

LNS®



QUICK LOAD SERVO S3 T BARFEED

Instruction Manual



For CNC machine tool peripherals,
it's **LNS**, then all the rest

9.021.04.US

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CHAPTER 1: BASIC PRINCIPLES

1. STRUCTURE

This manual consists of various chapters, each containing several points, paragraphs, etc. Lists may be contained in paragraphs.

- The page number is indicated in the top outer corner of the page.
- The chapter number and title are indicated in the top inner corner of the page.
- The model of the bar feed system is indicated in the bottom right-hand corner of the page.

1.1. Cross-references

Each chapter generally contains all of the information related to the description and settings of the devices and elements represented therein.

Therefore, if a setting must be made while you are handling the system, please refer to the chapter on the device to be set, for example: (see chapter *) or (see point *).

1.2. Captions

Whenever possible, the reference numbers contained in the instruction manual are shown with the LNS ordering number of the indicated element.

To make it easier to place an order of supplies, a form has been included in the annex at the end of this manual.

1.3. Symbols and terminology



This sign recommends following the directions very closely to avoid causing an incident that could result in injury, damage to the equipment or data loss.



This sign indicates that safety measures must be taken to avoid possible electrical shocks or mishaps.



The notes stress interesting points or comments, and provide useful advice for optimal system operation.



This sign indicates advice concerning environmental protection.

2. RIGHTS

All rights reserved. Reproduction, recording or transmission of all, or any portion, of this manual, in any form or by any means whatsoever, whether mechanical, photographic, audio or other, without the express written authorisation of LNS, is prohibited. LNS SA accepts no responsibility for errors which may be contained in this manual and any problems which may result.

LNS and its subsidiaries cannot be held liable for the debts, losses, expenses, or damage incurred, or suffered, by the buyer of this product, or a third party, following an accident, incorrect use, or misuse, or stemming from modifications, repairs, or transformations not authorised by LNS.

LNS and its subsidiaries cannot be held responsible for damage and problems arising from the use of options and products other than LNS products, or products approved by LNS.

The names of the products indicated in this manual are registered trademarks.

The instructions found in this manual are only for information; they are subject to change without notice. LNS reserves the right to alter this information without prior warning.

3. CE DECLARATION OF CONFORMITY

"CE" DECLARATION OF CONFORMITY

As per annex II A of directive 2006/42/EC



We hereby declare that the following machinery is manufactured in compliance with the following directives:

- Machinery directive: 2006/42/EC
- Low voltage directive: 2006/95/EC
- EMC directive: 2004/108/EC

Manufacturer:

LNS SA
Route de Frinville
CH- 2534 Orvin
Switzerland

Technical Dossier Compiled by: Plaseco Kurt De Pauw

Chemin des Petits-Clos 12
CH- 1744 Chénens
Switzerland

Description of the machine

Automatic bar feeder

Type

: QUICK LOAD SERVO M

Delivery serial no.

: (see no. on the official document)

The machine meets the following essential requirements applicable as per directive 2006/42/EC: 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, 1.2.6, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 1.3.7, 1.3.8, 1.3.9, 1.4.1, 1.4.2, 1.4.3, 1.5.1, 1.5.3, 1.5.4, 1.5.8, 1.5.9, 1.6.2, 1.6.3, 1.7.1, 1.7.2, 1.7.3, 1.7.4.

The following harmonised standards have been used as a basis:

- Concerning the Machinery directive:

- EN ISO 12100:2010 : Safety of machinery – General principles for design,
- EN ISO 14121-2:2013 : Safety of machinery – Risk assessment,
- EN ISO 13857:2008 : Safety of machinery – Safety distances,
- ISO 14120:2002 : Safety of machinery – Design of movable guards,
- EN ISO 13850:2008 : Safety of machinery – Emergency stop function,
- EN ISO 13849-1:2008 : Safety of machinery – Safety-related parts of control systems,
- ISO 14118:2000 : Safety of machinery – Prevention of unexpected start-up,
- EN 60204-1:2005 : Safety of machinery – Electrical equipment of machines,
- EN ISO 14119 :2013 : Safety of machinery – Interlocking devices associated with guards,
- EN ISO 4414:2011 : Pneumatic fluid power - General rules and safety requirements,
- IEC 60812:2006 : Safety of machinery – FMEA analysis,

- Concerning the Low voltage directive:

- EN 61439-1/3 :2013 : Low voltage switchgear and controlgear assemblies,

- Concerning the EMC directive:

- EN 61000-6-4: Generic standards - Emission standard for industrial environments,
- EN 61000-6-2: Generic standards - Immunity for industrial environments,

Location and date:

Stamp and signature:

Orvin, 10th April 2014

Nadia Pellaton
Export Department Manager

4. SAFETY INSTRUCTIONS

Only sufficiently qualified personnel with an understanding of the product may install, maintain and repair the product, if necessary, and start rotation of the spindle. The customer must provide the necessary resources for internal monitoring, maintenance instructions, organisation of the work, training of personnel and availability of the instructions for installation and use. All persons working with this device must have read and understood the instructions in this manual. LNS accepts no responsibility for possible accidents or property damage caused when safety instructions are not followed.

- Do not handle the equipment without having knowledge of the safety instructions and the instructions for use. Safety instructions for the bar feeder, as well as the CNC lathe, must be strictly observed.
- Non-qualified personnel, children, and persons under the influence of alcohol or medication should not handle the equipment.
- Loose garments, long hair and jewellery can be dangerous.
- Do not remove any covers while the bar feeder or the machine is powered on.
- Do not conduct any maintenance operations during the automatic cycle.
- Do not grasp moving or rotating objects, or nearby elements.
- If certain safety shields or safety covers are removed to conduct maintenance, they must be reinstalled as soon as the maintenance work is completed.
- No servicing should be carried out on the interface or inside the electrical cabinet while the bar feeder or the lathe is powered on.
- It is strictly prohibited to jump wire or remove circuit breakers, master switches, and especially safety switches.
- To avoid any harm to persons or damage to components, use only the indicated points for lifting and moving the bar feeder. No one should be near the hanging load, or within the operating range of the overhead hoist/crane, forklift, or any other means used for lifting and transportation.
- Do not knock the bar feeder while moving it as this could damage it.
- Do not move the bar feeder while it is electrically powered on.
- The work area surrounding the bar feeder should always be clear of objects and well lit. The presence of oil on the ground could cause falls; it is important to keep the floor clean on a regular basis.
- Do not place the machine in a damp area and make sure that water or oil does not come into contact with the electrical equipment.
- Do not open the clamping unit (collet or chuck) of the lathe manually when the bar feeder is in automatic mode (Interface).
- Each time the diameter is changed, also adapt the spindle reduction tube.
- The use of spindle reduction tubes is highly recommended for machining bars with diameters smaller than the maximum capacity of the spindle.
- Do not attempt to recharge the batteries of the PLC.
- For the use and maintenance of the bar feeder, use only parts provided by or recommended by LNS.
- If it is necessary to move the bar feeder once it has been originally installed, do not reinstall it before first contacting LNS or its local representative.
- The bar should never extend more than 3 times its diameter beyond the lathe's clamping unit without support.
- LNS accepts no responsibility for possible accidents or property damage caused when safety instructions are not followed.

5. SAFETY DEVICES

The feeder complies with the European standards that are indicated in the declaration of conformity and incorporation.

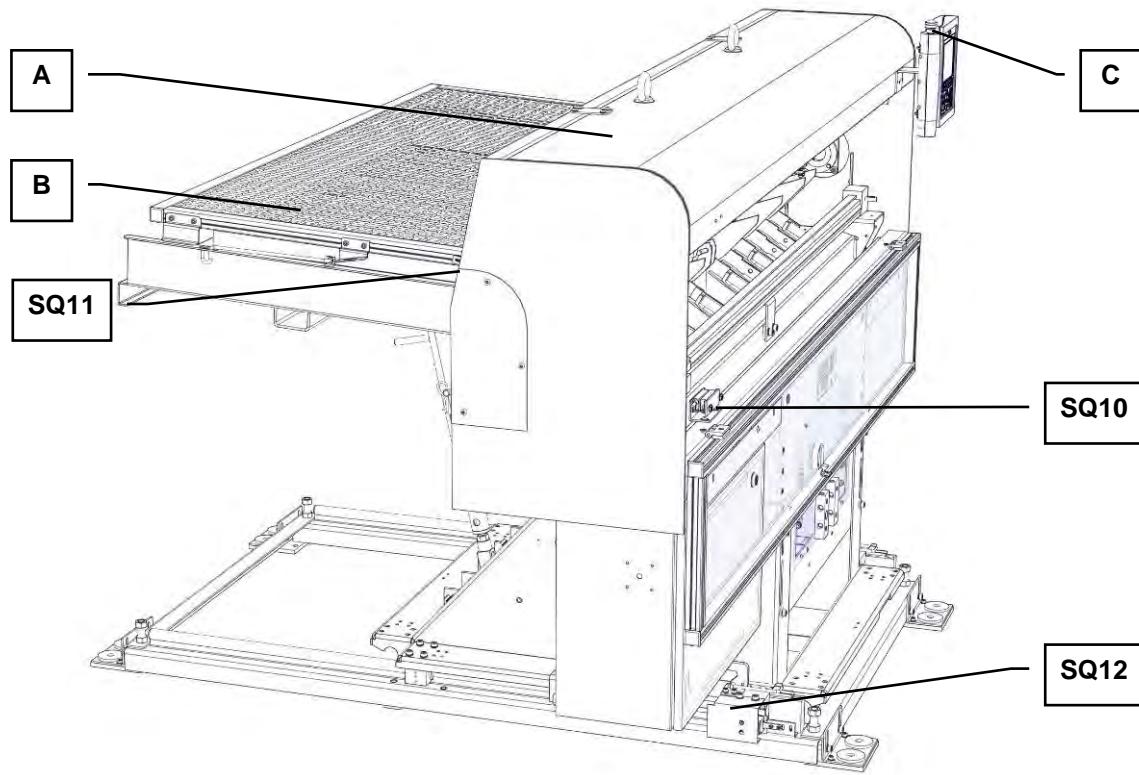
Safety covers and devices make access to the moving parts of the bar feeder impossible. Safety switches keep the bar feeder from operating when these protections are open. The design of switches, and their integration on the bar feeder, makes their exclusion almost impossible.

By pressing the emergency stop button located on the remote control, the functions of the bar feeder and the lathe are immediately stopped.



LNS, or its local representative, may not be held liable for any accidents or property damage which occur, whether caused directly or not, by any means whatsoever, if certain safety devices have been excluded.

5.1. Layout of the elements on the bar feeder



Designation	Description
A	Protection cover
B	Protection grid for the bar magazine
C	Emergency stop push button
SQ10	Safety switch of the protection cover
SQ11	Safety switch for the protection grid
SQ12	Safety switch for the retraction system

CHAPTER 2: TECHNICAL DATA

1. CHARACTERISTICS

Note: Depending on the options, these technical data may vary. Please refer to the technical data sheet.

Weight	1260 lbs	570 kg
Overall length	80.6 in	2048 mm
Overall width	58.5 in	1486 mm
Depth of the bar magazine	39.4 in	1000 mm
Height	49.1 – 68.8 in	1248 - 1748 mm
Axis height	35.1 – 47.2 in / 47.2 – 55.1 in	900 - 1200 mm / 1200 - 1400 mm
Retraction device	23.6 in	600 mm
Minimum diameter	0.236 in	6 mm
Maximum diameter	4.724 in	120 mm
Minimum bar stock length	11.8 in (*)	300 mm (*)
Maximum bar stock length	63.0 in (*)	1600 mm (*)
Maximum permitted bar weight	150 lb/bar	67 kg/bar
Pneumatic pressure	90 psi	6 bar
Maximum pneumatic consumption	1.6 gallons (per loading cycle)	6 liters (per loading cycle)
Supply voltage (Volts)	220 - 480 V, 50 Hz/60 Hz	
Max. current (Amps)	1 A	
Pushing force	123 ft lb	167 Nm
Maximum feed rate	> 330 ft/min	> 100 m/min
Loading cycle	8 - 12 sec.	
Loading time for short parts	4 - 7 sec.	

(*) according to options

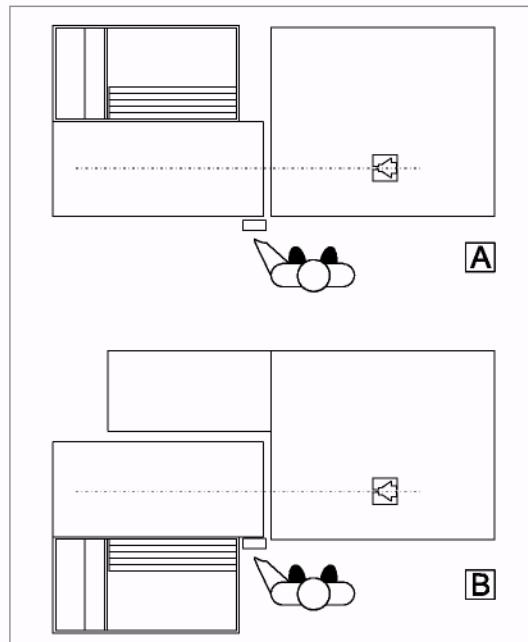
2. FLOOR PLAN

The following floor space plans indicate the most frequently used dimensions for placing the bar feed system. Details on the dimensions of other parts or elements of the bar feeder will be provided upon request.

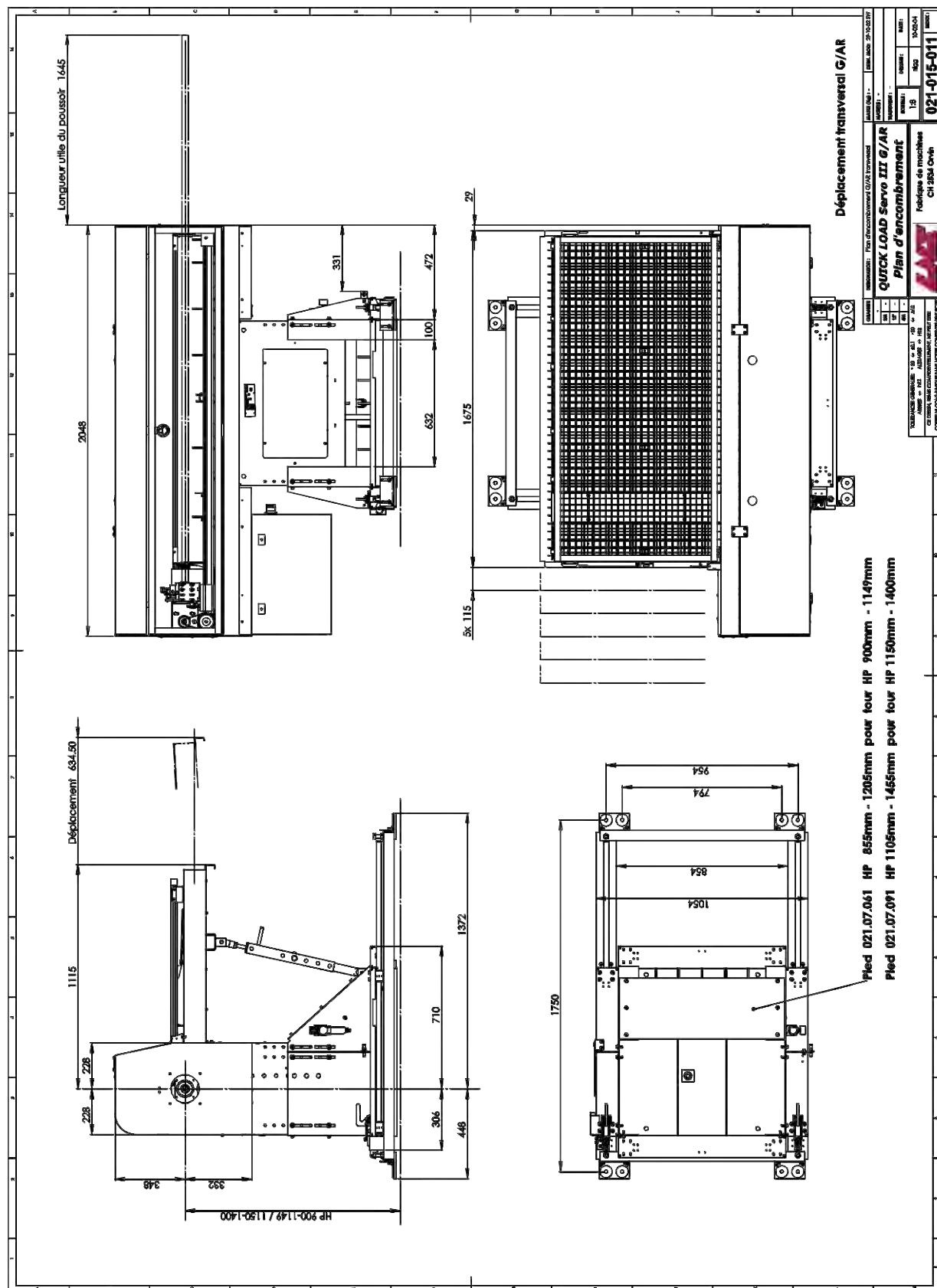
Plans 2.1 and 2.2 show the bar feeder with loading from the left rear (**A**).

Plans 2.3 and 2.4 show the bar feeder with loading from the left front (**B**).

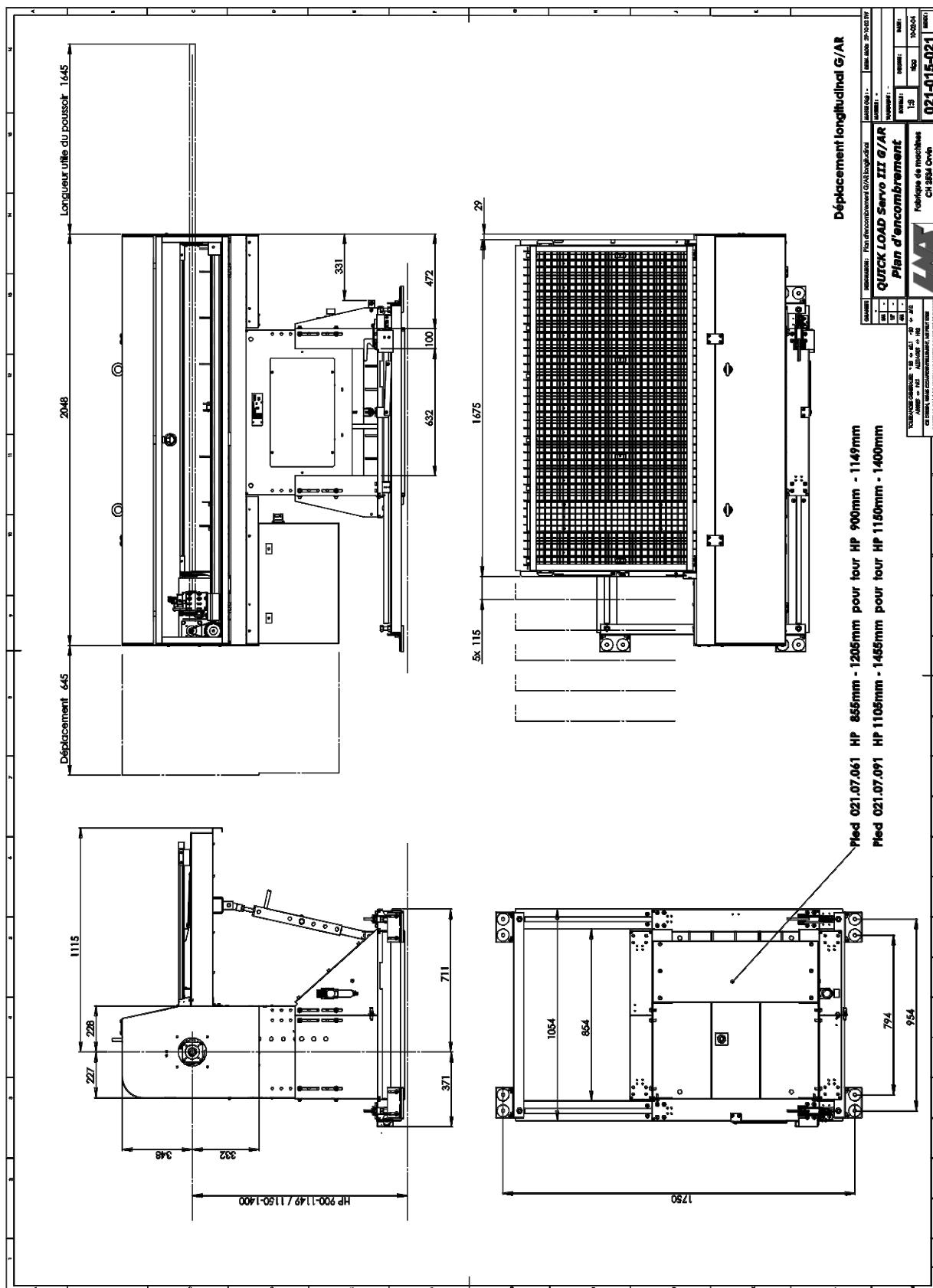
All dimensions are in millimetres



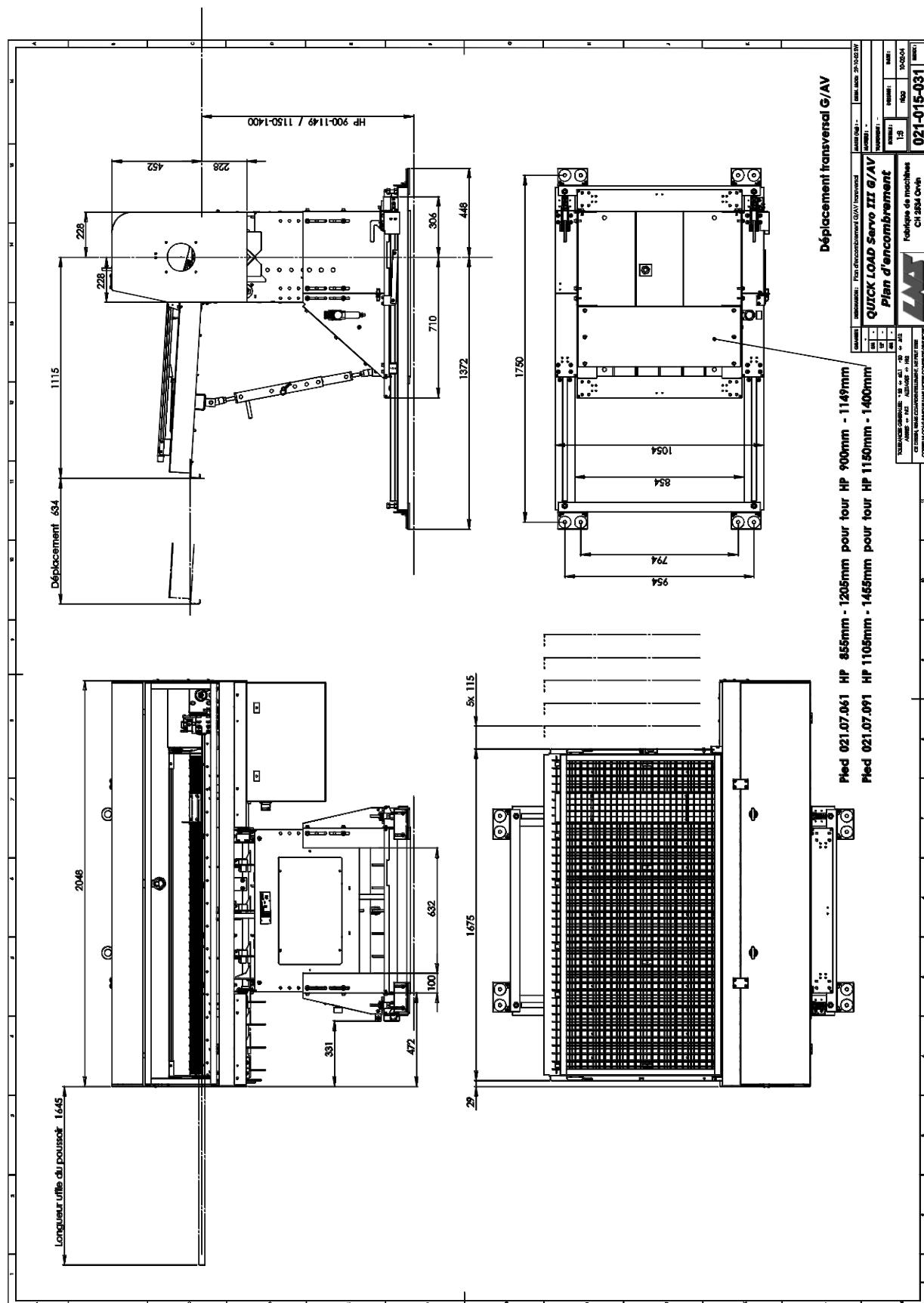
2.1. Loading from the rear/left, transverse movement



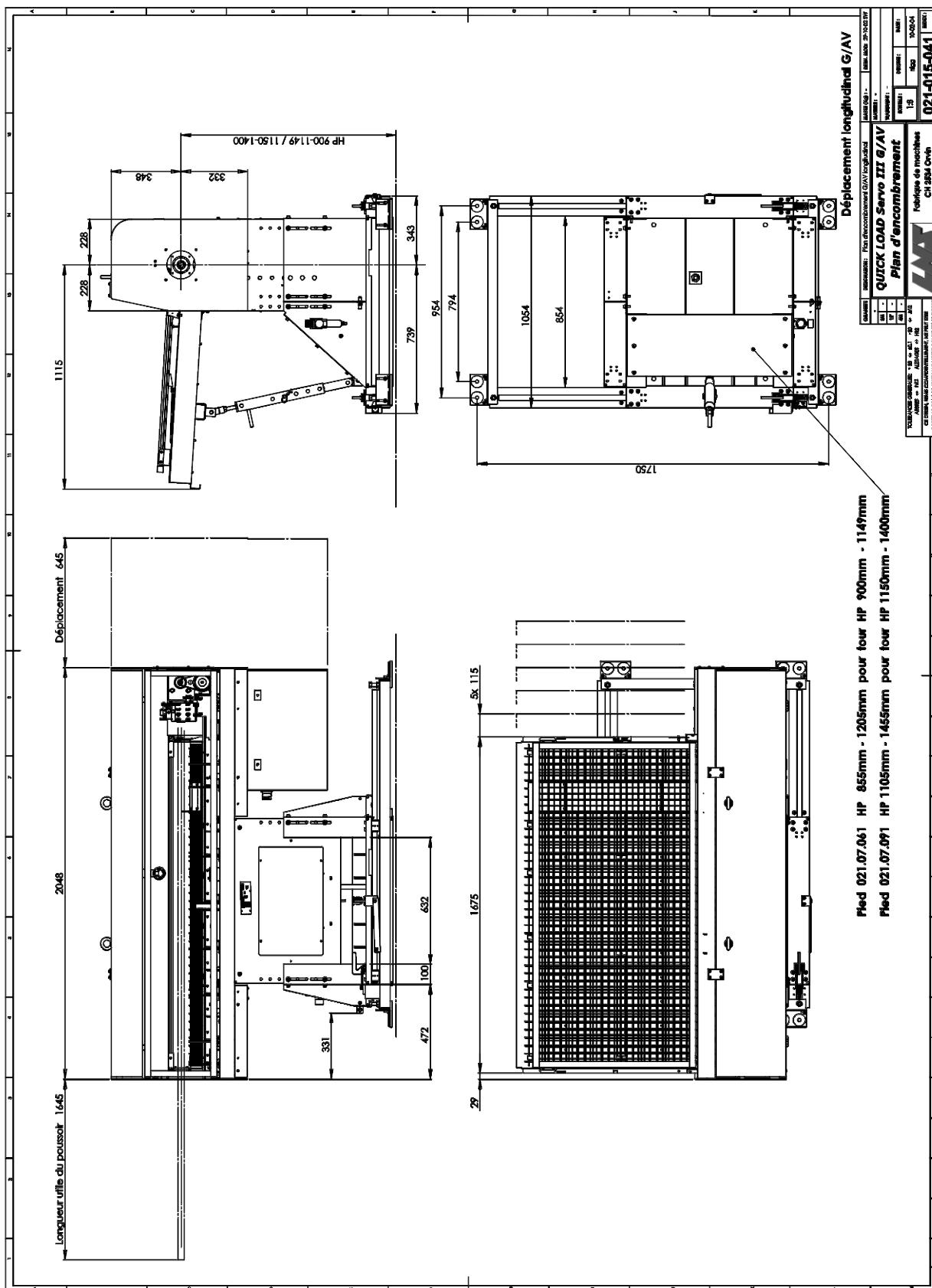
2.2. Loading from the rear/left, longitudinal movement



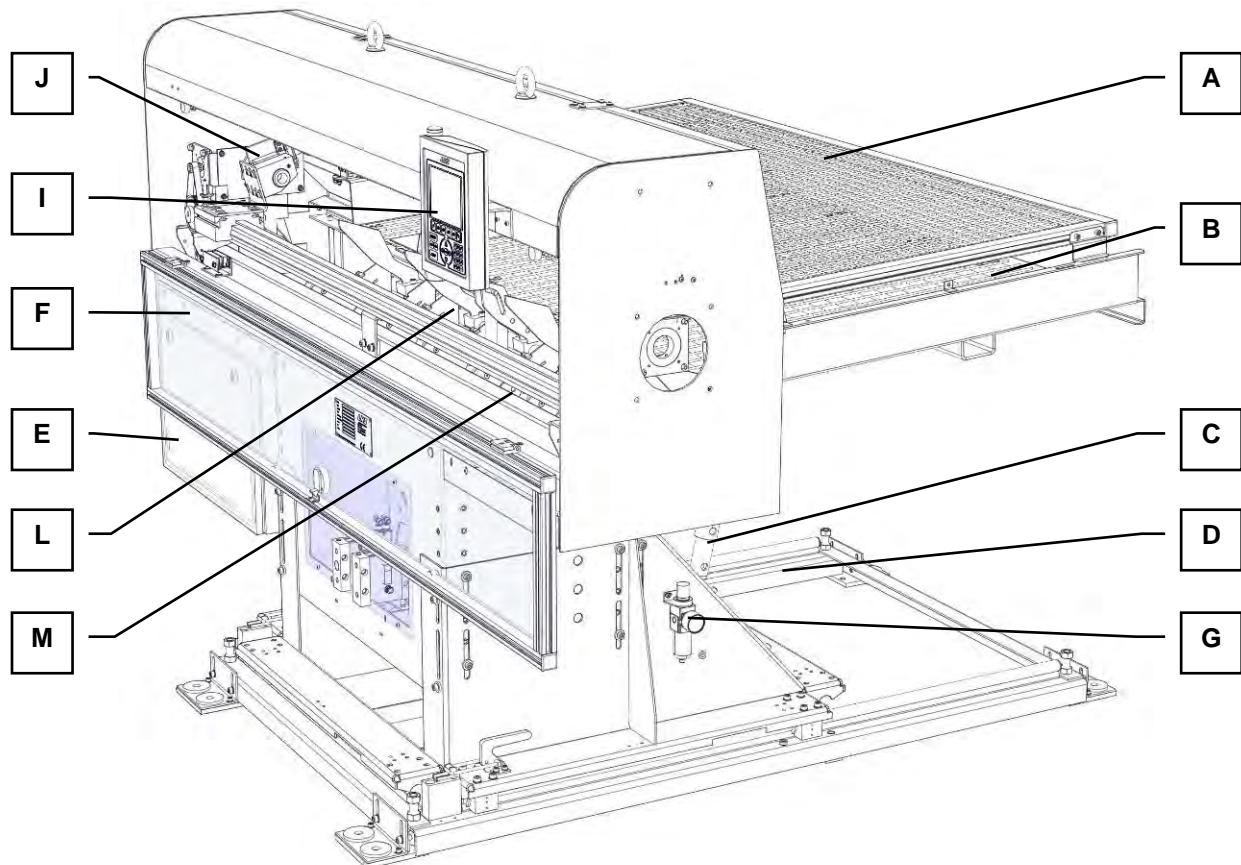
2.3. Loading from the front/left, transverse movement



2.4. Loading from the front/left, longitudinal movement



3. LAYOUT OF THE ELEMENTS



Designation	Description
A	Protection grid for the bar magazine
B	Bar magazine
C	Loading table support
D	Retraction device
E	Electrical cabinet
F	Protection cover
G	Air handling
H	Interface plug (depending on the interface; not visible)
I	Remote control
J	Carriage
K	Pusher (not visible)
L	Loading table
M	Positioning stops

CHAPTER 3: SYSTEM START UP

1. TRANSPORTATION



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

1.1. Description

Depending on its destination, the bar feeder may be delivered either on a pallet, or packed in a wooden crate. When transported by sea or air, the second solution is recommended.

