should be no play between end and knock-out pad.



- 1 Knock-out pad
- 2 End
- 3 Can
- 4 Play: -0 / +0.3 mm

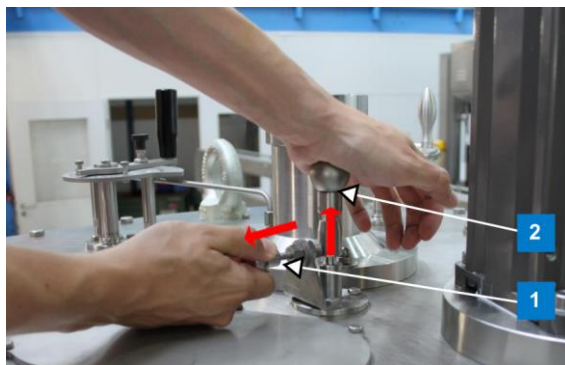
Fig. 111: Checking the height

6. Exchanging and setting additional knock-out pads

- a. Repeat points 3 and 4 until all knock-out pads have been set correctly.

7. Resetting the rod to the “Production” setting

- a. Pull out lock pin.



- 1 Lock pin
- 2 Rod

Fig. 112: Resetting the rod

- b. Slide the rod upwards.

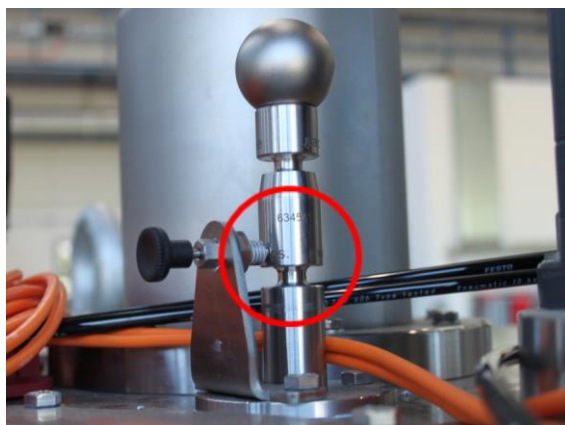


Fig. 113: Top rod, unsecured

- c. Secure rod in "Production" position.



Fig. 114: *Securing the rod in the "Production" position*

6.19 Setting the can/end diameter

The can seamer can be equipped for processing of various can and end formats.

Changing the can/end format means retooling the machine to other can and end dimensions:

1. Replace and set change parts.
2. Set the can height.

Retooling to other can/end diameters

Retooling the machine to other can and end diameters may only be performed by persons that have completed training by Ferrum Packaging Ltd..



NOTE

Can seamer with several can/end diameters.

For all information for converting the can seamer to other can/end formats, please refer to the separate operating instructions.

6.20 Setting the can seamer height

Changing or setting the can height is performed via the superordinate control by means of the electrically driven height adjustment.

To set the can height, change the height of the can seamer upper part.



DAMAGE TO EQUIPMENT

End in end feed magazine

Risk of damage to equipment at the ends in the end feed magazine when the machine upper part is moved upward.

If the end feed magazine is full of ends and the end feed magazine sensor is therefore activated, the can seamer can be moved up a maximum of **10 mm**.

As the pressure from the ends would be too great if the seamer were to be raised by more than **10 mm**, a sufficient number of ends must be removed so that the end feed magazine sensor is not blocked.

An adjustment downward is always possible.

- Empty the end feed magazine before moving the machine upper part upward.

6.20.1 Calculating the setting dimension of the can height gauge

To set the correct can height, first calculate the setting dimension for the can height gauge. Use the following formula:

