AUTOMATIC BAR FEEDER

ATTACHMENTS LIST
MANUAL FOR USE AND MAINTENANCE
KEYBOARD INSTRUCTION MANUAL
SPARE PARTS BOOK
SCHEMATICS
EC CONFORMITY DECLARATION FOR MACHINE

Master 100 F Verso

EN **MANUAL FOR USE AND MAINTENANCE**

Rel. 1.0 **Date** 30/11/2011

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S/N

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ON APPROVAL: Sbarzaglia Ivan

This manual is a translation of the original document

MANUFACTURER:	**IEMCA division of IGMI S.p.A.**
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TYPE OF DOCUMENT:	**MANUAL FOR USE AND MAINTENANCE**
PRODUCT:	**AUTOMATIC BAR FEEDER**
MODEL:	**Master 100 F Verso**

IEMCA S.p.A.
Via Granarolo, 167
Tel. 0546/698000 - Fax. 0546/46224
TLX 550879

INDEX

The operations described in the sections that are preceded by this symbol must be performed by qualified and skilled personnel with specific abilities and precise technical competence only.
Any other operation can be performed either by qualified personnel and/or by professional bar feeder operators.

Before carrying out any operation on the bar feeder, it is of the utmost importance to read this manual carefully.

1.1 WARRANTY CONDITIONS

The applicable warranty period is subordinated to a correct assembly and coupling of the bar feeder to the lathe. In particular, prior to the first start-up, accurately make sure that the bar feeder is correctly aligned with the lathe and fixed with the expansion plugs as shown in chapter 4.

The product warranty is valid only if the bar feeder is installed by an authorized technician with Original Installation Certificate.
Please ask the technician, who will make the installation, to show the certificate, in order to ascertain the quality of the technical operations being carried out.
The warranty shall begin from the date on the “Installation Certificate” duly filled in and signed.
The document must be sent by mail to:
TECHNICAL SERVICE DEPARTMENT
IEMCA division of IGMI spa
48018 Faenza (Ra) ITALY - Via Granarolo, 167

1.2 PURPOSE OF THE MANUAL

This manual has been written and supplied by the manufacturer, the information herein contained has been written in Italian (manufacturer's language) to be translated to other languages, in order to comply with legal and/or commercial requirements. This manual is integral part of the bar feeder equipment.

The compliance with the instructions herein ensures the operator and bar feeder safety as well as economy of operation and longer life of the bar feeder itself.

The important parts of this manual have been highlighted in bold type and are preceded by the following symbols:

DANGER - WARNING:

indicates impending danger which might cause serious injuries; exert the maximum caution.

WARNING – CAUTION:

indicates that it is necessary to adopt suitable behaviours so as to avoid accidents or damages to property.

INFORMATION:

these are technical instructions of particular importance.

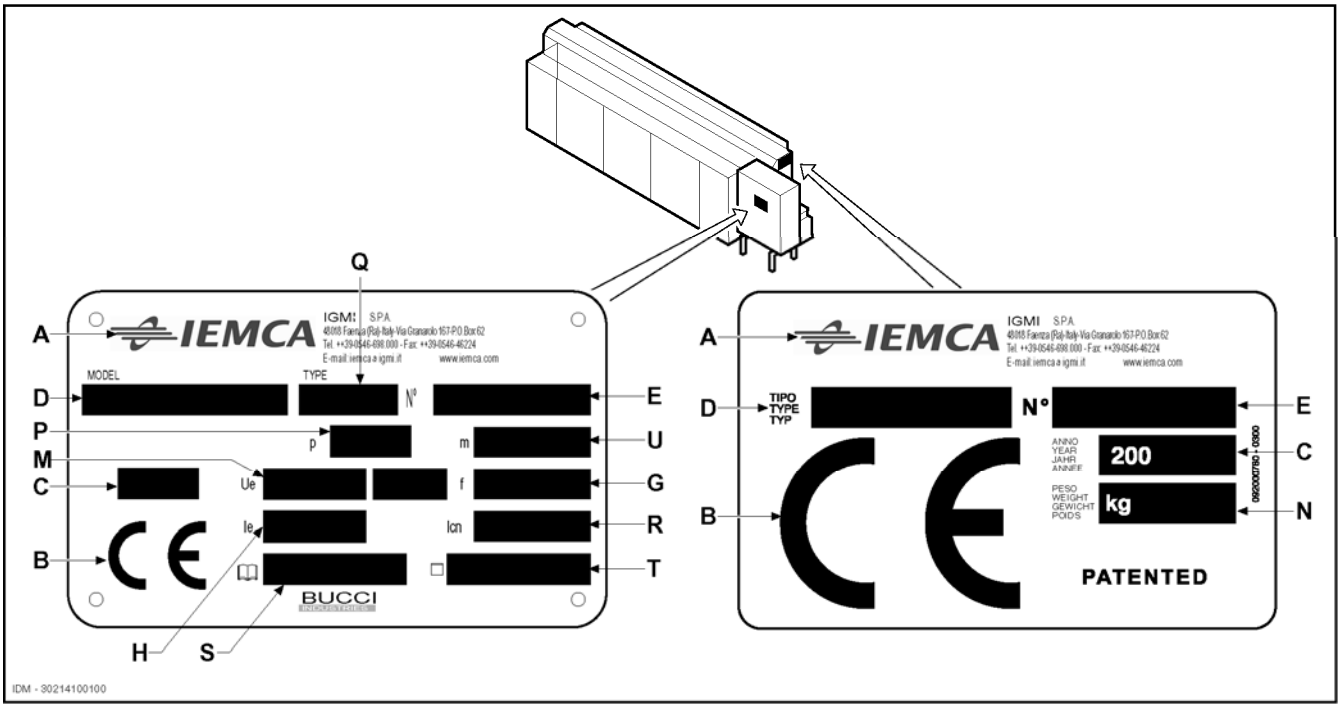
For a quick search of the topics, see the table of contents.
This manual, which contains all the instructions for the bar feeder operation and maintenance, is supplied with: the "Keyboard instruction manual".
The "Keyboard instruction manual" contains all the instructions on how to use the installed software.

INFORMATION:

The data included in this publication are only given as an example.

IEMCA may apply changes to the model described in this publication at any time for any technical or business reason. Contact IEMCA service department for further information.

1.3 MANUFACTURER AND BAR FEEDER IDENTIFICATION



A Manufacturer identification.
B EC mark of conformity.
C Year of manufacture.
D Bar feeder model.
E Serial number.
G Mains frequency.
H Power consumption.
M Supply voltage.
N Bar feeder weight.
P Pneumatic system pressure.
Q Bar feeder and bar pusher length.
R Interrupting power.
S Basic Wiring Diagram Number.
T Interface Wiring Diagram Number.
U Electric cabinet weight

INFORMATION:
always provide the manufacturer with the above mentioned specifications when requesting information or ordering spare parts, etc.

1.4 ASSISTANCE REQUEST

Whenever necessary, please apply to one of the centres shown in the "LIST OF THE CUSTOMER SERVICE CENTRES".

INFORMATION:

when requesting technical assistance for the bar feeder, always specify the data shown on the identification plate.

1.5 GLOSSARY AND TERMINOLOGY

Some recurrent words in the manual are here described in order to provide a more complete understanding of their meaning.
Routine maintenance: set of operations necessary to ensure the appropriate operation and efficiency of the bar feeder. Usually these operations are programmed by the manufacturer who defines the necessary competence and the assistance procedures.
Extraordinary maintenance: set of operations necessary to ensure the appropriate operation and efficiency of the bar feeder. These operations are not programmed by the manufacturer and must be carried out by the maintenance technician.
Expert technician: authorized person chosen among those who have the requirements, competence and information needed for the installation, operation and unscheduled maintenance of the bar feeder.
Expert operator: authorized person chosen among those who have the requirements, competence and information needed for the installation, operation and scheduled maintenance of the bar feeder.
Loading axis: axis of the bar coinciding with the spindle axis of the lathe.
Remnant: final ejection portion of the machined bar.
Facing position: position of the bar in the lathe, during the facing phase.
Solenoid valve: is essentially a valve that allows a fluid (liquid or gaseous) to pass through an opening detected by the same valve; the actuator of the mechanical drive of the valve is electrically controlled.
Magneto-thermal switch: also called automatic relay, is an electrotechnic device able to stop a circuit in case of overvoltage.
Threading tool: the tap is a threading device, which can be used manually with the tap wrench or mechanically fitted to the tap wrench. It kirves the female threads inside the holes for the internal screw threads and nuts. The thread carried out with the tap wrench is called tapping.
An actuator is a mechanism through which an agent (examples of actuators are electrical motors, the hydraulic cylinders, the relays, the electroactive polymers, the pneumatic devices) acts on the environment. The agent can either be an artificial intelligent agent or any other self-governing being (human, animal).

1.6 ATTACHMENT LIST

- Spare parts catalogue

- Keyboard instruction manual
- Interface wiring diagram
- CD:
  Depliant
  Spare parts catalogue
  Instruction manual
  Operation and maintenance manual
  Guide channel assembly diagram
  Base wiring diagram
  List of customer service centres.

INDEX

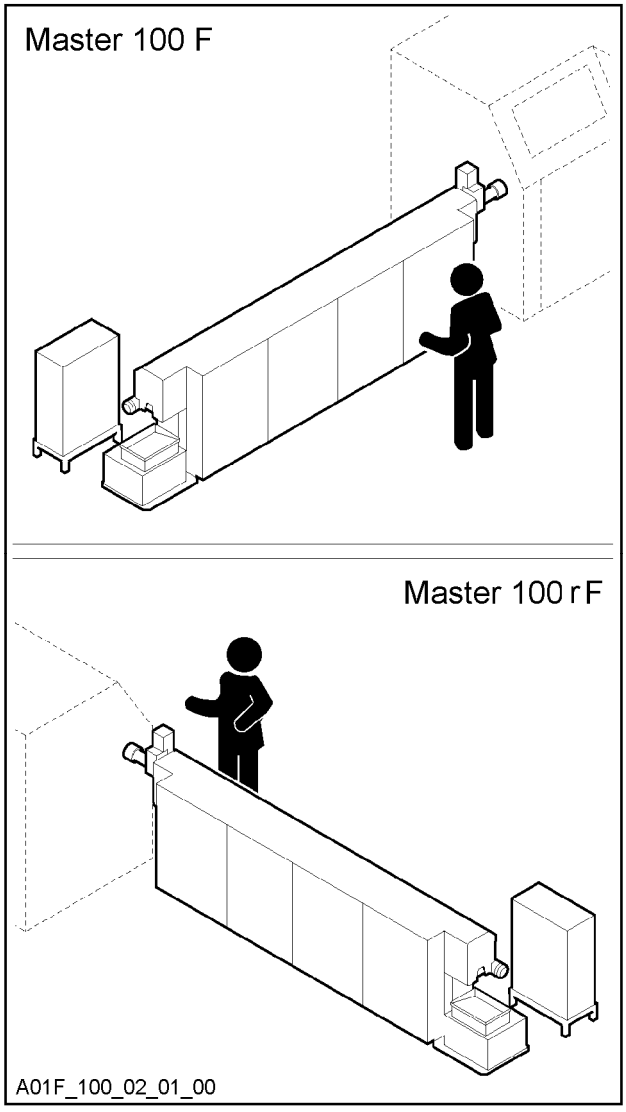
2.1 BAR FEEDER GENERAL DESCRIPTION

The MASTER 100 automatic bar feeder is used in the machine-tool industry and in particular, for automatic lathe feeding.
The operating cycle is controlled by a PLC, integrated in the electrical control panel, which is able to communicate with the lathe control system.
The digital handheld keyboard makes programming easier and allows the bar feeder functions to be controlled without leaving the lathe.
The bar feeder can be used to feed bars, pipes and various sections.
The guide channel is completely closed during machining; a pump is provided to maintain a continuous oil flow inside the guide channel, creating a hydrodynamic support effect; these features allow the bar to rotate at high r.p.m., with no vibrations and no surface damaging.
Thanks to the use of a "BRUSHLESS" and electronically controlled motor, the bar speed, torque value and bar feeding position may be determined at any time during the working cycle.
The bar remnant ejection can be performed by the bar pusher feeding or next bar feeding.
The lathe tooling and maintenance can be easily carried out thanks to the axial displacement of the bar feeder body.

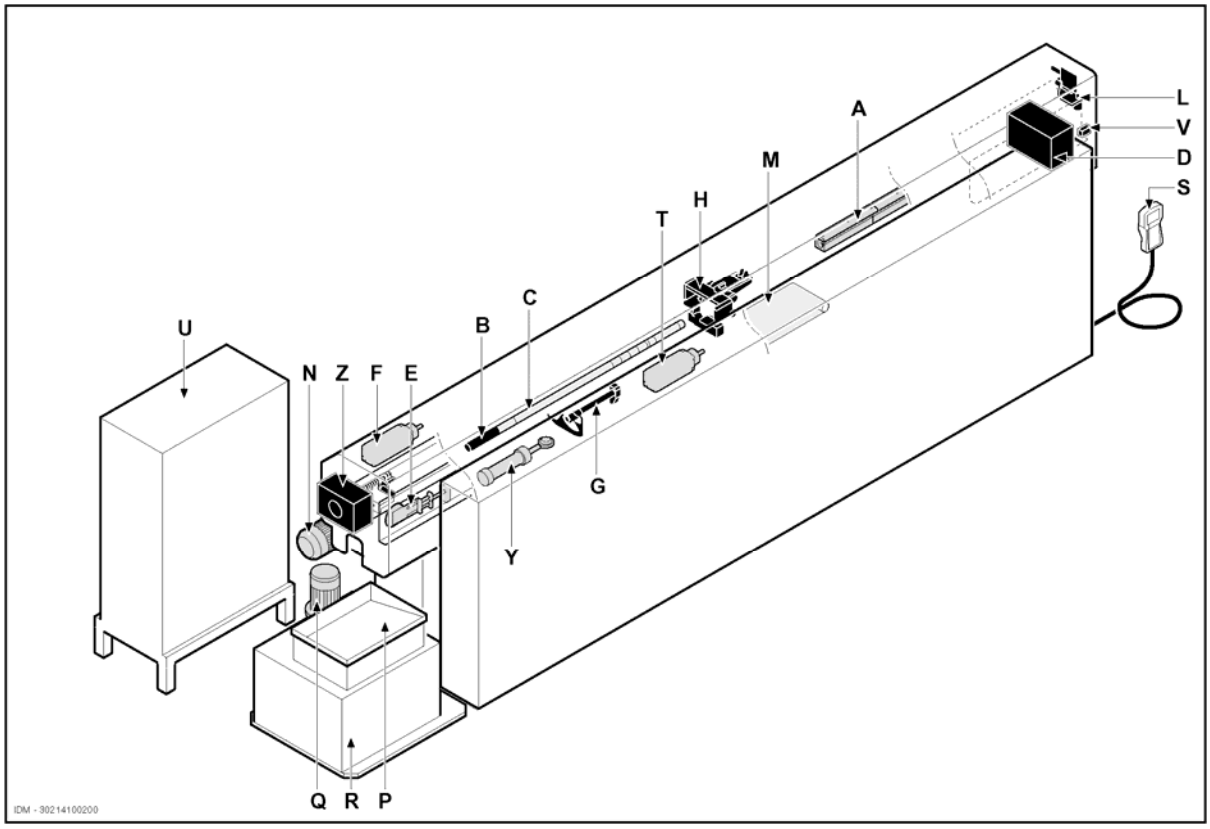
The MASTER 100 Verso bar feeders are available in the following models:

MASTER 100F (standard version) bundle magazine
MASTER 100rF (reversed version) bundle magazine.