	Crate	Pallet
<i>Weight</i>	1,750 lbs	1,600 lbs
<i>Width</i>	54"	53"
<i>Length</i>	109"	86"
<i>Height</i>	71"	70"

1.2. Unpacking

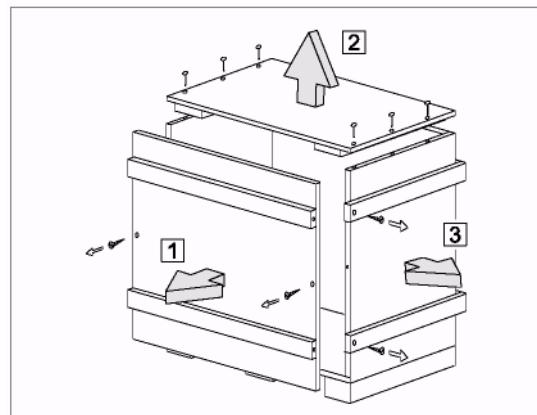
For practical and safety reasons, the bar feeder must be unpacked in a spacious, well-lit location.



Check to ensure that the lifting capacity of the hoisting crane or lift truck is adequate before proceeding with the handling of the merchandise. No one should be near the hanging load, or within the operating range of the overhead hoist/crane, forklift, or any other means used for lifting and transportation.

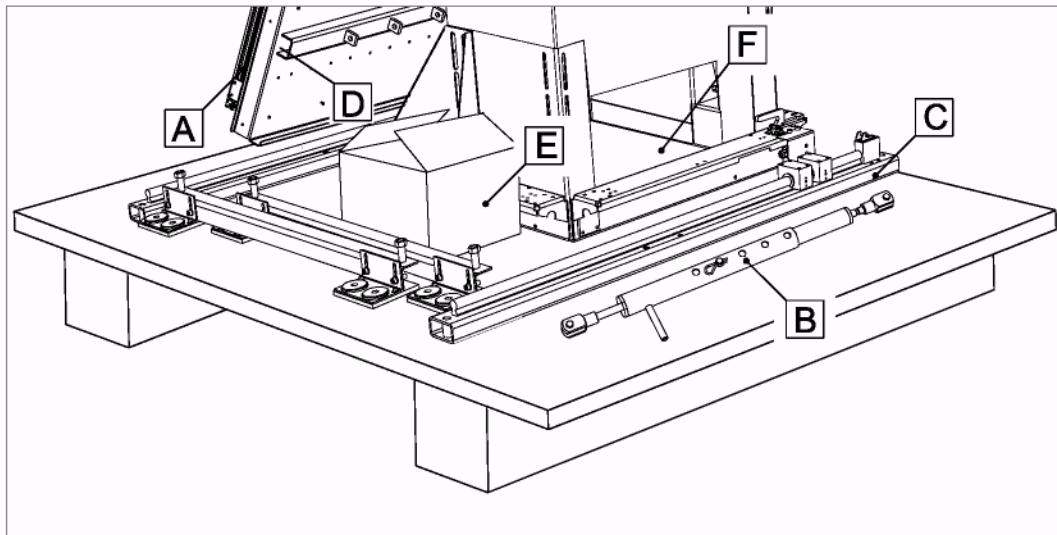
- 1) If the bar feeder is received in a crate, start by unscrewing the front panel.
- 2) Remove the top.
- 3) Remove the side walls.

From this point on, the bar feeder is unpacked in the same way as when delivered on a pallet.



The bar feeder is always delivered as follows:

- The magazine (**A**) is assembled on the bar feeder, the loading table support (**B**) is dismantled, the outer side of the magazine rests on the pallet.
- The retraction system (**C**) is supplied partially assembled, but is not fitted on the bar feeder.



- A pusher is supplied installed on the bar feeder. The additional pushers are affixed underneath the bar magazine (**D**).
- The technical documentation and the accessories are packaged separately (**E**).
- The bar feeder is affixed to the pallet with screws (**F**) located inside the frame.

Take out the accessories and place them in an area which can be easily accessed when mounting the bar feeder.

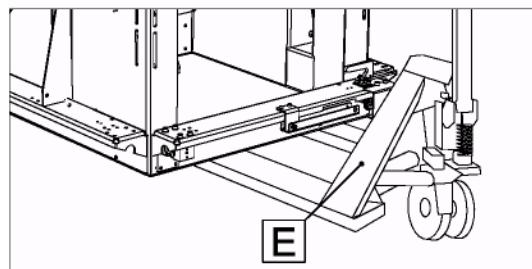
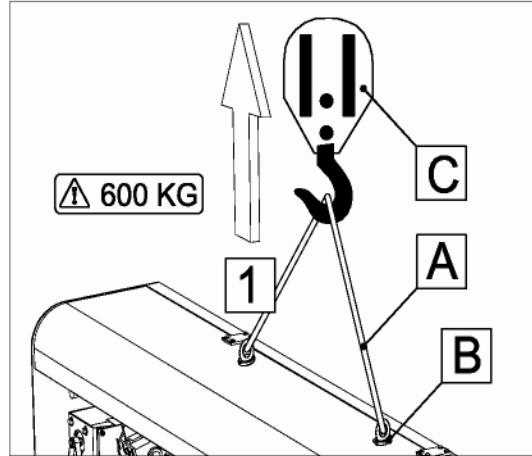


1.3. Preparation for mounting

For mounting and installing the bar feeder, it is advisable to contact LNS or one of its agents. The latter cannot be held responsible for any malfunction resulting from an incorrect installation in which they did not take part.

Note : If the lifting rings are not fitted, they should be with the accessories.

- Feed two straps (**A**) into the lifting rings (**B**) and attach them to a hoist (**C**). Raise the hoist to tighten the straps.
- Unscrew the screws (**F**) (see previous page) holding the bar feeder to the pallet during transportation.
- Lift the bar feeder (**1**) and remove the pallet.
- At present, the bar feeder may also be moved using a lift truck (**E**). In this case, position the lift truck underneath the bar feeder frame.
- Move the bar feeder, taking care that it remains horizontal and that no one is nearby or under the suspended load.
- Do not knock the bar feeder as you move it; this may damage it.
- Place the bar feeder behind the lathe, as close as possible and in approximate alignment with the spindle. For the placement, the stationary and mobile space requirements for the lathe and the bar feeder should be taken into account.



The distance between the lathe and the bar feeder should not exceed 20 mm. Should an obstacle impose a greater distance, contact LNS or their local representative.

The area around the lathe and the bar feeder must be cleared to allow for their maintenance and handling. It should remain clear after the installation is completed.

2. ASSEMBLY

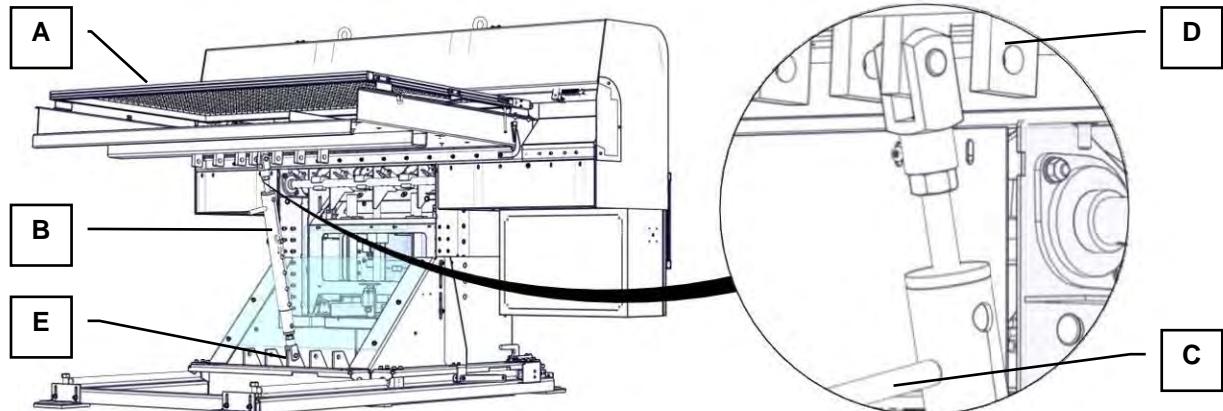
2.1. Assembly of the bar magazine



If, during installation, it seems that the magazine is going to collide with the lathe, it may be moved backwards. The magazine is positioned all the way forward in the factory and must only be moved under exceptional circumstances.

Panels must be installed at the front of the magazine. It is strictly prohibited to start up the device without the protective panels.

- Bring the loading table support close to the bar magazine.
Unlock and remove the pins located on the mounting forks.
- Lift the bar magazine.
- Insert the fork on the setting lever side into one of the tabs (**D**) in the magazine (as close to the center as possible).
Insert the pin and secure with the ring.
- Insert the fork on the other end of the loading table support into one of the tabs in the attachment component (**E**).
Insert the second pin and secure with the ring.



Designation	Description
A	Bar magazine
B	Loading table support
C	Setting lever
D	Mounting tab in the bar magazine
E	Attachment component

2.2. Position of the bar magazine

If, during installation, it seems that the magazine is going to collide with the lathe or if it obstructs maintenance operations, it may be moved backwards.



A service parameter, indicating the position of the magazine, must be changed. For this reason, only an LNS (or approved) technician is authorized to move the bar magazine.

Procedure:

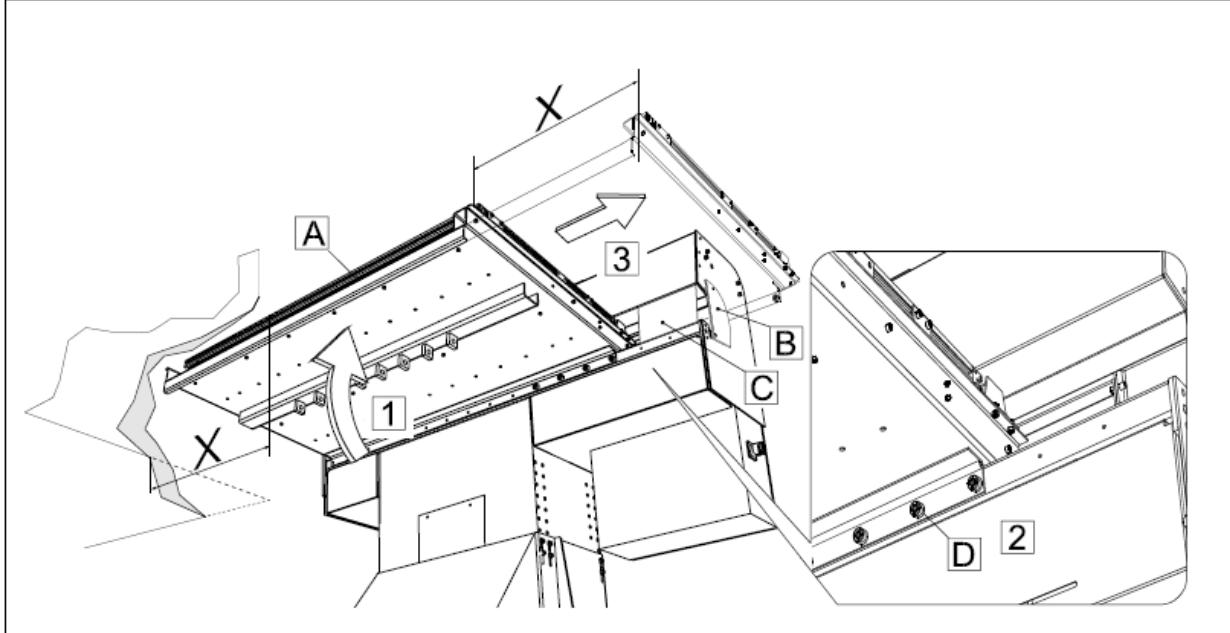


The loading table support must be installed after the bar magazine has been moved.

- 1) Lift the magazine (**A**) and measure the distance (**X**) where it should be positioned.
- 2) If necessary, remove the protective panels (**B**) and (**C**).
Unscrew the screws (**D**) on the hinge which links the magazine to the bar feeder.
- 3) Move the magazine to the distance (**X**) measured previously.
Secure the hinge with the screws (**D**).



Special panels (supplied on request) must be installed at the front of the magazine and as a replacement for panels (**B**) and (**C**). It is strictly prohibited to start up the device without the protective panels.



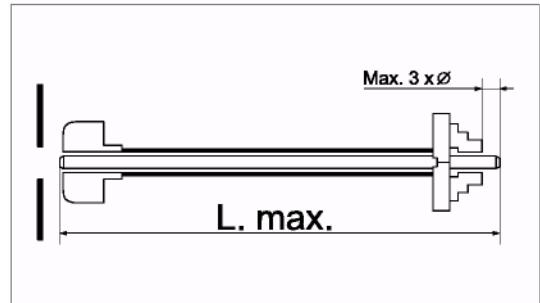
Carry out the installation of the loading table support, as explained in the previous point.

2.3. Assembly of the limiters

The bar feeder magazine can simultaneously house bars of different lengths (between 300 mm and 1600 mm).

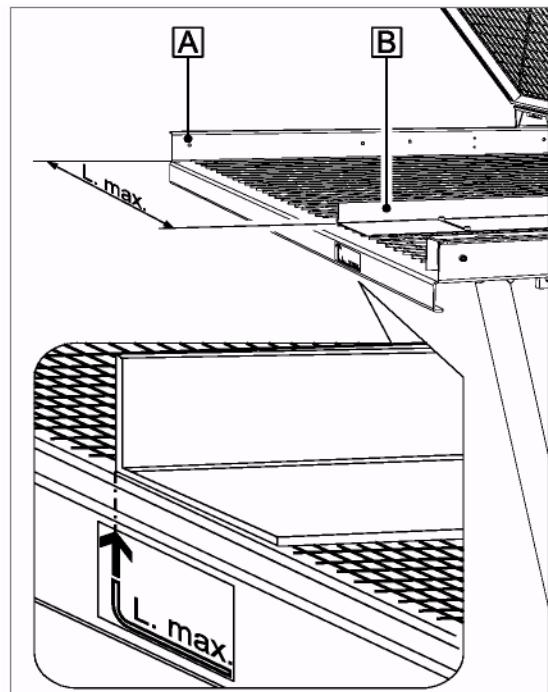


The maximum (L.max.) which can be loaded is given by the length of the lathe spindle. It is strictly prohibited to turn a bar which is protruding from the rear of the spindle. The bar should never extend more than 3 times its diameter beyond the lathe's clamping unit without support.



The bars are guided and held by two limiters. The first, **(A)**, is fixed and located at the front; it is an integral part of the bar magazine. The second, **(B)**, is mobile and located on the magazine, secured by screws.

- Measure the length of the spindle, from the entry to in front of the collet.
- Lift the protection grid. Unscrew the retaining screws for the rear limiter.
- Place the limiter at the distance measured in the spindle (L. max.), measuring from the front limiter. Tighten the retaining screws.
- Apply the adhesive marker to the bar magazine. This marker will enable the position of the limiter to be set at a later date, without the need to measure the spindle length each time.
- This enables the loading pusher to move at high speed as far as the position of the rear limiter and then to slow down, to prevent impact when it comes into contact with the bar. Furthermore, if a bar which is too long is loaded, the bar feeder knows this when it measures it, and interrupts the loading cycle.



The maximum length (L.max.) must be entered into the service parameters (only an LNS or approved technician is authorized to edit this value).

2.4. Assembly of the retraction system



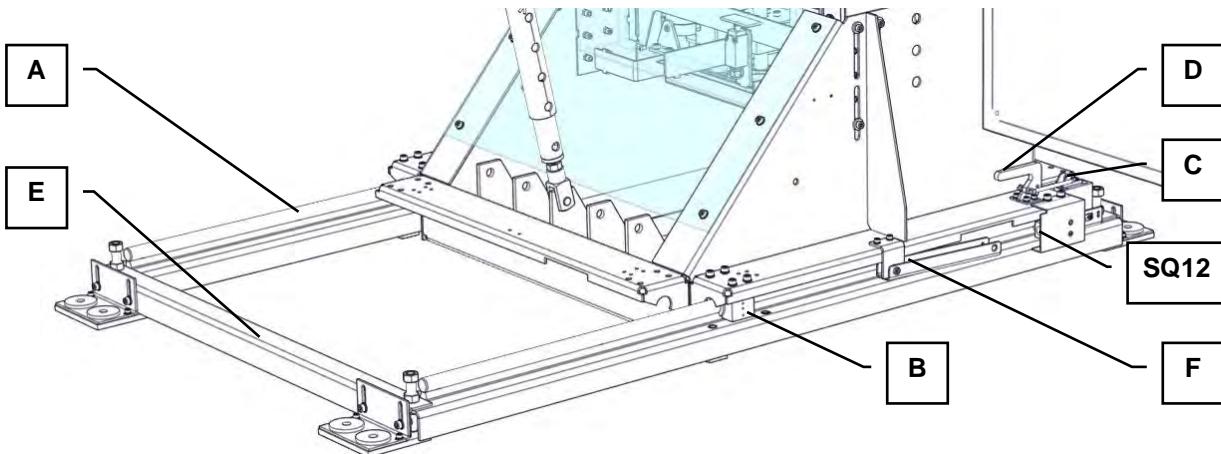
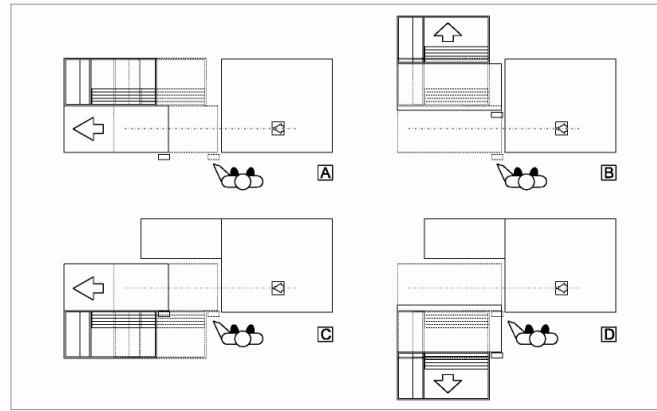
Please read the safety instructions provided at the beginning of this manual before handling the following devices.



Before handling the retraction mechanism, check to see that the interface cables between the lathe and the bar feeder are long enough.

The retraction system can be assembled to offer longitudinal or transverse movement, as required.

A	Left rear loading/longitudinal movement
B	Left rear loading/transverse movement
C	Left front loading/longitudinal movement
D	Left front loading/transverse movement

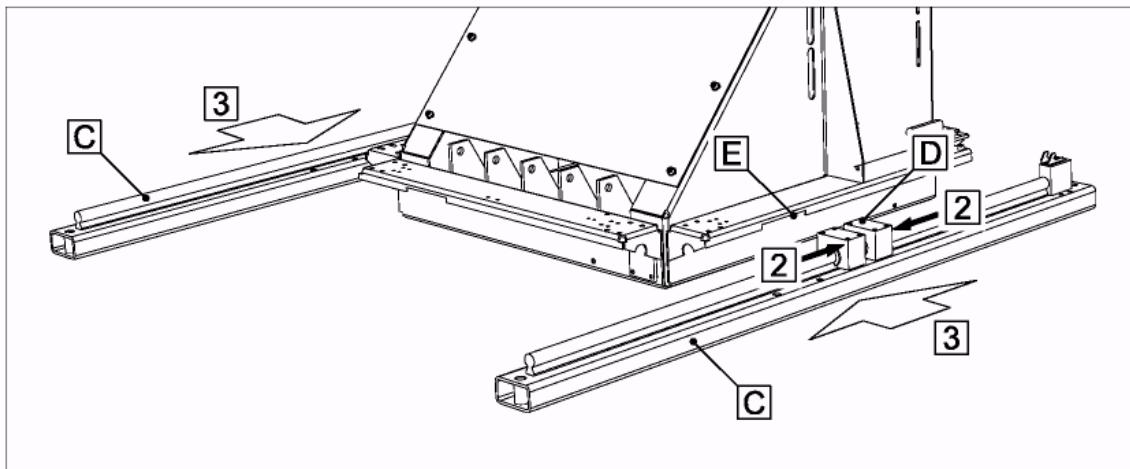


Designation	Description
A	Rails
B	Bearings
C	Mounting hooks
D	Levers
E	Transverse beam (longitudinal, depending on the direction fitted)
F	Non-return device
SQ12	Safety switch

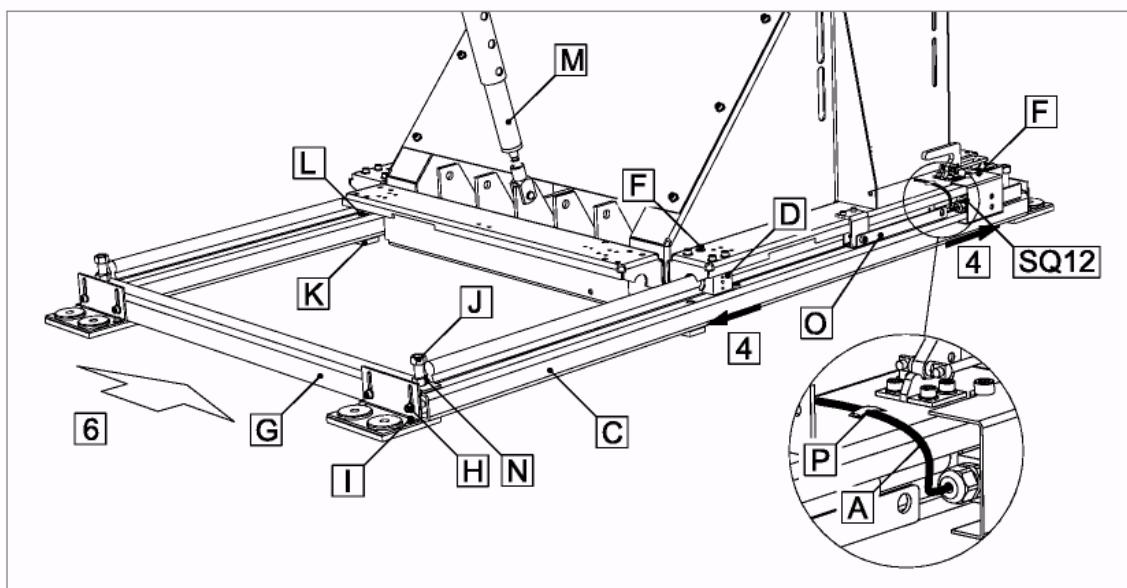
On delivery, the constituent elements of the retraction system, i.e. the rails and cross members, are not fitted on the bar feeder. The retraction system may be assembled longitudinally or transversally, as required.

Transverse assembly of the system:

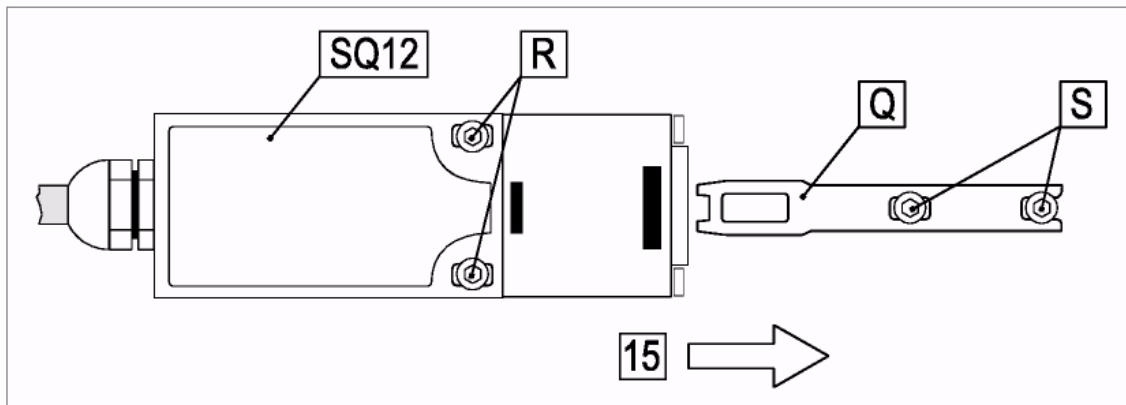
1. Move the rails to their respective sides.
2. Bring the bearings (**D**) opposite the recesses (**E**).
3. Push the rails (**C**) underneath the unit.



4. Move the bearings apart and place them opposite the mounting holes.
5. Insert the retaining screws (**F**) and screw them into the bearings (**D**), without tightening them.
6. Fit the cross members (**G**) onto the rails (**C**).
7. On each mounting bracket, unscrew the screws (**H**) and (**I**) (16 in total)
8. Install the four levelling screws (**J**) at the ends of the rails.



9. Tighten the retaining screws (**F**) for the bearings (**D**).
10. Slide the blades (**K**) underneath the rails, then screw the screws (**L**) until these are pushed against the blades.
11. Install the loading table support (**M**).
Install the bar magazine.
12. With the screws (**J**), lift the bar feeder so that the base plate is 5 mm above the ground, then level the bar feeder.
13. Tighten the screws (**H**) and (**I**) and the lock nuts (**N**).
14. Install the non-return device (**O**).
15. Couple the safety switch (**SQ12**) with the key (**Q**) which is located at the front of bar feeder rail, then screw (**R**) the switch onto the retraction system. If the mounting holes for the switch are not perfectly aligned, unscrew the retaining screws (**S**) for the security key, fit the switch then tighten the screws once more. Attach the cable (**A**) with a flange (**P**), so that it cannot come into contact with other elements of the bar feeder when the latter is moved.

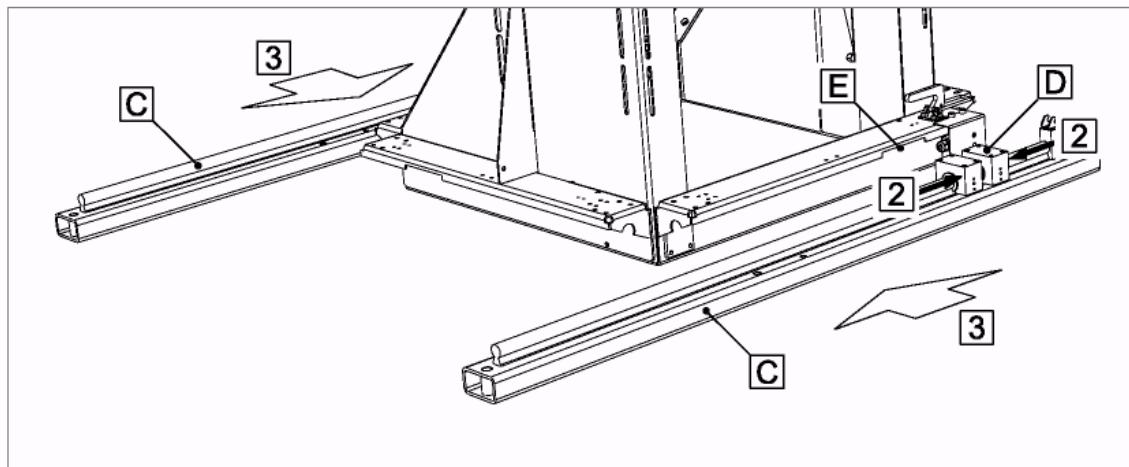


16. Perform the alignment as indicated in Chapter 3.

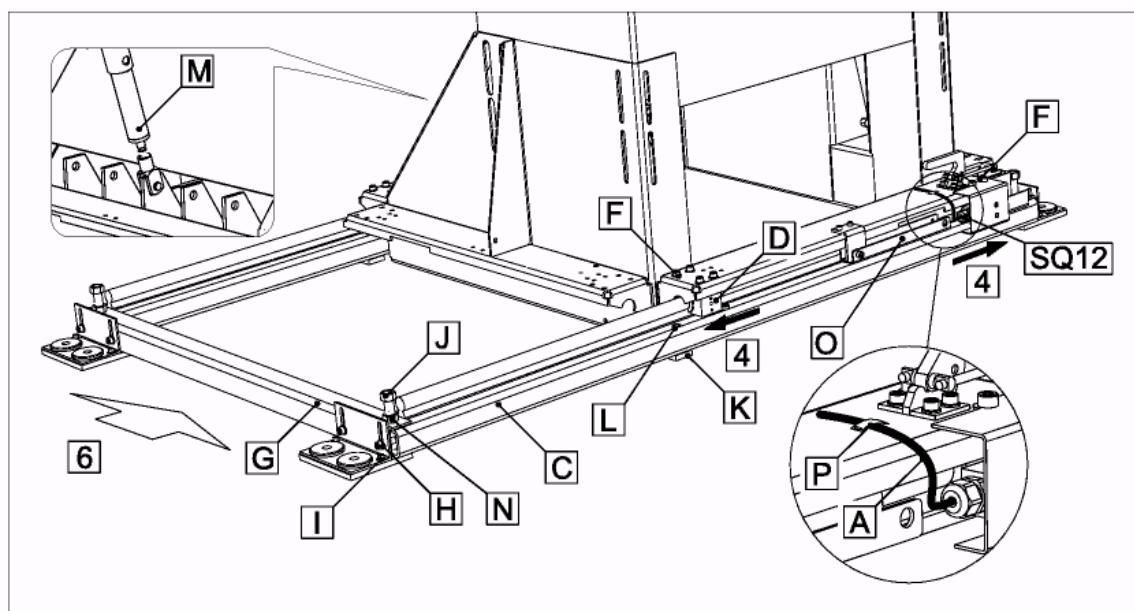
Once the bar feeder is attached to the ground, check the alignment of the switch and the key by moving the bar feeder then returning it to the working position.

Longitudinal assembly of the system:

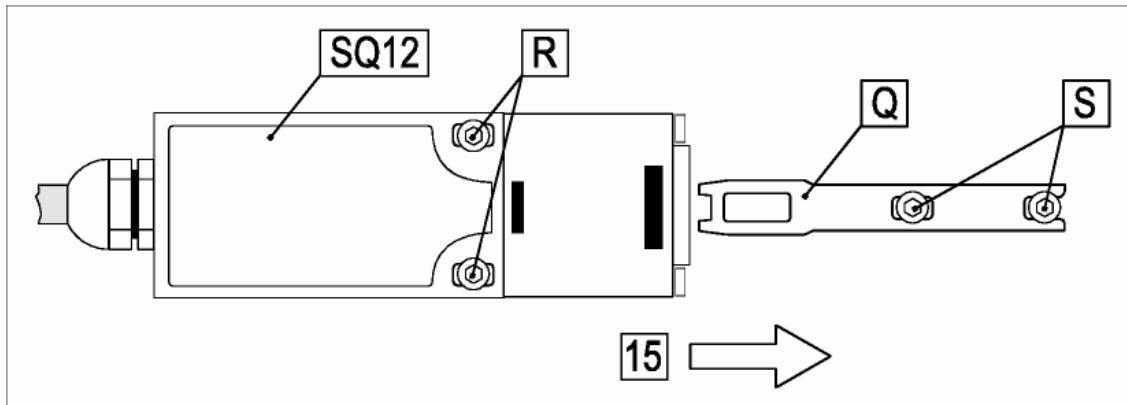
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4. Move the bearings apart and place them opposite the mounting holes.
5. Insert the retaining screws (**F**) and screw them into the bearings (**D**), without tightening them.
6. Fit the cross members (**G**) onto the rails (**C**).
7. On each mounting bracket, unscrew the screws (**H**) and (**I**) (16 in total)
8. Install the four levelling screws (**J**) at the ends of the rails.



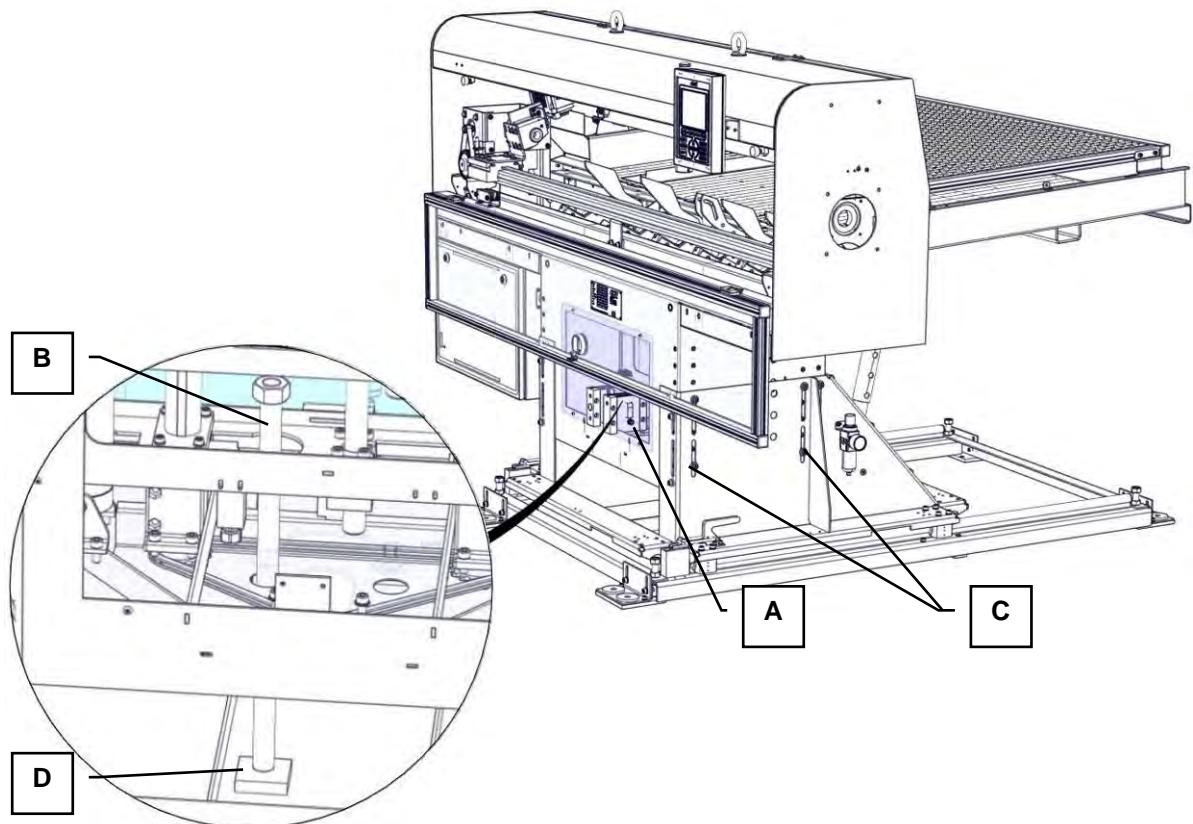
9. Tighten the retaining screws (**F**) for the bearings (**D**).
10. Slide the blades (**K**) underneath the rails, then screw the screws (**L**) until these are pushed against the blades.
11. Install the loading table support (**M**).
Install the bar magazine.
12. With the screws (**J**), lift the bar feeder so that the base plate is 5 mm above the ground, then level the bar feeder.
13. Tighten the screws (**H**) and (**I**) and the lock nuts (**N**).
14. Install the non-return device (**O**).
15. Couple the safety switch (**SQ12**) with the key (**Q**) which is located at the front of bar feeder rail, then screw (**R**) the switch onto the retraction system. If the mounting holes for the switch are not perfectly aligned, unscrew the retaining screws (**S**) for the security key, fit the switch then tighten the screws once more. Attach the cable (**A**) with a flange (**P**), so that it cannot come into contact with other elements of the bar feeder when the latter is moved.