$$PH = DoH - KT - EF - (Z)$$

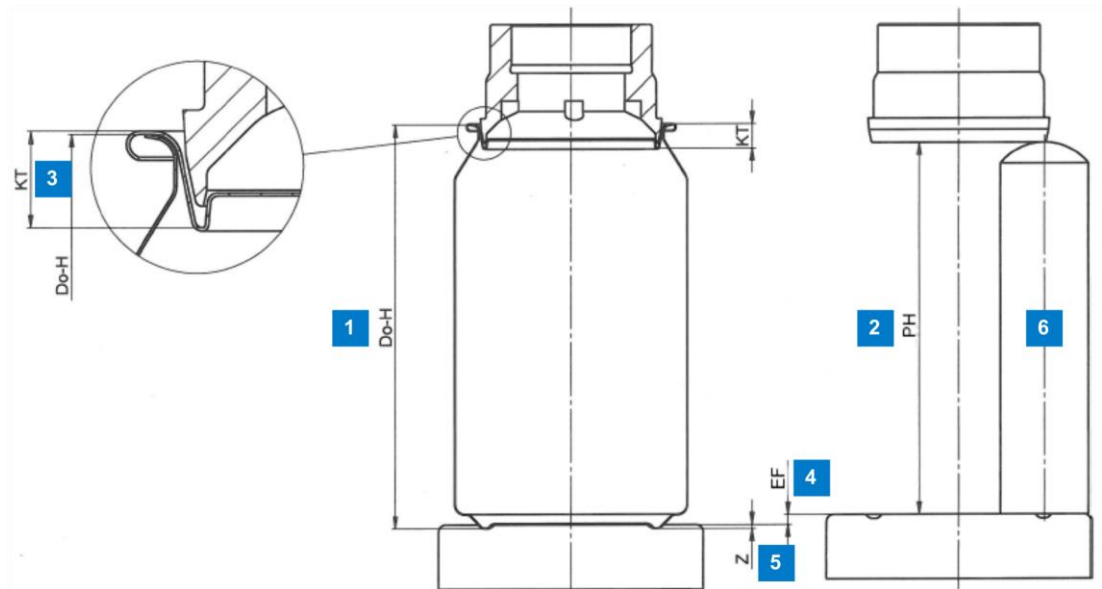


Fig. 115: Calculating the setting dimension of the can height gauge

1	DoH	=	can height of unclosed can (measured*)
2	PH	=	pin height (PH) / standard measure / can height gauge setting dimension
3	KT	=	end countersink depth
4	EF	=	spring deflection of the lifting station
5	Z	=	depth of any grooves in the base plate

* if can heights vary widely, the mean value of 10 height measurements must be used.

Calculation example

Calculation example with sample values for a beverage can 211/202, 330 ml, spring deflection: 0.6 mm

Can height, unclosed	115.20 mm
- End countersink depth**	6.86 mm
- <u>Spring deflection of the lifting station</u>	<u>0.6 mm</u>
Setting dimension of the can height gauge	107.74 mm

** depends on end type, see end specifications

6.20.2 Setting the can height

The can seamer height is correctly set if:

- The lifting station 1 is aligned with the OP 1 mark and the can height gauge fits free of play between the seaming chuck and base plate.

Location

- Lifting station at OP 1 mark.

Requirements

- The can seamer is on and has been stopped.
- The setting dimension for the can height gauge has been calculated (chapter "Calculating the setting dimension of the can height gauge").
- End feed magazine is emptied up to the end feed magazine sensor.



1 End feed magazine sensor

Fig. 116: Removing ends

Auxiliaries

- Can height gauge (in tool box)

Adjustments



CAUTION



Height adjustment

When adjusting the can seamer height, hands and fingers could be crushed in the area of the end feed.

- Before making a height adjustment, ensure that no persons are in the vicinity of the end feed.



DAMAGE TO EQUIPMENT

Upper part of can seamer

In the event of uncontrolled height adjustments to lower heights, the upper part of the can seamer (seaming lever, seaming chucks etc.) could damage other can seamer parts (center part, can guides, etc.) or could collide with the can height gauge on the base plate.

- During the lowering procedure, always keep an eye on the distance between the upper part of the can seamer and other can seamer parts, e.g. the center part, can guides, etc.

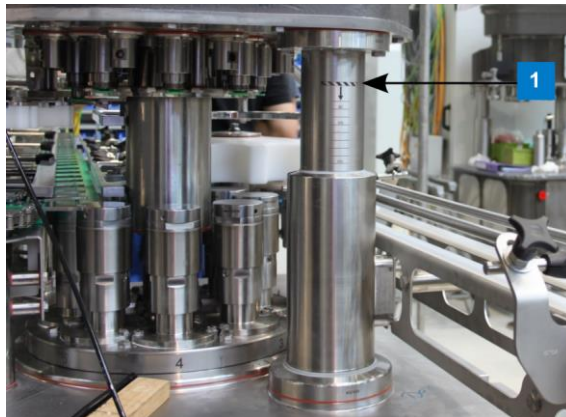


DAMAGE TO EQUIPMENT

Height range on the can seamer column

The can seamer can be damaged if the marked range is exceeded upwards or downwards.

- Always keep an eye on the marks on the can seamer column when moving upwards or downwards.
- Do not cross the marks.



- 1 Mark for lowest position of the can seamer upper part

Fig. 117: Height range on can seamer column

1. Select the height adjustment via the superordinate control.



NOTE

To even out the play in the spindle of the height adjustment, the set value must always be approached from below moving upwards.

2. Check the set can height at a seaming station with the can height gauge.
3. Check that the lock pin is correctly engaged.
4. Install height adjustment cover.

The can height has been set.

6.21 Emptying the end feed magazine manually

Requirements

- The can seamer is stopped, set up mode is enabled.
- Automatic end feed to the can seamer is deactivated.
- The ends above and outside of the can seamer are removed.

Auxiliaries

- Round plastic pin (approx. 20x300 mm)
- Box for storing the removed ends

Work steps

1. In manual drive, position the can/end-feed turret with the end feed magazine ring so that the ends can be accessed from below.