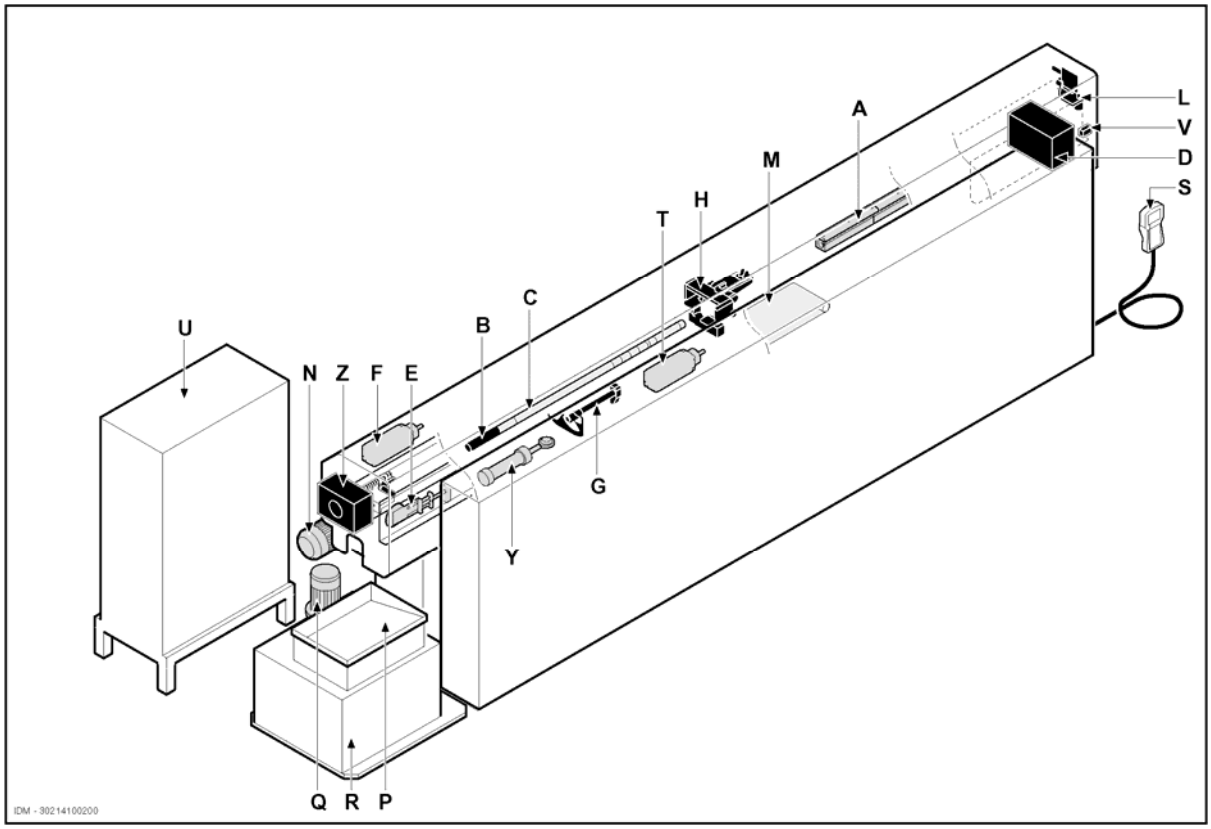
When not otherwise specified, the texts, tables and pictures of this manual refer to the standard version. As far as the reversed version is concerned, consider that the magazine and the electric cabinet are placed on the opposite side.



2.1.1 Bar feeder - Main components

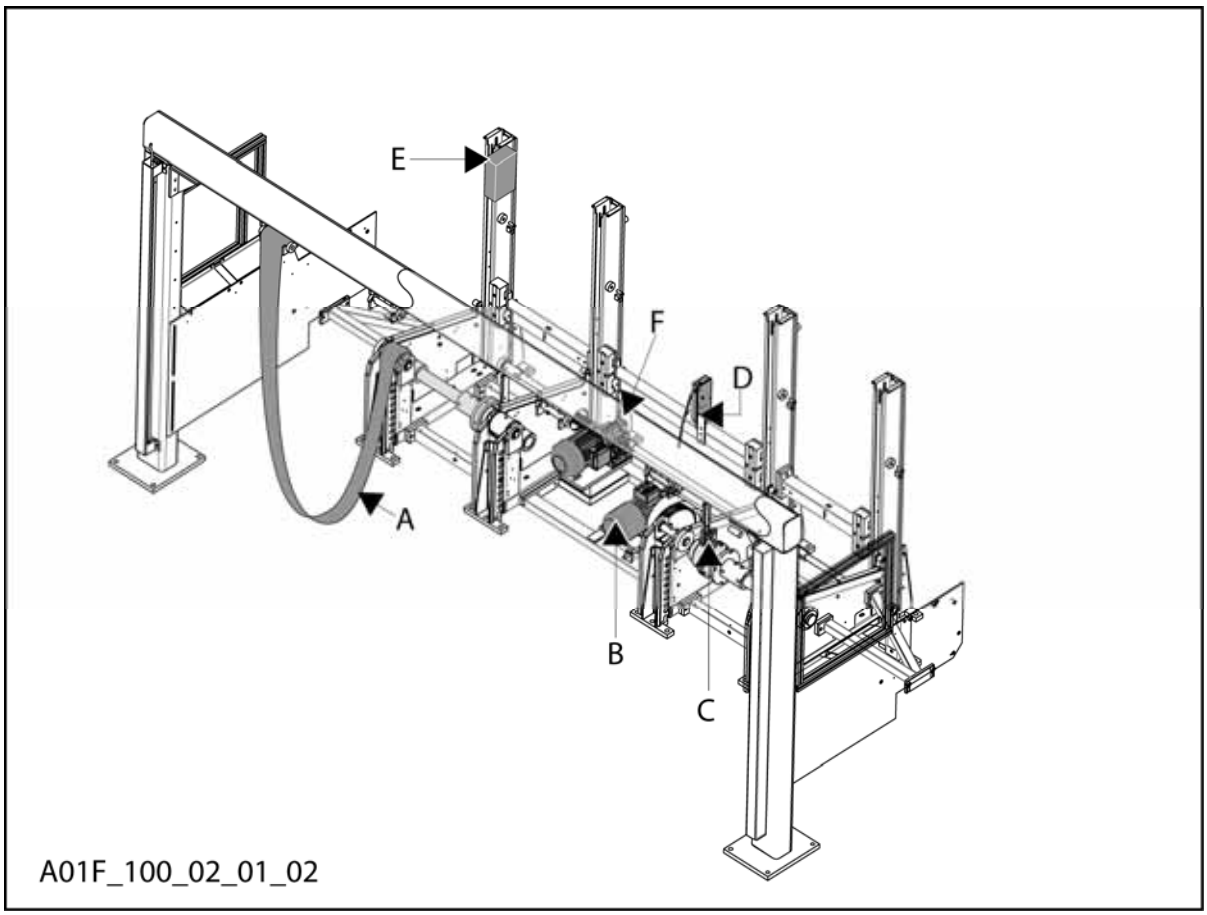


A GUIDE CHANNELS; drive the bar during the machining.
B FIRST FEEDING CARRIAGE; moves the bar forwards until the necessary space for the bar pusher introduction has been created.
C BAR PUSHER; pushes the bar during the machining. The collet is fixed on its front end.
D BAR PUSHER MOTOR DRIVE; moves the bar pusher.
E FEED CHAIN; transmits the motion from the motor drive to the bar pusher.
F GUIDE CHANNEL OPENING/CLOSING CYLINDER
Y UPPER GUIDE CHANNEL UNLOCKING.
G PNEUMATIC BAR DROP CONTROL LEVERS; guide the bar during the drop into the guide channels.
H PNEUMATIC CLAMPS; hold the bar during the loading and removal from the collet of the bar pusher.
L FACING DEVICE; it sends a signal when the bar passes.
M REMNANT CONVEYOR BELT; carries the bar remnant from the ejection area to the recovery box.
N REMNANT CONVEYOR BELT DRIVE; it moves the remnant conveyor belt.
P REMNANT RECOVERY BOX; collects the bar remnant.



Q LUBRICATION PUMP; delivers the lubricating oil to the guide channels.
R OIL TANK; contains the lubricating oil.
S HAND-HELD KEYBOARD; allows the bar feeder programming and function activation.
T PNEUMATIC BAR DROP CONTROL CYLINDER
U ELECTRIC CABINET; houses the electrical control panel.
V AXIAL DISPLACEMENT; allows moving the bar feeder body away from the lathe.
Z PNEUMATIC CLAMP CYLINDER

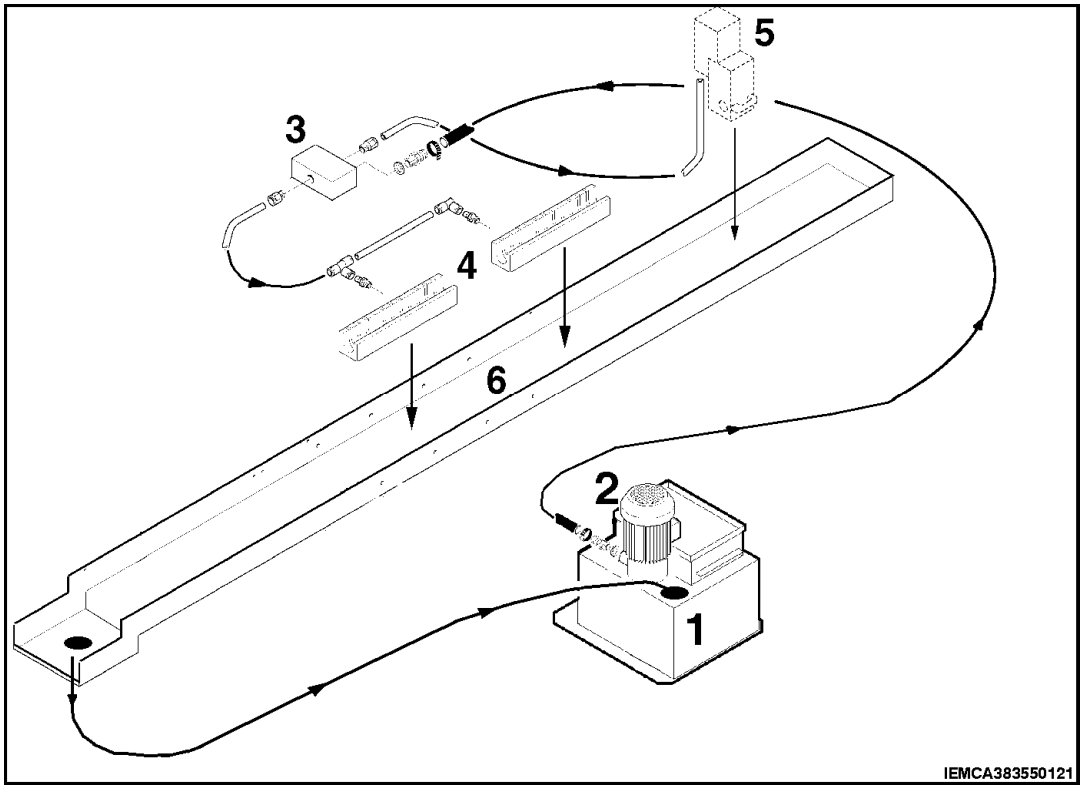
2.1.2 MASTER 100 F Bar bundle magazine - Main components



A LIFTING BELTS; lift the bar bundle so that some of them may fall on the selection table.
B LIFTING BELT DRIVE; drives the lifting belt upstroke and downstroke.
G FEELERS; hold the first bar coming from the lifting belts.
D MICROSWITCH LEVER; when it is activated from the bar the lifting belts stop.

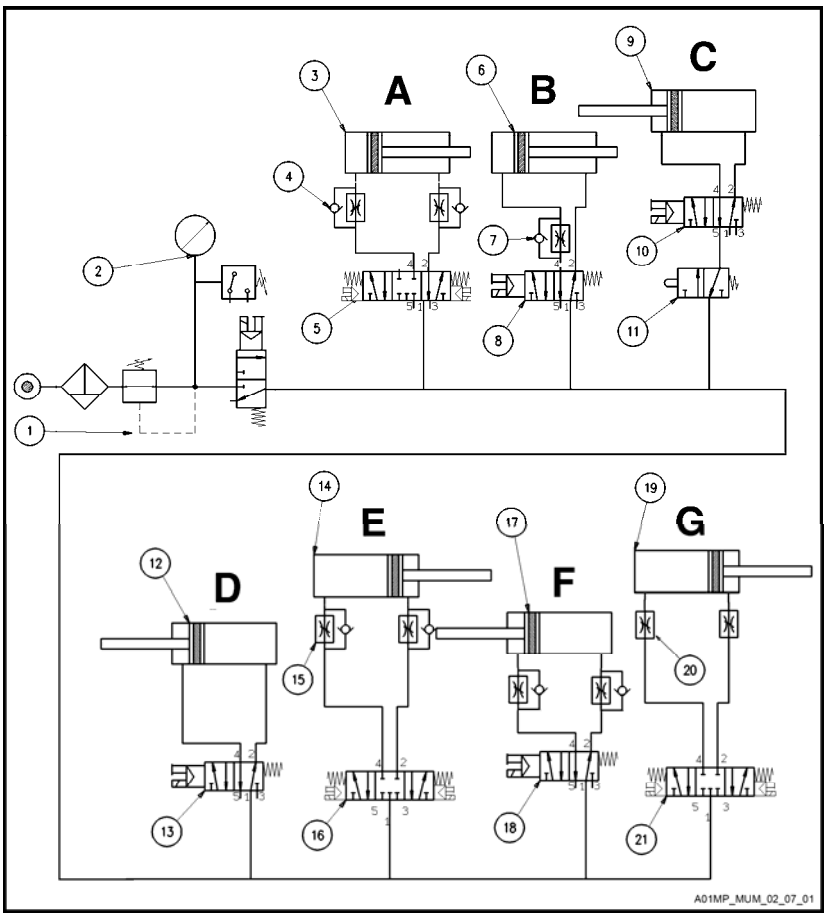
E ELEVATOR CARRIAGES; move bars from the magazine to the bar feeder guide channels.
M ELEVATOR CARRIAGE DRIVE; drives the elevator carriages upstroke and downstroke.

2.1.3 Hydraulic system - Main components



The oil performs the following cycle: it is forced by pump (2) of tank (1), it flows into the guide channels (4) and bush holder device (5) in order to lubricate the bars during the machining. From these two devices, the oil is gathered in the recovery tank (6) and filtered in the oil tank, from where it flows again for a new lubrication cycle.