16. Perform the alignment as indicated in Chapter 3.

Once the bar feeder is attached to the ground, check the alignment of the switch and the key by moving the bar feeder then returning it to the working position.

2.5. Adjustment of the height



- Remove the plate (A).
- Check that central screw (B) is pressing against the blade (D).
- Carefully unscrew the 16 screws (C).
- Adjust the height of the bar feeder, by loosening or tightening the central screw (B).

A hexagonal tube is supplied with the unit and can be used to access the setting screw from the top, via the loading table.

- When the height is correct, tighten the screws (C) and then align the bar feeder.
- Refit the plate (A).

2.6. Alignment



Before proceeding with the alignment of the bar feeder, ensure that the lathe is stable and preferably levelled.

Reminders:

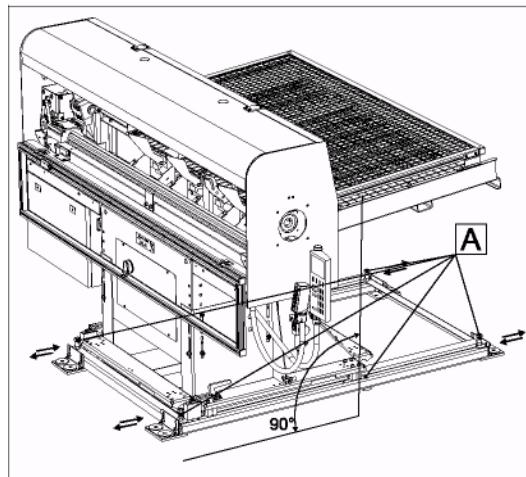
- The bar feeder must be positioned as close as possible to the lathe spindle.
- To ensure perfect alignment, it is recommended that the largest pusher is installed.
- If a spindle reduction is installed in the spindle, check that this is larger than the pusher.
- It is not crucial that the lateral level is perfect; it must be ensured, however, that the bar feeder is as straight as possible ($\pm 90^\circ$).
- The bar feeder's longitudinal level must be adjusted to the lathe's level, even if the lathe is only resting on three points and therefore cannot be made perfectly level. If the levels of the bar feeder and lathe do not match, there is a risk the pusher will touch the inside of the spindle.

Place a spirit level on the loading table. Use the screws (A) to set the correct level.

Manually lock the pusher and move it behind the lathe spindle.

If necessary, adjust the height by turning the central screw (see previous page), until the pusher is centered in the spindle.

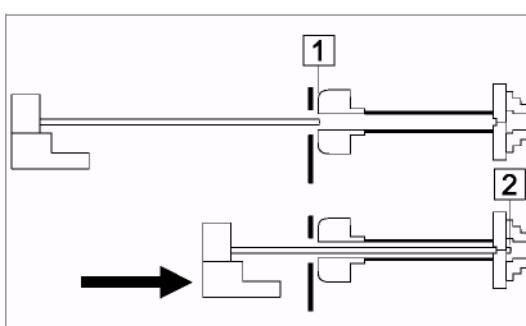
Simultaneously perform the lateral alignment by moving the unit (using a nylon hammer, for example).



Move the pusher forwards, monitoring its positioning within the spindle. If the pusher deviates, check the bar feeder level once more and adjust with the screws (A) if necessary.

The pusher must be centered both at the spindle inlet (1) and behind the lathe spindle (2), and must not come into contact with the spindle at any time.

When the alignment is correct, lock all the nuts and screws.

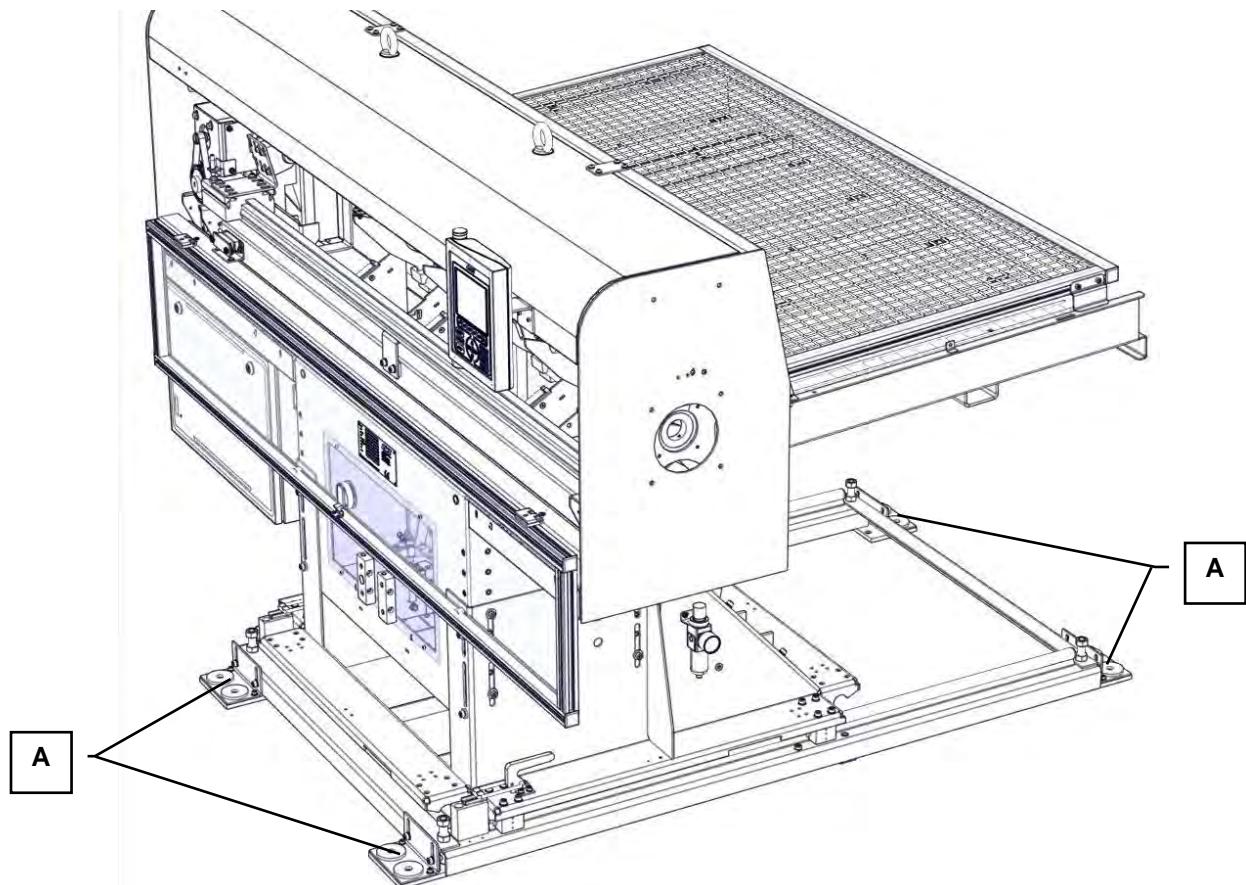


Remove the lifting rings and install the plastic plugs (supplied with the accessories) on the protection cover.

2.7. Anchoring

Once the bar feeder is in place and perfectly aligned, it should be anchored to the ground to make it stable. To accomplish this, 4x 2 anchorage points (**A**) have been provided.

Eight anchoring bolts must be provided by the customer (minimum M10 x 100 mm).



Once the anchoring bolts are tightened, check the alignment again, and correct it if necessary.

2.8. Safety analysis for a correct incorporation

Before considering assembling the machine, it is necessary to consider the following points:

- Consider safety strategies that reduce risks to an acceptable level;
- Define the tasks required for applications to predict and assess the need of access and / or for the approach;
- Identify sources of risks, including failures and failure modes associated with each task. Risks can come from:
 - the machine in which the QUICK LOAD SERVO III unit is integrated,
 - its association with other equipment,
 - People's interaction with the machine.
- Evaluate and assess the risks associated by using the QUICK LOAD SERVO III unit:
 - programming risks
 - operation risks
 - risks of use
 - maintenance risks
- Choose methods of protection :
 - the use of protective devices
 - the introduction of signals
 - compliance with safe work procedures

3. ELECTRICAL CONNECTIONS

See CHAPTER 4: ELECTRICS, section 4. INTERFACE.

4. PNEUMATIC CONNECTIONS

See CHAPTER 5: PNEUMATICS, section 2. AIR UNIT.

CHAPTER 4: ELECTRICS

1. ELECTRICAL EQUIPMENT



Please read the safety instructions provided at the beginning of this manual before handling the following devices.



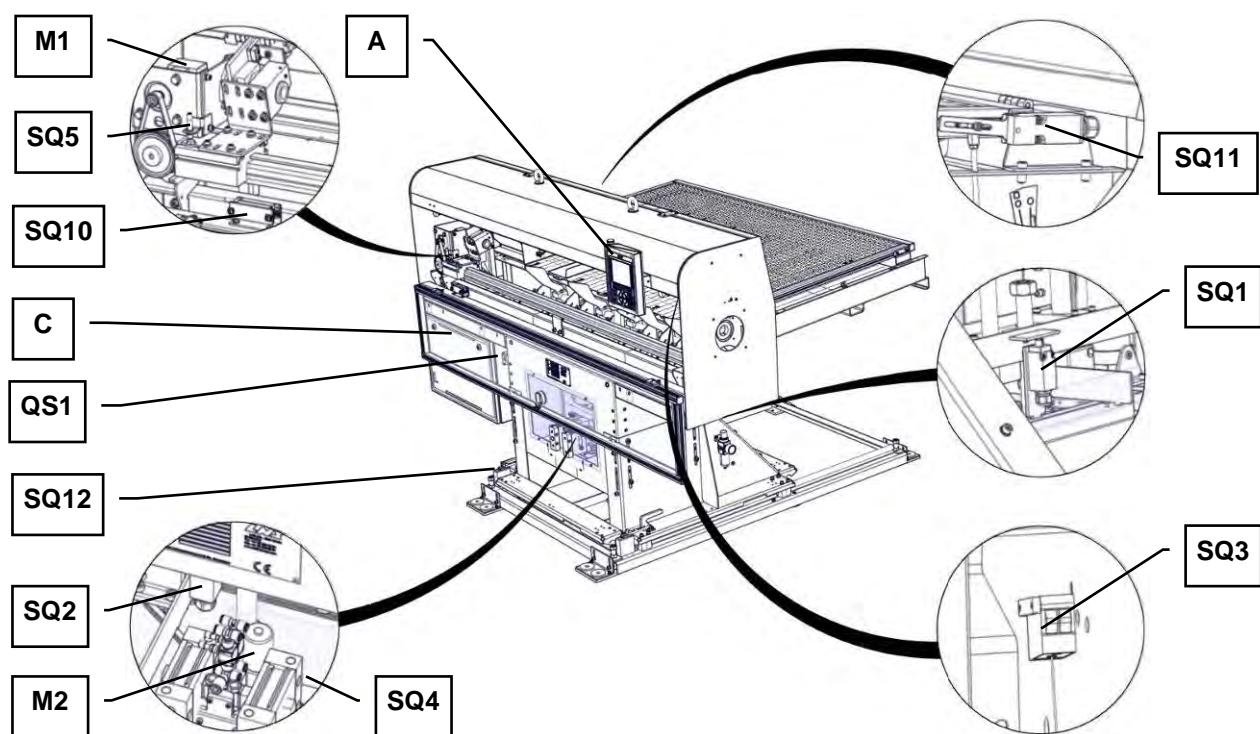
Particular attention should be given to the handling of electrical elements because of risks of electrocution. In case of possible electrical malfunctions, it is advisable to contact LNS or their local representative.

1.1. Description

This chapter contains all of the elements regarding the electrical circuit of the bar feeder. The electrical parts, and groups, which may require a setting, at some time or other, are described herein in detail.

Whenever possible, the article numbers of the elements are shown in tables below each drawing.

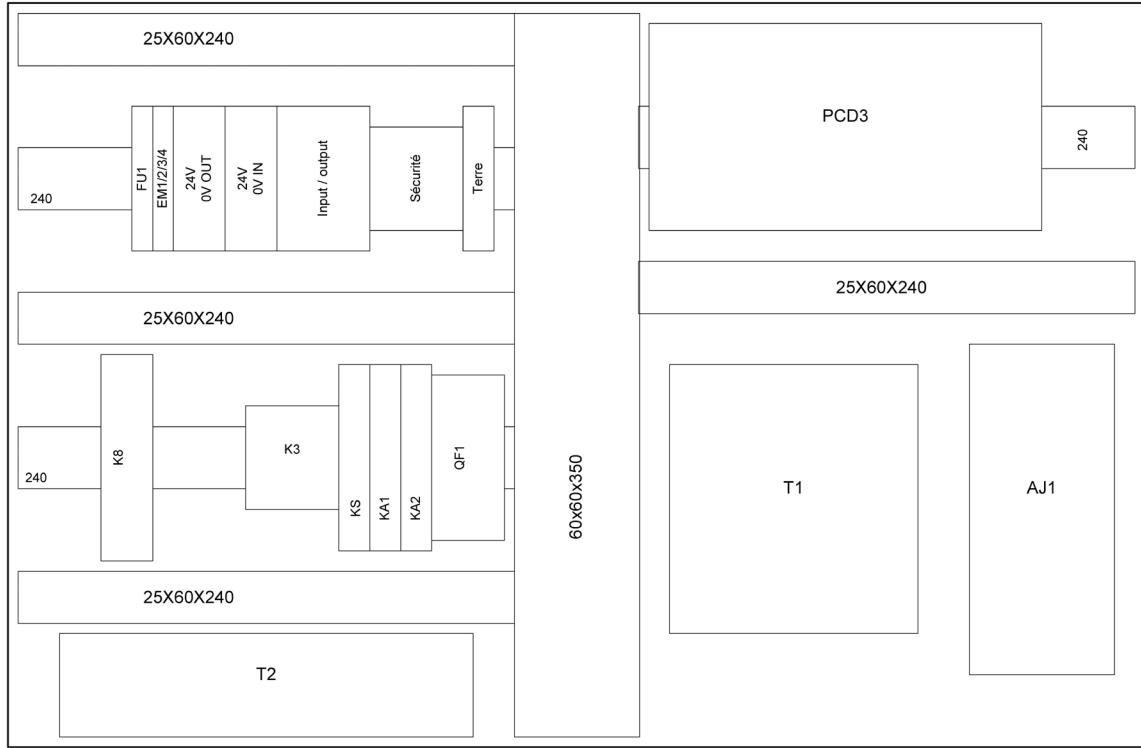
1.2. Layout of the electrical elements on the bar feeder



Designation	Item no.	Description
A	4.972	Remote control
B	-	24-pin interface plug with cover (depending on interface)
C	-	Electrical cabinet
QS1	4.242	Main disconnect switch
M1	44.0106	servomotor
M2	4.307	Motor for setting the diameter
SQ1	4.484	Control switch, table in lowered position
SQ2	4.484	Control switch, table in raised position
SQ3	44.0072	Light sensor
SQ4	4.391	Proximity switch for setting the diameter (not visible)
SQ5	4.391	Original position carriage sensor
SQ10	4.284	Cover safety switch
SQ11	4.277	Safety switch for the protection grid
SQ12	4.291/4.292	Safety switch for the retraction system/key

2. ELECTRICAL CABINET

2.1. Layout of the elements in the electrical cabinet



Designation	Item no.	Description
-	-	Interface terminal block X1 (YV1 – YV8)
-	-	Safety blocks X3 (T1 – T6)
PCD3	4.907	Programmable controller PCD3 (PLC)
AJ1	44.0105	Servo amplifier 400W
FU1	4.399	1A fuse (motor M2)
K3	4.507	Safety contactor
KS	4.925	Start relay
K8-K9	4.931	Safety control relay
K10	4.932	Safety breaker (option)
KA1	4.925	Relay: Motor M2 raised
KA2	4.925	Relay: Motor M2 lowered
QF1	4.815	Circuit breaker 4 A
QS1	4.242	Main disconnect switch
R1-R5	4.925	Interface relay
T1	4.769	Transformer 1 ph
T2	4.779	24 V supply with 24 VDC/150W cut-off

2.2. Description of the elements in the cabinet

2.2.1. Master switch QS1

When the main disconnect switch is at O (off), it interrupts the three-phase input in the bar feeder control cabinet.

2.2.2. Circuit breaker QF1 (4 A)

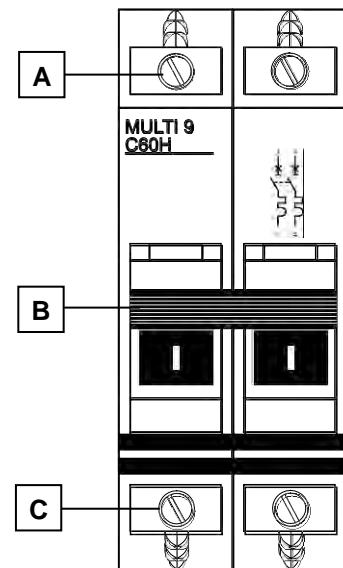
Circuit breaker QF1 protects the two phases, which power the transformer.

Should the latter require excessive power (>2 Amps), the breaker activates and the lever (**B**) flips down.

The power supply to the transformer is immediately interrupted to avoid material damage.

After having located and repaired the problem causing this interruption, reset the lever of the circuit breaker.

Designation	Description
A	Power in connecting terminal
B	Lever on/off
C	Power out connecting terminal



2.2.3. Transformers 230 V (T1) and 24 VDC (T2)

The transformers T1 and T2 power the entire bar feeder low-voltage network, as well as a portion of the interface signals (see the INTERFACE section in this chapter).

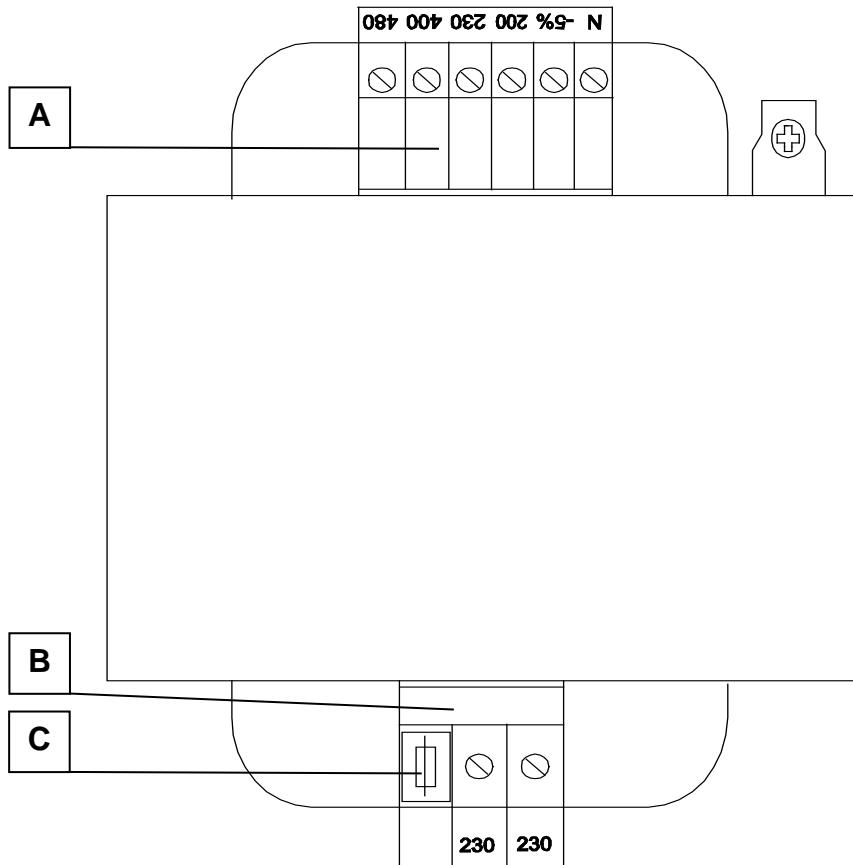
The transformer T1 has an output of 230 Volts which powers the amplifier of the SERVO motor.

A fuse installed in a support protects the transformer T1 output.

To replace the fuse:

1. Unscrew the cap a quarter of a turn to the left;
2. Remove and replace the fuse with an identical one, and put the cap back.

On the primary side, the transformer accepts a voltage of 200 V – 480 V, 50 Hz/60 Hz. Measure the power provided by the lathe. If necessary, adapt the terminal block wiring.



Designation	Description
A	Primary terminal block 200 V – 480 V, 50 Hz/60 Hz ± 15%
B	Secondary terminal block, 230 V
C	Fuse (3.15 A)

The transformer T2 has an output of 24 VDC and powers the rest of the barfeed.

The transformer T2 output is protected by the fuse FU1 installed in a support in the electrical control cabinet.

Although fuses seldom need replacing, is it advisable to keep some spares on hand.

2.2.4. Servo amplifier

The SERVO amplifier enables the programmable controller to control the movements of the motor.

The input values, as well as the position of the pusher carrier, are continuously registered. The values are saved by means of a battery, and, therefore, the axes do not need to be placed at zero when the bar feeder is powered on.

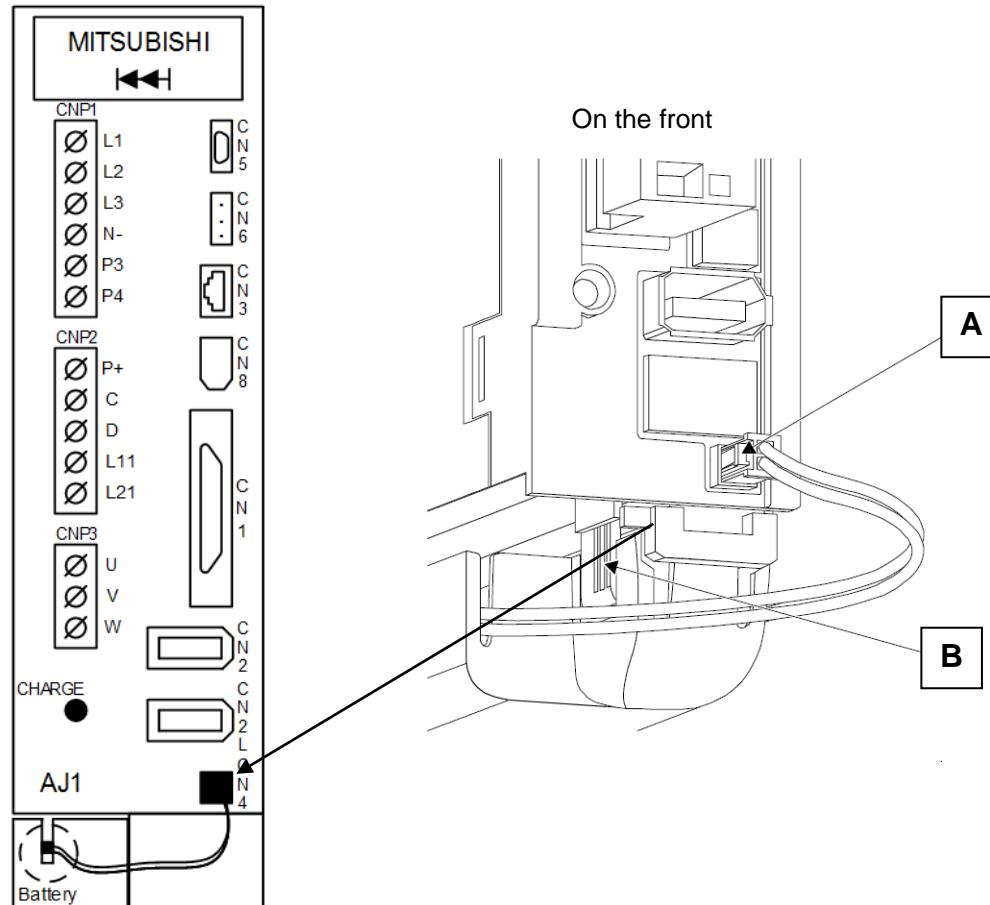
Although the batteries last for a relatively long time (2-3 years), it is advisable to keep spares on hand. When a battery becomes low, the amplifier signals this through a control light. The battery **is not rechargeable**, and must be replaced right away. The replacement must be done while the bar feed system is still powered up. The reference for the battery is **44.0107**.

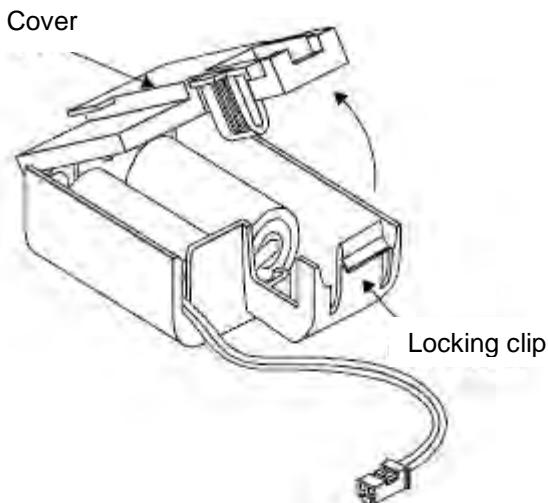
Procedure:

1. Disconnect the connector CN4 (**A**).
2. Open the battery compartment (**B**) according to the procedure below.
The wires on the extremities of the battery connecting it to the connector are part of the battery.
3. Fit the new battery inside the support and close it.
Connect the connector.

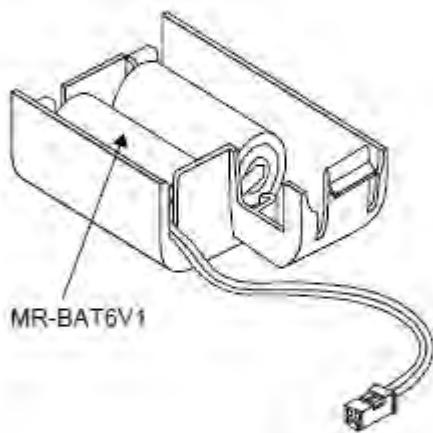


Used batteries must be disposed of in an ecologically safe manner.

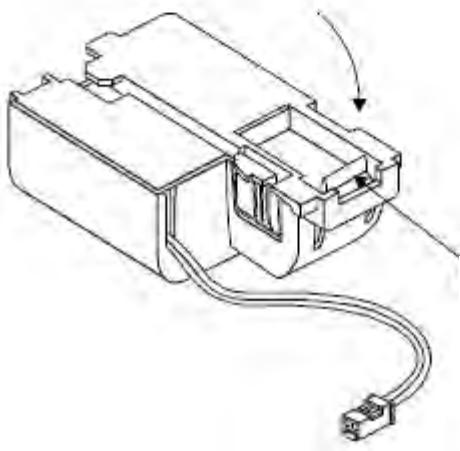




Open the battery compartment.



Remove the battery from its housing and replace.

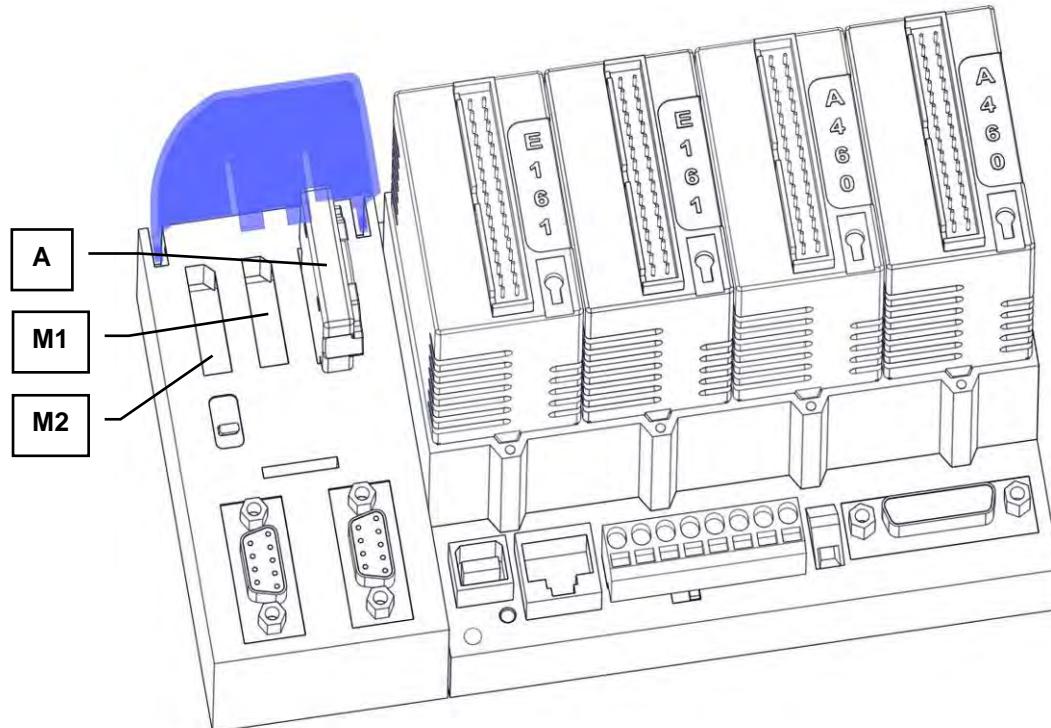


Close the battery compartment.

2.2.5. Programmable controller (PLC)

The programmable controller (PLC) continuously scrutinises all data from the remote control, probes, switches, cells, interface, etc.

The program loaded into the PLC manages this information. The PLC then distributes the interface signals, controls the motors and displays the appropriate messages on the remote control.



Designation	Description
A	Battery module
M1	Slot for software updates
M2	Slot for memory expansion (in use as standard)

Battery module:

Batt: The PLC does not need a backup battery on the information module.

Run: The PLC is in RUN mode. This is the standard mode.

Halt: The PLC is in HALT mode. Contact your LNS dealer.

Error: The PLC is in a failure mode. Contact your LNS dealer.

M1 slot:

Usually this slot is left unused, and is used for software updates through flash (red) cards. Do not insert any flash card unless instructed by LNS.