Fig. 118: Ends in the end feed magazine must be accessible from below

2. Remove 2 small end stacks (approx. 50 mm each) from the end feed hopper.

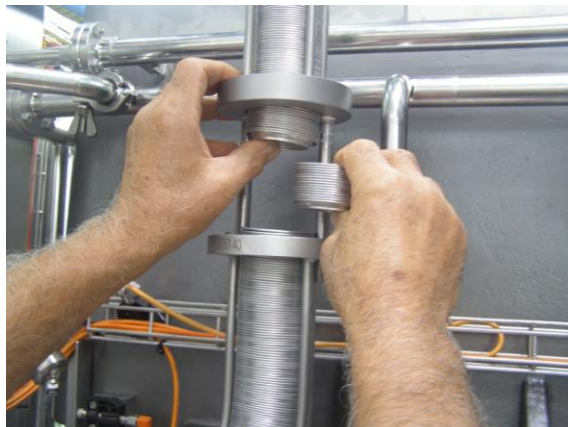


Fig. 119: Removing 2 small end stacks

3. Remove end stacks (approx. 100 mm each) from the end feed hopper up to the height of the end magazine ring.

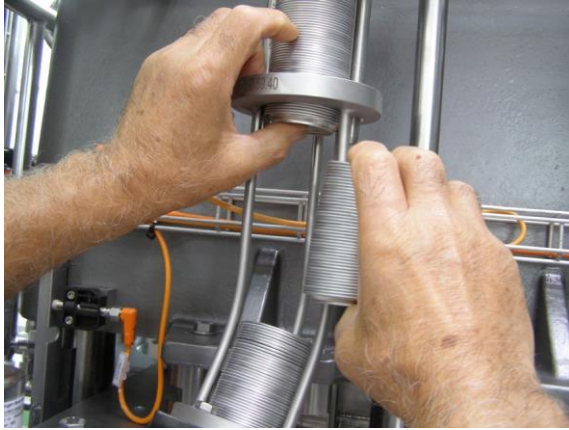


Fig. 120: Removing ends from the end feed hopper

4. Push up and then remove the remaining ends through the end magazine ring (by hand or with plastic pin).

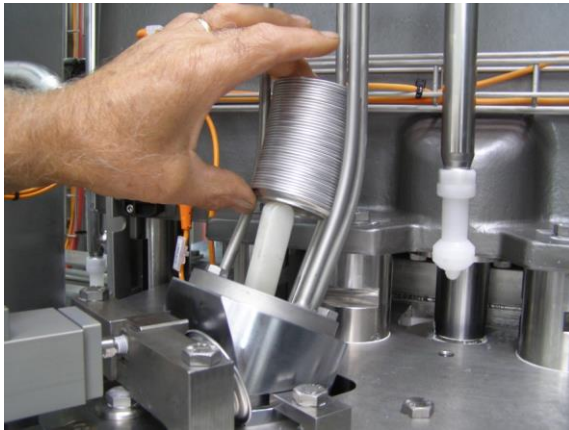


Fig. 121: Removing the ends from the end feed magazine ring

7 Operation

7.1 Overview

This chapter contains the instructions required for operating the can seamer in the various modes. The can seamer is mainly operated from the control panel at the filler control desk. For maintenance and adjustment tasks, there are additional control panels.



NOTE

For detailed information on the control panels, see the chapter "Displays and control elements".

7.2 Safety regulations



READ THE OPERATING INSTRUCTIONS!

Persons that operate the can seamer have to be instructed on the safety instructions and the correct operation steps.



NOTE

Before the can seamer can be operated, the machine has to be installed and started up correctly.

7.3 Switching on the can seamer

The can seamer is switched on using the filler supplier control panel. The functions are described in the operating instructions for the filler.

7.4 Production (normal operation)

7.4.1 Starting the can seamer

Adhere to the following steps to ensure problem-free operation when starting the can seamer.

1. Check that no tools or other foreign objects are in the area of the can seamer interior and the infeed table.
2. Check that all EMERGENCY STOP buttons have been unlocked.
3. Check that manual mode is deactivated.
4. Check that no faults have occurred (no fault message in the information box).
5. Set production speed.
6. Check that the can infeed and can discharge are ready for operation.



DANGER

Infeed table, can discharge, can seamer interior

Rotating can seamer parts.

If the safety devices and equipment are bypassed, the rotating can seamer parts can cause severe physical injury or death.

- It is strictly prohibited to bypass safety devices.
- Stop the can seamer for maintenance and adjustments and secure it against being switched back on.
- When the can seamer is running, stay away from the infeed chain at the infeed table and from the can discharge.
- Do not reach into the inside of the can seamer when the machine is running or when it has not been stopped and secured.
- Check the function of the safety devices regularly.

7. Press the START button on the filler control desk.

The can seamer begins to run at the preset speed.

7.4.2

Stopping the can seamer



NOTE

The machine may only be stopped when there are no cans left in the machine.

1. Make sure that there are no cans in the can seamer any more.
2. Press the STOP button on the filler control desk.

The can seamer decelerates to a stop using the standard delay ramp.

The can seamer has now been stopped and is ready for operation.



WARNING

Can seamer with voltage applied

Rotating can seamer parts

The drive motors have been set to rotational speed 0 and they are still energized. Machine components may move at any time, which can result in serious physical injuries or death if the safety regulations are not observed.

- Stop the can seamer for maintenance and adjustments and secure it against being switched back on.
- When the can seamer is running, stay away from the infeed chain at the infeed table and from the can discharge.
- Do not reach into the inside of the can seamer when the machine is running or when it has not been stopped and secured.

7.5 Manual mode

Manual mode is used for cleaning and setup work on the can seamer.
Manual mode operation is performed at the manual drive interface.



WARNING



Moving can seamer parts at the infeed table, at the can discharge and inside the can seamer.

In manual mode, moving can seamer parts, especially at the infeed table and can discharge, could cause physical injury if safety measures are not observed and safety equipment is not implemented correctly.

- Make sure that no persons are in the vicinity of the infeed table, can discharge and interior of the can seamer during manual mode.

1. Stop the can seamer at the filler control desk.
2. If necessary, select setup mode at the filler control desk.
3. If there are faults at the filler control desk, acknowledge faults.