2.1.4 Pneumatic system - Main components



A - PNEUMATIC BAR DROP CONTROL UNIT
B - FACING CYLINDER
C - BUSHING DRIVE UNIT
D - PNEUMATIC CLAMP UNIT
E - BAR SELECTION UNIT
F - GUIDE CHANNEL PNEUMATIC LOCKING UNIT
G - GUIDE CHANNEL OPENING UNIT

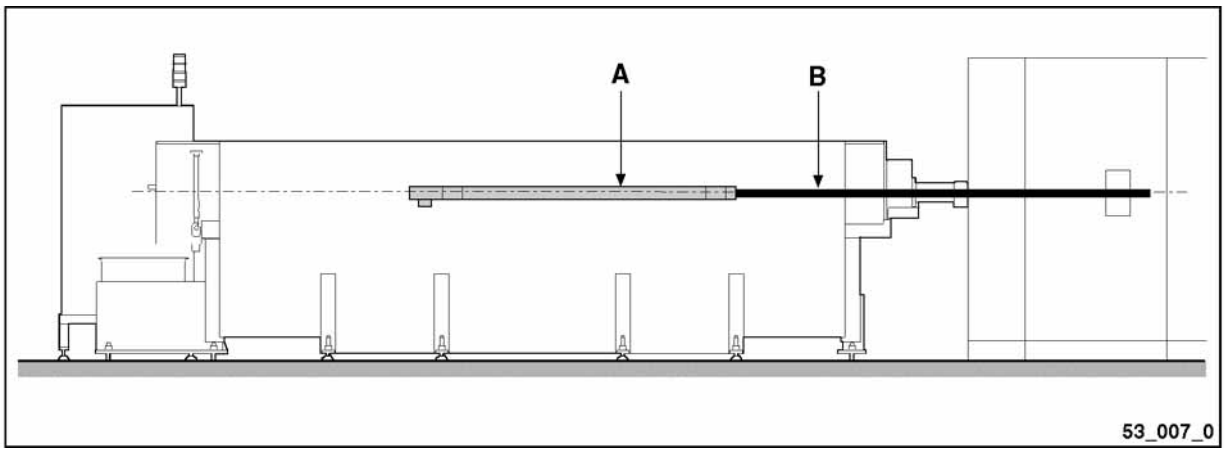
POS.	Description
1	FILTER
2	PRESSURE GAUGE
3	CYLINDER
4	REGULATOR
5	SOLENOID VALVE
6	CYLINDER
7	REGULATOR
8	SOLENOID VALVE
9	CYLINDER
10	SOLENOID VALVE
11	VALVE

POS.	Description
12	CYLINDER
13	SOLENOID VALVE
14	CYLINDER
15	REGULATOR
16	SOLENOID VALVE
17	CYLINDER
18	SOLENOID VALVE
19	CYLINDER
20	REGULATOR
21	SOLENOID VALVE

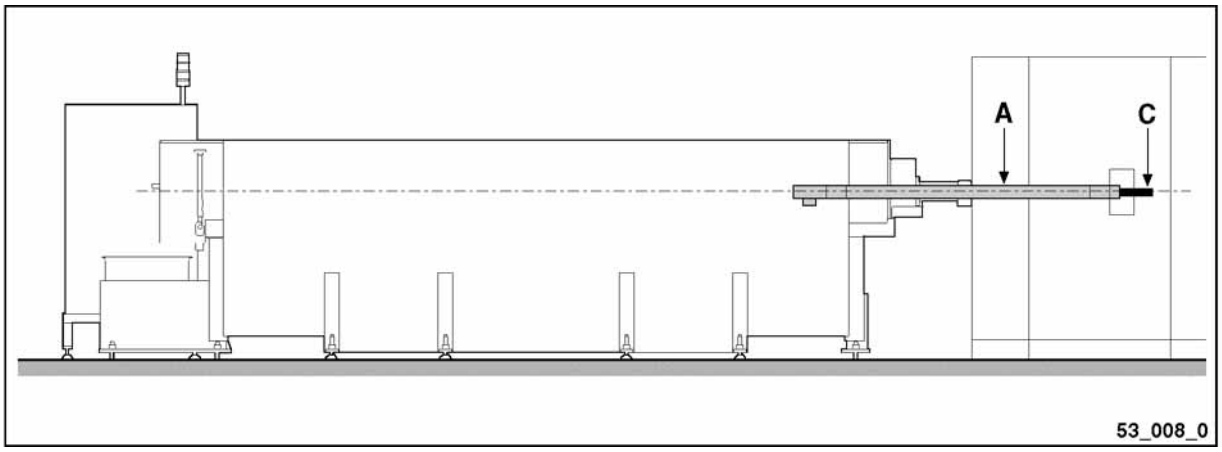
2.2 OPERATING CYCLE - GENERAL DESCRIPTION

2.2.1 OPERATING CYCLE

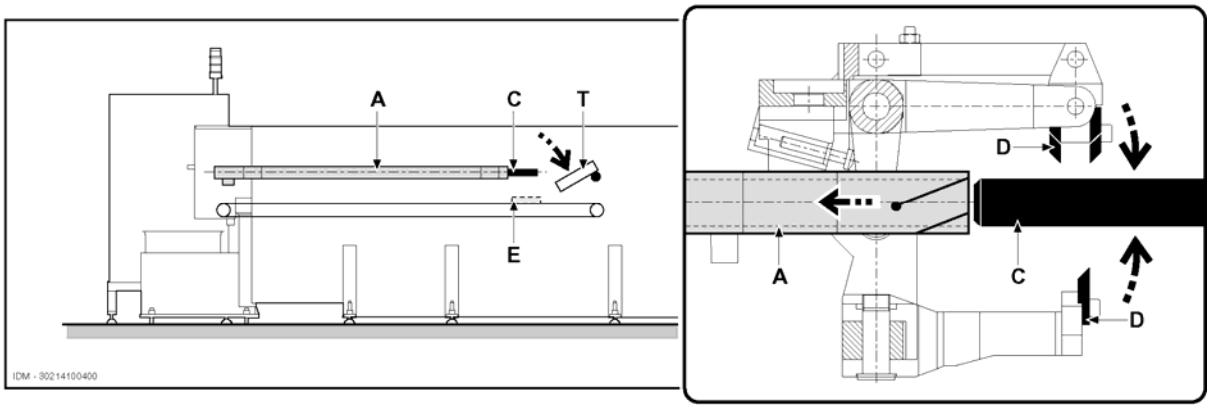
The automatic mode controls the movements of the bar feeder according to the sequence described below.
The bar pusher (A) makes bar (B) move forwards, until the bars are finished.



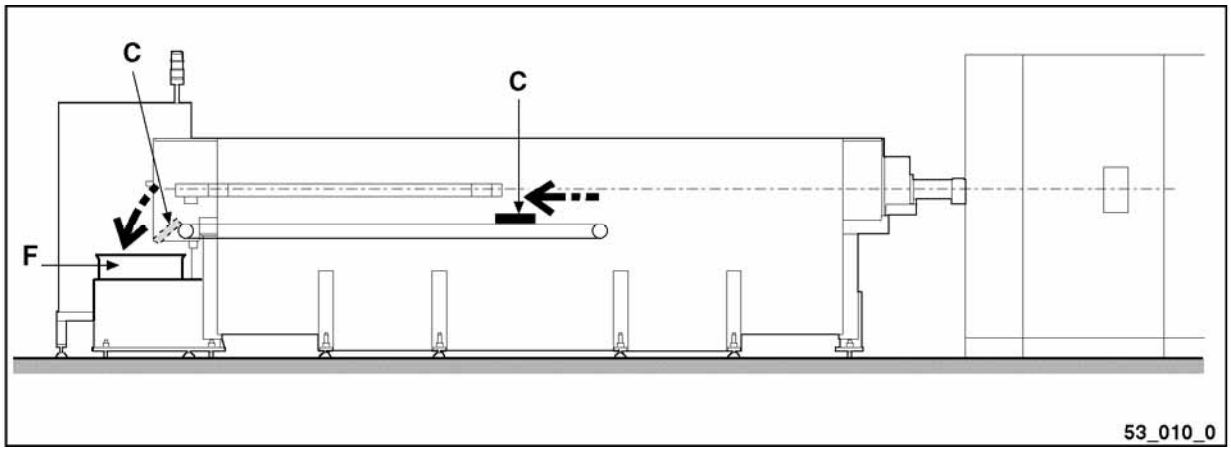
The bar pusher (A) and remnant (C) are in their forwards limit stop position.



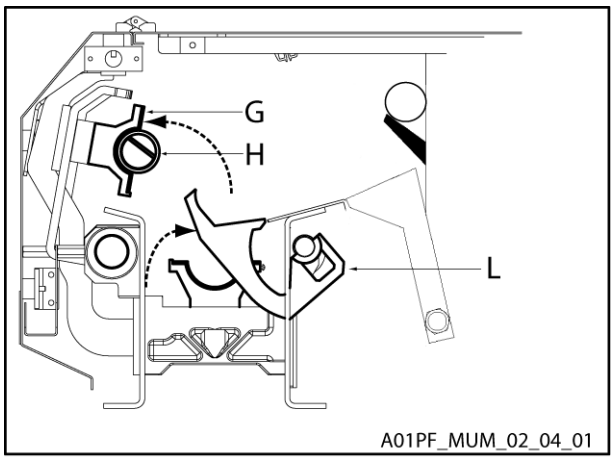
The bar pusher (A) and remnant (C) are in their backwards limit stop position.
The clamps (D) close and the bar pusher moves backwards; the remnant is removed from the collet. The clamps open, the bar pusher (A) moves forwards and place the remnant on the drop guide (T), then bar pusher moves backwards, the clamps (D) close and open again for the remnant drop check, and finally the remnant drop guide (T) is lowered and the remnant drops on the remnant conveyor belt (E).



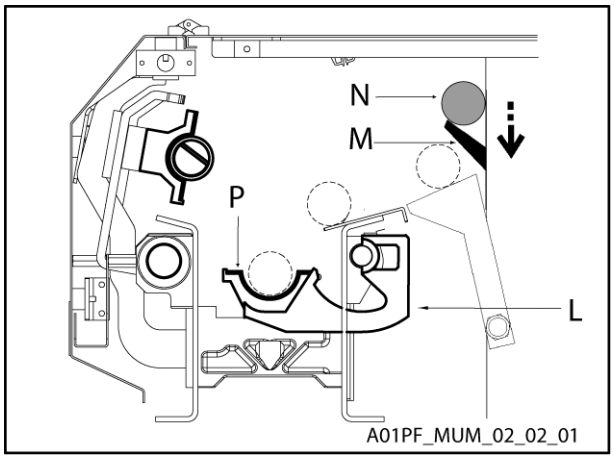
Remnant (C) is driven to the rear side and dropped in box (F). A sensor detects the remnant during the path; if the remnant is still in the bar pusher collet the bar feeder stops, otherwise the cycle goes on.



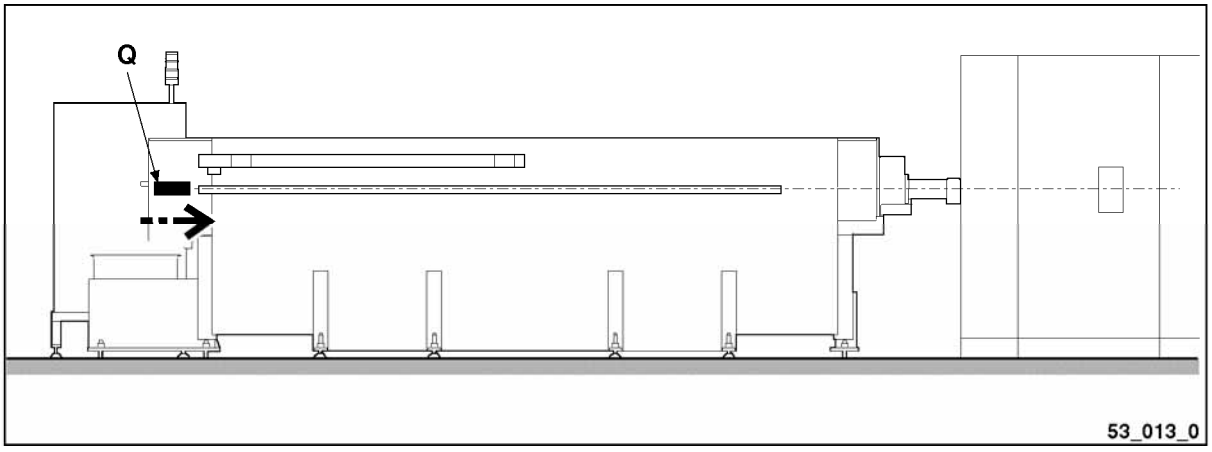
The upper guide channels (G) are lifted together with the bar pusher (H), and also the bar drop control levers L are lifted.



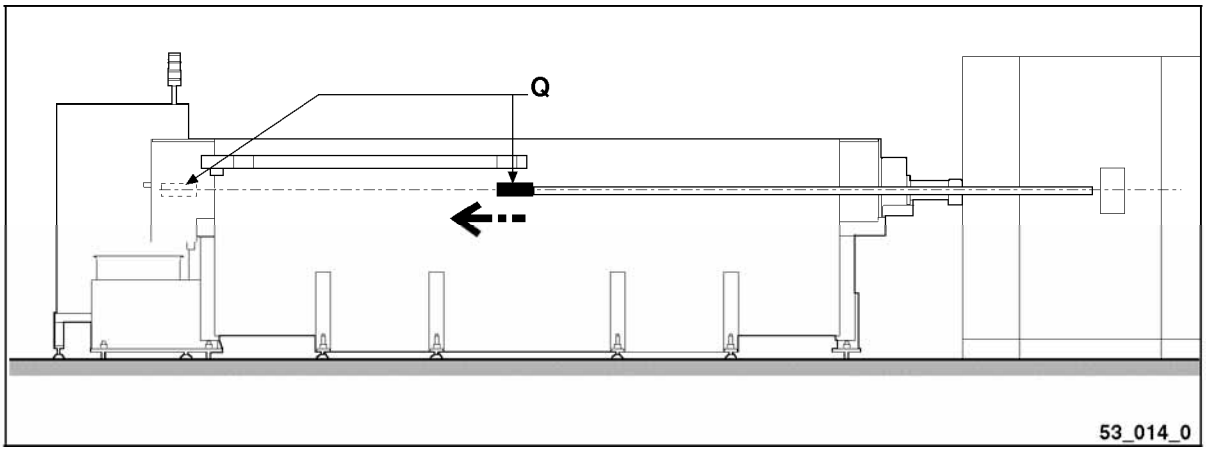
The elevator carriages (M) lower, the bar (N) drops on the lower guide channels (P) accompanied by the levers (L).



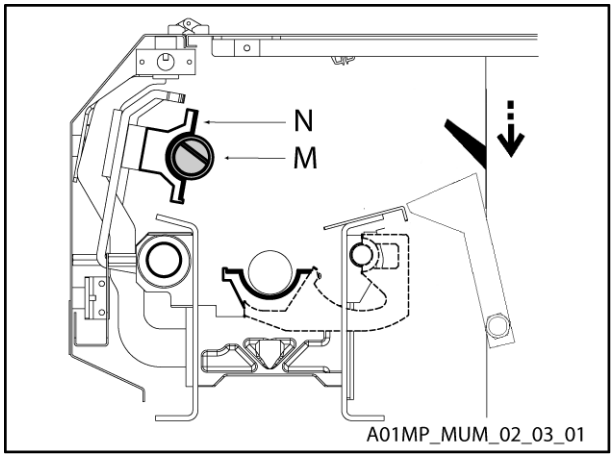
The first feeding carriage (Q) stroke begins.