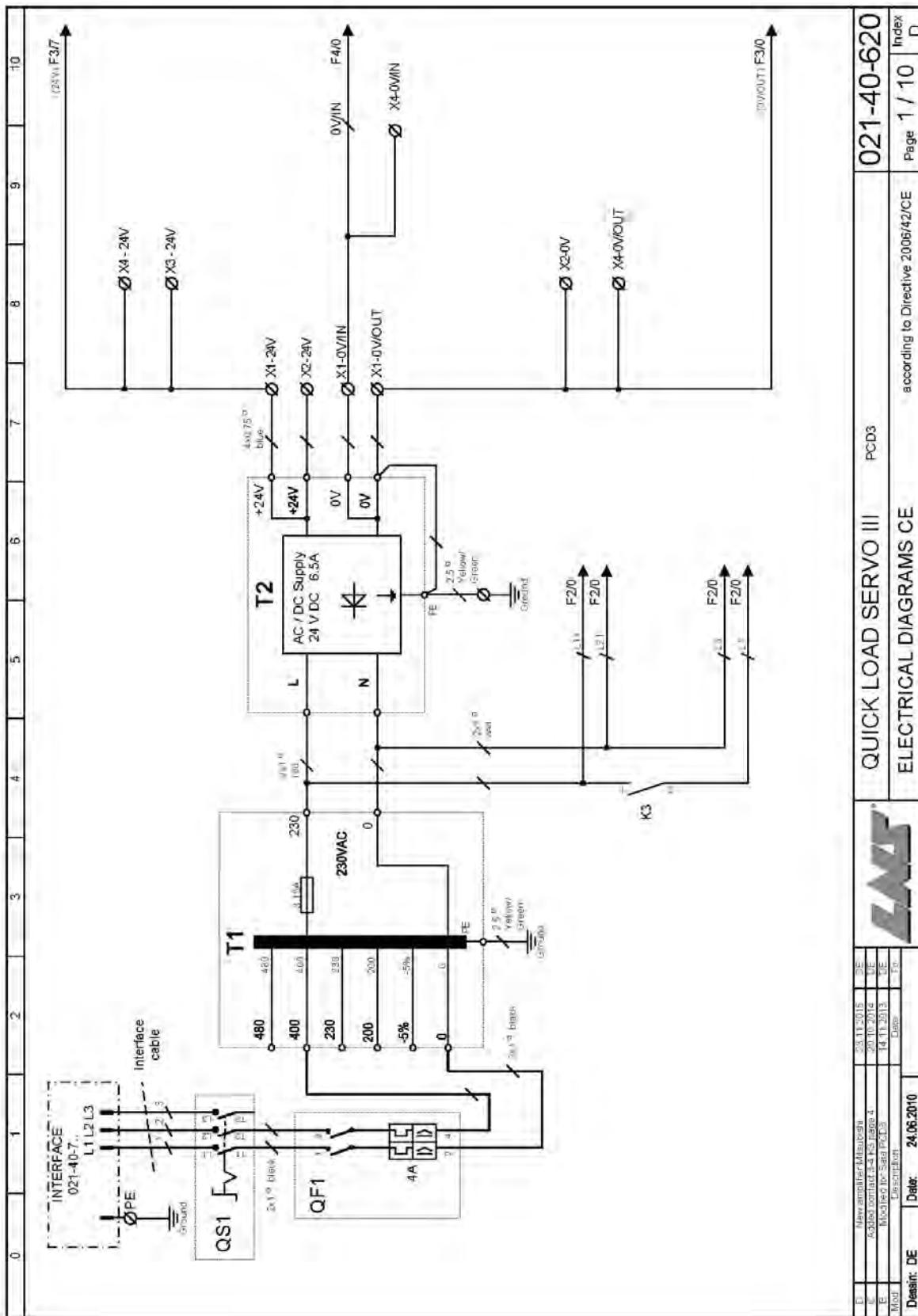
M2 slot:

This slot is used by a flash (blue) card as memory expansion. Do not remove the flash card unless instructed by LNS.

2.2.6. PLC inputs / outputs

Inputs			Outputs		
Inlet	Des.	Description	Output	Des.	Description
I0	K8	Safety line switch	O32	YV1A	Working position valve
I1	SP1	Air pressure control unit	O33	YV1B	Loading position valve
I2	SQ10	Protection cover safety switch	O34	KA1	Motor M2 raised relay (up)
I3	SQ11	Safety switch (grid protection)	O35	KA2	Motor M2 raised relay (down)
I4	SQ12	Retraction system safety device	O36	SON	M1 trigger servo
I5	-	<i>Not used</i>	O37	-	<i>Not used</i>
I6	-	<i>Not used</i>	O38	YV3	Profiled bar loading (option)
I7	-	<i>Not used</i>	O39	-	<i>Not used</i>
I8	SQ1	Working position probe (down)	O40	YV2	Telescopic pusher (option)
I9	SQ2	Loading position probe (up)	O41	-	<i>Not used</i>
I10	SQ3	Positioning stop probe	O42	-	<i>Not used</i>
I11	SQ4	Diameter setting motor M2 probe	O43	-	<i>Not used</i>
I12	SQ5	Original pos. carrier servo	O44	-	<i>Not used</i>
I13	SQ30	Empty bar magazine (option)	O45	-	<i>Not used</i>
I14	SQ31	Telescopic pusher (option)	O46	-	<i>Not used</i>
I15	-	<i>Not used</i>	O47	KS	Start relay
I16	-	<i>Not used</i>	O48	-	<i>Not used</i>
I17	-	<i>Not used</i>	O49	-	<i>Not used</i>
I18	-	<i>Not used</i>	O50	-	<i>Not used</i>
I19	-	<i>Not used</i>	O51	-	<i>Not used</i>
I20	-	<i>Not used</i>	O52	-	<i>Not used</i>
I21	-	<i>Not used</i>	O53	-	<i>Not used</i>
I22	-	<i>Not used</i>	O54	-	<i>Not used</i>
I23	-	<i>Not used</i>	O55	-	<i>Not used</i>
Interface			Interface		
I24	A1	Lathe collet	-	-	<i>Not used</i>
I25	A2	Lathe in auto cycle	-	-	<i>Not used</i>
I26	A3	Feed order	-	-	<i>Not used</i>
I27	A4	Part feed out signal	-	-	<i>Not used</i>
I28	A..	Programmable interface input	-	-	<i>Not used</i>
I29	A..	Programmable interface input	-	-	<i>Not used</i>
I30	A..	Programmable interface input	-	-	<i>Not used</i>
I31	A..	Programmable interface input	-	-	<i>Not used</i>

3. ELECTRIC DIAGRAMS



021-40-620		021-40-620	
E	Max. amperage/Momentary	25.1.20/5	SE
E	AC/DC converter 24V/24V 4A	20.0.20/4	CE
F	Max. voltage for static EC	14.1.20/3	FE
M	Electrolytic filter	Electro	FC
D	Date:	24.06.2010	Page: 1 / 10 Index D

4. INTERFACE



Before connecting, check to make sure that the voltage of the bar feeder corresponds to the one provided by the lathe. The voltage of the bar feeder is indicated on the identification plate. Only LNS (or certified) technician is authorized to modify the interface or parameter system.

4.1. Description

The interface cable(s), between the bar feeder and the lathe is (are) provided by LNS.

Although an example of an interface diagram is provided, the diagram for the interface corresponding to your device, essential when making the electrical connection, is located inside the electrical cabinet.

When making connections, ensure that the cables are long enough to allow the entire travel of the retraction system (600 mm) to be used.



Should the interface instructions not be observed during start-up, the damaged elements as well as the resulting damages are not covered by warranty.

4.2. Connections

4.2.1. Power supply

Voltage: 3 x 200-480 V, 50 Hz/60 Hz + Ground ($\pm 10\%$)
Maximum current: 1 A

In the case where the voltage supplied by the lathe does not match that provided for the bar feeder, the transformer T1 must be adapted.

LNS bar feeders are equipped with their own thermal protection systems (breakers, thermal relays, fuses, etc.). The power supply for the bar feeder should be connected to the output of a breaker mounted in the electrical control box of the lathe (10 A max.).

For the wiring inside the lathe, the section of the cables should be at least 1.5 mm².

4.2.2. Signals from the lathe to the bar feeder

Always refer to the electrical diagrams shipped with the bar feeder and placed in the electrical cabinet.

For any other type of connection, contact LNS or its local representative.

a) 24 V power supply

Corresponds to the +24 V of the bar feeder. This power shall be used to connect the signals from the lathe to the PLC.

- All signals from the lathe to the PLC shall be powered by the +24 V of the bar feeder.
- All signals from the bar feeder to the lathe shall be powered by the +24 V of the lathe.

For the other types of connections, please contact LNS S.A. or their local representative.

b) "EMERGENCY STOP" signal of lathe XT8-XT9

This signal is part of the safety link (Emergency Stop circuit) on the bar feeder.

XT8-XT9 corresponds to the Emergency Stop signal of the lathe. If the circuit is open, the bar feeder will go into an Emergency Stop mode.

When the lathe is in an Emergency Stop mode, or if the safety line of the bar feeder is interrupted, an alarm will sound and the R1 relay of the bar feeder will be triggered (see description of the R1 relay, below).

c) Lathe collet signal (Input A1)

This signal is for checking the mode of the lathe collet (open or closed), and is mainly used for feeding parts.



For safety reasons, wire a normally open contact, coming from the signal of the lathe collet. A **clamp open** signal must be selected.

d) Lathe in automatic cycle (Input A2)

This signal indicates that the lathe is in automatic cycle.

e) Feeding command (Input A3)

Should the lathe be equipped with a secondary spindle or pickup spindle, if the part requires multiple feeds (double feeding), or if the lathe is equipped with a sliding headstock, this signal will be used as a load command for the new bar.

f) Part feeding command (Input A4)

This signal orders the forward movement of the feeding pusher and the bar, independently of the mode of the lathe collet.



As long as this signal is present, the signal of the foot switch to open and close the lathe collet must be locked. The lathe should not start up in automatic cycle until the bar is clamped in the collet.

4.2.3. Signals from the bar feeder to the lathe

a) R1 alarm relay

When the bar feeder is in normal operation, the R1 relay is energized. In the event of an alarm or break in the emergency stop circuit, this relay is de-energized.

For safety reasons, this signal should bring to a stop all of the axis movements of the lathe as well as the rotation of the spindle.



When the bar feeder is in alarm mode, the feeding pusher control signal should also de-energize.

b) R2 lathe start and stop relay

Either:

- Confirmation of the pusher command
- Confirmation of the loading of a new bar

After the new bar has been loaded and positioned on the lathe spindle, relay R2 confirms the end of the loading cycle.



The operational cycle of relay R2 (pulsed, latched, etc.) is controlled by parameters.

c) R3 end of bar signal relay

When the feeding pusher reaches the End of Bar position, relay R3 energizes. This signal is used to indicate to the lathe that there is not enough material left to make another part.



The operational cycle of relay R3 (pulsed, latched, etc.) is controlled by parameters.

d) R4 automatic mode relay

This signal is present as soon as the bar feed system is in automatic cycle (Auto + Start).

e) Emergency stop button of the bar feeder (EM1-EM2)

When the Emergency Stop button is pressed, the contact opens. The lathe must be in Emergency Stop mode, and the feeding pusher signal from the lathe must switch off.

Two normally closed contacts on the Emergency Stop button are available for connection in the Emergency Stop circuit of the lathe.

4.2.4. Options

The options described below are an integral part of the standard equipment of LNS bar feeders.

These signals, however, are not required for the proper operation of the devices, or the safety locking for protecting persons and materials. The options are available only to optimize production conditions.

a) R5 auxiliary end of bar relay

This signal may be used to reduce the length of the remnant in case the remnants exceed the maximum admissible length for the parts catcher or its chip conveyor. Relay R5 energizes as soon as the feeding pusher reaches the programmed position.

b) R6 bar stock magazine empty relay

Contact of relay R6 (optional): this relay R6 engages after verification of the presence of a bar during the loading cycle of a new bar.

4.2.5. Review of safety instructions relating to the interface

- The lathe foot switch for opening the lathe collet or mandrel should not be operational during the automatic cycle of the lathe.
- The lathe foot switch should not be operational as long as the feeding pusher feed command signal is present.
- Whenever possible, it is advisable to interlock lock the manual command for opening the lathe collet or mandrel while the feeding pusher command signal is on.
- If the lathe is in the Emergency Stop mode, the bar feeder must also be in the Emergency Stop mode, and vice-versa.
- If the bar feeder generates an alarm, the lathe must go into alarm mode. The feeding pusher command signal must disappear, the spindle and axis rotation must stop.

CHAPTER 5: PNEUMATICS

1. PNEUMATIC EQUIPMENT



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

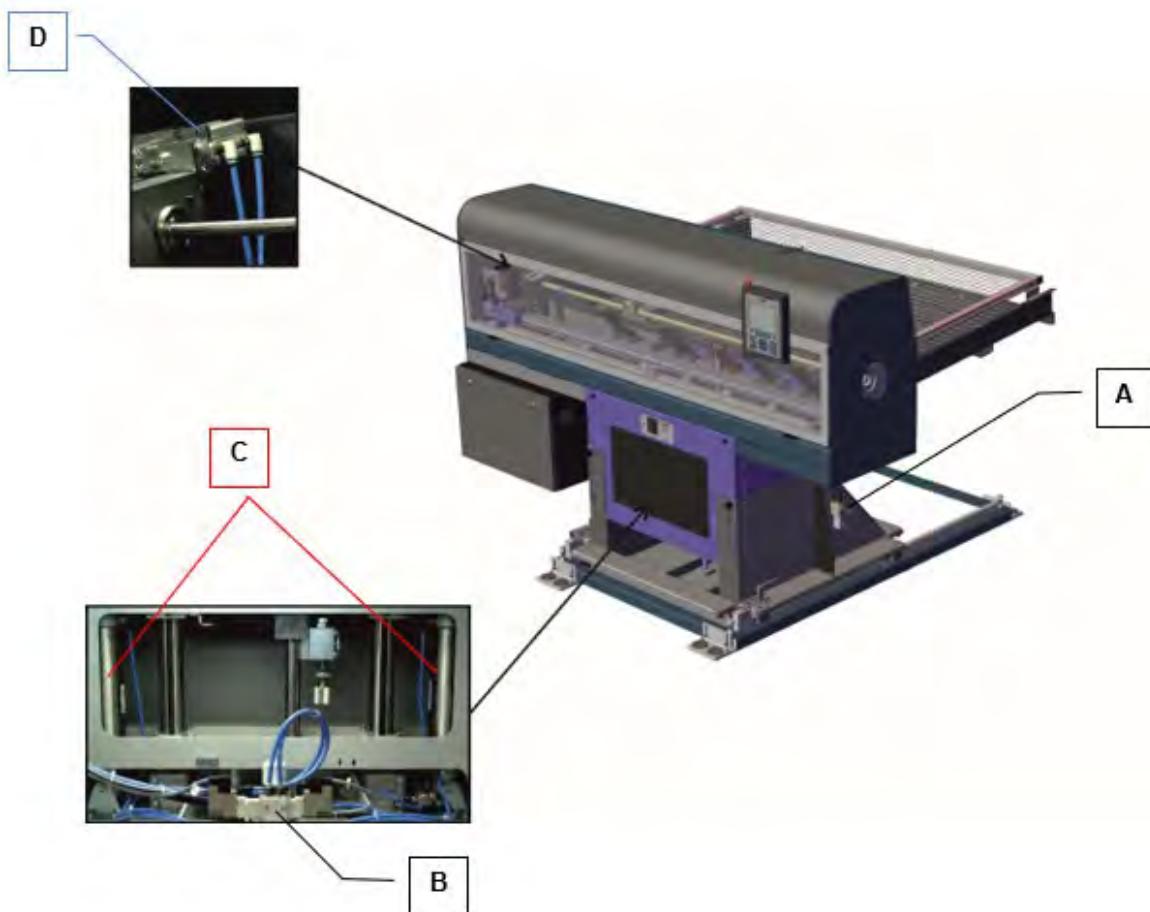
1.1. Description

The following automatic movements of the bar feed system are done via pneumatic elements, namely:

- Loading the bar onto the loading table
- Locking the pusher

To guarantee optimal operation of the bar feeder, a minimum pressure of 5 bar (75 PSI), and a maximum pressure of 6 bar (90 PSI) is mandatory.

1.2. Layout of the pneumatic components



Designation	Item no.	Description
A	3.636/3.638	Air handling unit with pressure control unit
B	3.668	Solenoid valve block
C	3.406	Pneumatic cylinders for vertical movement of the table
D	3.95020.A.30	Pusher locking pneumatic cylinder

2. AIR UNIT

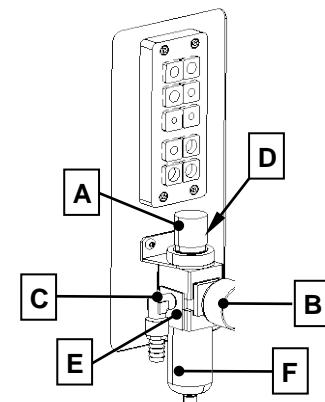
2.1. Description

The air filtering device serves to filter air and to set its pressure before it is distributed into the pneumatic circuit of the bar feeder.

The air must be supplied at a minimum pressure of 5 bar and, whenever possible, clean and dry.

2.2. Layout of the elements

Designation	Description
A	Pressure regulator
B	Pressure gauge with pressure control unit
C	Inlet
D	Regulated outlet to the pneumatic battery
E	Decanter/Tank
F	Automatic purging



2.3. Connections

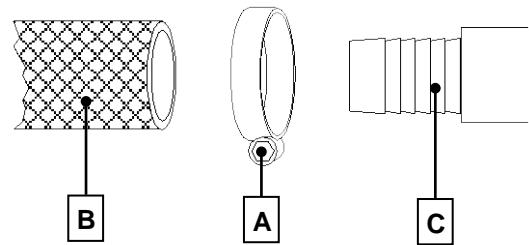
The pneumatic connection (**C**) is located behind the electrical cabinet.

For the pneumatic connections of the bar feeder, the customer must provide a pipe (**B**) with an inside diameter of 1/2" (12.7 mm).

Provide an air hose long enough to allow the complete travel (500 mm) of the retraction system to be used.

When the pipe is connected, it should not trail on the ground as it could be damaged.

1. Place a clamp (**A**) around the pipe (**B**)
2. Push the pipe (**B**) onto the fitting (**C**)
3. Tighten the clamp (**A**) to make it airtight.



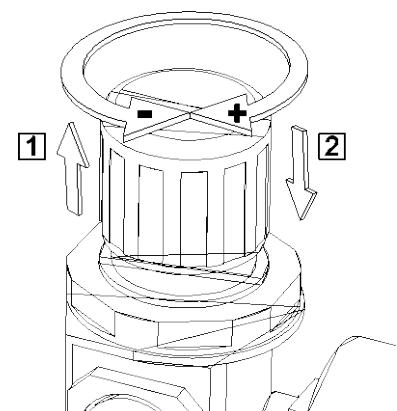
2.4. Settings

1. Unlock the adjusting knob by pulling it upward.

To increase the pressure, turn it clockwise. To decrease it, turn it in the opposite direction.

The service pressure should be set at 5 bar.

2. When the settings are done, lock the adjusting knob by pushing it downward.

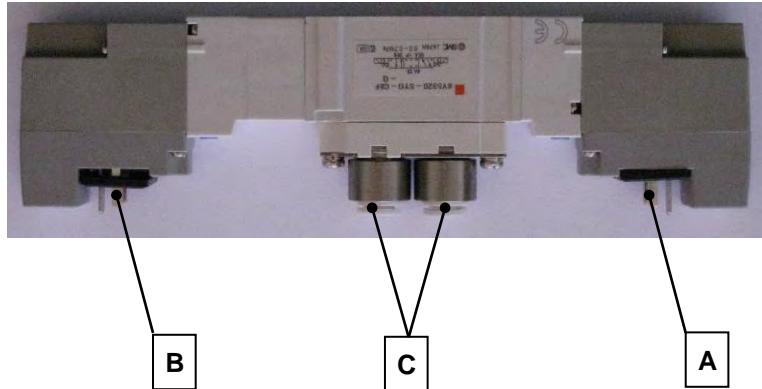


3. PNEUMATIC BATTERY

3.1. Description

The pneumatic battery includes the control and monitoring elements of the bar feeder pneumatic circuit.

3.2. Layout of the elements



Designation	Description
A	Inputs
B	Outputs
C	Silencer

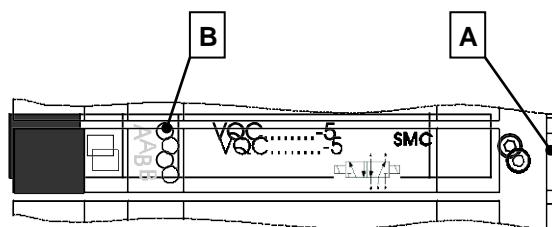
3.3. Manual activation

Directly controlled by the PLC, the solenoid valves actuate the pneumatic cylinders.

The pneumatic cylinders can be activated manually by pressing a key (B). This manoeuvre may prove to be useful during tests or maintenance.

When the key (B) is released, the pneumatic cylinder returns to its rest position (except for pneumatic cylinders activated by 2 solenoid valves).

Designation	Description
A	Air outlet
B	Manual activation key



3.4. Pressure control unit

To guarantee an optimal work of the bar feed system, the service pressure must be at least 5 bars (75 Psi). The pressure control unit serves to confirm that this pressure is present and adequate.

The pressure control unit is directly integrated into the air unit.

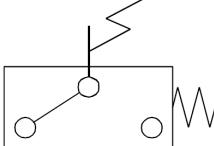
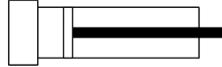
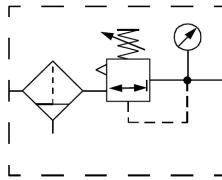
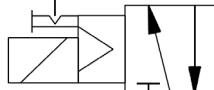
Setting procedure for the pressure control unit:

- Remove the transparent panel from the pressure gauge
- Using a screwdriver, turn the setting screw
- Refit the transparent panel on the pressure gauge.

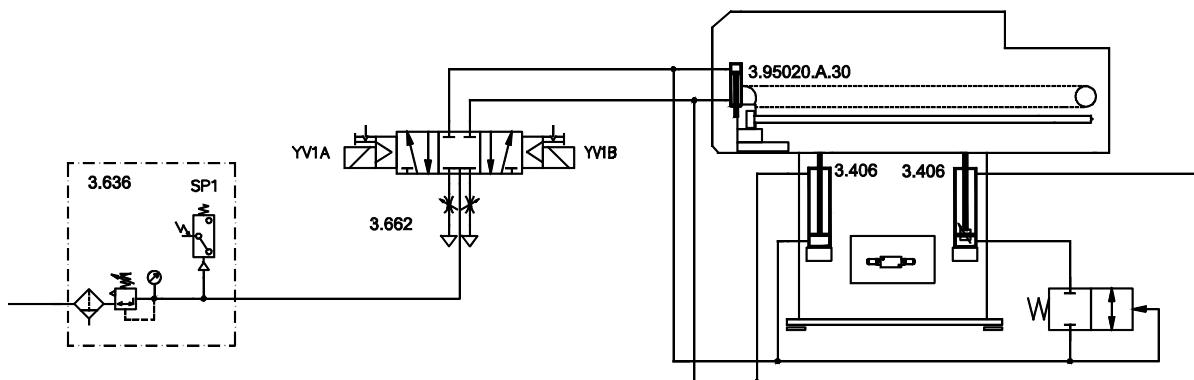


4. PNEUMATIC DIAGRAM

4.1. Symbols

Symbol	Description	Designation
	Pressure control unit	SP1
	Pneumatic cylinder	3.95020.A.30/3.406
	Air handling	3.636
	Solenoid valve	YV1A/YV1B

4.2. PNEUMATIC DIAGRAMS



CHAPTER 6: GENERAL DESCRIPTION

1. BAR MAGAZINE



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

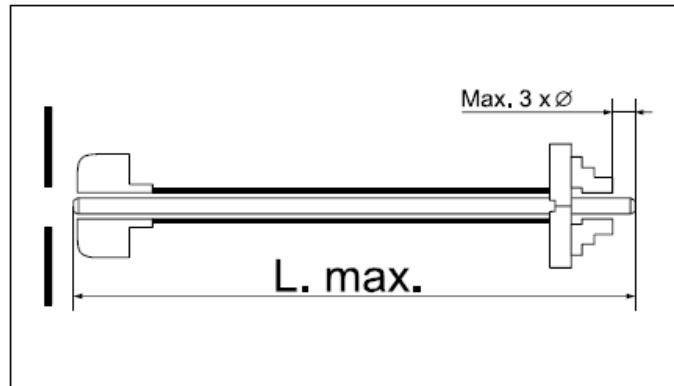
1.1. Description

Placed on the side of the bar feeder, the bar magazine is 1000 mm deep and can house bars of different lengths, from 300 mm to 1600 mm.

To facilitate movement of the bars on the magazine, the latter has been fitted with a grid onto which the bars are placed. However, if certain bars (profiled bars, for example) have difficulty sliding, the gradient can be increased using an axis located underneath the magazine. Conversely, if bars with a small diameter start to pile up, the gradient can be decreased.

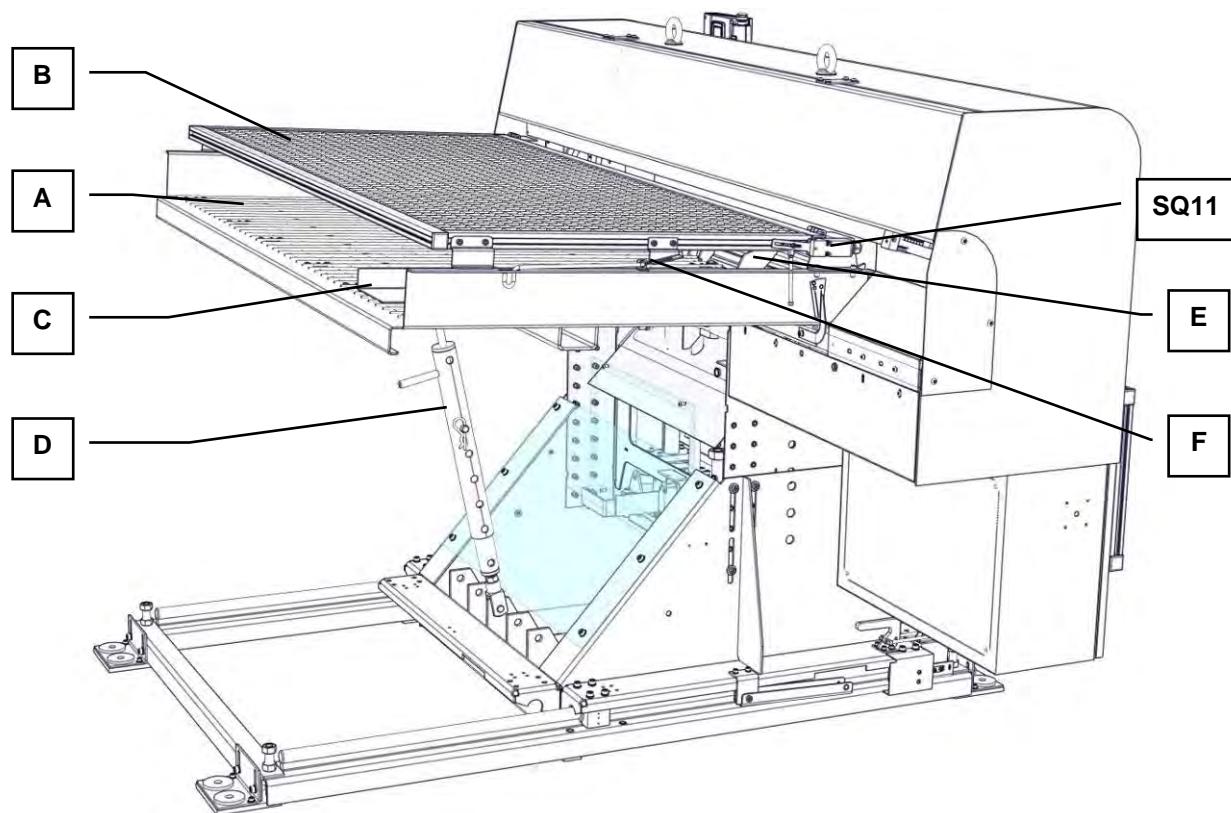
A protection grid prohibits access to the magazine during the automatic cycle. In manual mode, the grid, which is fitted onto hinges, can be retracted to enable the operator to perform all the required maintenance operations.

Under no circumstances may a rotating bar protrude past the end of the lathe spindle. The maximum authorized length that can be loaded by the bar feeder is given by the length of the lathe spindle. The bar should never extend more than 3 times its diameter beyond the lathe's clamping unit without support. A limiter enables the maximum bar length to be set on the magazine.



When they are on the magazine, the bars are held in place by stops arranged along an axis. The position of the stops is set automatically when the loading diameter is entered into the bar feeder parameters.

1.2. Layout of the elements



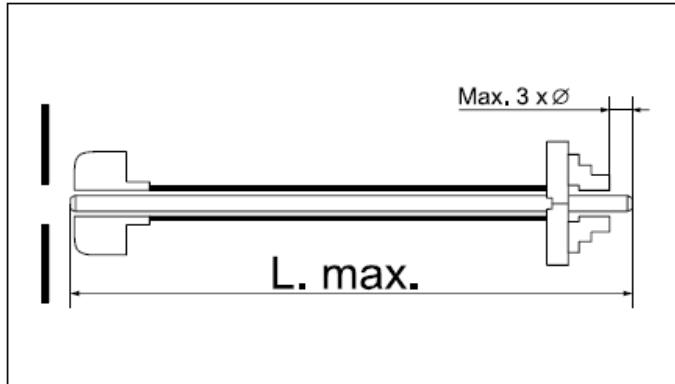
Designation	Description
A	Bar magazine
B	Protection grid
C	Rear limiter
D	Loading table support
E	Positioning stops
F	Support rod
SQ11	Safety switch

1.3. Limiters

1.3.1. Rear limiter

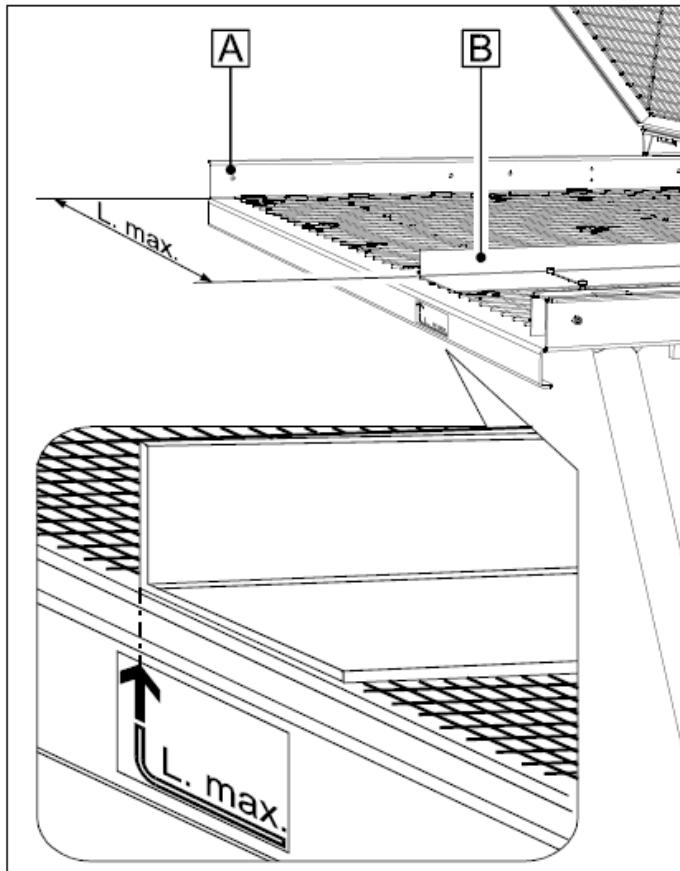
The bar feeder magazine can simultaneously house bars of different lengths (between 300 mm and 1600 mm).

The maximum (L.max.) which can be loaded is given by the length of the lathe spindle. It is strictly prohibited to turn a bar which is protruding from the rear of the spindle. The bar should never extend more than 3 times its diameter beyond the lathe's clamping unit without support.



The bars are guided and held by two limiters. The first, (A), is fixed and located at the front; it is an integral part of the bar magazine. The second, (B), is mobile and located on the magazine, secured by screws.

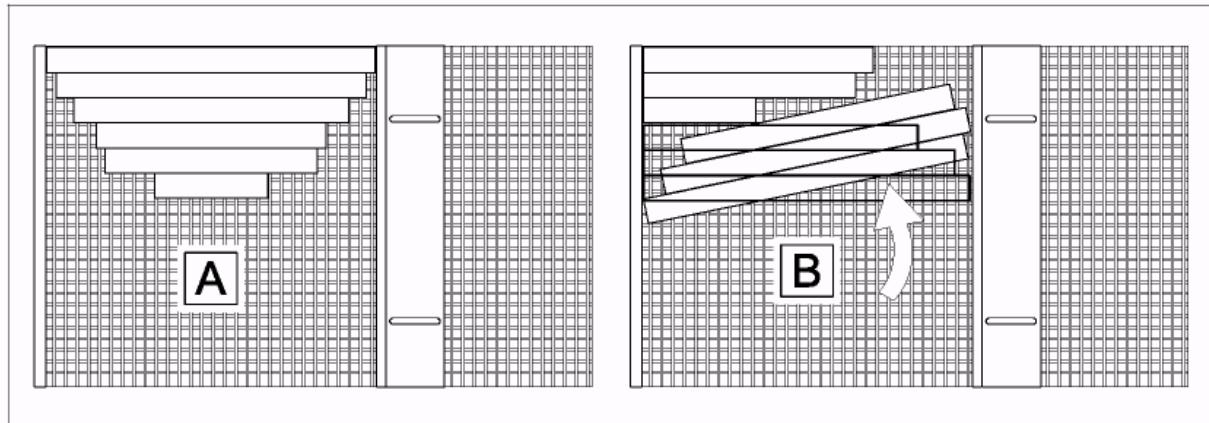
- Measure the length of the spindle, from the entry to in front of the collet.
- Lift the protection grid. Unscrew the retaining screws for the rear limiter.
- Place the limiter at the distance measured in the spindle (L. max.), measuring from the front limiter. Tighten the retaining screws.
- Apply the adhesive marker to the bar magazine. This marker will enable the position of the limiter to be set at a later date, without the need to measure the spindle length each time.
- This enables the loading pusher to move at high speed as far as the position of the rear limiter and then to slow down, to prevent impact when it comes into contact with the bar. Furthermore, if a bar which is too long is loaded, the bar feeder knows this when it measures it, and interrupts the loading cycle.