1 Manual drive interface

Fig. 122: Manual drive

4. Remove the cover of the manual drive interface.
5. Start manual mode by turning with a hexagon socket wrench at the manual drive interface.
6. Deselect setup mode at the filler control desk.
7. Mount the cover of the manual drive interface.

7.6 EMERGENCY STOP

In emergencies, press the EMERGENCY STOP button.
The EMERGENCY STOP button stays locked in its pressed status.

Unlocking the EMERGENCY STOP button

The EMERGENCY STOP button can be unlocked again by rotating the button clockwise.

7.7 Switching off the can seamer



NOTE

The can seamer has to be stopped before it is switched off. This can be done using the normal stop, and only in emergencies should EMERGENCY STOP be used.

1. Switch off the control voltage.
2. Switch off the main switch.



WARNING



Unintentional startup

If the can seamer is switched on unintentionally, moving and rotating can seamer parts can cause severe injuries or death.

- Take measures to prevent the can seamer from being switched on unintentionally.
- When working on the can seamer, secure it so that no person or situation can effect changes to the can seamer while you are away from it.
- Before starting settings adjustment and maintenance tasks, padlock the main switch against being switched back on.

The can seamer is off.

Air overpressure by supplying compressed air



NOTE

The compressed air must never be disconnected, as the can seamer operates using air overpressure. This also applies when the can seamer is switched off.

After turning off the machine, the compressed air supply must be ensured for at least four hours to prevent negative pressure in the machine and to prevent penetration of condensation.

8 Malfunctions/Troubleshooting

8.1 Overview

This chapter contains a description of possible faults and their causes in the can seamer as well as instructions on how to fix these faults.

8.2 Safety regulations

Target group

Service tasks may only be performed by specialized technicians with product-specific training who have received basic training in mechanical and electrical work.



READ THE OPERATING INSTRUCTIONS!

This chapter, the chapter "Safety", as well as all other chapters in these operating instructions that are referred to, have to be read and fully understood by all persons who perform service work on the can seamer.



DANGER



Rotating can seamer parts

If the safety devices and equipment are bypassed, the rotating can seamer parts can cause severe physical injury or death.

- It is strictly prohibited to bypass safety devices.
- Stop the can seamer for maintenance and adjustments and secure it against being switched back on.
- When the can seamer is running, stay away from the infeed chain at the infeed table and from the can discharge.
- Do not reach into the inside of the can seamer when the machine is running or when it has not been stopped and secured.
- Check the function of the safety devices regularly.



WARNING



Unintentionally switching the can seamer on

If the can seamer is switched on unintentionally, rotating can seamer parts can cause serious physical injury or death.

- Never reach inside the machine when the can seamer is running.
- Always stop the can seamer before performing any work on it.
- Take measures to prevent the can seamer from being switched on unintentionally.
- When working on the can seamer, secure it so that no person or situation can effect changes to the can seamer while you are away from it.
- Before starting settings adjustment and maintenance tasks, padlock the main switch against being switched back on.

8.3 Information messages

Information messages are displayed in the infobar of the control panel on the filler control desk.

8.4 Warning messages

Warnings are displayed in the infobar of the control panel on the filler control desk.

8.5 Fault messages

Faults are displayed in the FAULTS screen of the control panel on the filler control desk.

9 Maintenance, repairs

9.1 Overview

This chapter contains the maintenance schedule and the instructions required to properly perform the maintenance tasks mentioned in the maintenance schedule.

9.2 Safety regulations

Target group

Maintenance tasks may only be performed by specialized technicians with product-specific training who have received basic training in mechanical and electrical work and who have appropriate vocational experience.



READ THE OPERATING INSTRUCTIONS!

This chapter, the chapter "Safety", as well as all other chapters in these operating instructions that are referred to, have to be read and fully understood by all persons who perform maintenance work on the can seamer.



DANGER



Rotating can seamer parts

If the safety devices and equipment are bypassed, the rotating can seamer parts can cause severe physical injury or death.

- It is strictly prohibited to bypass safety devices.
- Stop the can seamer for maintenance and adjustments and secure it against being switched back on.
- When the can seamer is running, stay away from the infeed chain at the infeed table and from the can discharge.
- Do not reach into the inside of the can seamer when the machine is running or when it has not been stopped and secured.
- Check the function of the safety devices regularly.



WARNING



Unintentionally switching the can seamer on

If the can seamer is switched on unintentionally, rotating can seamer parts can cause serious physical injury or death.

- Never reach inside the machine when the can seamer is running.
- Always stop the can seamer before performing any work on it.
- Take measures to prevent the can seamer from being switched on unintentionally.
- When working on the can seamer, secure it so that no person or situation can effect changes to the can seamer while you are away from it.
- Before starting settings adjustment and maintenance tasks, padlock the main switch against being switched back on.

9.3 Cleaning

9.3.1 Safety regulations



READ THE SAFETY DATA SHEETS!

Wear additional protective equipment when using cleaning agents.

Inform yourself about the cleaning and disinfecting agents by reading the safety data sheets.



CAUTION

Contact with splashes of water, cleaning agents or product

If the safety devices are not used properly while cleaning the can seamer, areas of skin, such as hands, arms, face, etc. may come into contact with cleaning or disinfecting agents and cause irritation.

During removal of damaged containers from the can seamer, product splashes may occur if the safety devices are not used properly. This can cause eye injuries.