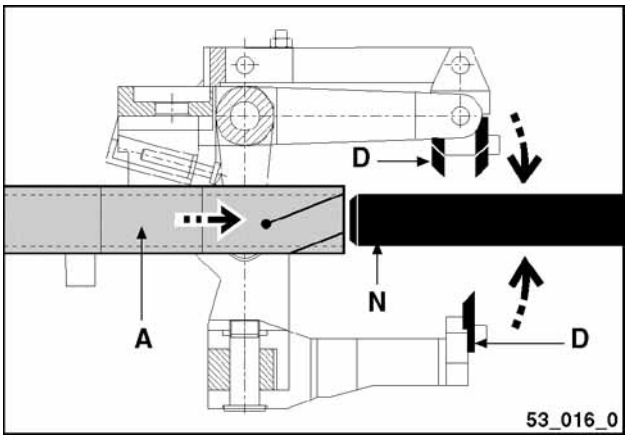
When the first feeding carriage (Q) completes its stroke, the required space for bar pusher introduction has been created.
The first feeding carriage performs the return stroke.



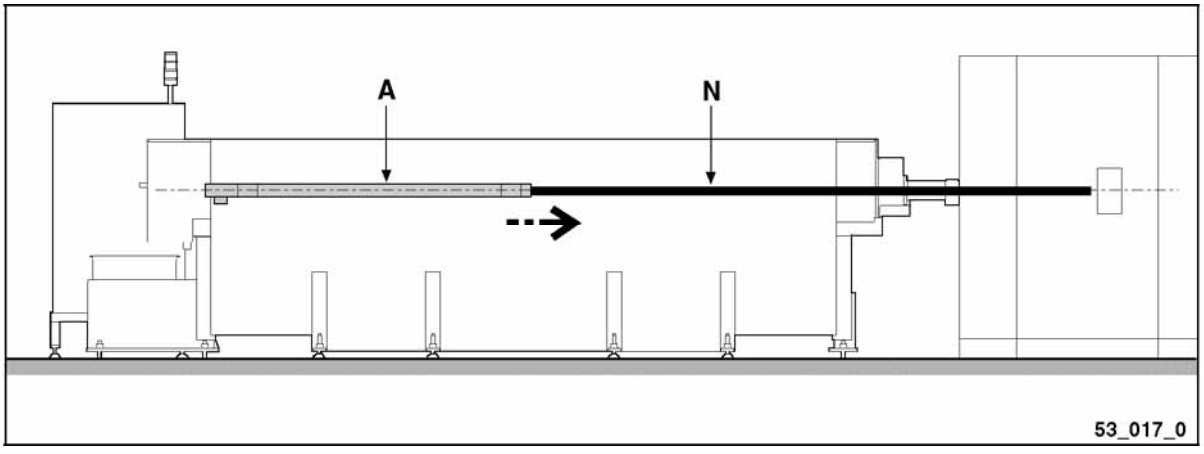
The upper guide channels (N) close; the bar pusher (M) is positioned along the spindle axis.



The clamps (D) close, the bar pusher (A) moves forwards; the bar (N) is inserted into the bar pusher collet.

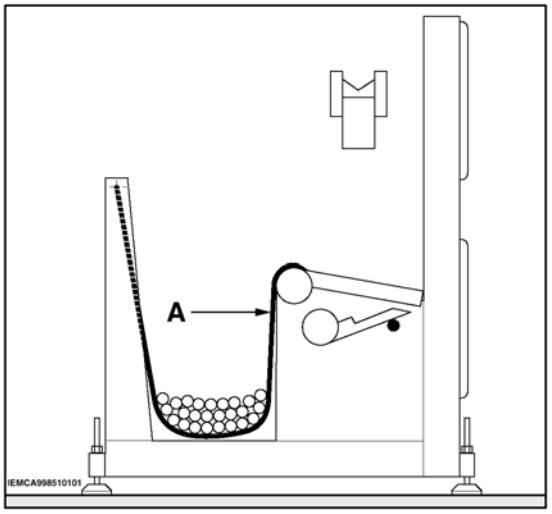


The bar pusher (A) and bar (N) perform the facing stroke. A new automatic working cycle is started.

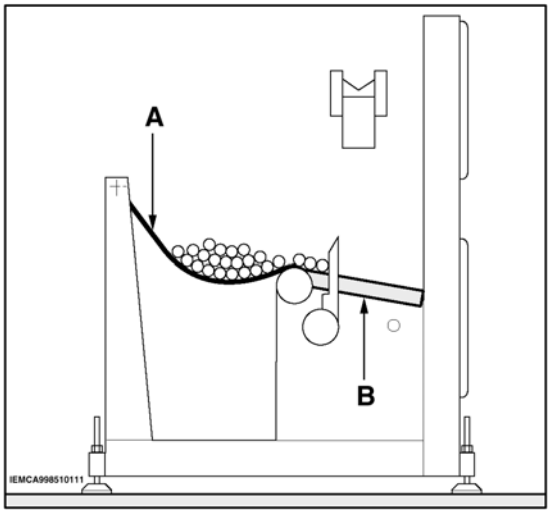


2.2.2 MASTER 100 F bar bundle magazine - Operating cycle

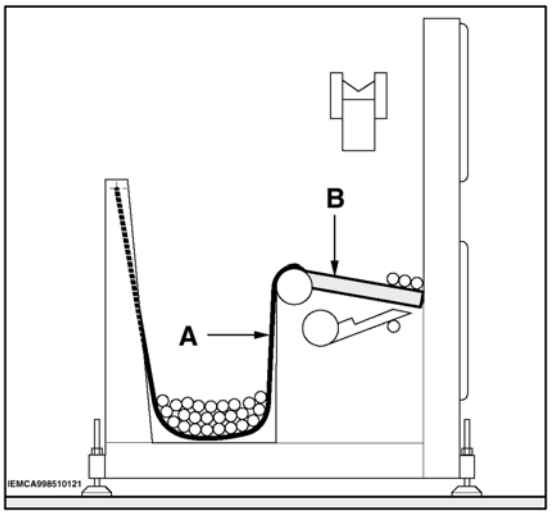
The automatic mode controls the magazine movements according to the sequence described below.
The bars are held inside lifting belts "A".



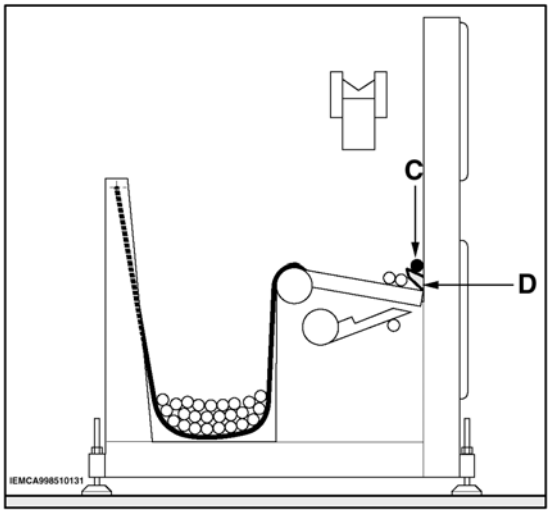
The lifting belts "A" move upwards until they make some bars fall on the magazine rack "B". The exact number of bars to drop depends on the adjustment of the lateral levers, see section 5.5.1.



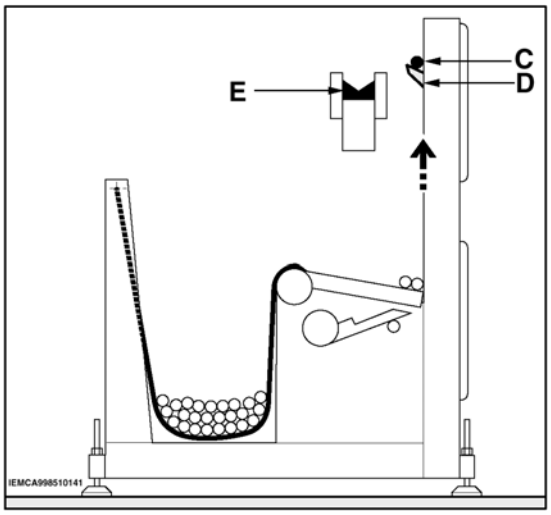
The lifting belts "A" lower and the bar PICK-UP PHASE on the magazine rack "B" starts.



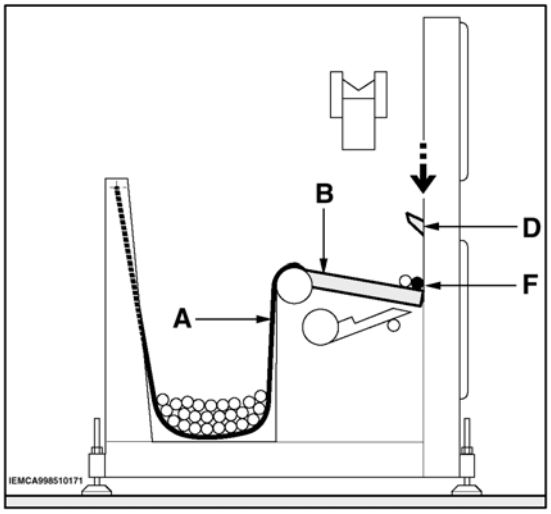
The first bar "C" is picked up from the elevator carriages "D".



elevator carriages 'D' reach the high position; the cycle stops.
When the bar feeder has completed the machining of the bar currently being machined, or when it carries out the bar pusher return strokes - if it is the first cycle - a pulse is transmitted, making the elevator carriages "D" lower and making bar "C" fall in the bar downstroke device "E" which will place the bar in the guide channel.

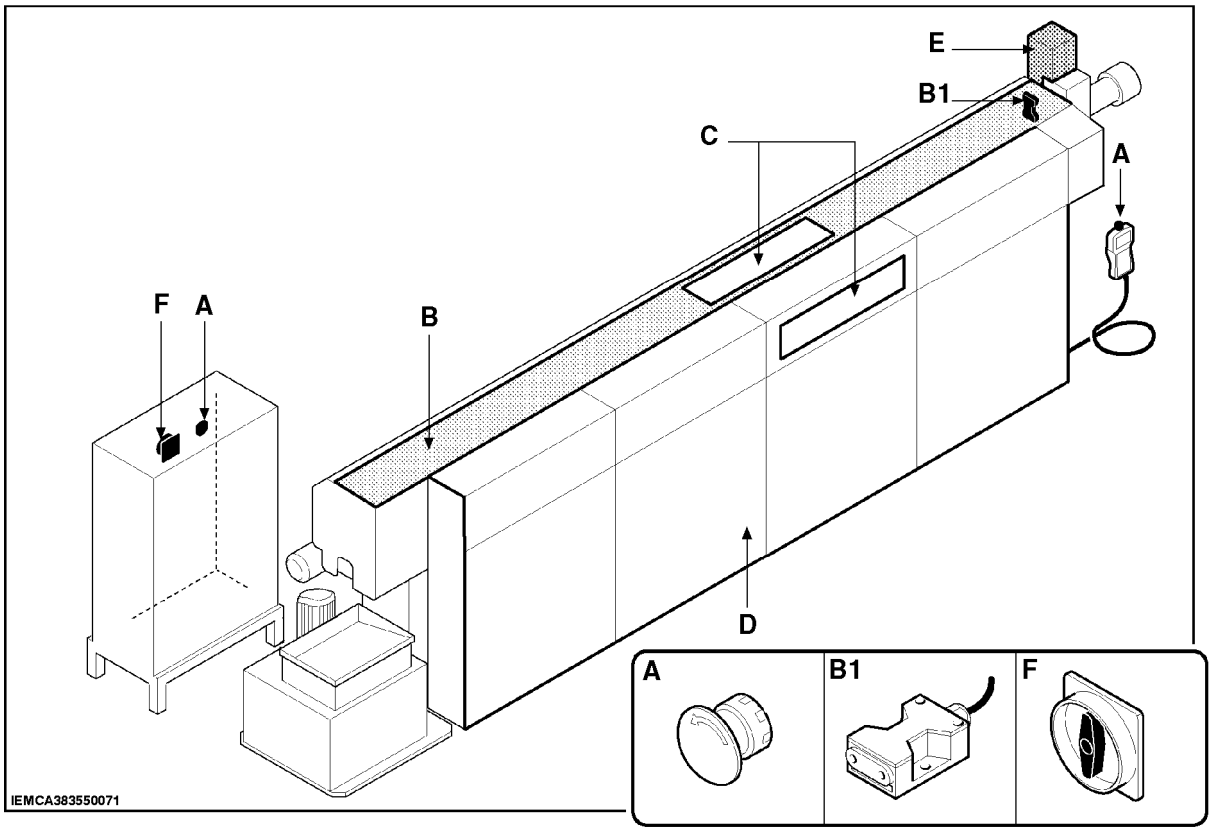


'D' elevator carriages lower and another cycle begins, which will end when the second bar 'F' is in the high position.
The cycles repeat until the bars on the magazine rack "B" are over; the lifting belts "A" will then rise to unload other bars.
The cycle goes on until the bundle bars are finished.



2.3 SAFETY DEVICES - POSITION AND DESCRIPTION

2.3.1 Bar feeder - Safety devices



A EMERGENCY BUTTON; when pressed, all bar feeder and lathe functions are stopped in an emergency condition.

B INTERLOCKED SLIDING GUARD; linked to microswitch B1. When the guard is opened, the bar feeder and lathe functions are suspended. When the guard is closed, the user can start the cycle again.