The maximum length (L.max.) must be entered into the service parameters (only an LNS or approved technician is authorized to edit this value).

1.3.2. Bars of different lengths

Although the bar feeder can load bars of different lengths, it is recommended to place them on the magazine in decreasing order of length and to center (**A**) them between the limiters so that they do not end up askew (**B**).



1.3.3. Bars of the same length

The bar feeder can also be used as a loading magazine for piston rods, axes or forged parts.



A corresponding interface is necessary, however, if the minimum loading times are to be achieved. These options can be studied and discussed in advance with the lathe manufacturer or with the distribution company.

If the parts are of the same length, it is possible to move the rear limiter to reduce the loading time.

- Lift the protection grid.
- Install a bar on the bar magazine, pressing against the front limiter.
- Move the rear limiter 1 millimeter behind the bar.
Check the parallelism of the limiter by rolling the bar on the magazine.
- Tighten the retaining screws.
- Close the protection grid
- Edit the corresponding parameter.

To facilitate movement of the bars on the magazine, the latter has been fitted with a grid onto which the bars are placed. However, if certain bars (profiled bars, for example) have difficulty sliding, the gradient can be increased using an axis located underneath the magazine. Conversely, if bars with a small diameter start to pile up, the gradient can be decreased.

1.3.4. Profiled material

Depending on the profile of the bars to be loaded, additional settings and accessories are required. Please contact LNS or their local representative.

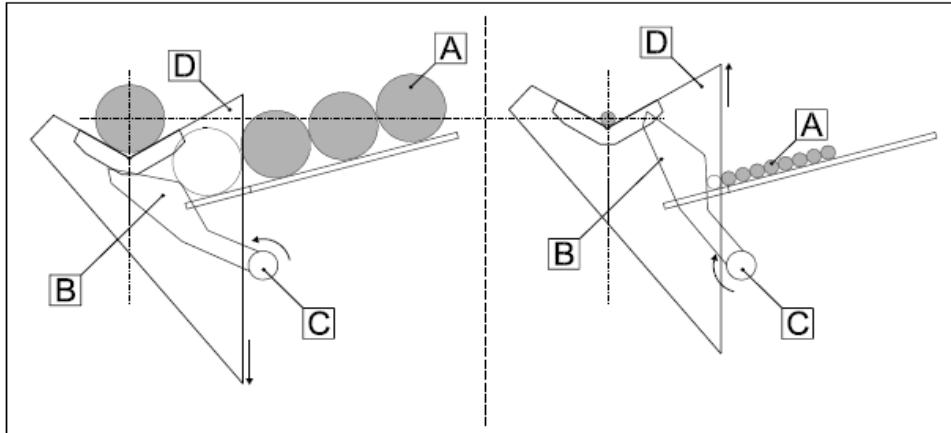
2. LOADING TABLE



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

2.1. Description

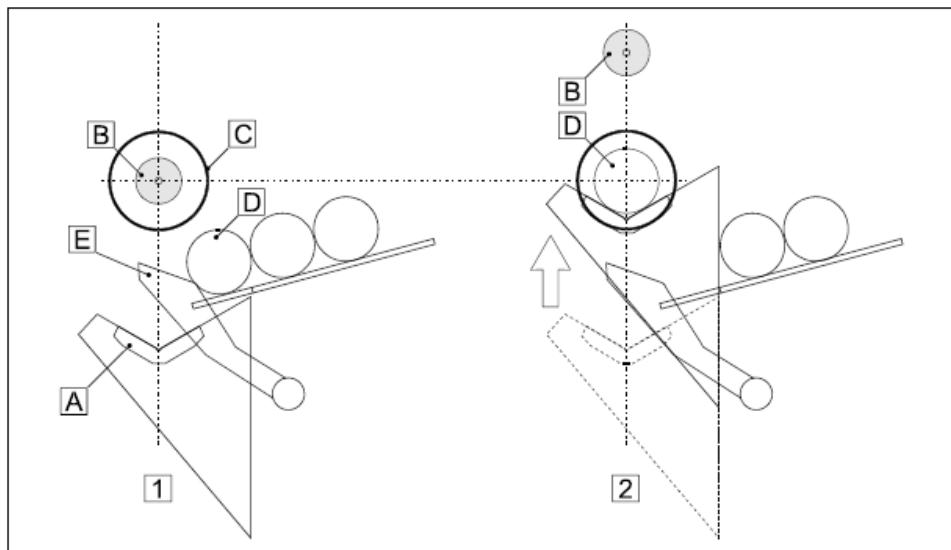
When they are on the magazine, the bars (**A**) press against the loading stops (**B**). The stops are arranged on an axis (**C**) which is coupled to the loading table (**D**). The stops are adjusted automatically by the electric motor M2, at the same time as the loading table is configured.



The bar feeder loading table performs two functions

1. Selection of the material

When the table (**A**) is in the lowered position, the pusher (**B**) is opposite the spindle (**C**). The pneumatic cylinders are active, the table is raised and selects the bar (**D**) which is pressing against the stops (**E**) on the bar magazine.



2. Guiding of the material:

When in the raised position, the loading table is aligned with the spindle. The bar can therefore be inserted into the spindle.

To ensure that the bar is always perfectly centered in the spindle, whatever its diameter, a motor (M2) adjusts the height of the loading table automatically, as soon as the bar diameter is entered into the parameters (see chapter 7).

2.2. Calibration of the loading table

To ensure optimum loading, it is necessary that the bar is perfectly centered in the spindle, whatever its diameter or profile. Each time the diameter or profile is changed, the position of the table is automatically set according to the parameters entered by the operator.

If, despite this, the position of the table proves to be incorrect for some reason (too high or too low), it may be corrected.



To enable the motor M2 to adjust it, the pneumatic cylinders for moving the table vertically are depressurized then reactivated.

Conditions:

- Bars on the bar magazine
- Table in the lowered position

- 1 Switch to manual mode by pressing the **[F2]** key.



- 2 Bring the table to the raised position **[F3]**.

The bar is now opposite the lathe spindle.

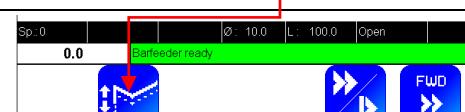


- 3 The remote control prompts the icons **[F4]** + **[FWD]**. Press the **[F3]** key (approx 3 seconds) until the loading table calibration icon **[F1]** appears.



- 4 The loading table calibration icon **[F1]** appears.

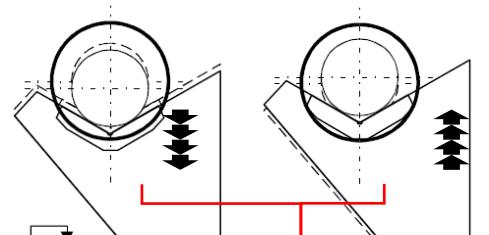
Press the **[F1]** key.



- 5 Three icons appear:
[F1] lowers the table
[F2] ESC (exit without saving)

[F4] raises the table

Each time **[F1]** or **[F4]** is pressed, the vertical position of the table is changed by 0.25 mm. For larger adjustments, press and hold the button so that the table moves continuously.



- 6 Once the required position is reached, press the **[F3]** **ENTER** key to confirm that you wish to recalibrate the unit to this new position.



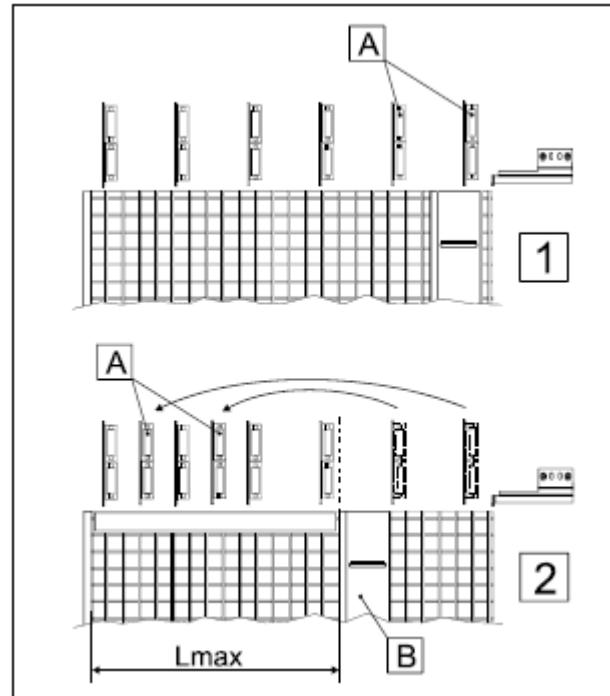
- 7 At this point in time, as the unit's calibration must be modified, the control automatically gives access to "Part settings – diameter and profile" (see Chapter 7).

The control asks the operator to confirm the set diameter. Use the number keys to enter the bar diameter which was used to center the table. Use the **[F3]** **ENTER** key to confirm.

2.3. Position of the roller supports

The bar feeder is supplied with 6 roller supports, arranged so that they cover the entire width of the bar magazine.

During installation, when the limiter (B) is positioned, move the supports (A) which are placed behind the limiter and install them at the front, to ensure the best possible support for the bar.



3. DRIVE DEVICE



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

3.1. Description

The servo motor uses a notched belt to drive a mobile carrier, onto which the loading pusher is fitted. When the bar is positioned in the spindle, the carrier slides freely along the pusher, which remains immobile.

When the carrier returns to the park position, an actuator locks the pusher so that it is then securely attached to the carrier.

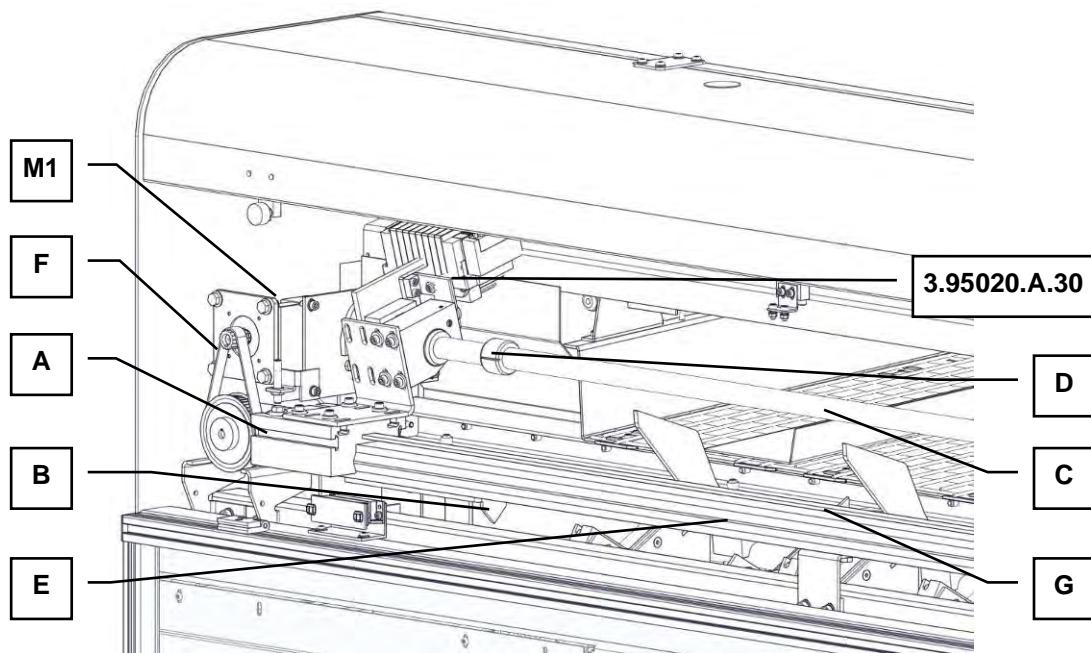
Locking of the pushers is linked to the position of the loading table:

1. Table in the raised position.
The loading pusher is opposite the spindle; **the pusher is not locked**.
2. Table in the lowered position.
The pusher is opposite the spindle; **the pusher is locked onto the carrier**.

The length of the pushers is fixed and does not depend on the spindle length. As a safety measure, the pushers are equipped with a mechanical stop.

For loading of tubes, profiled bars or short bars, optional elements may be installed. Please contact your local LNS agent for more information.

3.2. Layout of the elements



Designation	Description
A	Carriage
B	Loading finger
C	Pusher
D	Mechanical stop
E	Linear unit
F	Notched belt
G	Linear unit belt (item no. 1.830)
3.95020.A.30	Locking actuator
M1	servomotor

4. LOADING FINGER

Unlike the pusher, the loading pusher must not be replaced when the bar diameter or profile changes.

It is possible to load bars of the same length directly with the loading pusher, without using the pusher. To enable this, a special extended loading pusher, supplied as an option, is required. Some parameters must then be selected: see chapter 7.

5. PUSHER

5.1. Description

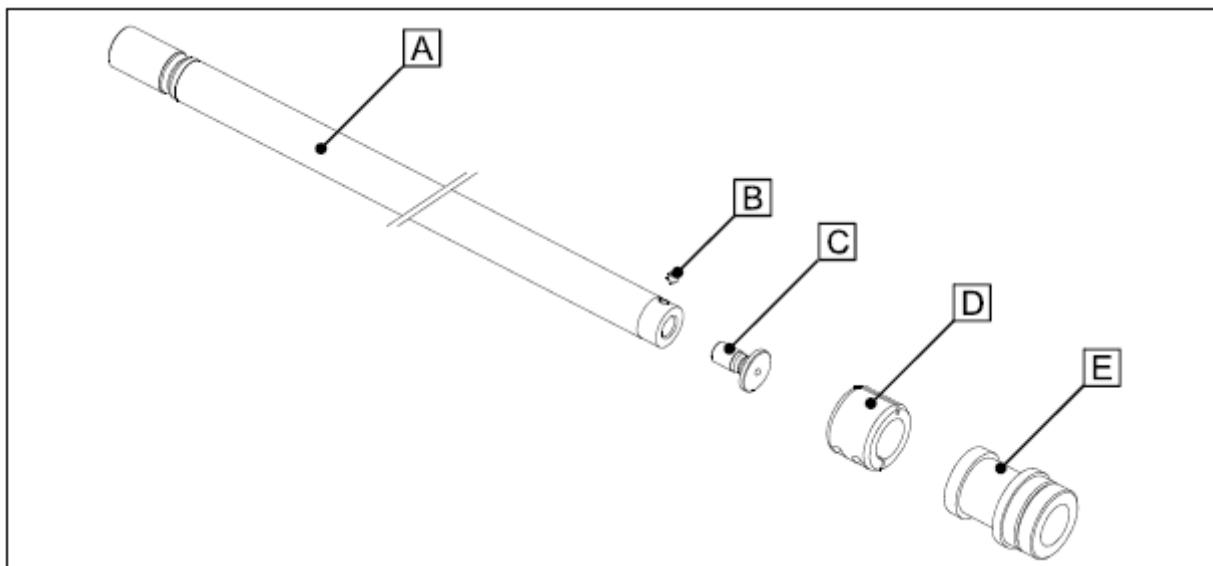
Three pushers are provided to cover the entire bar feeder range. Each pusher has a defined range of use:

Pusher diameter	Item no.	Range covered
**6.35 mm (1/4")	*021.011.022 / 6	6 mm - 15 mm (1/4" - 1/2")
12 mm (1/2")	*021.011.062	16 mm - 32 mm (>2/3" - 1 1/4")
25 mm (1")	*021.011.022 / 25	33 mm - 120 mm (>1 1/4" - 4.7")

* This number corresponds to the complete pusher, with all the elements indicated below. When a pusher is ordered for the first time, use this number.

** 2 supports with additional rollers, designed to provide better support for small diameter bars, are supplied with pushers with a diameter of 6.35 mm. Their positions on the loading table will be defined by the length of the bars to be loaded.

5.2. Layout of the elements



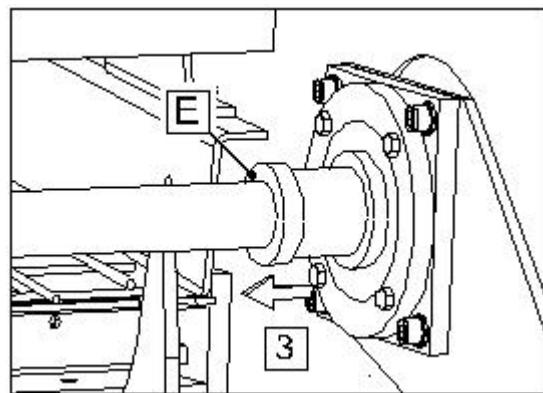
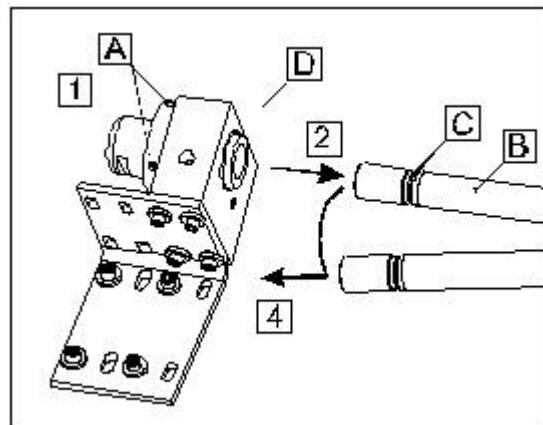
Des.	6,35 (1/4")	12	25	Description
	Item no.	Item no.	Item no.	
A	-*	-*	-	Pusher body
B	-*	-*	914.06.06	Retaining screw
C	-*	-*	011.07.444	Tip
D	011.07.234	011.007.184	011.07.014	Mechanical stop
E	021.05.244	021.05.164	011.007.194	Guiding bushing
A+B+C	**021.011.074	**021.011.294	**021.011.304	Pusher

* On 6.35 and 12 mm pushers, parts A, B and C are welded.

** This number is used when the bar feeder is already equipped with elements (D) and (E).

5.3. Replacement of the pusher

1. Bring the loading table to the working position (lowered), then place the bar feeder in the STOP position (using the remote control).
2. Undo the retaining screws (**A**) enough for them to release the recess (**C**) which holds the pusher (**B**) in the connection piece (**D**).
3. Move the pusher forward, sliding it inside the guiding bushing (**E**).
4. When the rear of the pusher been freed enough for it to be removed, pull the guiding bushing (**E**) backwards to remove it from its housing.
5. The pusher is now released and can be removed.
6. Insert the new pusher into the opening and insert the guiding bushing.
7. Insert the rear of the pusher into the connection piece and push it in fully.
8. Tighten the retaining screws so that they sit in the recess in the pusher.
9. Check that the mechanical stop is correctly positioned (see next point).



5.4. Mechanical stop

The bar feeder pusher has a fixed length, which was determined to ensure it is suited to all types of lathes.

To guarantee that they never collide with the collet (for example: end of bar incorrectly set or in manual mode), the bar feeder pushers are equipped with a mechanical safety stop.

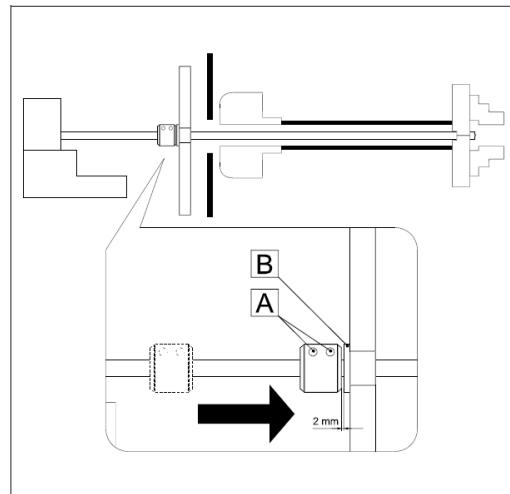
When the mechanical stop comes into contact with the guiding bushing, the pusher travel is immediately stopped.



This setting must be performed on all the pushers when the bar feeder is installed, and may only be altered under certain circumstances, when the clamping unit is replaced (collet/chuck). The end of bar must also be adjusted at this time.

Procedure:

1. Bring the loading table to the working position (lowered).
2. Open the protection cover.
3. Unscrew the retaining screws (**A**) on the mechanical stop.
4. Close the protection cover.
5. Move the pusher to its end of bar position (see chapter 7).
6. Open the protection cover.
7. Slide the mechanical stop against the guiding bushing (**B**), then move it back 2 millimeters.
8. Tighten the retaining screws.
9. Close the protection cover.



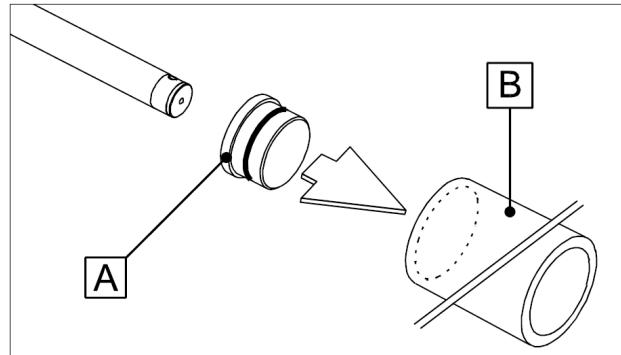
5.5. Loading of tubes

Standard pushers may be used for loading of tubes, provided that the inner diameter of the tubes is less than the diameters of the pushers.

If not, there are two courses of action:

1. The first consists of manufacturing plugs (**A**) and installing them behind the tubes (**B**).

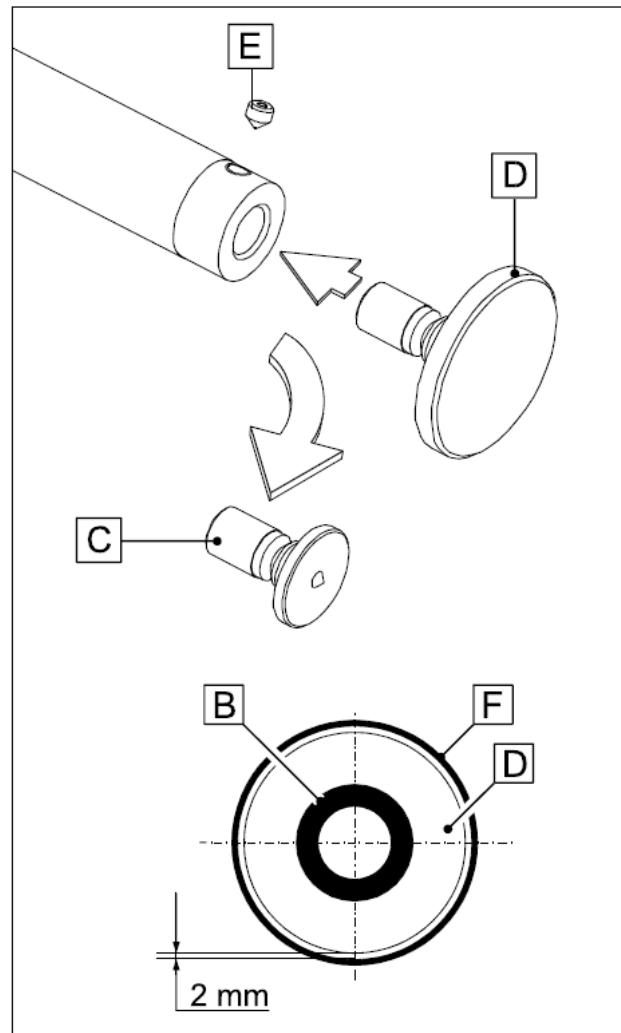
To ensure that the plugs do not come loose when the bar is rotating, it is recommended that they are fitted with an O-ring gasket. These plugs must be fitted at the rear of each tube. They also protect the bar feeder from contamination from the lathe's cutting fluid.



2. The second consists of replacing the pusher tip (**C**) with a special tip (**D**) with a diameter of 130 mm (available for the ø 25 mm pusher only).

Pos.	Item no.	Description
D	021.11.104.130	130 mm disc

To enable it to penetrate the spindle (**F**), the tip must be turned at a diameter 4 millimeters less than the spindle passage (**F**). The tip must be adapted before being fitted on the pusher.



Procedure:

1. Bar feeder in STOP position.
2. Unscrew the threaded dowel (**E**) securing the tip on the pusher.
3. Remove the standard tip (**C**).
4. Install the special tip (**D**), pushing it fully into the pusher.
5. Secure the tip with the retaining screw.

6. BELT

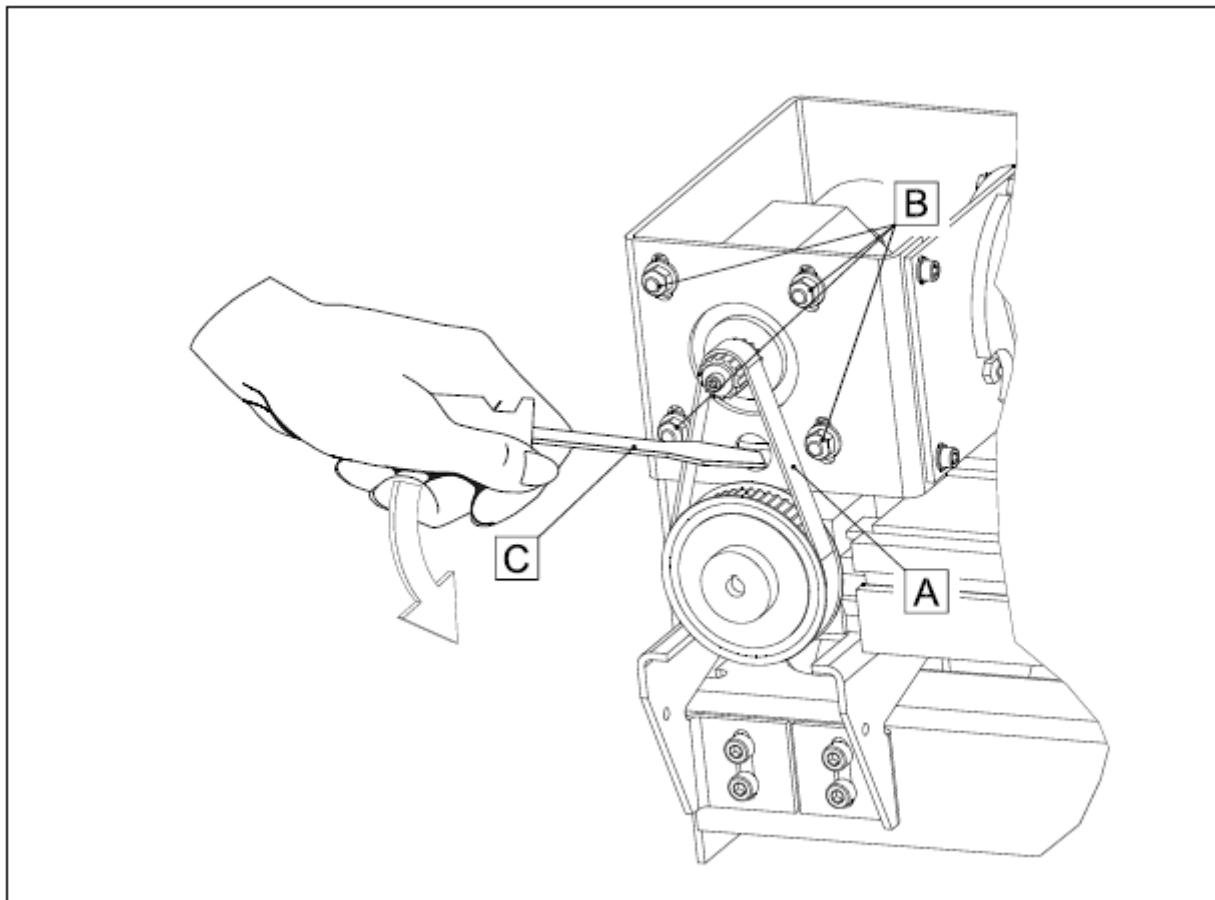
It is possible that, after a certain period of use, the bar feeder will indicate that the belt (**A**) requires tensioning, via an on-screen message.



During the intervention, the belt must remain tensioned. If the belt and the toothed wheels are misaligned, the motor will lose its reference points. In this case, reload the motor's original reference points (see chapter 7). The same procedure applies if the belt is replaced.

Procedure:

1. Bar feeder in STOP position.
2. Open the protection cover.
3. Insert a lever (**C**) into the opening between the pulleys and push it against the motor, using the frame as support.
4. Whilst supporting the motor, undo the retaining screws (**B**).
5. With the lever (**C**), push the motor upwards and then tension the belt (**A**).
6. Keep the motor in this position and tighten the retaining screws (**B**).
7. Remove the lever and close the protection cover.



7. RETRACTION SYSTEM



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

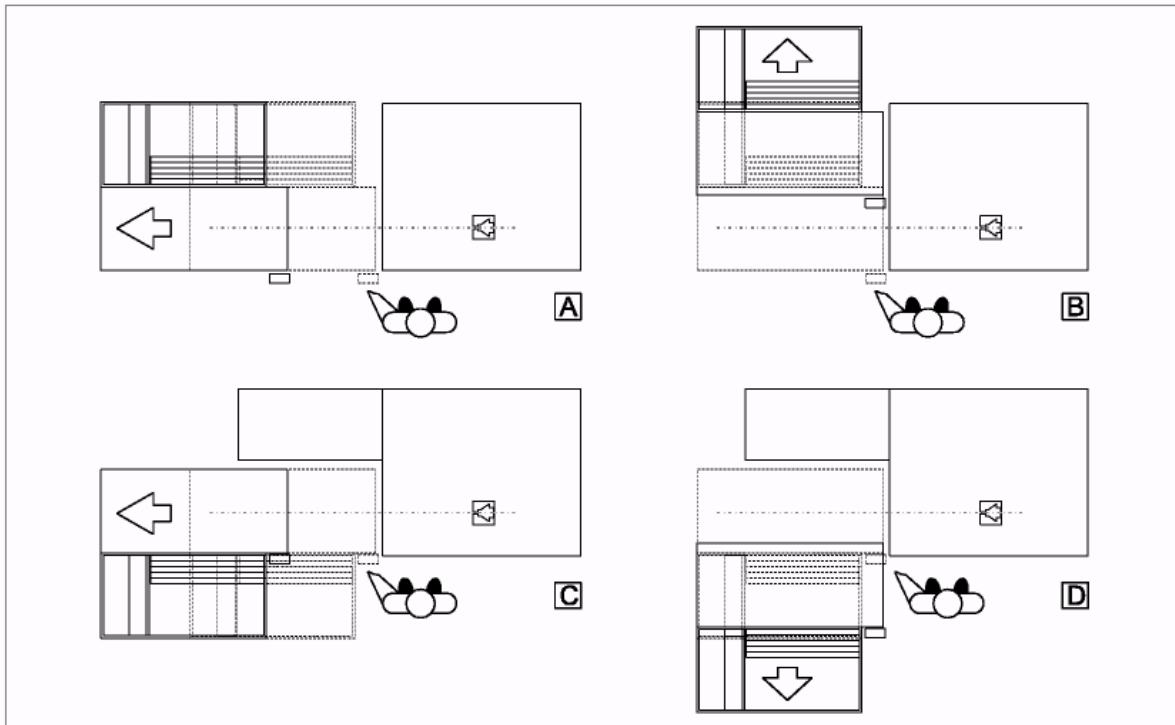


Before handling the retraction mechanism, check to see that the interface cables between the lathe and the bar feeder are long enough.

7.1. Description

When a lathe is equipped with a bar feeder, certain elements (motors, spindle reduction tubes, etc.) become inaccessible, and sometimes it is difficult, or even impossible, to proceed with their maintenance.

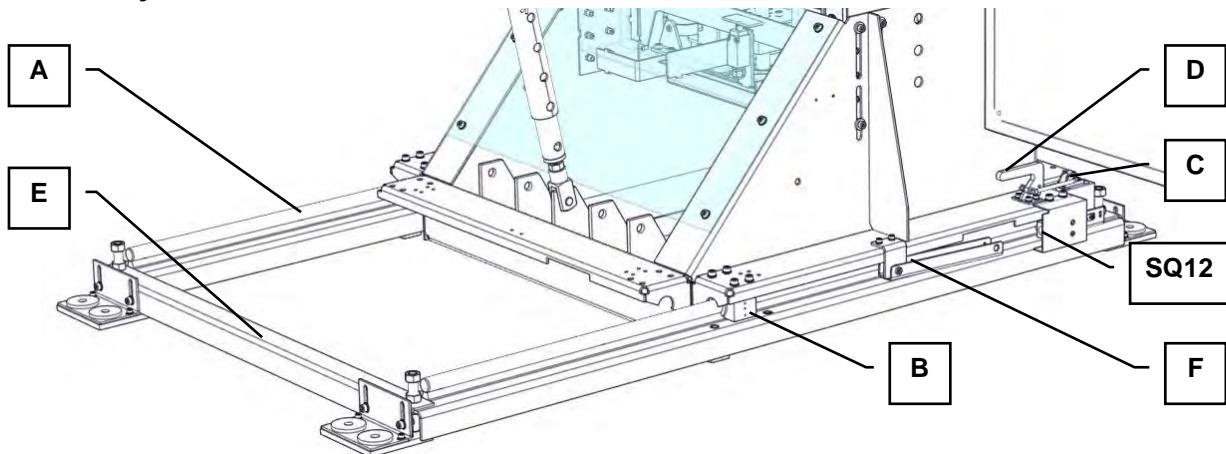
To facilitate these tasks, the bar feeder is equipped with a retraction system which allows the operator to move it.