- To remove damaged cans or clean the can seamer, wear protective goggles.
- If something does splash into an eye, rinse out the eye for several minutes with running water whilst holding the eyelid open. If the symptoms persist, contact a physician.



- When cleaning the can seamer, wear protective gloves.
- Wash your hands before breaks and when you finish work.
- If you swallow something, rinse out the mouth and drink plenty of water. If the symptoms persist, contact a physician.
- The protective measures will vary depending on the product. It is therefore highly recommended that you inform yourself about the cleaning or disinfecting agents that are used, by reading the safety data sheets.



NOTE

In the event of deviations or statutory restrictions, please contact the supplier of your cleaning solution.



DAMAGE TO EQUIPMENT

Cleaning agents and water on the ends

Ends in the end feed magazine can corrode if they are wetted with cleaning agent. Cleaning agent that comes in contact with the ends may also get into the product.

- Empty the end feed magazine completely before cleaning the can seamer.



DAMAGE TO EQUIPMENT

High pressure on shaft sealing rings.

The shaft sealing rings can be damaged by cleaning.

- It is strictly prohibited to use medium and high pressure for cleaning the can seamer.
- Cleaning solutions and water may only be applied with the maximum permissible application pressure of **4 bar** absolute pressure. Spray lance distance min. **30 cm**.



DAMAGE TO EQUIPMENT

Cleaning agent and water in the can seamer

Water and cleaning solutions that penetrate into the can seamer can result in water coming into the oil, heavy corrosion and premature failure of the can seamer.

- Cleaning solutions and water may only be applied with the maximum permissible application pressure of **4 bar** absolute pressure. Spray lance distance min. **30 cm**.



DAMAGE TO EQUIPMENT

Cleaning agents and water on the electrical components

Electrical components such as rotary encoders and safety switches can be damaged by cleaning.

- The use of medium or high pressure for cleaning electrical components is strictly prohibited.
- Do not apply cleaning solutions or water directly to the electrical components.

9.3.2

Cleaning process and cleaning times



NOTE

The cleaning process and cleaning times are recommendations from Ferrum Packaging Ltd.. The customer must determine cleaning times on site and if necessary adjust to any hygiene requirements. The cleaning agents must be selected in cooperation with a specialist company in accordance with Technical Note TM0048 (located in the appendix to these operating instructions).

9.3.3

Water quality requirements

The hot and cold water for cleaning and thinning the cleaning concentrates must fulfill the following minimum requirements:

- Filtered with a 50-micrometer particle filter
- Water hardness less than 12 German degrees of hardness

Please refer to technical information TM0048 in the appendix of these operating instructions for further information.

9.3.4 Manual cleaning

To keep the can seamer clean, it is absolutely necessary to perform a thorough manual cleaning. Plan enough time for the manual cleaning.

- Ensure that sufficient distance is kept between the spray lance and the components (min. 30 cm).
- Do not spray vertically (from below) on sealing parts like V-ring, seaming chuck shaft sealing ring, or seaming roll seal, etc.
- Do not spray the center part from below.
- Proceed systematically so that the seamer is cleaned completely. Make sure that the seamer is cleaned from top to bottom so that surfaces which have already been cleaned do not become soiled again.
- Check corners and hidden edges for soiling, and clean with brushes if necessary. Warning: Work carefully so that seals are not damaged!

Manual cleaning procedure

1. Cleaning of solids
2. Pre-rinsing
3. Alkaline foaming
4. Rinsing



NOTE

Acidic foaming

Depending on the water hardness, it is recommended to additionally clean the can seamer with an acidic cleaning agent 1-2 times per week:

1. Cleaning of solids
2. Pre-rinsing
3. Acidic foaming
4. Rinsing

Cleaning

Remove visible, hardened soiling and solid residues. Remove any cans, ends, or other large objects that are lying around in the seamer. Switch off the belt lubrication. This is important so that you can reach every area during cleaning.

Pre-rinsing

Rinsing is done by hand using a spray lance (max. 4 bar, min. distance of 30 cm). Make sure that all relevant components are pre-rinsed.

Foaming

Apply the cleaning foam (alkaline or acidic) using a hand lance (max. 4 bar, min. distance of 30 cm). Allow cleaning agent to soak in to dissolve contaminations. If any contamination remains after soaking, clean by hand using suitable brushes (textile or plastic).



NOTE

When foaming, turn the seamer using the hand wheel/slow motion mode in order to reach all the seaming and lifting stations. Subsequently check if all areas have been covered with foam. If necessary, reapply foam and remove stubborn contamination with suitable brushes.

Rinsing

You can begin rinsing the can seamer as soon as the specified acting time has passed. Use the hand lance to thoroughly wash off the foam. Make sure that the can/end feed turret is thoroughly rinsed and subsequently blown off.

Check if there is still foam on any of the cleaned components. If there is, the machine has to be rinsed again before production is started. Switch the belt lubrication back on.

9.3.5

Cleaning with cleaning/disinfecting agents

Concept

Removal of water-insoluble residue (e.g. protein layers, fats, product deposits) using appropriate chemical agents (alkaline foam cleaners) or mechanical equipment if necessary (brushes).

Use

Comprehensive, no-pressure application of the cleaning agent with a foam applicator.



DAMAGE TO EQUIPMENT

Cleaning agent in the can seamer

The cleaning agent must not be allowed to dry.