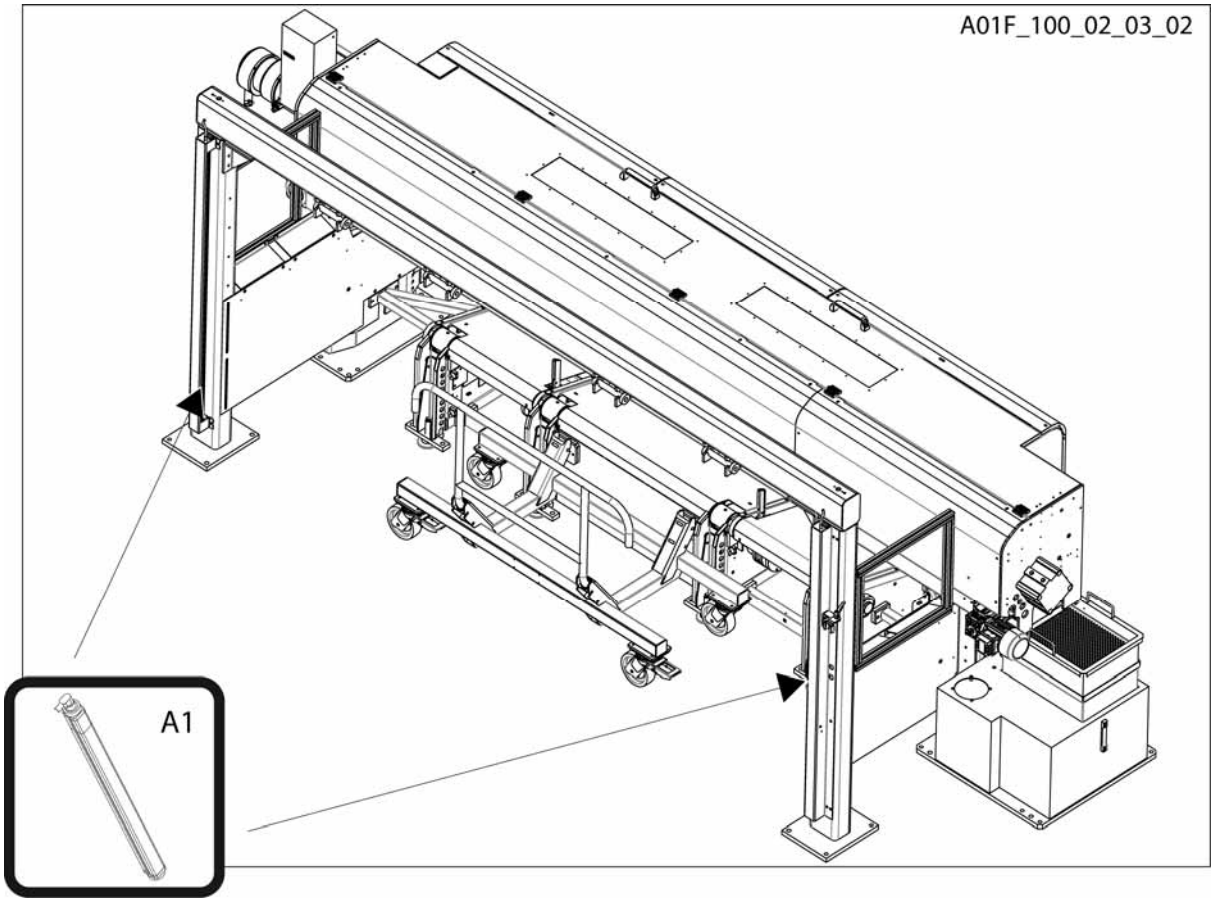
C FIXED GUARD: made of transparent material to allow the visual detection of the bar drop area in the guide channels.

D FIXED GUARD: hinders an accidental access to the moving components.

E FIXED GUARD: prevents an accidental access to the bush holder device area.

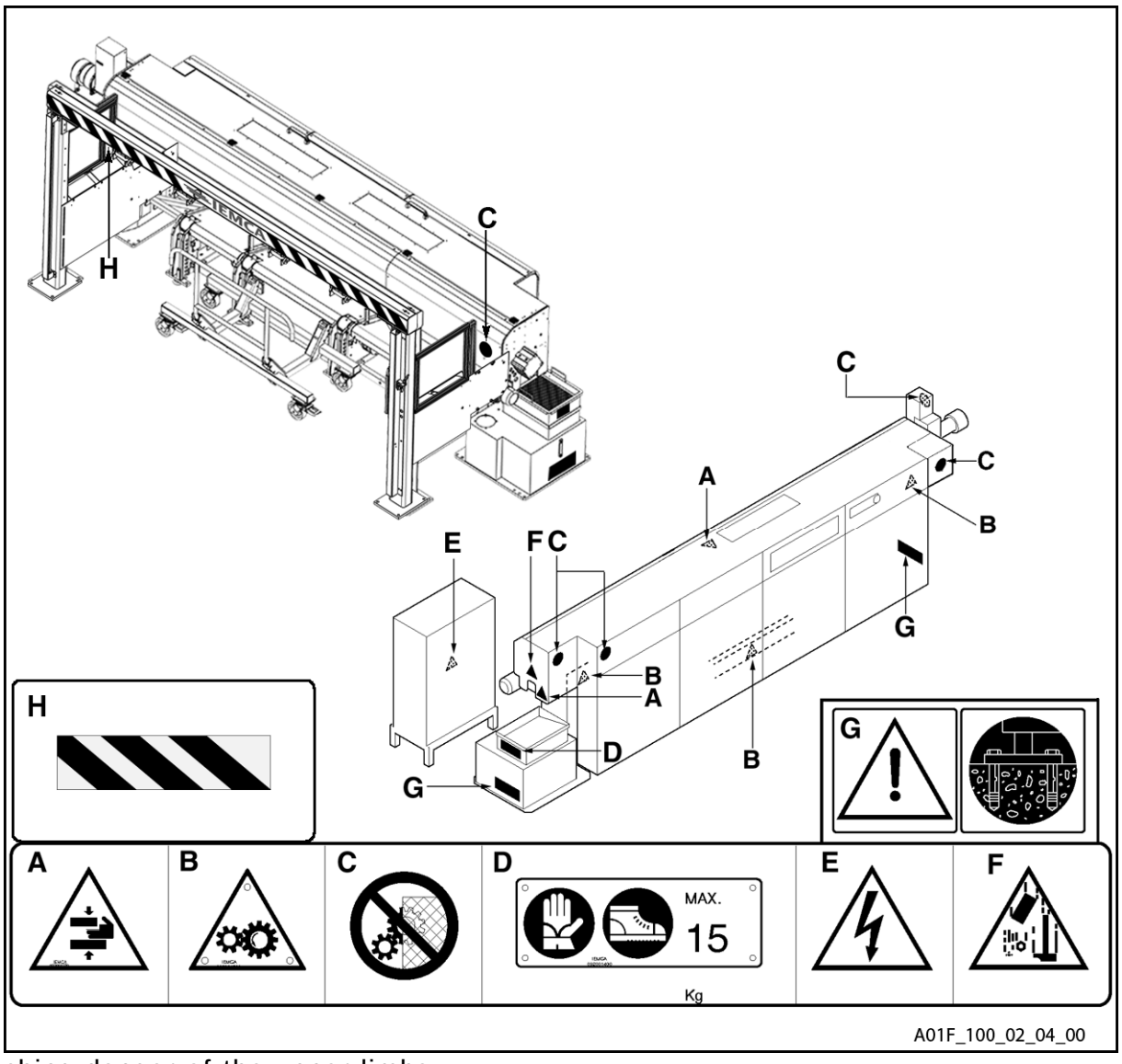
F MAIN SWITCH: disconnects the electric power supply during the operations in the electrical control panel, and during the bar feeder inactivity periods.

2.3.2 MASTER 100 F bundle magazine - Safety devices



A1 If the detection area of the photocell A1 is engaged, the magazine stops. The bar feeder and the lathe continue working. The user can restore the cycle only after disengaging the detection area of the photocells.

2.4 SAFETY PLATES - LOCATION AND DESCRIPTION



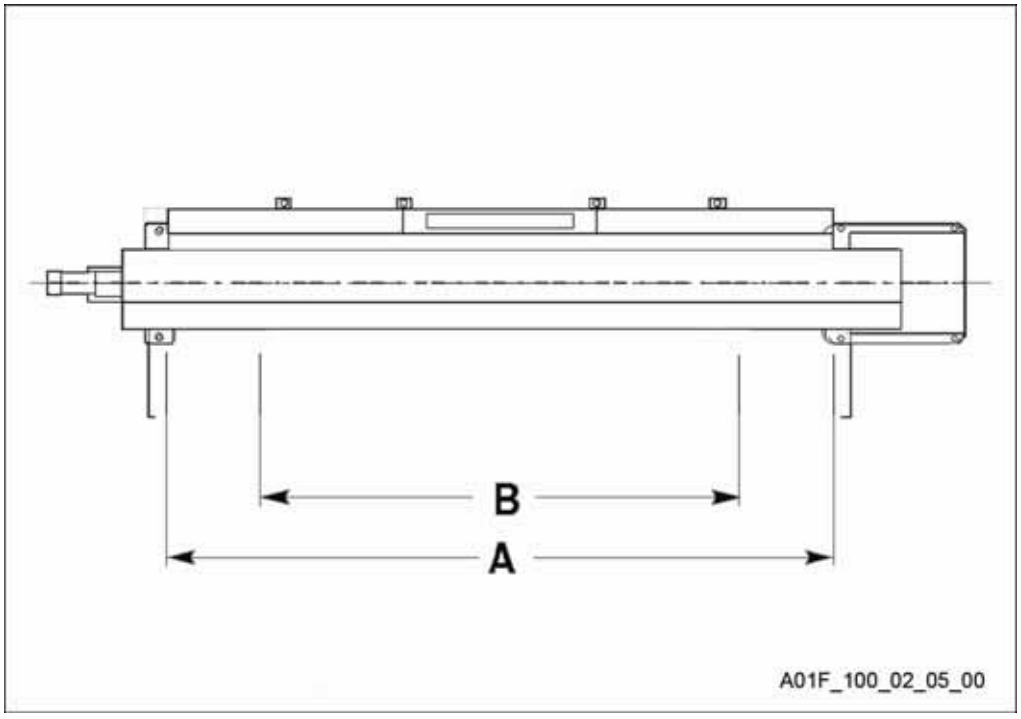
A Crushing danger of the upper limbs.
B Pay attention to the moving parts.
C Prohibition of removing the safety enclosures.
D Wear safety gloves and shoes.
Do not manually lift loads exceeding 15 kg.
E Warning; danger of electric contact.
F Warning; danger of material falling.
G Warning; fix the bar feeder to the ground.
H Warning; indicates that the magazine upright is present.

2.5 VERSION DESCRIPTION

Bar length

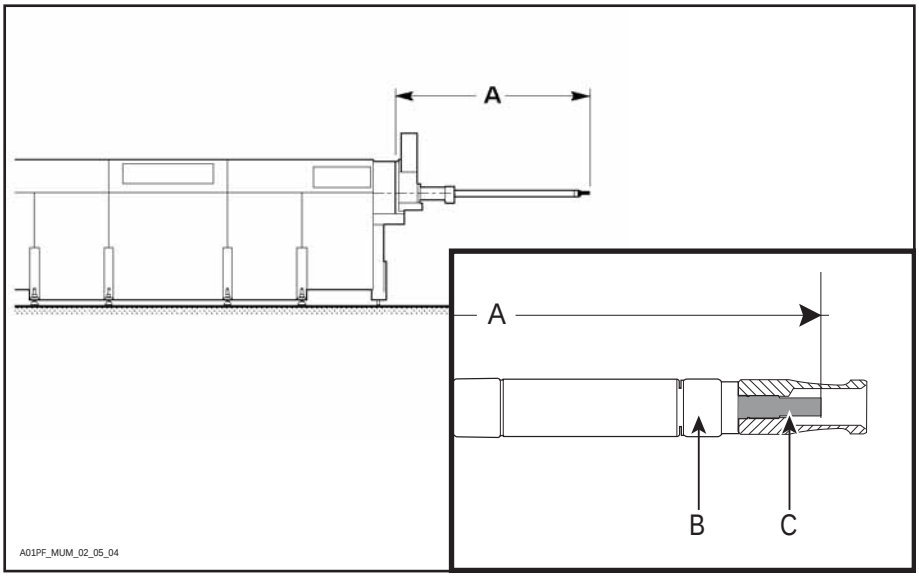
Model	Version	Maximum length mm (ft) - A	Minimum length mm (ft) - B
MASTER 100 F	33	3300 (10,8)	1400 (4,5)
	43	4300 (14,1)	1400 (4,5)

The bars are to be loaded in the middle of the bundle magazine
Place the bars shorter than 5,000 mm into the 6,300-mm-long bundle magazine, as shown in the figure, position(B).



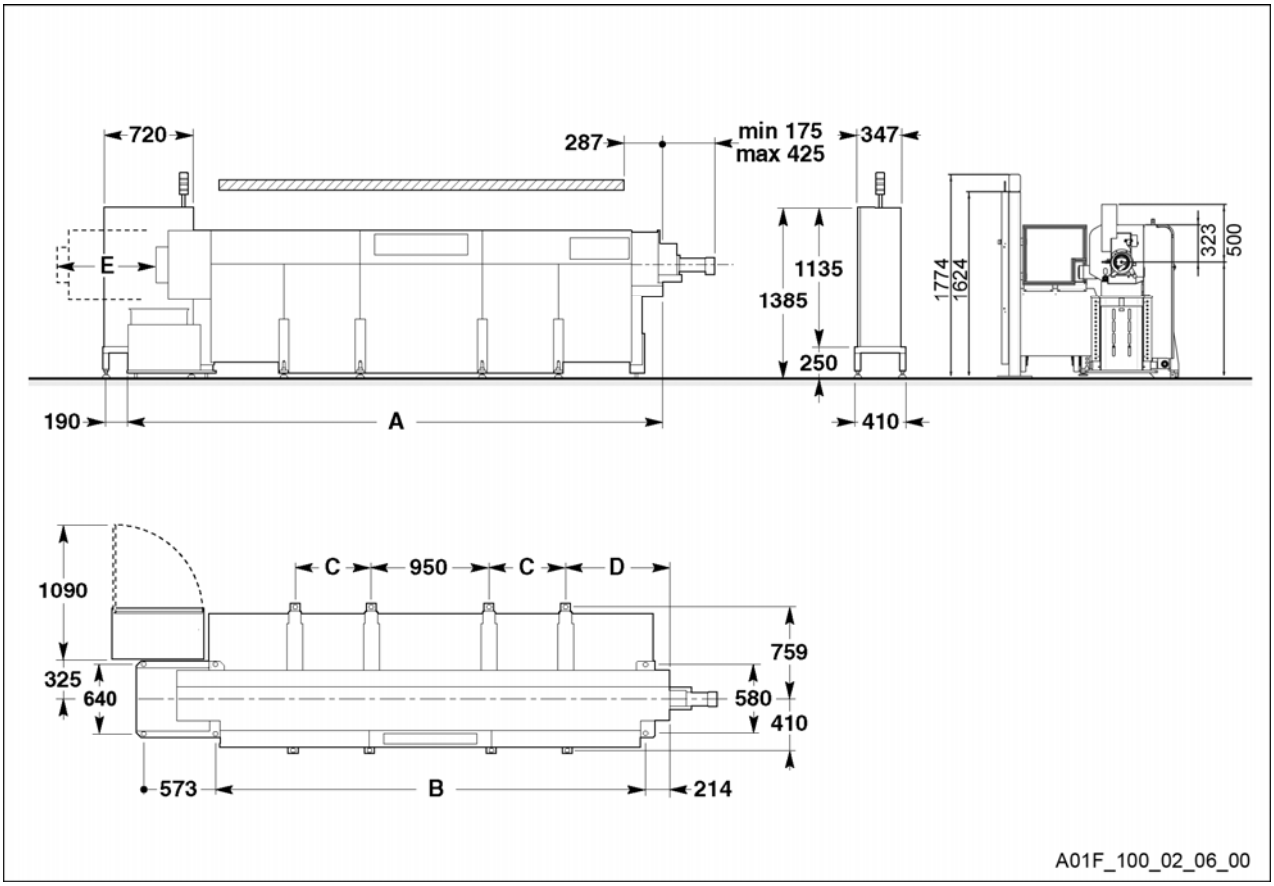
Max. bar pusher extension

Model	Version	Version	A – Max. extension (mm)
MASTER 100 F	33-43	LL	1545
		XLL	1795
		XXL	2045