The retraction system can be assembled to offer longitudinal or transverse movement, as required.

A	Left rear loading/longitudinal movement
B	Left rear loading/transverse movement
C	Left front loading/longitudinal movement
D	Left rear loading/transverse movement

7.2. Layout of the elements



Designation	Description
A	Rails
B	Bearings
C	Mounting hooks
D	Levers
E	Transverse beam (longitudinal, depending on the direction fitted)
F	Non-return device
SQ12	Safety switch

7.3. Operation of the retraction system

Fitted on four extremely rigid bearings (B), the bar feeder slides along two cylindrical rails (A), which guarantee its alignment, when it is in the working position. In this position, the bar feeder is secured by two robust hooks (C).

A safety switch (SQ12) prevents any handling when the bar feeder is not in the working position.

To move the bar feeder, unlock the mounting hooks by lifting the levers (D).

A device (F) prevents the bar feeder accidentally returning to the working position. This manoeuvre can only be performed if the device (F) was lifted beforehand.

8. OPTIONS



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

8.1. Kit for square bars

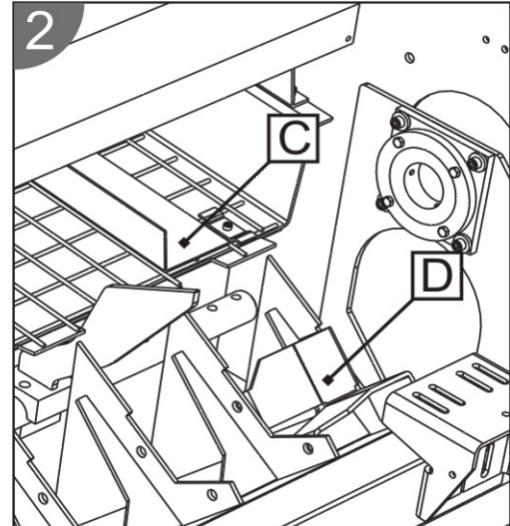
An adapter for square bars must be used to enable to bar to be oriented from the table to 120° from the center of the spindle.

This kit includes:

- A 120° -> 90° angle converter (**D**)
- An additional limiter (**C**)

Depending on the configuration, various items are available:

Bar feeder version	Item no.
Left/rear	021.002.163
Left/front	021.002.153



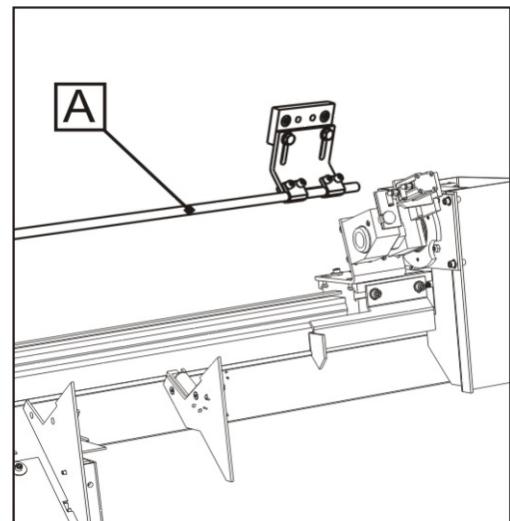
8.2. Kit for quick part loading

Parts of the same length may be loaded with a special pusher (**A**).

The loading procedure is simplified, and the loading time can be reduced by adapting the interface with the lathe.

This kit includes a specific pusher with a diameter of 12 mm, which can be adjusted to the length of the part to be loaded.

Description	Item no.
quick part loading	021.018.012

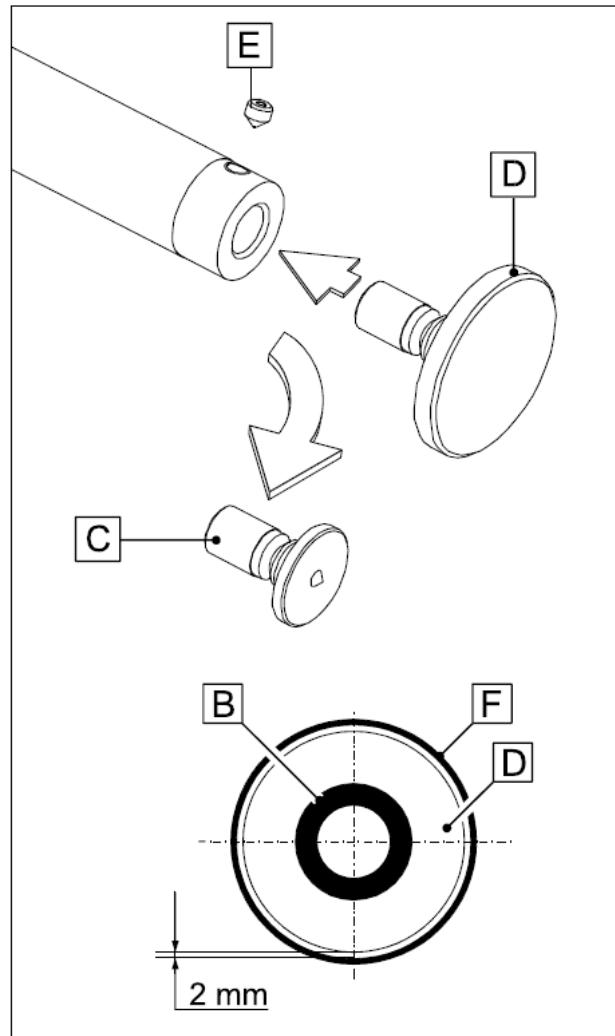


8.3. Loading of tubes

When the bar stock to be loaded are tubes, an adapter is needed in order to create a flat surface plate between the pusher and tube.

The adapter must be adapted to the outer diameter of the tube (by turning the outside of the adapter), then fitted in place of the 25 mm pusher tip.

Pos.	Item no.	Description
D	021.11.104.130	130 mm disc



CHAPTER 7: OPERATION

1. POWERING ON



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

The motor for the bar feeder is equipped with a built-in absolute encoder that continuously controls the position of the pusher.

When the bar feeder is powered down or there is a power failure, this position is kept in the memory by the PLC.

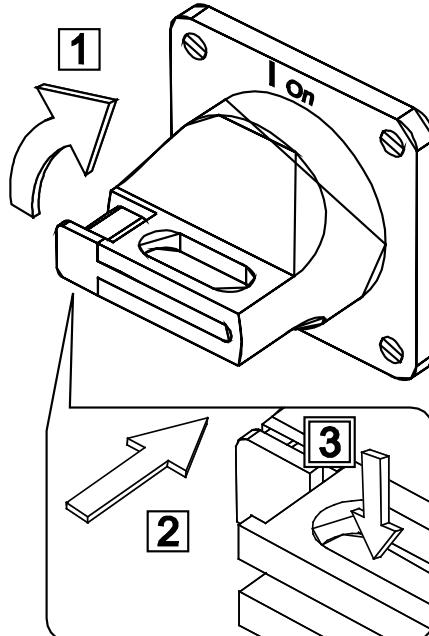
When powering on, the value saved is immediately taken into account, thus avoiding any referencing position. The status parameters saved in the PLC prior to powering off are then checked by the PLC which analyses them. The latter then gives the operator access only to those handling operations that can be undertaken.

To power up the bar feeder, turn **(1)** the switch to the right, to the **I (on)** position.

To power down, turn the switch to the left, to the **O (off)** position.

The master switch can be locked with a padlock. This means it is impossible to switch the bar feeder on.

Push **(2)** the locking mechanism and insert **(3)** the padlock into the opening. Lock the padlock.



2. REMOTE CONTROL

The ergonomic and user-friendly remote control with a clear built-in display facilitates the handling of the bar feeder. Depending on the sequence under way, the bar feeder gives access only to those functions which are available, thus avoiding any incorrect handling, and reducing the access time to the necessary functions.

The screen continuously and clearly shows the status of the bar feeder and the production, allowing the functions, diagnostics and error signals to be checked or analysed at any time.

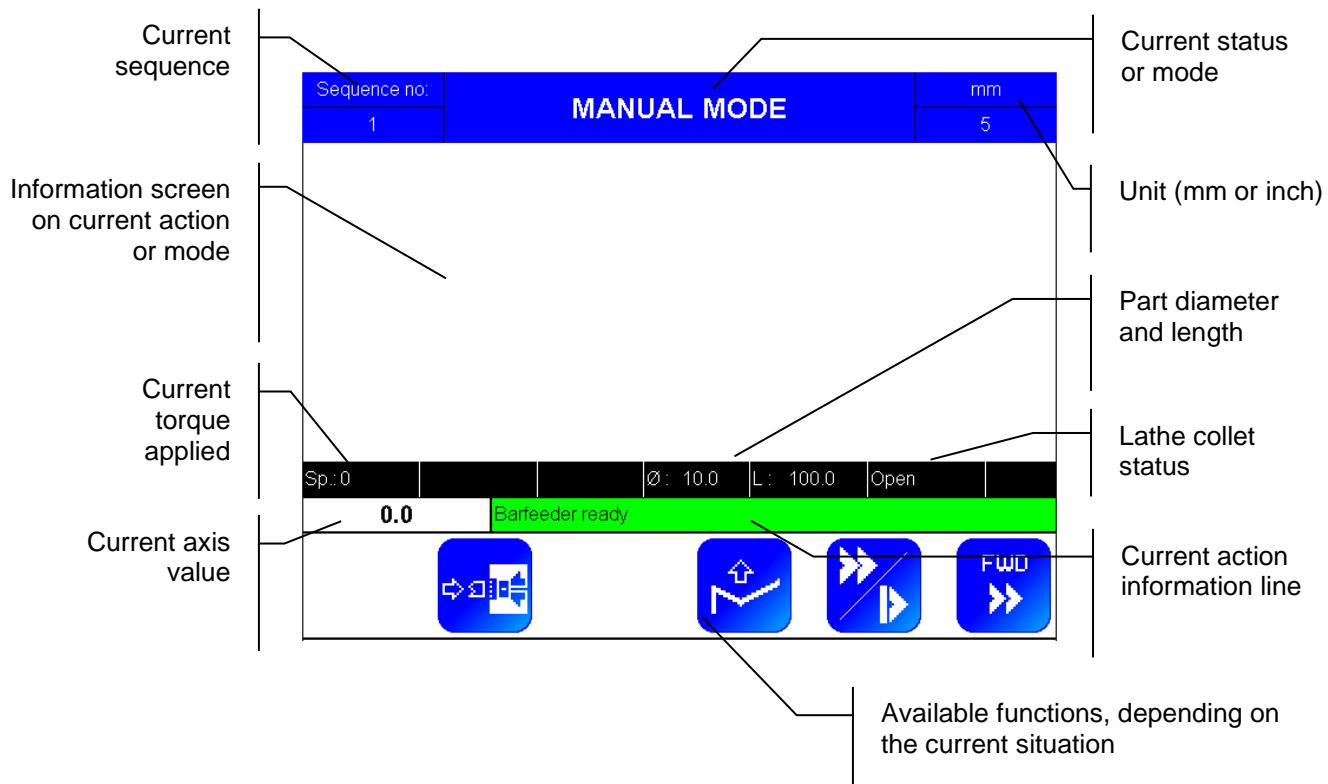
The most recent error signals are saved in a register and can be recalled to establish diagnostics.

The remote control has five distinct segments, namely: display (**A**), function keys (**B**), directional keys and numeric pad (**C**), modes keys with STOP, MENU and HELP buttons (**D**), and the emergency button (**E**).



2.1. Display

The liquid crystal display with touchscreen function provides the operator with all the necessary data, both for handling the bar feeder and for maintenance



The available icons are as follows:

Icon	Meaning	Icon	Meaning
	Referencing position		Set current parameter
	Switch to automatic mode		Exit the current function, back to start
	Stop after machining one bar		Back to previous page
	Switch to manual mode		Go to next page
	Pusher forward (picture may be reversed depending on the feed side)		Fit the loading table (load a bar)
	Pusher reverse (picture may be reversed depending on the feed side)		Lower the loading table

	Switch between normal and quick feed rate (in manual mode only) to improve positioning accuracy		Move material to the Top-Cut position
	Confirm		Teach data
	Cancel		Value modification by correction
	Confirm. In settings mode, to validate a new parameter or a new value, press and hold until the icon disappears. (approximately 3 seconds)		Increase value during correction setting
	Start sequence		Reduce value during correction setting
	Calibration of the loading table		Lower the loading table
	Fit the loading table		

2.2. Multi-function keys F1 - F4

The multi-function keys are located right below the display. The functions attributed to them are indicated on the display by icons.

As the operator advances through the handling operations, the functions of the buttons are automatically reattributed.

2.3. Direction keys and number key pad

These keys allow values to be entered (bar stock diameter, part length, etc.).

2.4. Emergency stop push button

When a dangerous situation arises, pressing the emergency stop button immediately interrupts all bar feeder and lathe functions.

To cancel the alarm, turn the button anticlockwise.

2.5. MODE buttons

2.5.1. MENU key

The MENU key allows access to the main menu, where the parameters concerning production, the interface and the general settings can be reviewed and changed.

2.5.2. STOP key

The STOP key is used to interrupt the sequence under way.

Important: the automatic cycle of the lathe must first be interrupted.

The STOP key can be pressed to exit setting mode, regardless of the level reached, and return to the work screen.



The STOP key is not an emergency button, and cannot be interpreted as such. In emergency cases, always use the emergency stop button located on the top of the remote control.

2.5.3. HELP key

The HELP key displays useful information about the software version, the firmware of the critical components, the current status of the inputs and outputs of the system.

3. SET-UP



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

All handling, adaptations and settings required by the bar feeder to carry out a specific job are part of the set-up.

A few simple operations are necessary to prepare the device to handle another range of diameters.

The set-up must be modified when following parameters change:

1. Bar stock diameter
2. Bar stock shape
3. Part length

3.1. Bar feeder mechanical setup

3.1.1. Adaptation of the pusher



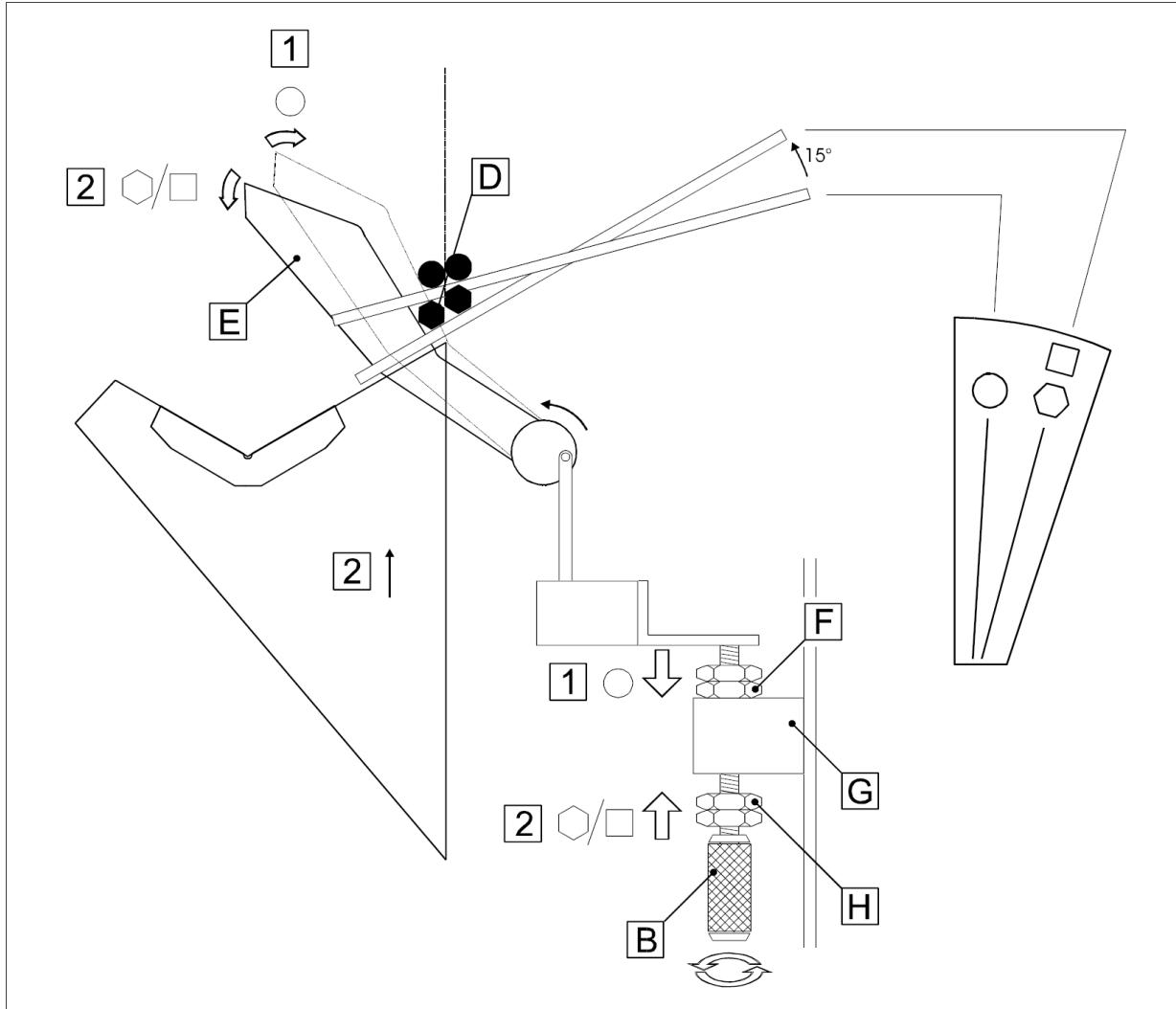
Please read the safety instructions provided at the beginning of this manual before handling the following devices.

Depending on the bars to be loaded, it may be necessary to change the pusher. See CHAPTER 6 of this manual: Pusher changeover section.

3.1.2. Adjustment of the loading stops



If the angle of the table needs to be set in between the two recommended positions, adjust the setting of the stops according to this setting. The key point is that only one bar is loaded when the loading table is raised.



Profiled material

1. When the knurled screw (**B**) is turned, the positioning stops (**E**) are angled. Tighten until the lower nuts (**H**) press against the block (**G**), in position (**2**).
2. Place two bars (**D**) on the table, pressing against the positioning stops (**E**).
3. Proceed with manual loading, checking the setting.

Bars

1. Adjust the angle of the table in the position for loading round bars.
2. Adjust the stops by unscrewing the knurled screw (**B**) until the upper nuts (**F**) press against the block (**G**), position (**1**).

3.2. Mechanical settings for the lathe

3.2.1. Clamping method

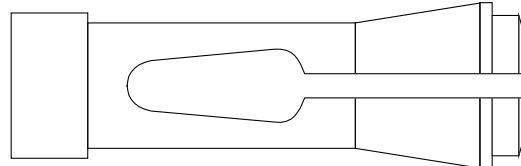
Collet

There are different kinds of collets that are more or less effective:

- a) Single cone collet

The bar is held over about 350 degrees, over a length of 0.5 to 7 times the diameter.

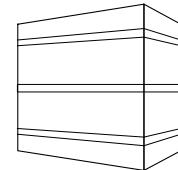
Efficiency : good to very good



- b) Biconical collet

Clamping over 1 or 2 x 350 degrees, over an approximate length of 1.2 times the diameter.

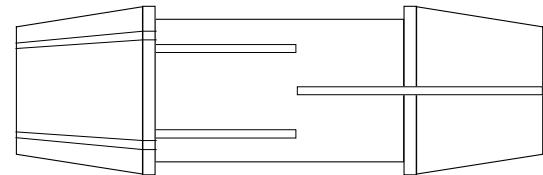
Efficiency : very good to excellent



- c) Double cone collet

The double cone collet has the great advantage of holding the bar at two points separated by about 1.5 the diameter, with clamping 2 times 350 degrees over about 0.5 times the diameter.

Efficiency : excellent



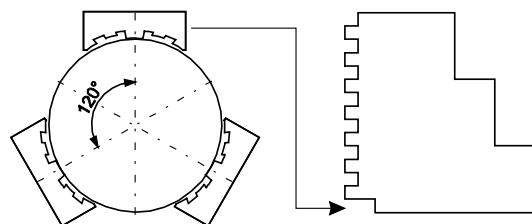
3-jaws chuck

With this type of clamping, one should be very careful given that in many cases the bar is held only at three points, thereby greatly increasing the risk of vibration.

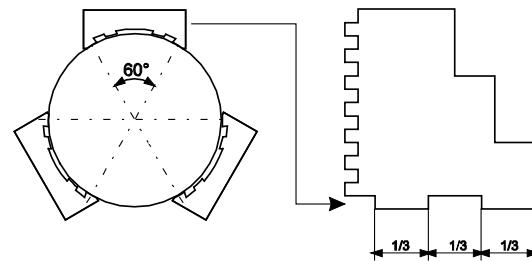
Frequent errors and possibilities for improving the effectiveness of the clamping grip.

- a) Hard grips

Incorrect: The radius of the grip is greater than the radius of the bar. The jaws press against only three points at 120 degrees.

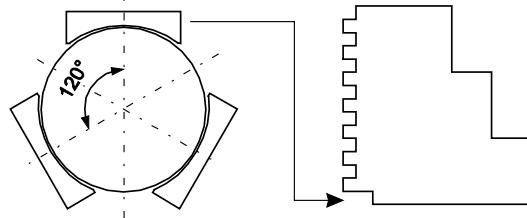


Correct: Modify the centers of the jaws to obtain 2 times 6 support clamping points at 60 degrees.

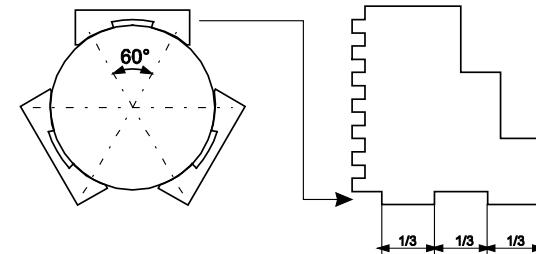


b) Soft grips

Incorrect: The radius of the grip is greater than the radius of the bar. The jaws press against only three points at 120 degrees.



Correct: Modify the centers of the jaws to obtain 2 times 6 support clamping points at 60 degrees.



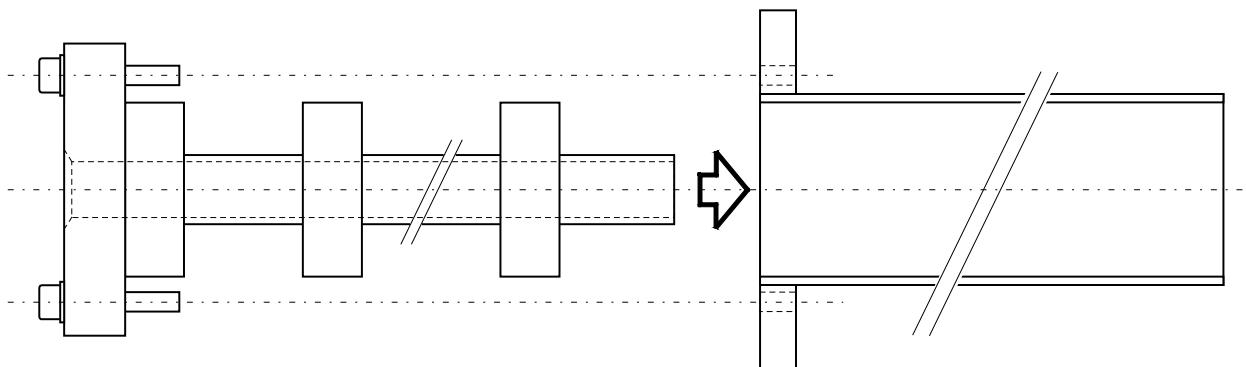
3.3. Lathe – barfeed adaptation

3.3.1. Reduction tubes

The efficiency of the bar guiding in the lathe is determined by the clearance between the spindle bore and the rotating bar. The greater the clearance, the more frequent the vibrations.

Using reduction tubes helps to reduce this clearance. Guiding is thus improved, but, in addition, the insertion of the bar into the collet of the lathe is made much easier.

The inside diameter of reduction tubes should be based on the diameter of the bar (\varnothing of the bar + 1 mm), but should always be larger than the diameter of the pusher.



For inserting and removing the spindle reductions, move the bar feeder using the retraction system (see Chapter 6, section 7. RETRACTION SYSTEM for more information).

Spindle reduction tubes are available from LNS, upon request.

4. SETTINGS



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

4.1. Description

The bar feeder has several parameters and functions allowing the operator to configure it so that it adapts as closely as possible to the lathe on which it is installed, as well as to the production mode being employed.

Thanks to these parameters, when feeding, the material can be positioned in the lathe's clamping unit. Then, during the production cycle, each time the clamping unit is opened, the material is moved forward with precision.

Information regarding the position of the flag, or the quantity of material left to be machined, can be consulted at any time via the remote control.

The pushing torque of the motor is automatically selected according to the bar stock diameter.

When hexagonal or squares bars must be loaded, the servo motor intelligently manages the loading into the lathe.

This section indicates the activating and setting procedures for these functions.

4.2. Access to the functions

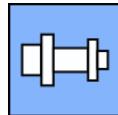
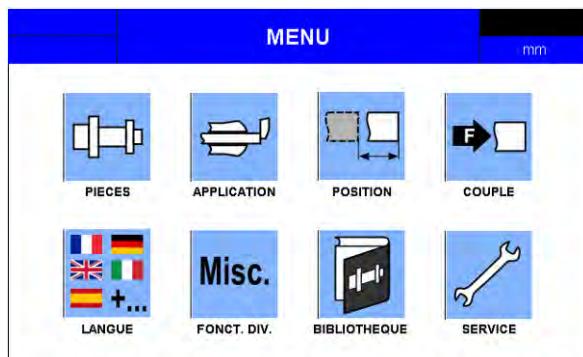
By pressing the **MENU** key, it is possible to access the setting functions.



To edit these parameters, the bar feeder must be in **STOP** mode. To validate a new parameter or a new value, keep **[ENTER]** pressed until the icon disappears.



Depending on your lathe or your production needs, some of the parameters may not be visible. The additional parameters to be displayed can be selected under **SERVICE > DISPLAY**.



Part

Used to define the parameters and values of the part, e.g.:

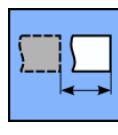
- Bar shape (round, hex, square, other)
- Bar diameter
- Feeding length
- Number of collet openings



Application

Used to quickly set the working mode by selecting the desired application. Following working modes are always available:

- Feed with turret
- Feeding without turret
- Dry Run



Positions

Quick access to the current position values:

- End of bar
- Top-cut position
- Auxiliary end of bar



Torques

Quick access to the current torque values:

- Torque for the bar loading
- Torque for part feeding



Language

Access to other languages



Miscellaneous functions

- Referencing position
- Timings on lathe's clamping device

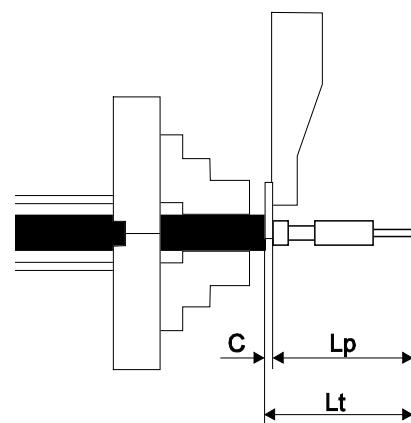
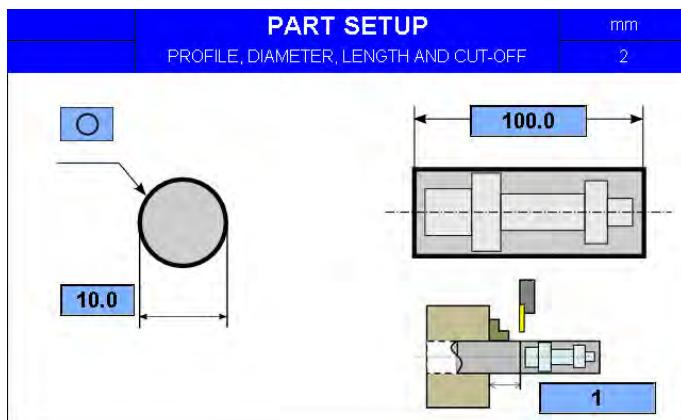


Service

Reserved for LNS technicians for maintenance and displaying masked parameters.

4.2.1. Part adjustment

Form and diameter of the bar, length of part, face-off variable distance



Material shape

Round bar:

- Outside diameter

Hexagonal / square bar:

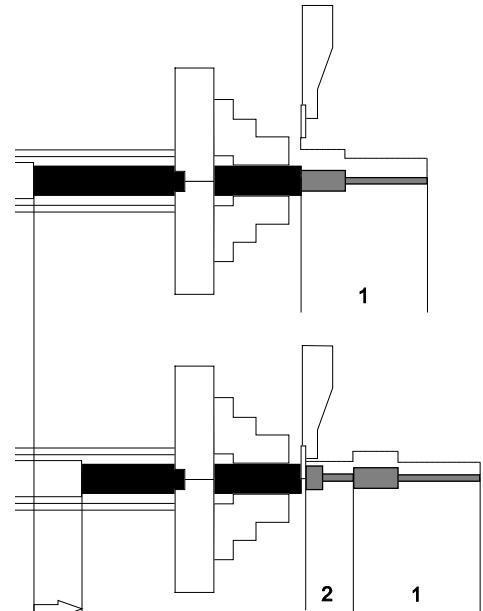
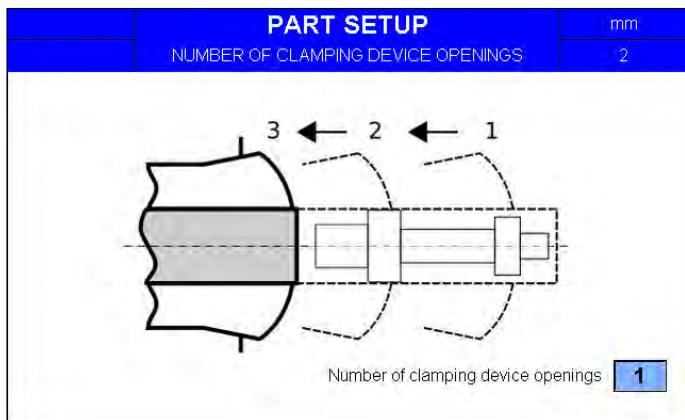
- Size on flat sides
- Size on corners

During the bar feed cycle, the bar feeder tries several times (during 2 minutes) to insert the bar in the lathe collet or chuck. The precision of the positioning is also ensured by a procedure specially dedicated to profiled bars.

Total feeding length

The total loading length (L_t) included the work piece length (L_p), the thickness of the top-cut tool (C) and the thickness of the facing tool (not represented on this picture, depends on the part program).

Number of openings of the clamping unit per part

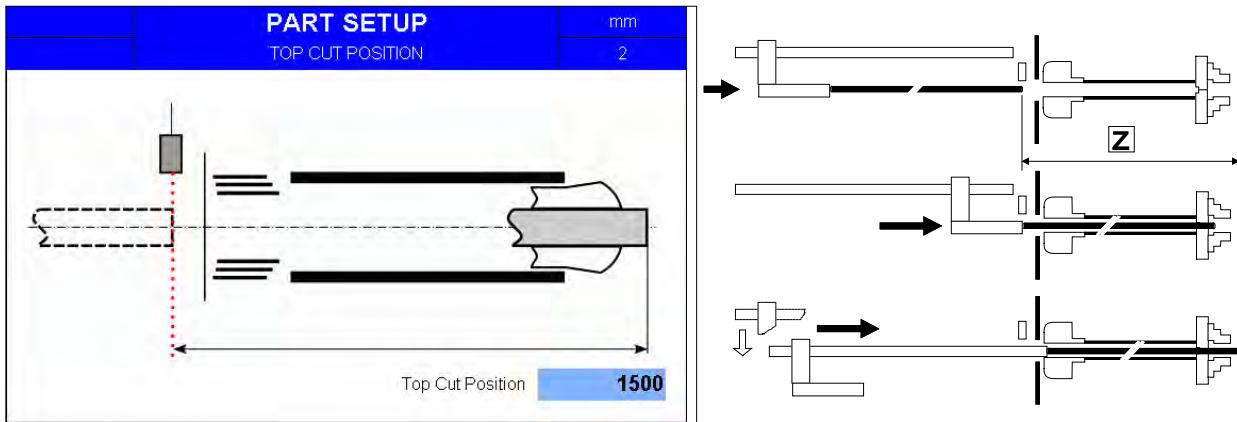


When the machining of a part requires several openings of the collet (e.g. a long part, or transfer of the part to the second spindle), some interface conflicts may occur during the feeding process.