- When using cleaning solutions, after the specified soaking time, the machine must be rinsed immediately and thoroughly with pure water.



DAMAGE TO EQUIPMENT

Alkaline and acidic cleaning agents

Alkaline and acidic cleaning agents can degrade the machine's seals and lead to subsequent damage.

- Only use cleaning agents authorized by Ferrum. See technical information TM0048 in the appendix of these operating instructions.
- The recommended cleaning solutions are not aggressive towards non-ferrous metals, Viton, silicone and NBR rubber.
- Acidic cleaners may only be used if Ferrum customer services has been consulted and given approval.
- Use soft water (ion exchanger) if limescale deposits occur.

9.3.6 Non-approved cleaner or disinfecting agents

Ferrum Packaging Ltd. only approves the use of the listed cleaning and disinfecting agents. If you wish to use other cleaning or disinfecting agents, please discuss this with Ferrum Packaging Ltd. Customer Support.

Ferrum Packaging Ltd. provides no guarantee for oil loss and defective seals when a non-approved cleaning or disinfecting agent has been used.

9.3.7 Disposing cleaning and disinfecting agents



ENVIRONMENTALLY HAZARDOUS SUBSTANCES

Cleaning and disinfecting agents

Cleaning and disinfecting agents contain chemical substances and must be disposed of according to the corresponding regulations.



READ THE SAFETY DATA SHEETS!

Inform yourself about proper disposal of the cleaning and disinfecting agents by reading the corresponding safety data sheets.

9.4 Maintenance of the centralized oil lubrication

9.4.1 Checking the oil level

The lower part of the can seamer has to be filled so that the oil level can be seen in the oil sight glass (max. 20 liter).

If the oil level is below the minimum when the machine is switched off (after at least 30 minutes of standstill), oil must be refilled at the filling nozzle.

Location

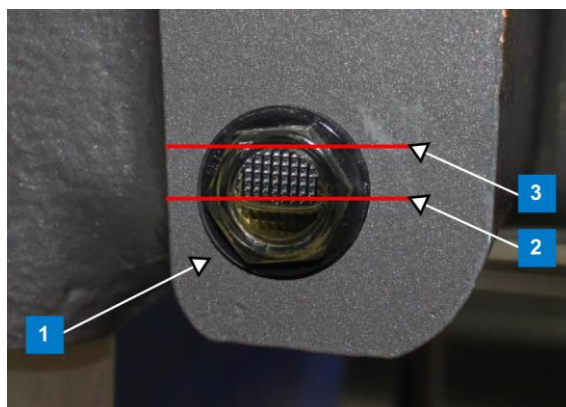
- Lower part of can seamer

Requirements

- Can seamer is off and has been secured.
- Can seamer has been at a standstill for at least 30 minutes.

Maintenance work

1. Check oil level at the oil sight glass.



- 1 Oil sight glass
- 2 Minimum oil level (14 liters)
- 3 Maximum oil level (20 liters)

Fig. 123: Oil sight glass

The oil level has been checked.

9.4.2 Refilling oil

Location

- Lower part of can seamer

Requirements

- Can seamer is off and has been secured.
- Can seamer has been at a standstill for at least 30 minutes.

Auxiliaries

- Cloths
- Oil (for approved oils, see the chapter "Technical data", section "Oil lubrication")

Maintenance work

1. Open filling nozzle.



- 1 Filling nozzle
- 2 Oil sight glass

Fig. 124: Filling nozzle

2. Fill up oil.
3. Check oil level in oil sight glass (see chapter "Checking the oil level").
4. Close filling nozzle again.

The oil has been filled up.

9.4.3 Cleaning the strainer



ENVIRONMENTALLY HAZARDOUS SUBSTANCES

Waste oil

Waste oil, as well as all oil used for maintenance and cleaning work on the can seamer, must be collected and disposed of properly.

Location

- Lower part of can seamer

Requirements

- Can seamer is off and has been secured.
- Can seamer has cooled off. The cool-off duration is approx. 1 hour.

Auxiliaries

- Cloths
- Cleaning agent
- Collection container with approx. 0,5 liter capacity
- Fork wrench, size 17

Maintenance work

1. Remove oil filter cap by unscrewing the screw.



- 1 Oil filter cap screw

Fig. 125: Oil filter cap

2. Remove the strainer and clean with cleaning agent and cloth.



1 Strainer

Fig. 126: Strainer

3. If necessary, blow out with compressed air.
4. Place the cleaned strainer back into place.
5. Screw the oil filter cap back on.
6. Ensure that the screw has been sufficiently tightened.

The strainer has been cleaned.

9.4.4 Changing easy-change filter

Location

- Lower part of can seamer

Requirements

- Can seamer is off and has been secured.
- Can seamer has cooled off. The cool-off duration is approx. 1 hour.

Auxiliaries

- Cloths
- Collection container with approx. 0,5 liter capacity

Maintenance work

1. Unscrew old easy-change filter.



1 Easy-change filter

Fig. 127: Easy-change filter

2. Screw on new easy-change filter.

The easy-change filter has been changed.

9.4.5 Changing oil / changing oil type

The oil must be replaced...:

- ... when using a different type of oil
- ... When an oil/water emulsion is formed. ...(Oil loses transparent color and becomes white.)
- ... After 2,500 operating hours or 1 x per year.