B - Revolving tip
C - Nipple

2.6 TECHNICAL DATA



Overall dimensions

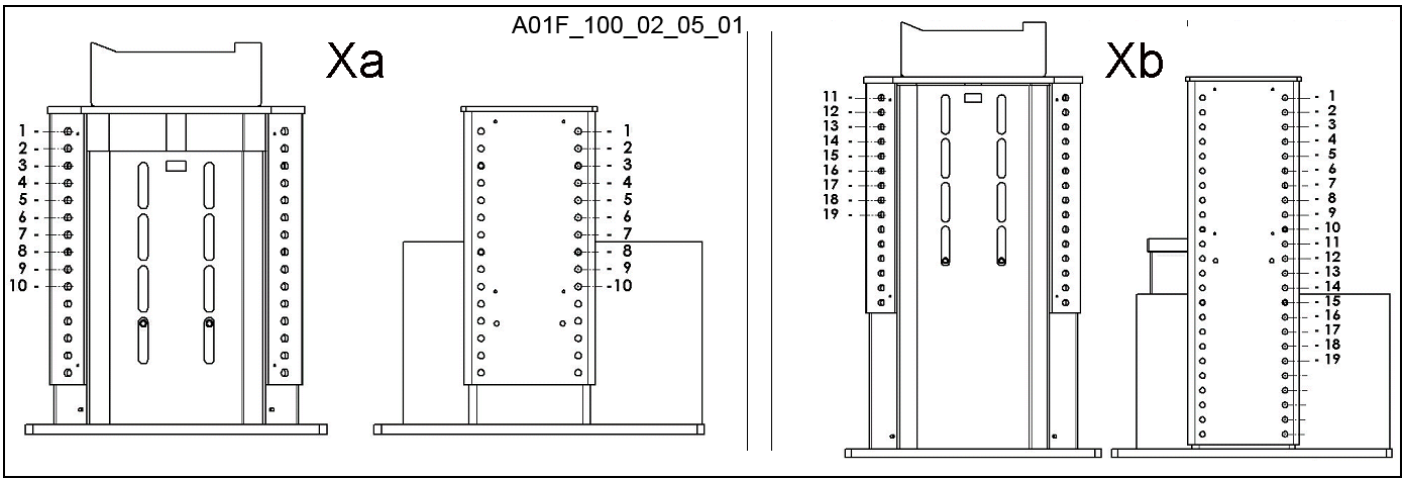
Model	Version	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
MASTER 100 F	33	4330	3640	617	860	600
	43	5330	4640	867	1110	800

General technical data

	MASTER 100 F	
Round bar size	Ø Min 20 mm (51/64")	Ø Max 100 mm (4")
Hexagonal bar size (key socket)	Min 17 mm (3/4")	Max 95 mm (4")
Square bar side	Min 15 mm (5/8")	Max 75 mm (3")
Minimum bar length	Ver. 33 – 1400 mm (4,5ft) Ver. 43 – 1400mm (4,5ft)	
Maximum bar length	Ver. 33 – 3300mm(10,8 ft) Ver. 43 – 4300mm(14,1 ft)	
Magazine capacity (working width)	~ 2500 Kg	
Maximum bar weight	120 kg	
(Adjustable) feeding speed	150 mm/sec	
(Adjustable) return speed	950 mm/sec	
Maximum remnant length	ø 20÷80 mm = 400 mm ø 80÷100 mm = 250 mm	
Minimum remnant length	110 mm	
Bar change time (with 3,000 mm bar)	40 sec (according to the bar ø)	
Power supply voltage	230/400 Volt	
Mains frequency	50/60 Hz	
Control voltage	24 Volt A.C. - 24 Volt D.C. – 220 Volt A.C.	
Installed power	4 kW	
Oil quantity	80 l	
Air pressure	6 bar	
Air consumption	35 Nl/bar change	
Bar feeder weight	Ver. 33 - 2000 kg Ver. 43 - 2400 kg	
Electric cabinet weight	140 kg	

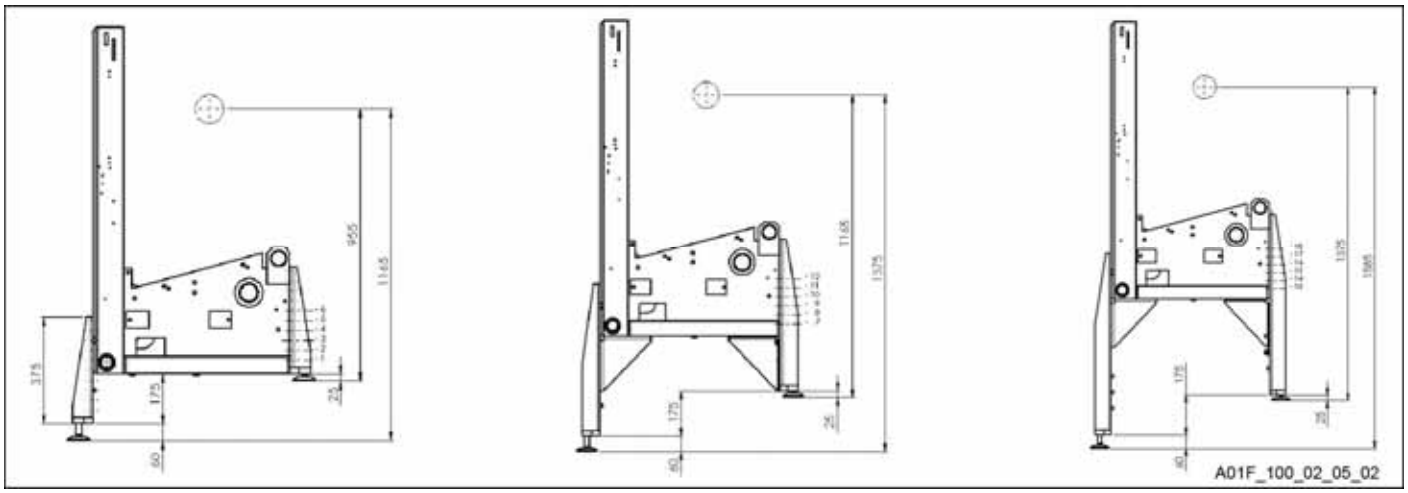
Working axis height

Model	Screw position	X_A (mm) Low base	Screw position	X_B (mm) High base
MASTER 100 F	**2**	955÷995	**11**	1270÷1310
	3	990÷1030	**12**	1305÷1345
	4	1025÷1065	**13**	1340÷1380
	5	1060÷1100	**14**	1375÷1415
	6	1095÷1135	**15**	1410÷1450
	7	1130÷1170	**16**	1445÷1485
	8	1165÷1205	**17**	1480÷1520
	9	1200÷1240	**18**	1515÷1555
	10	1235÷1275	**19**	1550÷1590



Magazine axis height

Model	Screw position	X_B (mm) High base	Screw position	X_A (mm) Low base
MASTER 100 F	1	955÷995	10	1270÷1310
	2	990÷1030	11	1305÷1345
	3	1025÷1065	12	1340÷1380
	4	1060÷1100	13	1375÷1415
	5	1095÷1135	14	1410÷1450
	6	1130÷1170	15	1445÷1485
	7	1165÷1205	16	1480÷1520
	8	1200÷1240	17	1515÷1555
	9	1235÷1275	18	1550÷1590



Guide channel, bar pusher, bar and pipe diameter.

Model	Guide channel diameter (mm)	Bar pusher diameter (mm)	Bar diameter (mm)		Pipe diameter (mm) (*)
			Minimum	Maximum	
MASTER 100 F	26	25	20	23	25
	33 (**)	32	20	29	31
	36	35	20	32	35
	38	37	20	35	37
	43	42	20	39	42
	46	45	20	42	45
	52	51	20	47	51
	57	56	22	52	55
	61 (**)	60	30	56	59
	66	65	38	61	64
	69	68	48	63	67
	71	70	48	65	69
	73	72	50	67	71
	76	75	50	70	74
	81	80	52	75	79
	86 (**)	85	55	80	80
	95	94	60	88	93
	103	102	60	95	100

(*) Valid also for prepared bars or normal bars machined with front remnant ejection.

(**) Recommended guide channel according to the maximum lathe bar passage.
Example: ø85 maximum bar passage – GUIDE CHANNELS 86-61-33.
Example: ø80 maximum bar passage – GUIDE CHANNELS 81-61-33.
Example: ø75 maximum bar passage – GUIDE CHANNELS 76-61-33.

WARNING – CAUTION:

diameters for barstocks in any guide channel are only given as an indication. A diameter of a bar to be machined approximately 10 mm smaller than the guide channel diameter may cause vibration and failure to the bar feeder. Therefore, it may be necessary to slow down the bar rotation speed or to change the guide channel diameter in order to obtain the best performance.

WARNING – CAUTION:

the collet external diameter should be at least 0.5 mm smaller than the bar pusher external diameter.

INFORMATION:

the bar feeder is usually supplied with a bar pusher whose diameter is equal to the spindle drawbar hole. Sometimes, in order to ensure the best working conditions, it may be necessary to use a bar pusher with a smaller diameter.

Guide channel lubricating oils.

ISO/UNI rating	Brand	Name
CLASSE C CKB 150	BP	ENERGOL CS 150
	Agip	Acer 150
	Api	Api Cis 150
	Aral	Aral Degol Tu 150
	Castrol	Magna 150
	Chevron	Circulating Oil 150
	Elf	Movixa 150
	Esso	Nuto 150
	Fina	Solina 150
	IP	IP Hermea 150
	Klüber	Crucolan 150
	Olio FIAT	Daphne Hidrobak 150 HL
	Roloil	Arm V 150
	Shell	Vitrea 150 Tellus C 150
	Tamoil	Hydralic Oil 100
	Texaco	Rando oil HD 150
	Total	Cortis 150

Oil quantity: 80 litres.

2.6.1 Noise levels

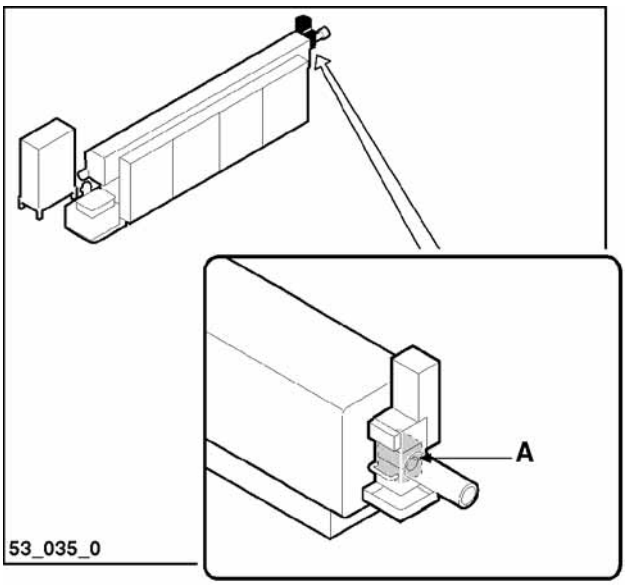
The bar feeder does not cause acoustic noise.
The noise occurs when the lathe, to which the bar feeder is connected, is working and the bar is rotating into the bar feeder guide channels.
In this case, the noise level depends on the following conditions:

- perfect alignment and levelling of the lathe-bar feeder unit;
- proper fixing to the floor both of the lathe and bar feeder;
- suitable bar gripping device fitted on lathe;
- use of a guide channel and a bar pusher with suitable dimensions as regards to the bar diameter;
- use of a front guide bush of suitable diameter (if supplied);
- use of bars with a straightness within the set limits (maximum deflection in mm equal to 0.5 ‰ of the bar length);
- use of a spindle liner having the same diameter as the bar feeder guide channel diameter;
- spindle rotation speed suitable for the material to be machined;
- as to the bar feeder, use of oil having features suitable for the diameter of the machined bar;
- all bar feeder guards must be closed.
  Should the above mentioned conditions be met, the noise level emitted during the bar rotation into the guide channel, measured in compliance with the international standards, will be within the following limits:
- brass and steel round bars within 80 dbA
- hexagonal steel bars within 83 dbA
- brass hexagonal bars within 85 dbA

2.7 ACCESSORIES - FOREWORD

To increase the bar feeder performance and flexibility, it may be provided with the accessory described below.

2.7.1 Bush holder device - Description



It is applied to the front part of the bar feeder. Its function its to reduce bar vibrations to a minimum, by keeping the bar centred during the rotation by means of two half-bushings (A), which are coupled to form a round guide channel with a diameter just slightly larger than the one of the bar being machined.
In many cases, this device may be used (by only changing the diameter of the half-bushings) to greatly extend the range of diameters which can be machined without having to replace the guide channel.

OPERATION

- When the bar is dropped into the guide channel, the two half-bushes are open.
- The closing phase is controlled by a pneumatic cylinder when the bar feeder has completed the bar loading cycle. The oil flow for the machined bar lubrication and support starts together with the closing phase.
- When the bar pusher approaches the device, the half-bushes open up to allow its passage and the oil flow stops.
- By enabling subparameter B of Parameter 17 (see INSTRUCTION MANUAL, sec 2) it is possible to close the half-bushings (A) on the bar pusher, making the approach to the lathe spindle liner more stable.

INDEX

3.1 GENERAL SAFETY REGULATIONS

It is of the utmost importance to read this manual carefully before installing, operating and servicing the bar feeder or performing any other work on it. The constant compliance with the instructions in this manual ensures the operator safety.

- The user and expert operator must perform their specific tasks only.
- Do not tamper with the safety devices for any reason whatsoever.
- Strictly comply with the health and safety regulations at work issued by the relevant authorities in each country.
- IEMCA declines any liability for injury to persons or damage to property if the relevant safety regulations are disregarded.

3.2 HANDLING AND INSTALLATION - Safety

- The bar feeder must be handled using suitable means and methods only.
- Do not stand or transit underneath a suspended load, or within the range of action of the crane, elevator carriage or other suitable lifting and transport means.
- The bar machining and loading area must be delimited to prevent collisions between the operator and the means of transport or handling of the material to be machined or of other kinds.
- Correct positioning of the bar feeder, lighting and cleanliness of the working environment are of the utmost importance for personal safety.
- The connection to the electrical installation must be carried out by skilled personnel only.
- Make sure that the electrical installation is connected to an efficient earthing system by means of an appropriate cable.

3.3 ADJUSTMENTS AND SETUP - Safety

- Carry out the adjustments as described in the operation manual.
- Do not change the machining parameters to obtain performances other than those envisaged in the design and testing phases.
- Do not adjust the bar feeder when it is running, unless expressly requested in the manual.
- Do not feed the machine with bars of dimensions other than those recommended by the manufacturer.
- Do not use hoses as handholds.