It is important for the bar feeder to be "informed" of the number of times the collet must open for the machining of a part.

The bar feed system only carries out the first positioning for a single part. The following positioning (if any) must be done by the turret.

Top-cut position (*may not be visible*)

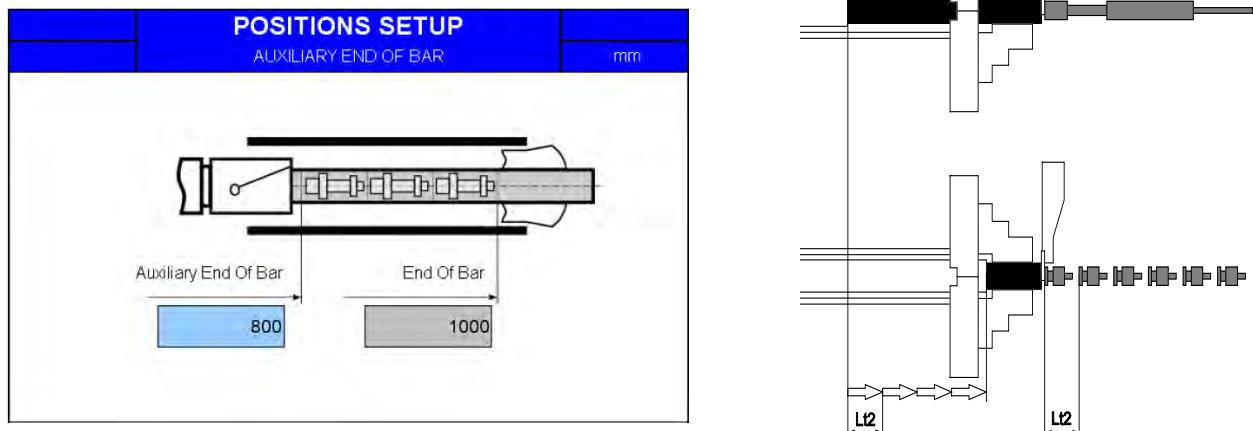


During feeding, the bar is inserted in the spindle and automatically positioned in the clamping unit of the lathe.

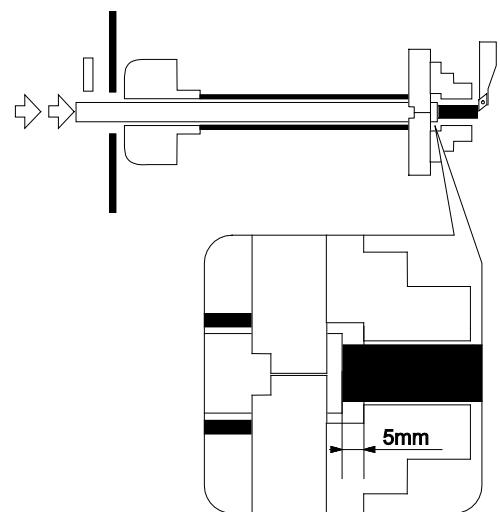
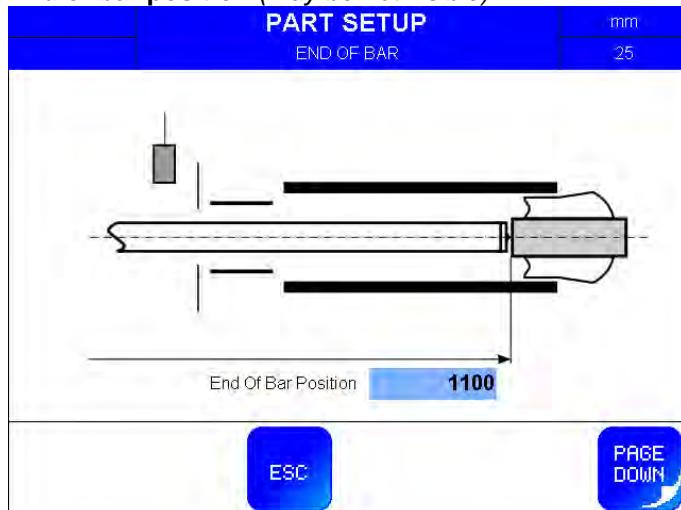
This positioning corresponds to a value (**Z**) programmed by the operator, which is equal to the distance between the measuring cell and the position of the material in the lathe clamping device. With this system, the setting is the same for any bar length.

More information in section 7 of this chapter.

Auxiliary end of bar position (*may be not visible*)



Depending on the lathe and its options, the auxiliary end of bar may be used in several ways. For example, for the opening of an additional front rest installed at the rear of the lathe spindle. The procedure is the same as this for the end of bar signal.

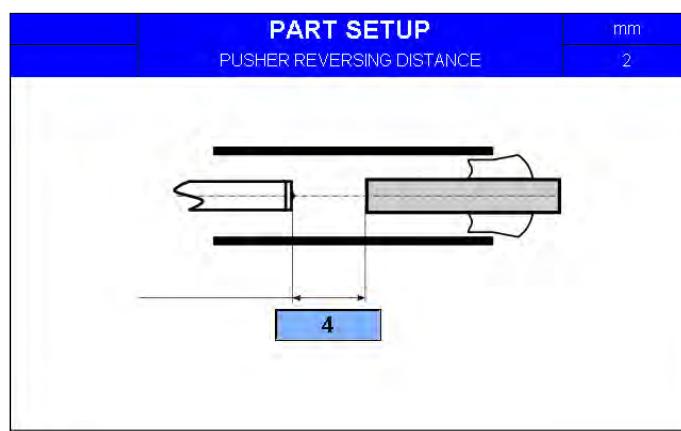
End of bar position (may be not visible)

The end of bar position determines the moment when the bar feeder enters the loading cycle.

In principle, the end of bar position is adjusted as closely as possible behind the lathe's clamping unit (approximately 5 mm) to ensure the shortest remnants.

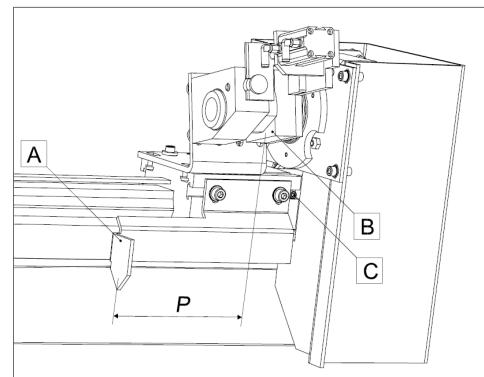
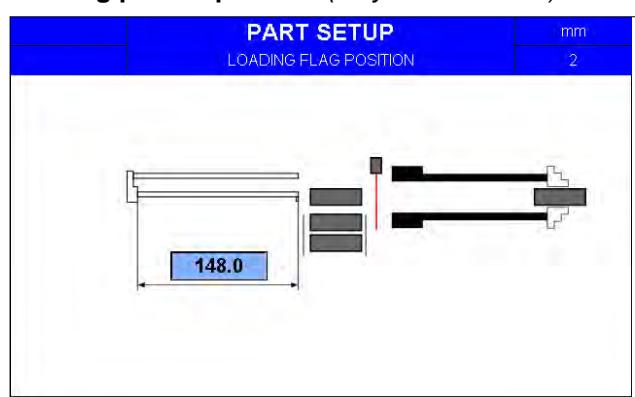
Regardless of the length of the bars or parts, the end of bar position is always the same. In very special cases, a different end of bar setting needs to be selected.

More information in section 6 of this chapter.

Pusher retraction value

During the production cycle, each time the clamping device is closed, the pusher retracts to ensure it is not in contact with the rotating bar. The retraction value is factory set at 4 mm, but can be altered as required.

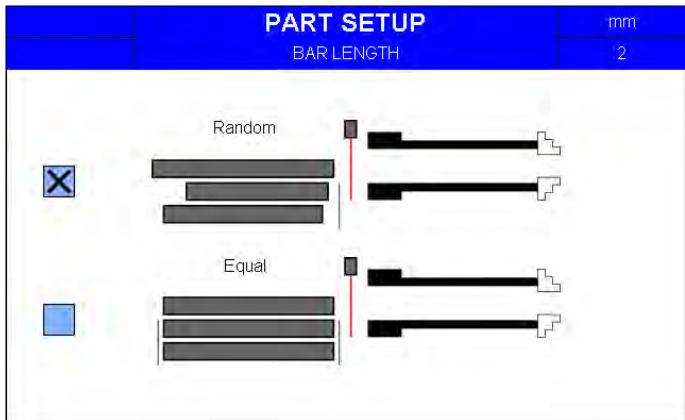
Depending on the play between the pusher and the reduction tube, it is recommended that pushers with diameters of 6.35 and 12 mm are retracted just behind the spindle inlet, to prevent them coming into contact with the inside of the reduction tube.

Loading pusher position (may not be visible)

This value corresponds to the distance (**P**) between the front of the loading pusher (**A**) and the part (**B**). When working with an extended loading pusher, this value can be adapted.

When returning to work with the standard loading pusher, the latter must be installed so it is pushing against the positioning screw (**C**). In this position, the value (**P**) to be entered will be 148 mm.

Variable/constant material length (*may not be visible*)



By activating this parameter, it is possible to save time when loading the new bar.

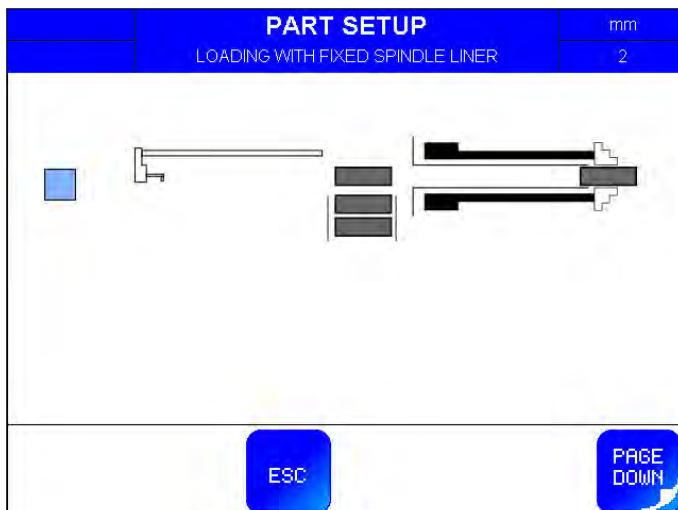
In standard operation, the loading pusher moves at high speed until it reaches the rear limiter, the position which matches the maximum bar length which may be loaded (Lmax). It measures and then inserts the bar in the spindle at moderate speed.

When the bars to be loaded are identical in length, it is possible to activate this parameter. The rear limiter must then be moved to ensure that longer bars cannot be loaded.

When the first bar is loaded, the bar feeder measures the length of the bar, which explains why the loading pusher moves slowly.

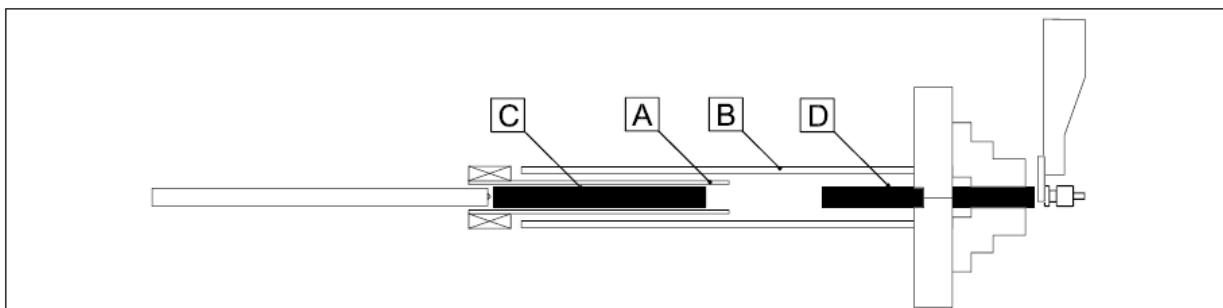
From the second bar, the loading pusher will move to the position of the rear limiter at high speed, thereby reducing the loading time.

Quick loading with non-rotating reduction (*may not be visible*)

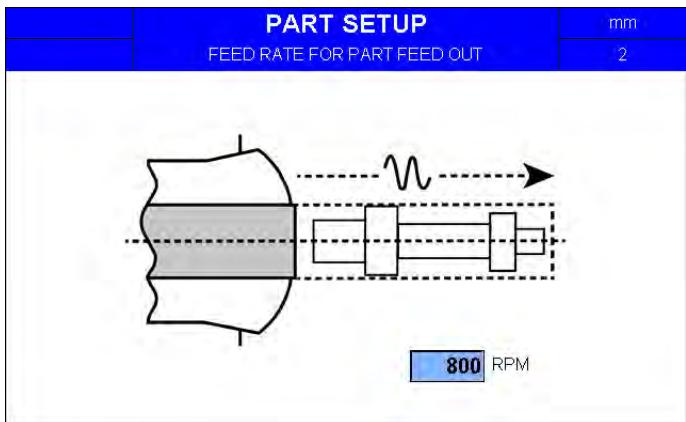


When a fixed (non-rotating) reduction is installed in the spindle at the rear of the lathe, it is possible to feed the new bar while a part is being machined.

This parameter must only be used when a physical limiter is in place on the bar magazine to prevent longer bars from being loaded, which could damage the lathe. Please contact your LNS agent for more information on this application.



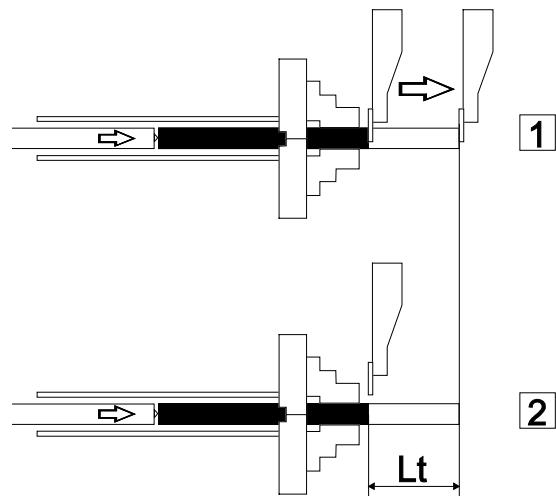
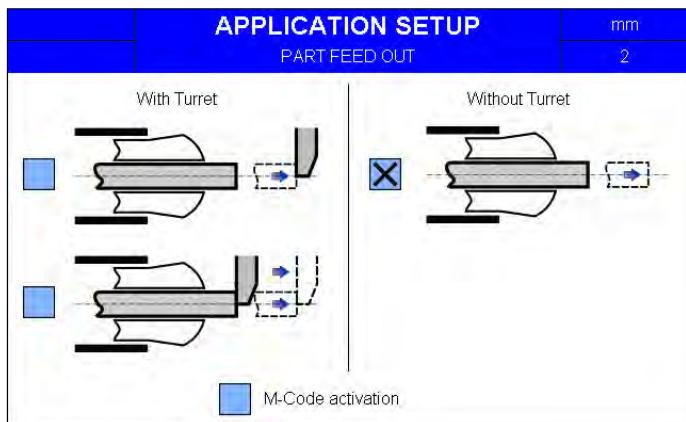
Part feed out rate (*may not be visible*)



This parameter is used to adapt the feed rate to the weight of the bar, for example when feeding out aluminum bars.

4.2.2. Application setup

Part feed out with/without turret



Part feed out with turret

This parameter determines whether the lathe controls the part feeding. In this case, a special loop must be provided in its programme.

Additional parameter (may be not visible):

- The turret is parked in position:
the turret travels to where the material will arrive and waits for the bar feeder to push the material to this point.
- The turret is moving to position:
The turret comes to the bar stock end; the bar feed starts pushing against the turret. Then, the turret moves to the desired feeding length, the bar feed still maintaining the bar stock pressure against the turret.

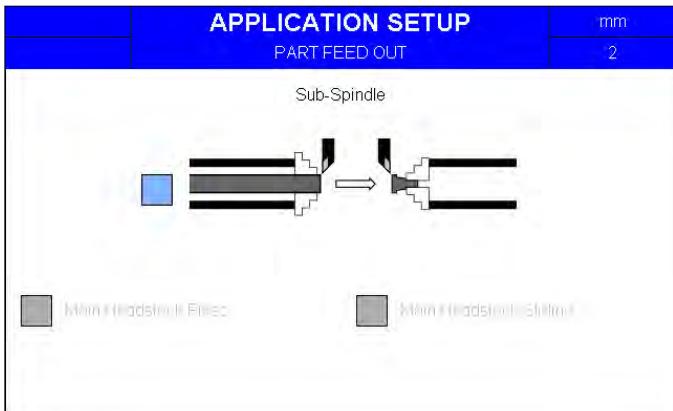
Feeding without turret

The bar feeder feeds the part. When the collet opens, the pusher pushes the bar according to the value entered in the "total part feeding length" parameter. The bar feeder is not able to drive the feeding cycle if the manufacturing process requires several collet openings.

Receipt of the turret with "M" function (*may not be visible*)

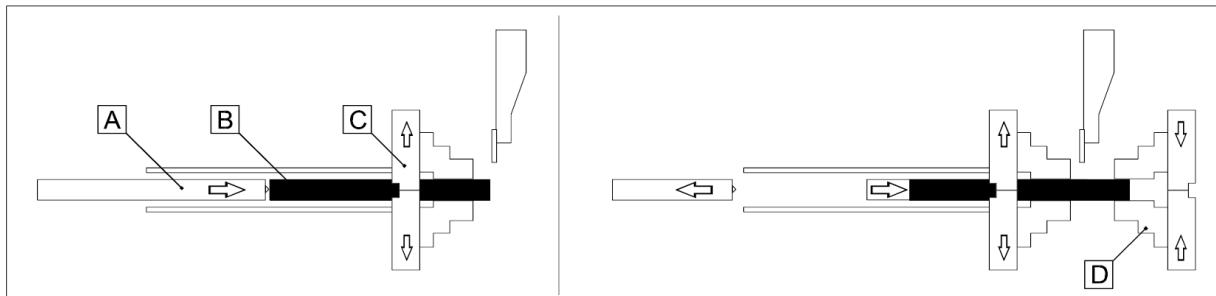
This parameter is used to deactivate the M function receipt of the turret if this function is not used in the lathe interface. In this case, a timer can be used to give acknowledgement.

Part feed out via the sub spindle

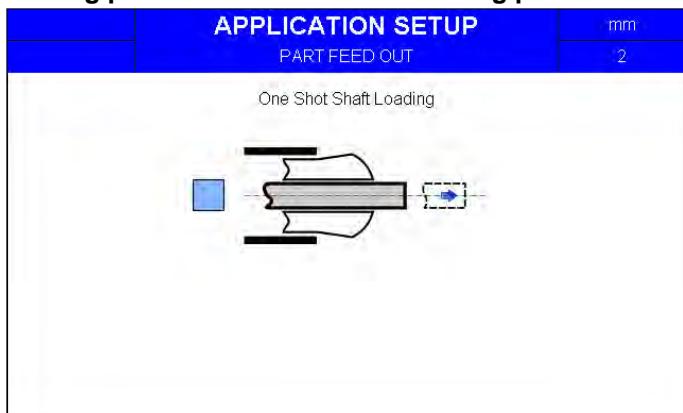


This parameter is mainly used on lathes with two spindles, when the sub spindle is responsible for part feed out.

In this case, the pusher does not follow the material, but the bar feeder can calculate the end of bar time, using known variables as a basis, such as: bar length, total part feed out length, number of collet openings, minimum remnant length.

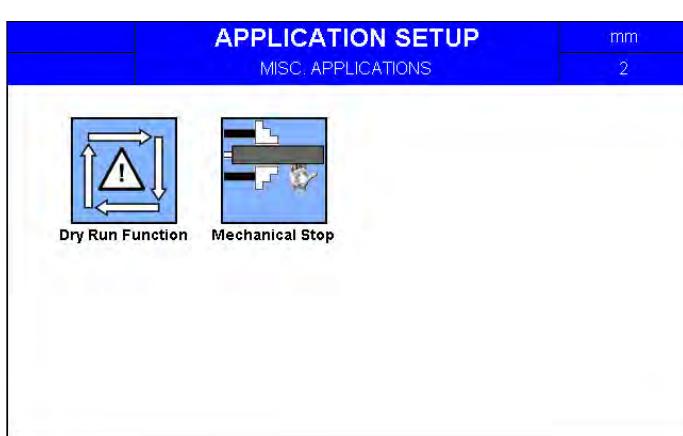


Loading parts with the extended loading pusher



When this working mode is selected, the pusher is not used. Loading is ensured by a special extended loading pusher. When the loading table is in the lowered position, the manual functions are deactivated. The end of bar position does not require any particular setting for this type of work.

Contact your LNS agent for more information on this application.



Misc. Applications

Auto cycle simulation function - Dry Run (may not be visible)

This function allows the lathe to be used (in a production cycle) without the bar feeder (piece work, lathe preheating, etc.).

Mechanical stop

When loading parts in manual mode (without the bar feeder), to facilitate positioning of parts in the lathe collet, a stop is usually installed behind the collet.

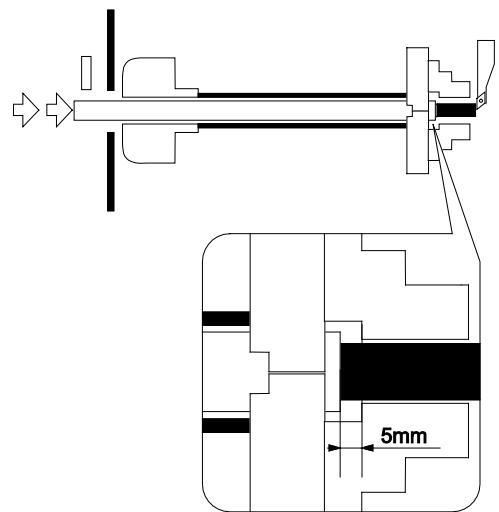
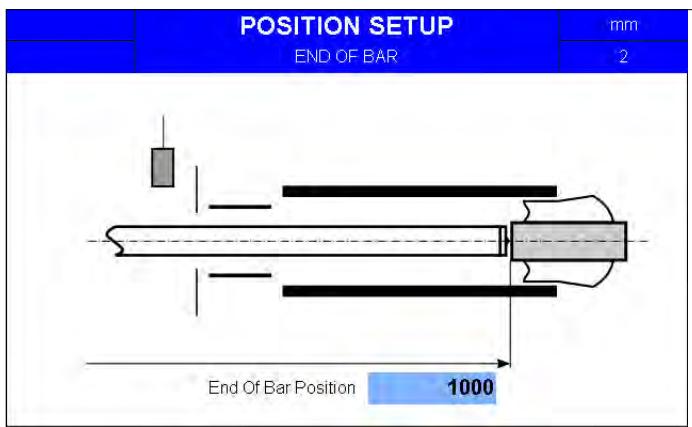
This parameter enables the bar feeder pusher to be used as a stop.



This application cannot function on lathes which have a "door open" signal which is connected to the safety line, as this does not allow the pusher to be moved when the lathe door is open.

4.2.3. Positions

End of bar position (*may be not visible*)



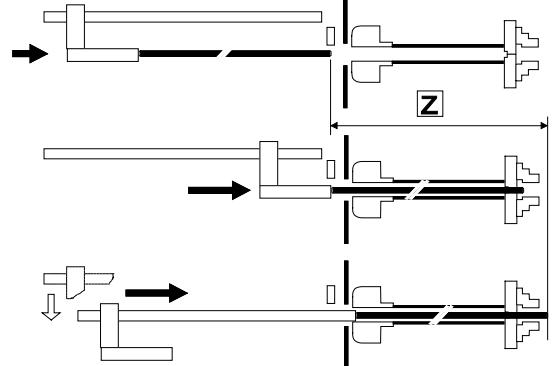
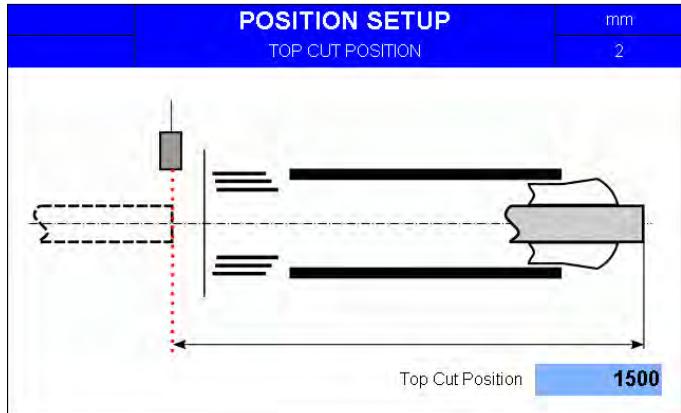
The end of bar position determines the moment when the bar feeder enters the loading cycle.

In principle, the end of bar position is adjusted as closely as possible behind the lathe's clamping unit (approximately 5 mm) to ensure the shortest remnants.

Regardless of the length of the bars or parts, the end of bar position is always the same. In very special cases, a different end of bar setting needs to be selected.

More information in section 6 of this chapter.

Top-cut position (*may not be visible*)



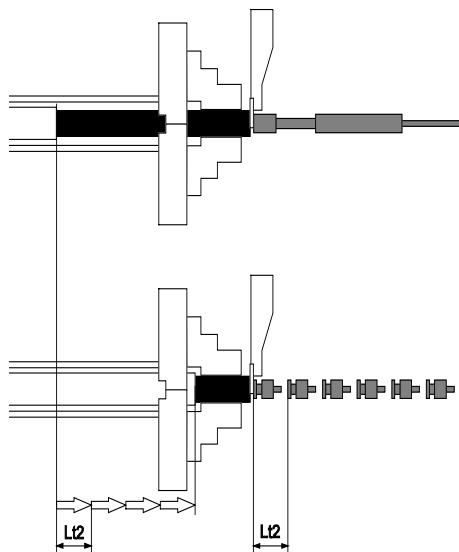
During feeding, the bar is inserted in the spindle and automatically positioned in the clamping unit of the lathe.

This positioning corresponds to a value (**Z**) programmed by the operator, which is equal to the distance between the measuring cell and the position of the material in the lathe clamping device. With this system, the setting is the same for any bar length.

More information in section 7 of this chapter.

Auxiliary end of bar position (may be not visible)

PART SETUP		mm
PRODUCTION CHANGE AT END OF BAR		5
STRAIGHT LENGTH	100	
1	2	3
JOURNAL STAMPING POSITION		1
Function activation		
ESC	PAGE DOWN	



Depending on the lathe and its options, the auxiliary end of bar may be used in several ways. For example, for the opening of an additional front rest installed at the rear of the lathe spindle. The procedure is the same as this for the end of bar signal.

4.2.4. Torques

TORQUE SETUP		mm
		2
Torque during part feed out according to diameter	12	%
Torque during loading according to diameter	12	%
ESC		

Torque set according to the diameter for part feed out (%)

Depending on the bar diameter, the feeder suggests a suitable thrust torque. The operator can modify this torque if required. When the material to be loaded has a high specific weight, the torque must also be high. Conversely, low specific bar weight requires low torque.

Torque set according to the diameter of the material in quick feed (%)

Same principle as for the part feed out torque, this time applied to quick feed.

4.2.5. Miscellaneous functions

Language

LANGUAGE		mm
		2
English		

This parameter allows to adapt the language in which the messages will appear, depending on the country of destination of the bar feed system (*for practical reason, it is not necessary to stop the bar feeder to select a language*).

Miscellaneous functions

MISCELLANEOUS FUNCTIONS		mm 2
Referencing	YES	
Clamping device signal inversion	NO!	YES
Time for clamping device to close	0.0 s	
Time for clamping device to open	0.0 s	

Forced referencing position

This operation allows the bar feeder to find the original parameters and positions of the servo motor if these have been lost.

Clamping mode reversed (*may be not visible*)

The interface signal is reversed depending on whether the clamping device functions by pushing or by pulling. When changing clamping unit, the interface signal that indicates opening and closing is reversed. At this point, the bar feeder will incur an error.

Mechanical closing time for the clamping system (*may not be visible*)

For clamping with a chuck, a closing time may have to be configured to prevent the lathe starting up before the unit has closed completely.

Mechanical opening time for the clamping system (*may not be visible*)

For clamping with a chuck, an opening time may have to be configured to prevent the lathe starting up before the unit has opened completely.

4.2.6. Parts library



The parts library is only operational if an optional memory extension card is installed on the PLC. Please contact LNS for more information.

PART LIBRARY

PART LIBRARY		mm 2
Active Part	2	Memory Present
Total Parts	4	Memory Used 71 Memory Free 4057

The main parts library screen shows the current state of the library.

- Active part: shows the part number currently in use.
- Total parts: shows the total number of parts stored in the library.
- Memory present: A memory extension card is required.
 - Green: Card installed and operational.
- Red: No card installed. No part may be loaded or added to the library, or deleted.
- Memory used: shows the amount of memory used by the parts, in kilobytes.
- Memory free: shows the amount of unused memory, in kilobytes.
-

LOAD PART

PART LIBRARY		mm	
LOAD PART			
Active Part	2	Total Parts	4
Enter part ID: 0			

This screen allows the parameters for an existing part to be recalled from the parts library and loaded into the parts parameters, by indicating its part ID.

- Active part: shows the part currently loaded.
- Total parts: shows the total number of parts stored in the library.
- Enter part ID: enter the ID for the new part to be loaded.

ADD PART / OVERWRITE EXISTING PART

PART LIBRARY		mm	
ADD PART			
Active Part	2	Total Parts	4
Enter part ID: 0			

This screen allows a new part to be added to the parts library by storing all the current parameters under a part ID.

Caution: Entering and confirming an existing part ID overwrites all the parameters for this ID with new ones. Once confirmed, the parameters of the old ID are permanently overwritten in the Parts Library and cannot be recovered.

- Active part: shows the part currently loaded.
- Total parts: shows the total number of parts stored in the library.
- Enter part ID: enter the ID for the new part to be saved.

DELETE PART

PART LIBRARY		mm	
DELETE PART			
Active Part	2	Total Parts	4
Enter part ID: 0			

This screen allows deleting a part from the Parts Library by calling its part ID.

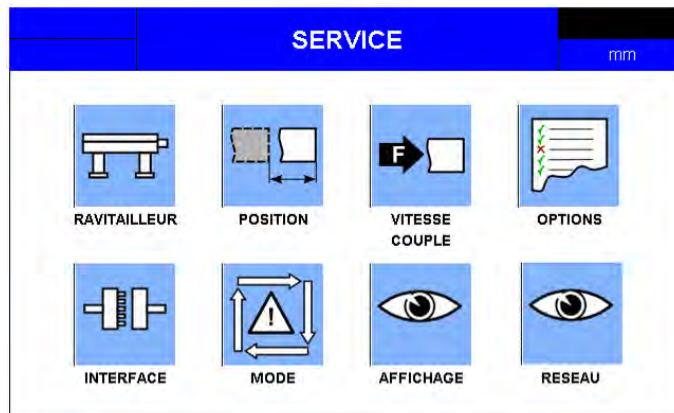
Caution: Entering and confirming an existing part ID overwrites all the parameters for this ID. Once the operation has been confirmed, the parameters for the part are permanently deleted, and cannot be recovered.

- Active part: shows the part currently loaded.
- Total parts: shows the total number of parts stored in the library.
- Enter part ID: enter the ID for the new part to be deleted.