ENVIRONMENTALLY HAZARDOUS SUBSTANCES

Waste oil

Waste oil, as well as all oil used for maintenance and cleaning work on the can seamer, must be collected and disposed of properly.

Location

- Lower part of can seamer

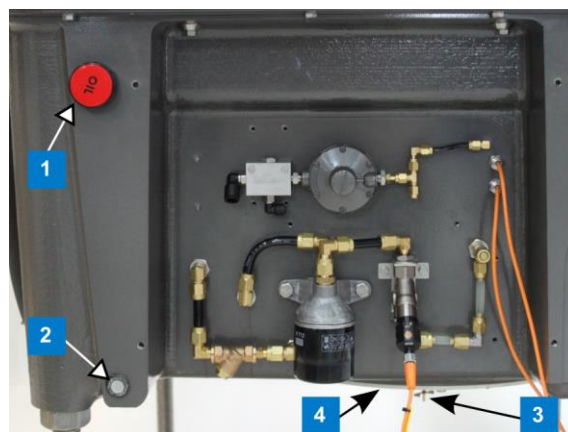
Requirements

- Can seamer is off and has been secured.
- Can seamer has cooled off. The cool-off duration is approx. 1 hour.

Auxiliaries

- Cloths
- Bendable hose or pipe with 90° bend
- Collection container with at least 30 liter capacity
- 20 liters of oil
- Cleaning concentrate for oil circulation systems

Maintenance work



- 1 Filling nozzle
- 2 Oil sight glass
- 3 Oil drain screw
- 4 Cover for the lower part

Fig. 128: Changing the oil

1. Open filling nozzle.
2. Fill the lower part of the can seamer with the cleaning concentrate for oil circulation systems in the concentration specified by the manufacturer.
3. Close the filling nozzle.
4. Continue to operate the machine for a defined period of time in order to distribute the cleaning concentrate for oil circulation systems throughout the oil circuit. The duration is specified by the manufacturer of the cleaning concentrate for oil circulation systems.
5. Drain the used oil including cleaning concentrate for oil circulation systems via the oil drain screw into the collection container.

6. Remove the cover to the lower part: Remove the screws on the cover.
7. If present: Remove any remaining coarse soiling from the lower part of the can seamer.
8. Remount the cover to the lower part: Tighten the screws on the cover. Make sure the O-ring is correctly seated.
9. Clean or replace the strainer and easy-change filter
10. Open filling nozzle.
11. Fill in new oil (max. 20 liters) at the filling nozzle until the oil level has reached the upper edge of the oil sight glass.
12. Close the filling nozzle.

The oil has been replaced.

9.4.6 Draining condensed water



ENVIRONMENTALLY HAZARDOUS SUBSTANCES

Oil contaminated with condensed water

Condensed water that accumulates in the oil tank gets mixed with oil during the drainage procedure. This water must therefore be collected and disposed of properly, like the oil.

Location

- Below the oil tank

Requirements

- Can seamer is stopped.

Auxiliaries

- Cloths
- Collection container

Maintenance work

1. Open oil drain screw.



- 1 Oil drain screw

Fig. 129: Oil drain screw

2. Drain water until clear oil comes out.
3. Close oil drain screw.

The water has been drained.

9.5 Maintenance schedule

You can find the maintenance schedule in the appendix.

Comprehensive periodic maintenance

In addition to the maintenance work listed in the maintenance schedule, Ferrum Packaging Ltd. recommends having expanded maintenance services performed by our specialists. Different models are available depending on the number of service hours performed and the reliability requirements. Please contact Ferrum Packaging Ltd. Customer Support for personalized consultation.

Advantages and use of the maintenance schedule

This maintenance schedule is the basis for the Ferrum service package. For optimal results and maximization of the machine reliability and minimum maintenance costs, the specifications in this table must be adhered to.

The information regarding maintenance and all additional data are provided to the customer by Ferrum Packaging Ltd. for internal use. This information remains the intellectual property of Ferrum Packaging Ltd..

9.5.1 Checking the seaming rolls

Inspection	Possible cause	Measures
Check that the seaming rolls move easily by briefly moving all seaming rolls by hand while they are at operating temperature.	■ Bearing damage ■ Contaminated oil	■ Replace the seaming roll.
Visual inspection of the seaming rolls and seaming chucks for mechanical damage in the profile area	■ Cracks or chips in the profile area of the seaming rolls.	■ Replacing the seaming rolls or seaming chucks
Tool wear	■ Large changes in the seaming parameters. ■ Dark hard material layer in the seaming groove of the seaming rubs off.	■ Replacing the seaming rolls or seaming chucks

9.5.2 Seaming test

The check of the 1st operation must be performed at least 1 × weekly or after a new setting of the can seamer.

The check of the finished seam with a seam projector must be performed at different intervals depending on the capacity:

Capacity	Intervals for seam monitoring
1,500 cans/minute or less	At least 1 × per shift
More than 1,500 cans/minute	At least every 4 hours

Per station of the can seamer, at least one can must be checked. Additional information on the seaming test and the seam monitoring can also be found in the chapter "Settings", sections "OP1 seaming test" and "Seaming monitoring".

Seam monitoring is also necessary after machine malfunctions and after a change of cans or ends.

The correct seaming parameters can be found in the documents of your can manufacturer.

10 Repairs

10.1 Overview

This chapter contains instructions for repair work that is to be performed by the operating company. All other repair work must be performed by trained specialists from Ferrum Packaging Ltd..