3.4 USE AND OPERATION - Safety

- The working area around the bar feeder must always be kept clean and uncluttered so as to allow immediate access to the emergency devices and to perform the bar loading without creating obstructions or danger.
- Perform the starting sequence of the operating cycle as recommended.
- Do not put hands or anything else near or inside the moving parts or parts in tension.
- Do not wear bracelets, watches, rings and ties.
- If necessary, use strong work gloves with five fingers, which do not reduce the grip sensitivity or power.
- Wear work shoes as well as personal protection equipment as provided for by the safety regulations in force in all countries.
- Inform the maintenance personnel of any operating anomalies.
- Before starting the bar feeder, make sure that there is no personnel engaged in servicing or cleaning the machine.

3.5 BAR FEEDER MAINTENANCE - Safety

- Do not allow unauthorized personnel to carry out maintenance operations.
- Read this manual carefully before carrying out maintenance operations.
- Do not lubricate, repair or adjust the bar feeder while running, unless expressly indicated in the manual.
- Stop the bar feeder in accordance with the foreseen procedures before carrying out lubrication or other operations.
- Do not use matches, lighters or torches as lightning means during operations with inflammable fluids.
- Keep drain oil in suitable containers and deliver it to companies specialized in the storage and disposal of polluting waste products.
- Avoid environmental pollution.
- Use original IEMCA spare parts only.
- Considering that oil and polyurethane material is used, the disposal of the guide channels will be performed according to the regulations in force in the installation country.

EC CONFORMITY DECLARATION

(2006/42/ EC Regulation, Enclosure II, Part A)

Mr. TOMASO TAROZZI, acting as MANAGING DIRECTOR CEO and delegated by the company I G M I S.p.A. DIVISIONE IEMCA with legal office and establishment in Via Granarolo, 167 – 48018 FAENZA (RA) as manufacturer,

DECLARES

on his own responsibility that the machine:

AUTOMATIC BAR FEEDER

(type/model)	(registration number)

- is in compliance with the requirements of 2006/42/ EC regulation and with the national implementing regulations,

- is in compliance with the following European regulations:

    - 2006/95/ EC regulation (low tension);
    - 2004/108/ EC regulation (electromagnetic compatibility).

Otherwise he declares that the person in charge for the technical issue editing is Mr. Giampaolo Morandi, General director of the a.m. company.

TOMASO TAROZZI – Managing Director CEO

FAENZA, 11/11/2011

……
(delegate signature)

3.6 General Description of Supply

The bar feeder you bought is a machine designed to feed machine tools properly prepared for bar machining. It consists of:

A basic unit made up of a metal structure, a control panel, safety devices and protections in compliance with the EU regulations governing this sector.

A set of format parts related to the specific machining processes that the machine will perform. According to the terminology used by Iemca these parts are named: guide channels, bar pushers, revolving tips, collets, bushes and front noses. Because of the kind of use, these parts are subject to wear.

Any additional parts can be supplied upon request.

Applicable Safety Regulation

According to Directive 2006/42/EC article 2B, the bar feeder is an interchangeable equipment and is supplied with the appropriate safety devices.

Together with the supply you will find the EC declaration of conformity in compliance with the above-mentioned Directive.

The list of the safety devices is shown in section 2, paragraph 2.3, of this manual.

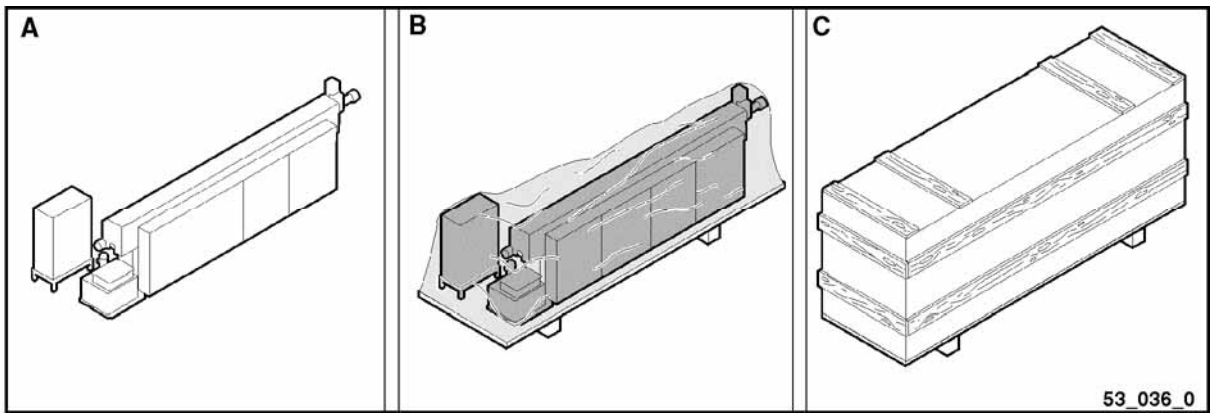
The bar feeder should be installed according to the manufacturer's instructions which are highlighted in the supplied check list.

Should the bar feeder be used together with machine tools that do not have the CE marking, Iemca reminds to their clients that they should assess if the device is in compliance with Directive 2009/104/EC and subsequent amendments even after installing the bar feeder.

Safety warning. Only qualified and properly trained personnel can work with machine tools and the related interchangeable equipments.

INDEX

4.1 PACKAGING



There are three possible bar feeder packaging:
A WITHOUT PACKAGING.
B WITH PALLET: the bar feeder is placed on a pallet and wrapped with protective film.
C WITH CRATE: the bar feeder is contained in a crate and wrapped with protective film.

4.2 LIFTING

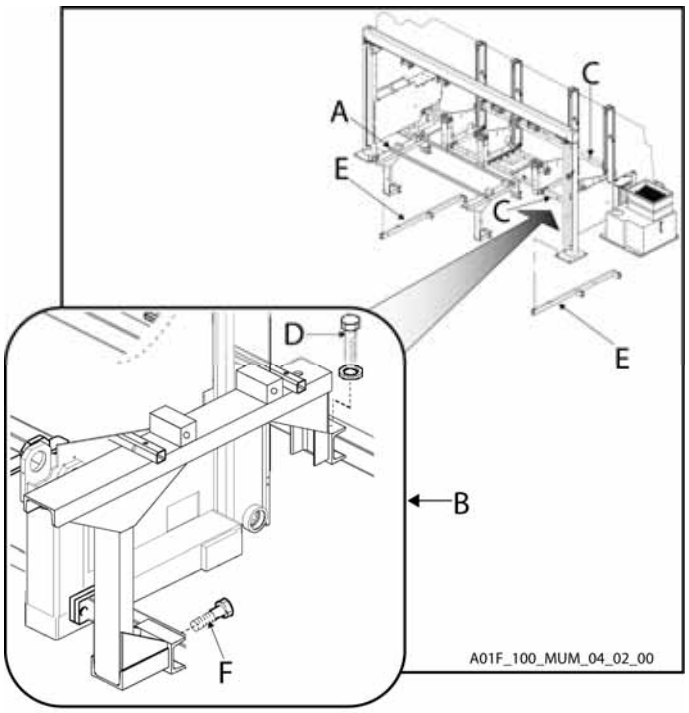
DANGER - WARNING:
lifting and handling shall be carried out using suitable means and performed by skilled personnel only.

4.2.1 Bar feeder without packaging - Lifting

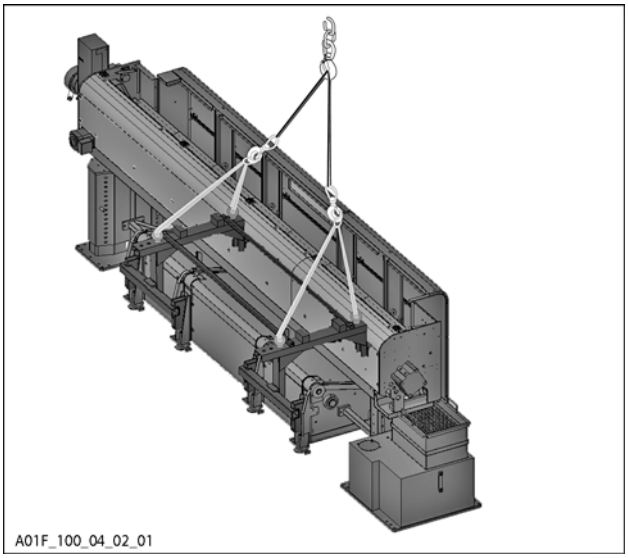
MASTER 100 F

- Use a hook type lifting device of suitable capacity.

- Install the frame (A) in the position indicated in the box (B).
- Fix the frame (A) to the tubular element (C) using the screws (D) and (F).
- Fix the two tubular elements (E) to the front and rear feet to connect the magazine to the bar feeder bases.

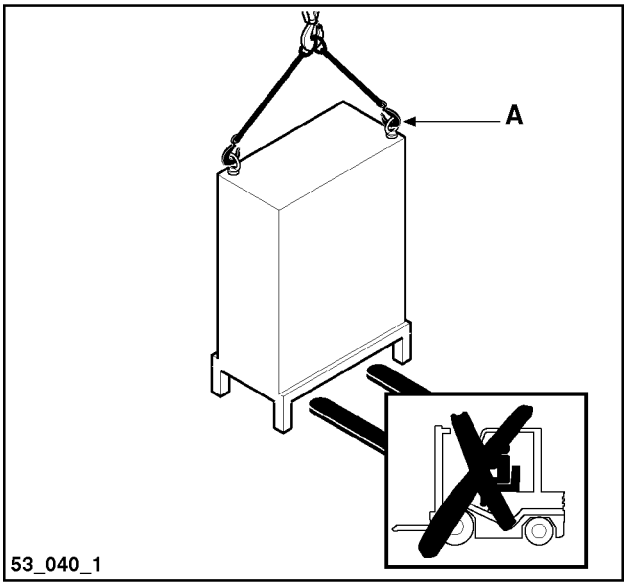


- Use a hook type lifting device of suitable capacity.



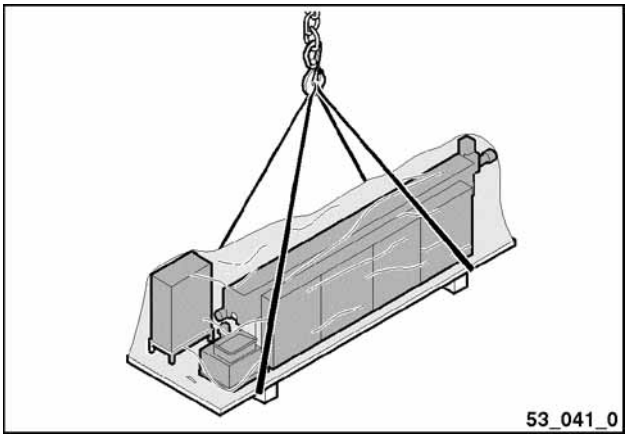
ELECTRIC CABINET

- Install two round eyebolts (A) with threaded stem (1 UNI - ISO3266 M10).
- Use a hook type lifting device of suitable capacity.



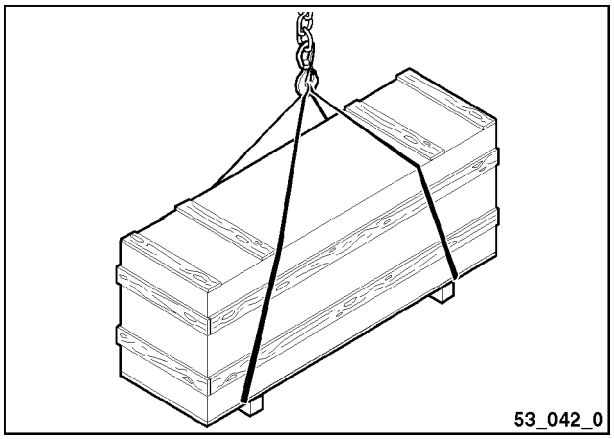
4.2.2 Bar feeder with pallet - Lifting

Use a hook type lifting device of suitable load capacity.

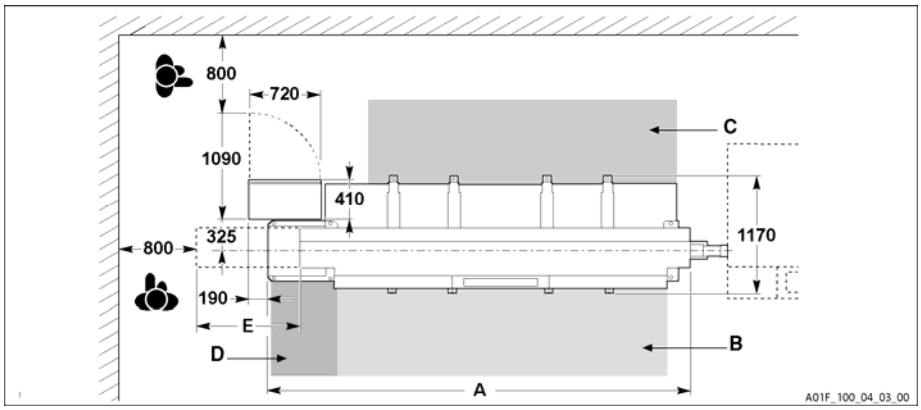


4.2.3 Bar feeder with crate - Lifting

Use a hook type lifting device of suitable load capacity.



4.3 INSTALLATION AREA - FEATURES



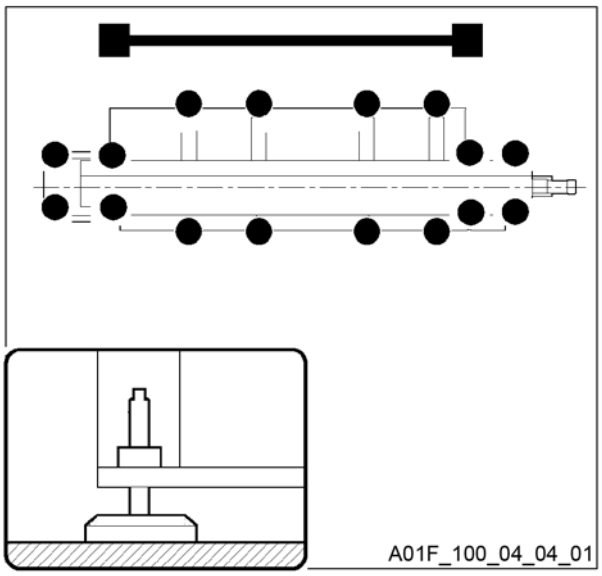
The floor should be stable and levelled to guarantee good fastening to the ground.
Provide an area of suitable dimensions according to the type of bar feeder used.
The areas (B) (working area), (C) (bar loading area) and (D) (remnant ejection area) should be properly delimited to prevent collisions between the operator and any handling equipment or means of transport travelling near the bar feeder.
The selected area should be illuminated and provided with an electric and pneumatic power supply socket.
During operation, the bar feeder will release small amounts of oil mist. Install the bar feeder in a suitably ventilated area.
The bar feeder has not been designed for use in an explosive atmosphere.

4.4 BAR FEEDER INSTALLATION - FOREWORD

Before carrying out the bar feeder installation, check the lathe stability; make sure that it is firmly fixed to the ground and that the spindle axis is perfectly in horizontal position.