4.2.7. Service



The service parameters allow to configure the bar feed system in its environment and to adapt the interface connected to the lathe. Changing these values can damage the devices and create operator safety issues. Therefore, these parameters are protected with a password, and only an LNS (or certified) technician is authorized to modify them



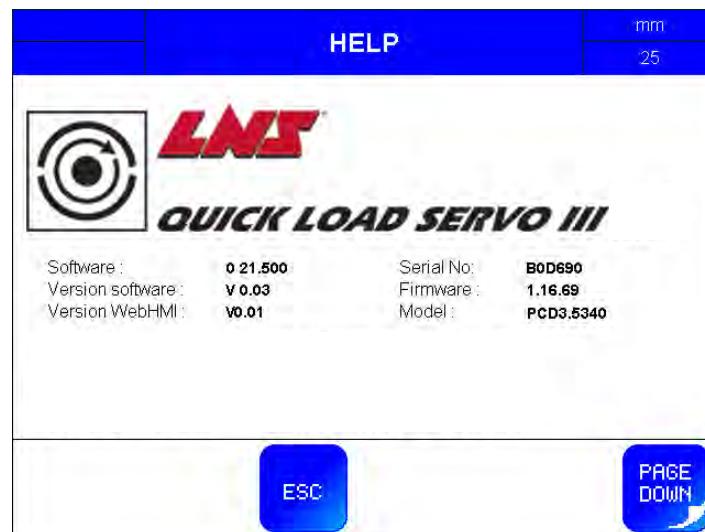
1. Bar feeder	1. Bar feeder location (<i>left hand / right hand</i>) 2. Unit (<i>mm/inch</i>) 3. Time for clamping device to close (<i>factory value 0.0 sec</i>) 4. Time for clamping device to open (<i>factory value 0.0 sec</i>)
2. Position	1. Distance behind the clamping system (<i>mm</i>) 2. Safety distance (<i>factory value 10 mm</i>) 3. Limit position for the loading pusher (<i>mm</i>) 4. Max. bar length (<i>mm</i>) 5. Front limiter position (<i>mm</i>) 6. Measuring probe position (<i>mm</i>) 7. Loading pusher length (<i>mm</i>)
3. Speed/Torque	1. Speed before bar measurement (<i>min/max factory values 80 - 400 rpm</i>) 2. Loading cycle speed (<i>min/max factory values 100 -3000 rpm</i>) 3. Speed without bar (<i>min/max factory values 1000 - 4000 rpm</i>) 4. Bar feed rate (<i>min/max factory values 100 - 3000 rpm</i>) 5. Speed at front in manual mode (<i>min/max factory values 100 - 1000 rpm</i>) 6. Speed at rear in manual mode (<i>min/max factory values 100 - 2000 rpm</i>) 7. Torque without bar (<i>min/max factory values 0 - 100%</i>) 8. Torque during bar loading (<i>min/max factory values 2 - 80%</i>) 9. Torque during part loading (<i>min/max factory values 2 - 80%</i>)
4. Options	1. Bar feeder with guide for profiled bars (no/yes) 2. Bar feed with telescopic pusher (no/yes)
5. Interface (standard parameters)	These parameters set the communication and working mode between the lathe and the barfeed.
6. Working mode setup	1. Bar feeder in : Working mode (normal operation) 2. Simulation 3. Demo mode 4. Interface simulation with lathe, without bar
7. Display	1. Parameter access: Sub spindle (no/yes) 2. Parameter access: Quick part loading (no/yes) 3. Parameter access: Loading with non-rotating reduction (no/yes) 4. Parameter access: Mechanical stop (no/yes) 5. Parameter access: Dry run function (no/yes)

6. Parameter access: Loading with turret (*no/yes*)
 7. Parameter access: Bar feeding with or without M-code (*no/yes*)
 8. Parameter access: Sub spindle: fixed or mobile (*no/yes*)
 9. Parameter access: End of bar (*yes/no*)
 10. Parameter access: Top-cut position (*no/yes*)
 11. Parameter access: Lathe collet signal inversion (*no/yes*)
 12. Parameter access: Loading pusher position (*no/yes*)
 13. Parameter access: Variable or constant bar length (*no/yes*)
 14. Parameter access: Selection of production (*no/yes*)
 15. Parameter access: Part feed out rate (*no/yes*)
-

4.2.8. Help screens

From any screen in manual or automatic mode, press the HELP or "?" button on the screen, displays the help screens to troubleshoot or gather information about the software and components.

1. Software



This screen displays the current software running the bar feeder and its version.

2. Interface

		HELP		mm
		INTERFACE		25
		INPUT	OUTPUT	
A1	<input type="radio"/>	BF Mode	<input type="radio"/>	R1 <input type="radio"/> Jog Spd.
A2	<input type="radio"/>	Cycle Start	<input type="radio"/>	R2 <input type="radio"/> BF Ready
A3 - M65	<input type="radio"/>	M69	<input type="radio"/>	R3 <input type="radio"/> COM_OUT
A4 - M68	<input type="radio"/>	Part Req.	<input type="radio"/>	R4 <input type="radio"/>
A5	<input type="radio"/>	M564	<input type="radio"/>	R5 <input type="radio"/>
A6	<input type="radio"/>	COM_IN	<input type="radio"/>	R6 <input type="radio"/>
A7	<input type="radio"/>			R7 <input type="radio"/>
A8	<input type="radio"/>			R10 <input type="radio"/>

At the bottom are three buttons: "PAGE UP" (disabled), "ESC", and "PAGE DOWN".

This screen shows the current signals being sent / received through the interface between the barfeed and the lathe.

3. Inputs

		HELP		mm
		INPUT		5
		MODULE 1		MODULE 2
I0 - K8-24	<input checked="" type="radio"/>	I8 - SQ1	<input checked="" type="radio"/>	I16 - <input type="radio"/>
I1 - SP1	<input checked="" type="radio"/>	I9 - SQ2	<input type="radio"/>	I17 - <input type="radio"/>
I2 - SQ10	<input type="radio"/>	I10 - SQ3	<input type="radio"/>	I18 - <input type="radio"/>
I3 - SQ11	<input type="radio"/>	I11 - SQ4	<input type="radio"/>	I19 - <input type="radio"/>
I4 - SQ12	<input type="radio"/>	I12 - SQ5	<input checked="" type="radio"/>	I20 - <input type="radio"/>
I5 - K10	<input type="radio"/>	I13 - SQ30	<input type="radio"/>	I21 - <input type="radio"/>
I6 -	<input type="radio"/>	I14 - SQ31	<input type="radio"/>	I22 - <input type="radio"/>
I7 -	<input type="radio"/>	I15 -	<input type="radio"/>	I23 - <input type="radio"/>
PAGE UP		ESC	PAGE DOWN	

This screen shows the current input signals being used in the barfeed.

4. Outputs

		HELP		mm
		OUTPUT		25
		MODULE 3		MODULE 4
O32 - YV1A	<input checked="" type="radio"/>	O40 - YV2	<input type="radio"/>	O48 - <input type="radio"/>
O33 - YV1B	<input type="radio"/>	O41 -	<input type="radio"/>	O49 - <input type="radio"/>
O34 - KA1	<input type="radio"/>	O42 -	<input type="radio"/>	O50 - <input type="radio"/>
O35 - KA2	<input type="radio"/>	O43 -	<input type="radio"/>	O51 - <input type="radio"/>
O36 - SON	<input type="radio"/>	O44 -	<input type="radio"/>	O52 - <input type="radio"/>
O37 -	<input type="radio"/>	O45 -	<input type="radio"/>	O53 - <input type="radio"/>
O38 - YV3	<input type="radio"/>	O46 -	<input type="radio"/>	O54 - <input type="radio"/>
O39 -	<input type="radio"/>	O47 - KS	<input type="radio"/>	O55 - <input type="radio"/>
PAGE UP		ESC	PAGE DOWN	

This screen shows the current output signals being used in the barfeed.

5. Alarms list

HELP			mm
ALARM LIST			25
1:	1	6:	1
2:	1	7:	1
3:	1	8:	1
4:	6	9:	1
5:	6	10:	1

PAGE UP **ESC** **PAGE DOWN**

This screen shows the history of the last 10 alarms.

6. Memory list

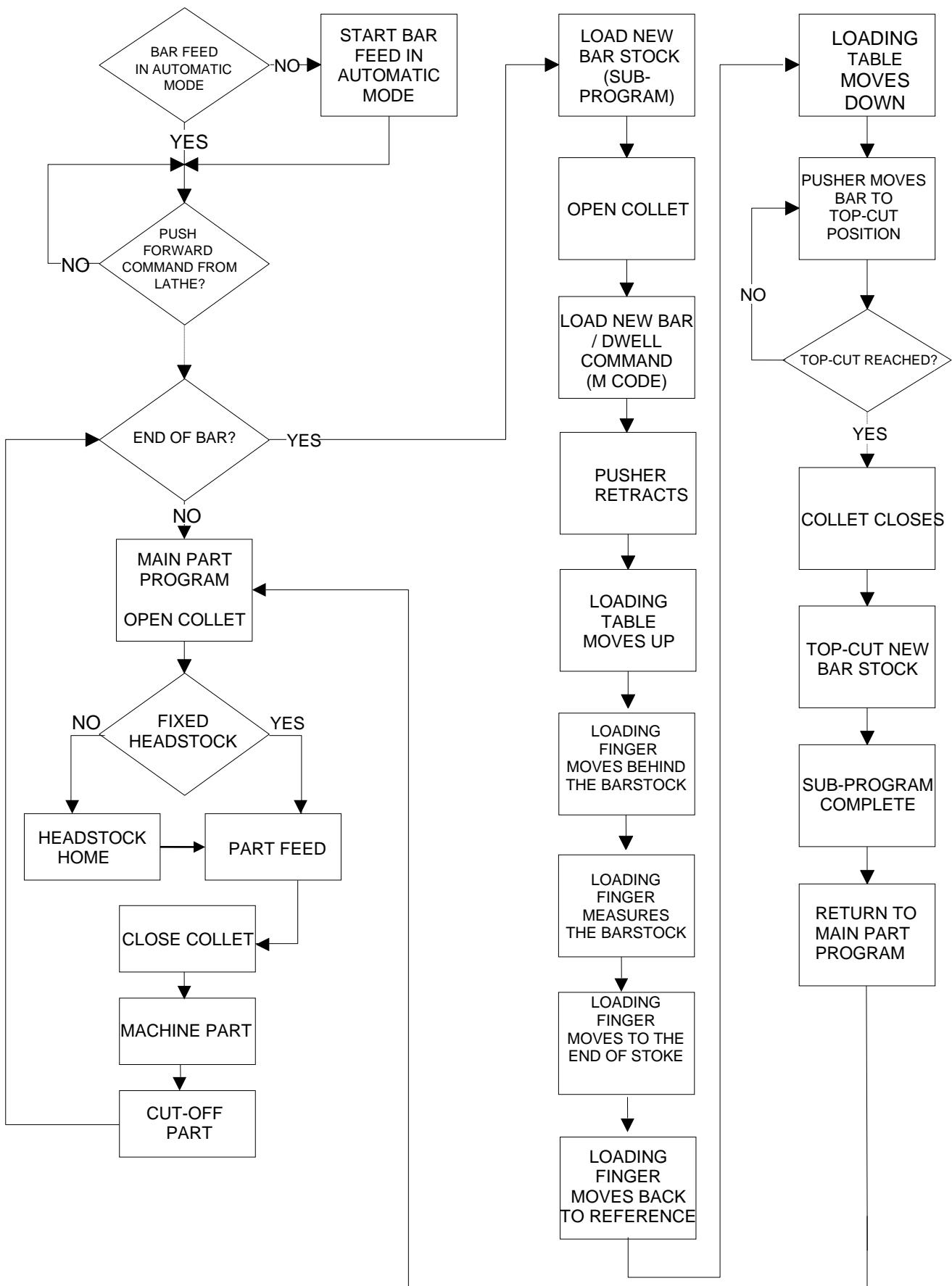
HELP			mm
MEMORY LIST			25
BIT	REGISTER		
0	0	1100	
0	0	1100	
0	0	1100	
0	0	1100	
0	0	1100	
0	0	1100	

PAGE UP **ESC** **PAGE DOWN**

This screen helps entering and monitoring specific bits (status in green/red), and register values (value in left box).

5. AUTOMATIC CYCLE

5.1. Sequential diagram



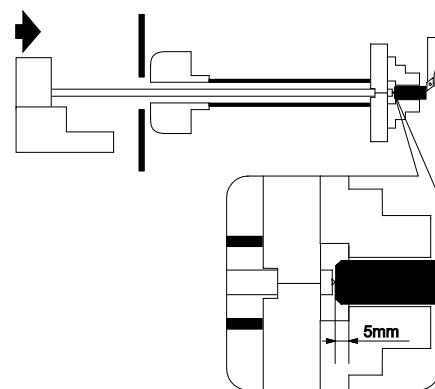
6. END OF BAR POSITION

6.1. Description

The end of bar position determines the moment when the bar feed enters the loading cycle.

Usually, the end of bar position is adjusted as closely as possible behind the clamping system of the lathe (approximately 5 mm or a 1/4" behind the chuck jaws or collet pads). This will provide minimum bar stock remnant.

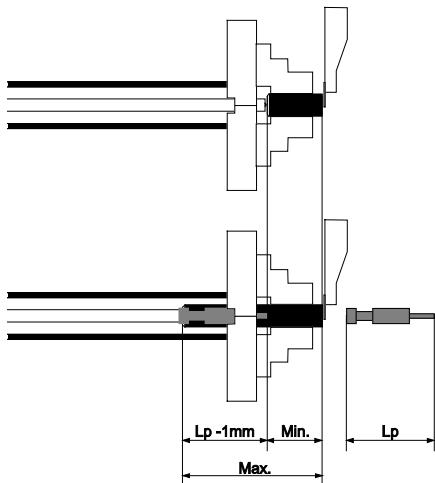
Regardless of the length of the bars or parts, the end of bar position is always the same.



The length of the remnant may vary :

- The minimum remnant length (Min) is obtained when the feeding pusher is just behind the clamping device while the last part is being machined.
- The maximum (Max) remnant length is obtained when there is not enough material for machining an additional part ($L_p - 1 \text{ mm}$).

$$\text{Max remnant} = L_p - 1 \text{ mm} + \text{Min}$$



6.2. Setting



Before handling the bar feeder, stop the lathe at the end of part cycle !

To edit these parameters, the bar feeder must be in **STOP** mode. To validate a new parameter or a new value, keep **[ENTER]** pressed until the icon disappears.

1 Press the key **[STOP]**.

2 Press the key **[MENU]**.

3 Press the key **[POSITIONS]** on the screen.

4 Press the key attributed to the icon **[PAGE DOWN]** to scroll through the screens, until the "END OF BAR" screen is displayed.

5



The remote command displays the following text : "**END OF BAR POSITION**".

Tap the value displayed on the screen.



Depending on which sequence the bar feed is in when the parameter is selected, the available functions and icons can change :

Conditions	Functions	
	By offset correction	By teaching
- Loading table lowered	Icon [+/-]	Icon [TEACH IN]
- No bar in the table		---
- Loaded with extended loading pusher	Icon [+/-]	

Setting by offset correction:

jump to point 6

Setting by teach in:

jump to point 7

6



[+/-] by offset correction:

- Press the key corresponding to the icon [+/-].
- The display shows the current end of bar position.
- Select the field named "Enter the new value", enter the correction to be considered and confirm with ok.
- Press the [+] icon to add the value, or the icon [-] to subtract it. The new value is stored.
- To exit the end of bar set mode, press the key attributed to the icon [ESC].



Jump to point 8.

7



[TEACH IN]



[REW] [FWD]



[ENTER]

[TEACH IN] By teaching:

- Press the key attributed to the icon [TEACH IN]. The display shows the current end of bar position.
- Press the [FWD] icon and advance the pusher to the desired position (see previous page). Correct if necessary with the key [REW].
- To validate the new end of bar position, keep [ENTER] pressed until the screen blinks.

8



[ESC]

or



[STOP]

To exit the set mode, press the keys [ESC] or [STOP].

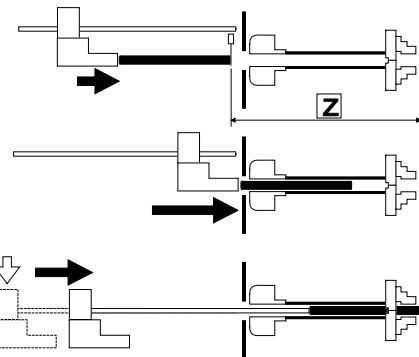
7. TOP-CUT POSITION

7.1. Description

During feeding, the bar is inserted in the spindle and automatically positioned in the clamping unit of the lathe.

This positioning corresponds to a value (**Z**) programmed by the operator, which is equal to the distance between the measuring cell and the position of the material in the lathe clamping device.

With this system, the setting is the same for any bar length.



7.2. Setting



Before handling the bar feeder, stop the lathe at the end of part cycle !

To edit these parameters, the bar feeder must be in **STOP** mode. To validate a new parameter or a new value, keep **[ENTER]** pressed until the icon disappears.

- 1 **STOP**
[STOP] Press the key **[STOP]**.

- 2 **MENU**
[MENU] Press the key **[MENU]**.

- 3 **POSITIONS**
Press the key **[POSITIONS]** on the screen.

- 4 **PAGE DOWN**
[PAGE DOWN] Press the key attributed to the icon **[PAGE DOWN]** to scroll through the screens, until the "TOP CUT POSITION" screen is displayed.

- 5 The remote command displays the following text : "**TOP CUT POSITION**".

Tap the value displayed on the screen.

Depending on which sequence the bar feed is in when the parameter is selected, the available functions and icons can change :

Conditions	Functions	
	By offset correction	By teaching
- Loading table lowered	Icon [+/-]	Icon [TEACH IN]
- No bar in the table		
- Loaded with extended loading pusher	Icon [+/-]	---

Setting by offset correction:
Setting by teach in:

jump to point 6
jump to point 7

6



[+/-] by offset correction:

- Press the key corresponding to the icon [+/-].
- The current top-cut position (z) is displayed.
- Select the field named "Enter the new value", enter the correction to be considered and confirm with ok.
- Press the [+] icon to add the value, or the icon [-] to subtract it. The new value is stored.
- To exit the end of bar set mode, press the key attributed to the icon [ESC].

Jump to point 8.

7



[TEACH IN] By teaching:

- Press the key attributed to the icon [TEACH IN].
- Press the key attributed to the icon [START].
The loading table is raised, and loads a bar. The feeding pusher inserts the bar into the lathe spindle. The loading pusher retracts, and the loading table is lowered. The feeding pusher is now facing the spindle.
- Press the [FWD] icon and advance the pusher to the desired position (see previous page). Correct if necessary with the key [REW].
- To validate the new end of bar position, keep [ENTER] pressed until the screen blinks.

8



To exit the set mode, press the keys [ESC] or [STOP].

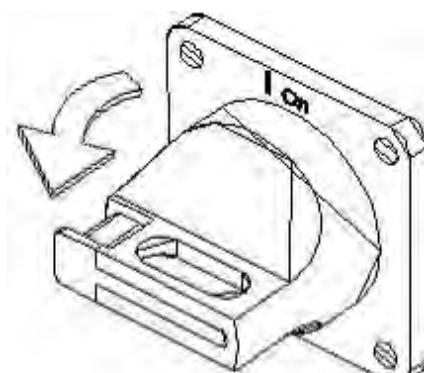
8. POWERING DOWN



Before handling the bar feeder, stop the lathe at the end of part cycle.

When activating the unit, check that the pusher is in the rear position, the table is in the lowered position, and that no bar is loaded.

To power down, turn the switch to the left, to the **0-off** position.



CHAPTER 8: MALFUNCTIONS/MAINTENANCE

1. ALARMS



Please read the safety instructions provided at the beginning of this manual before handling the following devices.



Particular attention should be given to the handling of electrical elements because of risks of electrocution. In case of possible electrical malfunctions, it is advisable to contact LNS or their local representative.

1.1. PLC alarms

AL01 - SAFETY LINE OPEN!

Description

The lathe or the bar feeder goes into an emergency stop condition. The problem is generated anytime the safety line opened.

Solutions

Check the states of the emergency stop buttons of barfeed and lathe.
Check the wiring according to the electrical drawings.
Check the PLC connection.

AL02 - MAIN ACCESS COVER OPEN !

Description

The PLC does not detect the input (I2 – SQ10) for the safety sensor on the protection cover. The problem is generated when the protection cover is open, exposing the automated mechanical parts.

Solutions

Close the cover.
Check probe SQ10.

AL03 - PROTECTION GRID OPEN!

Description

The PLC does not detect the input (I3 – SQ11) for the safety sensor on the protection grid. The problem is generated when the grid is open, exposing the automated mechanical parts.

Solutions

Close the protection grid.
Check switch SQ11.

AL04 - BAR FEEDER NOT IN WORKING POSITION!

Description

The PLC does not detect the input (I4 – SQ12) for the safety sensor on the retraction system. The problem is generated when the barfeeder has not been brought into working position.

Solutions

Check the bar feeder position.
Check switch SQ12.

AL05 -

Not in use.

AL06 - AIR PRESSURE TOO LOW!**Description**

The PLC does not detect input (I1 – SP1). The problem is generated any time the air pressure is below 3 bar or 45 psi.

Solutions

Check the air pressure (min. 3 bar and max. 6 bar).

Adjust pressure switch SP1.

Replace pressure switch SP1.

AL07 -

Not used.

AL08 -

Not used.

AL09 -

Not used.

AL10 - SWITCH SQ1 FAULT!**Description**

The PLC does not detect input (I8 – SQ1).

Solutions

Check probe SQ1.

AL11 - SWITCH SQ2 FAULT!**Description**

The PLC does not detect input (I9 – SQ2).

Solutions

Check probe SQ2.

AL12 - FAULT WHEN RAISING THE TABLE!**Description**

A mechanical blockage prevents the table being raised.

Solutions

Check that no mechanical obstruction is preventing the table being raised.

AL13 - SWITCH SQ1 FAULT!**Description**

The PLC does not detect input (I8 – SQ1).

Solutions

Check probe SQ1.

AL14 - SWITCH SQ2 FAULT!**Description**

The PLC does not detect input (I9 – SQ2).

Solutions

Check probe SQ2.

AL15 - FAULT WHEN LOWERING THE TABLE!**Description**

A mechanical blockage prevents the table being lowered.

Solutions

Check that no mechanical obstruction is preventing the table being lowered.

AL16 - PROBE SQ3 FAULT!**Description**

The PLC does not detect input (I10 – SQ3).

Solutions

Check probe SQ3.

AL17 - PROBE SQ4 OR MOTOR M2 FAULT!**Description**

The PLC does not detect input (I11 – SQ4).

Solutions

Check probe SQ4.

Check motor M2.

AL18 - PROBE SQ5 FAULT!**Description**

The PLC does not detect input (I12 – SQ5).

Solutions

Check probe SQ5.

AL19 -

Not used.

AL20 - LIGHT PROBE SQ3 ACTIVATED TOO SOON!**Description**

The alarm "LIGHT PROBE SQ3 ACTIVATED TOO SOON!" is generated when the PLC detects the input (I10 – SQ3) before the safety distance has been reached during measurement of the bar.

Solutions:

Press the **STOP** button on the remote control to clear the message.

Press the **MENU** button.

Press the **SERVICE** button.

Press the **POSITION** button.

Find the value corresponding to the text "**MAX BAR LENGTH**".

This value may not exceed that of the bar length. If necessary, correct this value.

Measure the bar to be loaded. This bar must not exceed the value entered above.

AL21 – BAR MAGAZINE EMPTY!**Description**

No bar has been detected in the bar feeder.

Solutions

Check presence of bars on the ramp.

Load bar stock to continue the production.

AL22 - LOADING CYCLE INTERRUPTED!**Description**

Signal A2 (automatic cycle) has been lost.

Solutions

Check the lathe <-> bar feeder connection.

Verify the wiring of the signal A2.

Check the lathe programming.

AL23 - LOADING TIME ELAPSED!**Description**

The time allotted to reach the position has elapsed.

Solutions

Remove the bar out of the spindle.

Start the top-cut cycle again.

Check the part settings.

AL24 - LATHE DID NOT RESUME ITS PRODUCTION CYCLE !**Description**

The alarm "LATHE DID NOT RESUME ITS PRODUCTION CYCLE!" is generated if the bar feeder does not receive the signal from the lathe collet (I24 – A1) within a minute of it reaching the top-cut position.

Solutions

Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.

Restart the bar feeder and the lathe automatic cycle.

AL25 - THE LATHE COLLET WAS OPENED DURING THE PRODUCTION CYCLE!**Description**

Signal A1 (Lathe collet) was detected at an inappropriate time.

Solutions

Check the lathe programming.

AL26 - LATHE COLLET CLOSED BEFORE END OF FEED OUT!**Description**

The signal A1 (lathe's chuck signal) has been lost before the end of the positioning.

Solutions

Check the lathe programming.

Check the interface wiring.

AL27 - THE PART FEED OUT TIME HAS ELAPSED!**Description**

The time allotted to reach the position has elapsed.

Solutions

Signal A1 missing.

Check the presence of the signal when the collet is closed.

Check the wiring of the collet signal.

AL28 - START OF PART M-CODE GENERATED NOT SYNCHRO!**Description**

The parts counter and the number of collet openings do not match.

Solutions

Check the lathe programming.

Check the number of collet openings in the collet settings.

AL29 -

Not used.

AL30 - TELESCOPIC PUSHER SYSTEM FAULT**Description**

The telescopic pusher system has caused an error.

Solutions

Contact your LNS agent.

AL31 -

Not used.

AL32 -

Not used.

AL33 -

Not used.

AL34 -

Not used.

AL35 -

Not used.

AL36 -

Not used.

AL37 – MOTOR POSITION NOT REACHED!**Description**

The motor has encountered resistance during movement.

Solutions

Search for a mechanical obstruction such as a bar loaded incorrectly, tools forgotten in the apparatus, an incompatibility between the diameters of the plunger and pin reduction.

AL38 - CC-LINK COMMUNICATION FAULT!**Description**

There is a communication issue between the lathe and the bar feeder.

Solutions

Contact your LNS agent.

AL39 - CUT OFF FEED FAULT!**Description**

The values do not match the specifications.

Solutions

The value must be greater than 0 mm, up to a maximum of 50 mm.

The value must be shorter than the remnant length.

The part ID in the library must be in the range 9990-9999.

AL40 – A BAR IS PRESENT IN SIMULATION!**Description**

A bar has been detected during simulation, which is not allowed.

Solutions

Check for bar presence and remove it.

AL41 - PART ID DOES NOT EXIST**Description**

An invalid part ID was requested.

Solutions

Check the part ID. If necessary, create the ID before use.

AL42 - FILE READ ERROR!**Description**

File cannot be read.

Solutions

Check the file (when loading the part). If it cannot be read, delete then recreate it.

AL43 - INCORRECT PART CONFIGURATION!**Description**

The required part ID does not match the current parameters.

Solutions

Check the bar diameter and the bar shape.

AL44 - PART LOADING FAULT!**Description**

M-Code request parameter deactivated.

Solutions

Check that the M-Code request is active.

AL45 – POSITION NOT REACHED !**Description**

An obstacle prevents the progression of the pusher.

Solutions

Search for a mechanical obstruction such as a bar loaded incorrectly, tools forgotten in the apparatus, an incompatibility between the diameters of the plunger and pin reduction.

AL46 – SERVO MOTOR NOT READY!**Description**

There is a communication problem between PLC and servo amplifier.

Solutions

Check that cable CN1B is correctly connected to the servo driver.
Check that the sound output is activated in manual or auto mode.

AL47 – ALARM ON THE AMPLIFIER!**Description**

An alarm was generated by the servo amplifier.

Solutions

Please refer to CHAPTER 8: MALFUNCTIONS/MAINTENANCE, section 1.2. Servo amplifier alarms.

AL48 - COMMUNICATION ERROR!**Description**

There is a communication problem between PLC and servo amplifier.

Solutions

Check the connection between the PLC and amplifier.

Check the 24V power supply is not fluctuating.

AL49 – AMPLIFIER BATTERY LOW!**Description**

The voltage level of the battery located on the motor power driver is low.

Solutions

The charge level of the amplifier battery is low. Replace as soon as possible. **Do not switch off the bar feeder until the battery has been replaced.**

AL50 - INCOMPATIBLE AMPLIFIER FIRMWARE!**Description**

The firmware of the servo driver is not compatible with the LNS software.

Solutions

Please replace the driver. (check with your LNS representative).

1.2. Servo amplifier alarms



Please read the safety instructions provided at the beginning of this manual before handling the following devices.



Particular attention should be given to the handling of electrical elements because of risks of electrocution. In case of possible electrical malfunctions, it is advisable to contact LNS or their local representative.

	Display	Alarm code (note 2)			Error name	Deactivation of the alarm		
		Pin CN1B -19	Pin CN1A -18	Pin CN1A -19		Power ON-> OFF	Press "SET" on the control unit	Alarm reset signal
Alarms	AL.10	0	1	0	Electrical voltage too low	✓	✓	✓
	AL.12	0	0	0	Memory 1 error	✓	-	-
	AL.13	0	0	0	Timer error	✓	-	-
	AL.15	0	0	0	Memory 2 error	✓	-	-
	AL.16	1	1	0	Encoder 1 error	✓	-	-
	AL.17	0	0	0	Circuit error	✓	-	-
	AL.19	0	0	0	Memory 3 error	✓	-	-
	AL.1A	1	1	0	Motor combination error	✓	-	-
	AL.20	1	1	0	Encoder 2 error	✓	-	-
	AL.24	1	0	0	Main circuit error	✓	-	-
	AL.25	1	1	0	Complete position clearance	✓	-	-
	AL.30	0	0	1	Regeneration error	✓	✓	✓
	AL.31	1	0	1	Overspeed	✓	✓	✓
	AL.32	1	0	0	Electrical current too high	✓	✓	✓
	AL.33	0	0	1	Electrical voltage too high	✓	-	-
	AL.35	1	0	1	Command pulsation frequency error	✓	✓	✓
	AL.37	0	0	0	Parameter error	✓	-	-
	AL.45	0	1	1	Main circuit overheating	✓	✓	✓
	AL.46	0	1	1	Servo motor overheating	✓	✓	✓
	AL.50	0	1	1	Overload 1	✓(note 1)	✓(note 1)	✓(note 1)
	AL.51	0	1	1	Overload 2	✓(note 1)	✓(note 1)	✓(note 1)
	AL.52	1	0	1	Excessive error	✓	✓	✓
	AL.8A	0	0	0	Serial comm. time-out error	✓	✓	✓
	AL.8E	0	0	0	Serial communication error	✓	✓	✓
	8888	0	0	0	Watchdog	✓	-	-
Warnings	AL.90	Return to start pos. incomplete "Open battery cable" warning "Start pos. setting" warning "Software limit" warning "Battery" warning "Excessive regen." warning "Overload" warning "Complete pos. count" warning "Servo emergency stop" warning "Low elec. voltage" warning			The removal of the cause automatically deactivates the warning.			
	AL.92							
	AL.96							
	AL.98							
	AL.9F							
	AL.E0							
	AL.E1							
	AL.E3							
	AL.E6							
	AL.E9							

Note 1: Deactivate the alarm 30 minutes after having deleted the cause to allow time for cooling.

Note 2: 0 = off / 1 = on

2. MAINTENANCE



Please read the safety instructions provided at the beginning of this manual before handling the following devices.

2.1. Pneumatics

The air unit filter is equipped with an automatic drain valve, avoiding the need to empty it. The water recuperated comes from the pneumatic circuit of the building. It is recommended that steps are taken to ensure the air supplied to the bar feeder is as dry as possible (see CHAPTER 5: PNEUMATICS).

2.2. Batteries

In the event of a power failure, a backup battery saves the data contained in the PLC. It is possible that with time this battery will slowly drain; in this case a message will be displayed on the remote control. The battery must be replaced as soon as possible with a battery of the same type.



Switching off the bar feeder when the message "Battery low" is displayed may wipe the parameters. Do not switch off the power until the battery has been replaced.

2.3. Belt

It is possible that after a certain amount of use, the bar feeder belt will require tensioning. Refer to chapter 6. GENERAL DESCRIPTION, section 6. BELT.

2.4. Cleaning

Regular cleaning of your bar feeder can only serve to improve its operation and prolong its useful life.

To clean the outside, use a soft cloth and a regular detergent; for the inside, use a cloth or a brush soaked in petrol or benzine. However, make sure that the rollers and parts made of synthetic materials do not come into contact with these products.

The use of compressed air for cleaning is not advisable, because particles could become lodged in sensitive areas and compromise the operation of the bar feeder.



At no time should solvents, such as acetone or thinners be used for cleaning the bar feeder. At no time should cleaning products come into contact with electrical components.

2.5. Spare parts

Unless written consent is provided by LNS, no addition or modification may be made to the machine or its spare parts.

LNS cannot be held liable if spare parts not provided by LNS are used.

CHAPTER 9: APPENDICES

1. ORDERING FORM

This form should be photocopied, duly filled out, and returned to your retailer or nearest LNS agent.

Company name:

Person in charge:

Address:

ZIP: _____ City: _____

Country:

Phone:

Fax:

Type of device:

Serial number:

Expected delivery:

Location and date:

Signature and stamp of the company:

2. PROGRAMMING EXAMPLE

MAIN PROGRAM

N... "M" CODE "LATHE IN AUTOMATIC CYCLE"
 N... SPINDLE STOP
 N... COOLANT OFF
 N... TURRET TO FEED IN POSITION
 N... CLAMPING UNIT OPEN
 N... TURRET TO FEED OUT POSITION

N... END OF BAR CHECK
 (PROGRAM JUMPS) >

N... CLOSE CLAMPING UNIT
 N... TURRET HOME
 N...

PART PROGRAM

N... X, Z, G, F, T, S, M, ...
 N... MACHINE PART
 N... PARTS CATCHER IN (IF AVAILABLE)
 N... TOP-CUT
 N... PARTS CATCHER OFF (IF INSTALLED)
 N...
 N...
 N... X, Z, G, F, T, S, M, ...
 N...
 N... END OF PROGRAM (LOOP)

> SUB-PROGRAM

N... TURRET HOME
 ... "M"CODE (FEED OK)
 N... CLOSE CLAMPING UNIT
 N... START SPINDLE
 N... COOLANT ON
 N... TOP-CUT
 N...
 N...
 N... END OF SUB-PROGRAM
 < (RETURN TO MAIN PROGRAM)

Important: The above is only an example. Programming may change depending on the interface.

3. LNS ADDRESSES & CONTACTS

LNS Europe: www.lns-europe.com
LNS America: www.lns-america.com
LNS Asia: www.lns-asia.com