10.2 Safety regulations

Target group

Repair tasks may only be performed by specialized technicians with product-specific training who have received basic training in mechanical and electrical work and who have appropriate vocational experience.



READ THE OPERATING INSTRUCTIONS!

This chapter, the chapter "Safety", as well as all other chapters in these operating instructions that are referred to, have to be read and fully understood by all persons who perform repair work on the can seamer.



DANGER



Rotating can seamer parts

If the safety devices and equipment are bypassed, the rotating can seamer parts can cause severe physical injury or death.

- It is strictly prohibited to bypass safety devices.
- Stop the can seamer for maintenance and adjustments and secure it against being switched back on.
- When the can seamer is running, stay away from the infeed chain at the infeed table and from the can discharge.
- Do not reach into the inside of the can seamer when the machine is running or when it has not been stopped and secured.
- Check the function of the safety devices regularly.



WARNING



Unintentionally switching the can seamer on

If the can seamer is switched on unintentionally, rotating can seamer parts can cause serious physical injury or death.

- Never reach inside the machine when the can seamer is running.
- Always stop the can seamer before performing any work on it.
- Take measures to prevent the can seamer from being switched on unintentionally.
- When working on the can seamer, secure it so that no person or situation can effect changes to the can seamer while you are away from it.
- Before starting settings adjustment and maintenance tasks, padlock the main switch against being switched back on.

10.3 Repairs

For repairs, please contact the Ferrum Packaging Ltd. customer service department.

11 Decommissioning, storage

11.1 Storage conditions

The following conditions must be met for the storage of the can seamer and additional components in other containers:

- The storage location must be covered.
- The climate of the storage location must comply with the usual industrial conditions:
 - Temperature range 12°C to 40°C / 54°F to 104°F
 - Humidity < 90%
 - No large or quick temperature fluctuations, because these can lead to condensation forming
- The can seamer must be stored in a dry place.
- Containers in which the can seamer and additional components are packed for shipping should be opened after packing. Open all layers of packaging around the machine or the components in order to avoid condensation forming between or within the layers of packaging.
- The can seamer must not come into contact with water or rain while being stored.

11.2 Decommissioning



DANGER



Live parts in the electric cabinet

Touching live parts in the electric cabinet can lead to serious physical injury or death when the safety regulations are not observed.

- Even when the main switch has been switched off, some parts remain live in the electric cabinet.
- Check that there is no voltage at the electrical lines on the terminal box of the can seamer.
- The electric cabinet may only be opened by trained electricians.
- Only trained electricians may connect the can seamer. Observe technical connection data.
- Observe local regulations regarding energy supply. The electrical system is designed according to European safety standards.

Disconnect:

- The electrical lines at the terminal box of the can seamer and
- The compressed air lines on the can seamer.

For longer periods of inactivity, drain the lubricating oil from the can seamer.

11.3 Maintenance during storage

No maintenance is required on the can seamer during storage.

11.4 Recommissioning



NOTE

The following points must be taken into consideration before reusing the can seamer:

- If the can seamer is stored for more than 6 months, Ferrum Packaging Ltd. recommends replacing all the seals.
- Some special bearings must be replaced after being stored for more than 18 months.
- Electric motors can be damaged during storage to the point where they need repair work done before they can be used again.
- If they are stored for more than 24 months, Ferrum Packaging Ltd. recommends having them inspected by a Ferrum Packaging Ltd. service technician and having the machine overhauled before installation, or at least having the seals and special bearings replaced.

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1. Follow the instructions in the chapter "Commissioning" in the assembly instructions.
 2. Pour the lubricating oil into the lubrication system. For more information, refer to the chapter "Maintenance, repairs", section "Centralized oil lubrication maintenance" in these instructions.

12 Disposal

12.1 Basic principle

Be careful with the raw materials that are contained within this can seamer. Before disposal, check whether the auxiliary materials, materials and machine parts can be reused. Recycle as much as possible.

Careless or improper disposal can lead to unforeseen damage. Show care for yourself, for us, for the children, nature, the environment and the economy. Dispose of auxiliary materials, materials and machine sections so that the disposal is verifiably friendly to society, nature and the environment. Follow the manufacturer's specifications and the local laws and regulations.

12.2 Auxiliary materials

12.2.1 Cleaning solutions (lye)



ENVIRONMENTALLY HAZARDOUS SUBSTANCES

Cleaning solutions (lye)

If disposed of carelessly or improperly, cleaning solutions (lye) can poison the environment and harm people. For disposal, please follow the manufacturer's specifications and the local laws and regulations.

12.2.2 Machine oil



ENVIRONMENTALLY HAZARDOUS SUBSTANCES

Machine oil

If disposed of carelessly or improperly, machine oil can strain the environment and nature and harm people. For disposal, please follow the manufacturer's specifications and the local laws and regulations.

12.3 Materials and machine parts

For disposal, separate the materials and machine parts of the can seamer by material type, according to the local laws and regulations:

- Stainless steel from steel scrap
- Copper in electric parts and cables
- Copper and non-ferrous metals in cables
- Plastics
- Batteries

Recycle as much as possible.

13 Appendix

- PID diagram
- Pneumatic scheme
- Hydraulic circuit diagram
- Maintenance schedule
- Operating instructions „Quick tool changeover“