4.4.1 Backing plates and support feet - Installation

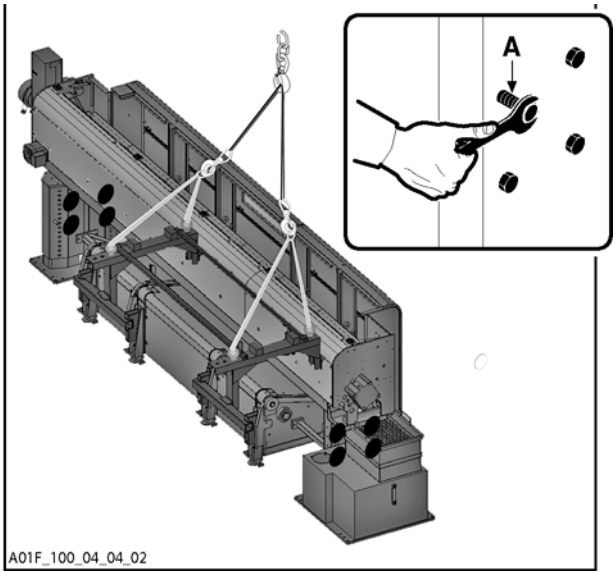
- Position the bar feeder next to the lathe.
- Lift it and install the plates in the positions shown in the figure.



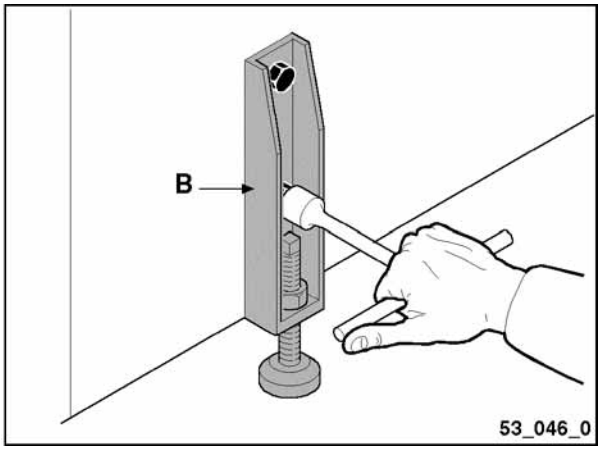
4.4.2 Height - Adjustment

The bar feeder is normally supplied with the working axis height adjusted to the lathe height. However, if an adjustment is needed, proceed as follows:

- stretch the lifting chains and remove screws (A) in the front and rear bases;



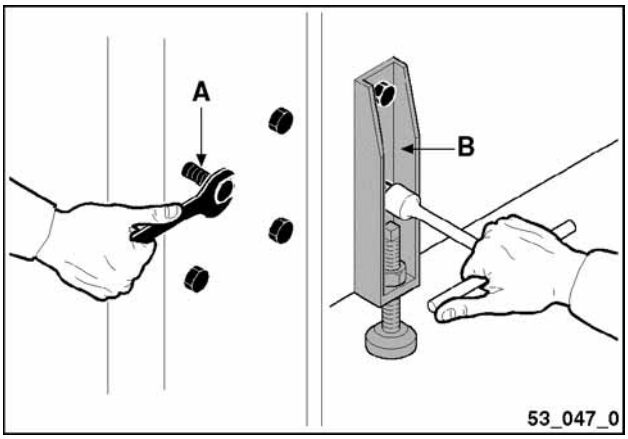
- remove all the brackets (B) of the magazine feet.



- lift or lower the bar feeder according to the necessary X value, see table.

- The height of the working axis may be adjusted according to the data indicated in the table of the "Technical data" section.

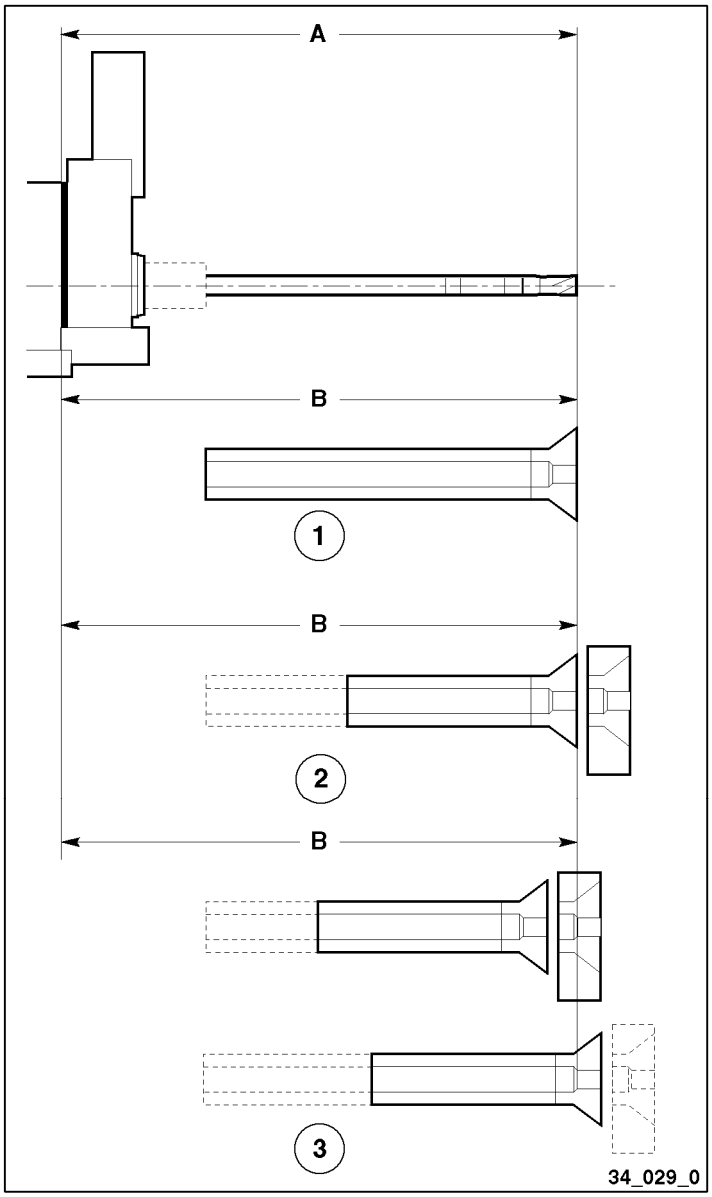
- tighten screws (A) and fit brackets (B) again.



4.4.3 Preliminary positioning

- Place the bar feeder behind the lathe, considering the fixed and moving dimensions of both machines. The coupling distance (B) should not exceed the bar pusher maximum extension (A).

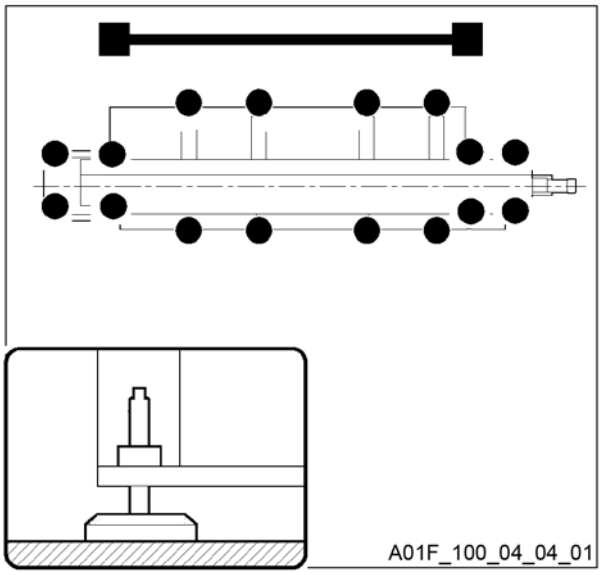
1 Fixed headstock or sliding rest lathe
2 Sliding headstock CNC lathe
3 Sliding headstock cam lathe



Max. bar pusher extension

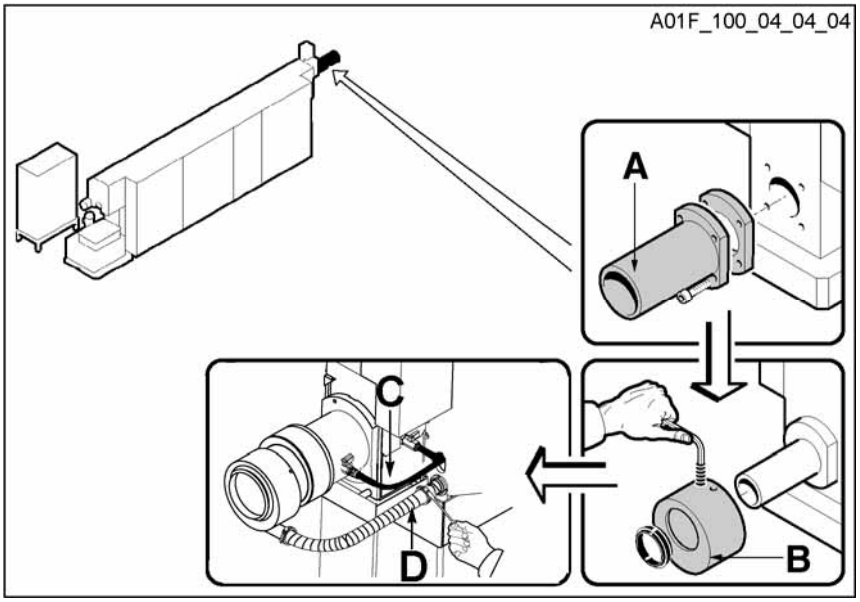
Model	Version	Version	A – Max. extension (mm)
MASTER 100 F	33 - 43	LL	1600
		XLL	1850
		XXL	2100

- Roughly adjust the height of the working axis and the alignment with the lathe by turning the screws of the support feet.



4.4.4 Front nose - Installation

- Install the front nose (A) in the bush holder device.
- Install the oil recovery tank (B).
- Connect the lubrication pipe (C) to the front nose.
- Connect the drain pipe (D) to the tank



4.4.5 Levelling and alignment

FOREWORD

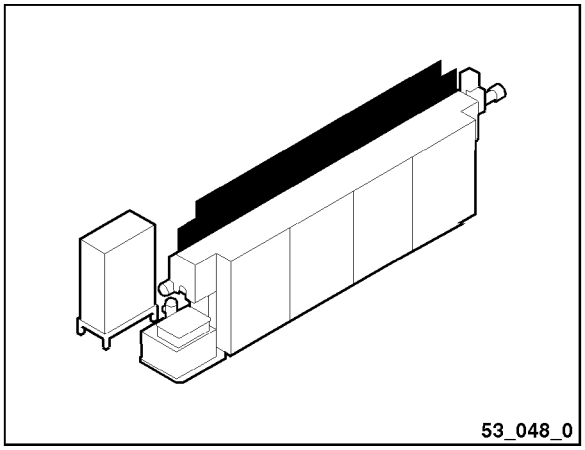
The alignment between the bar feeder and lathe is the most critical phase; therefore, this operation should be carried out with the greatest accuracy by experienced personnel.

WARNING – CAUTION:

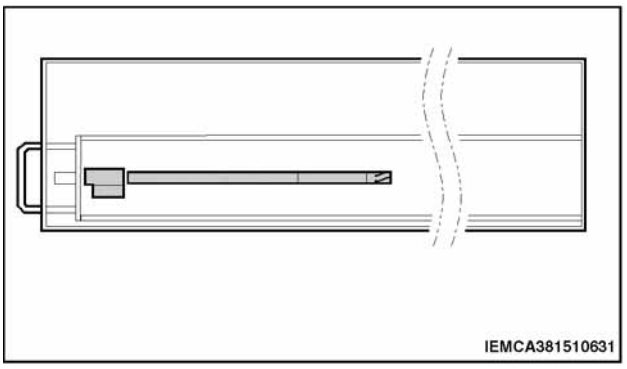
an error during the alignment may be the major cause of a bad operation of the bar feeder and of its consequent damage.

PRELIMINARY PROCEDURE

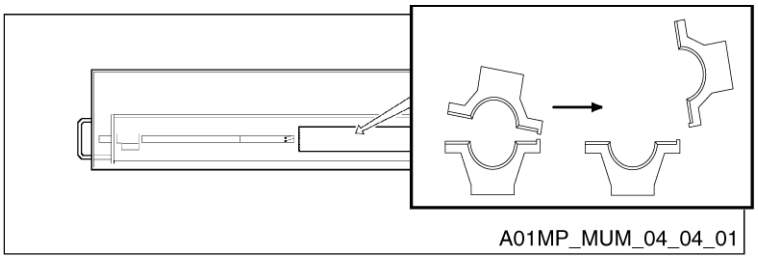
- Open the upper guard.



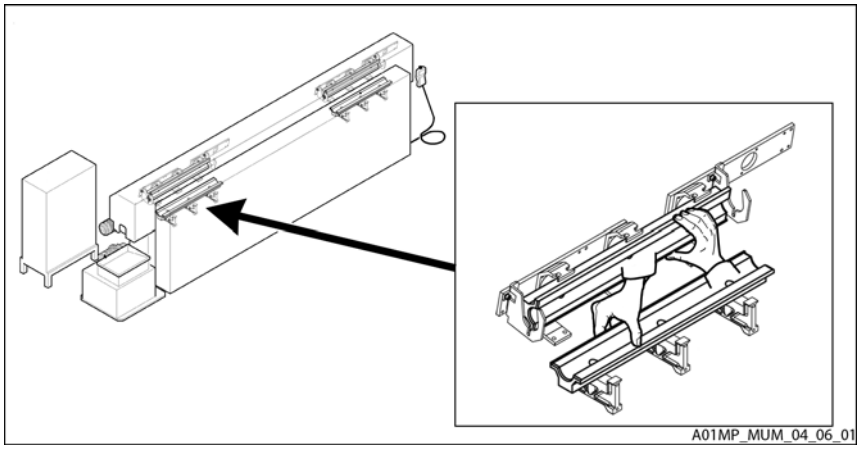
- To bring the bar pusher to the backwards limit stop, in manual mode, press  or  on the handheld keyboard.



- Press SEMI AUT. and AUT. to select the semiautomatic function. Press STEP by STEP several times until the upper guide channels open; "GUIDE CHANNEL FULL OPENING" should appear on the display.

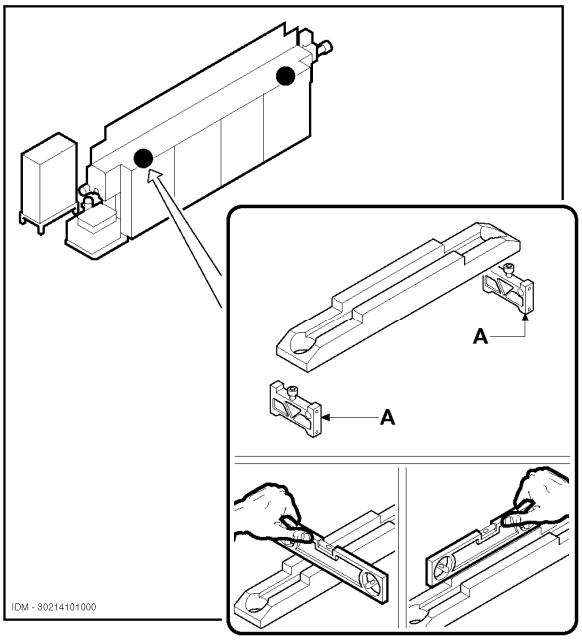


- Remove the first and last lower guide channels by pressing on the pressure couplings.

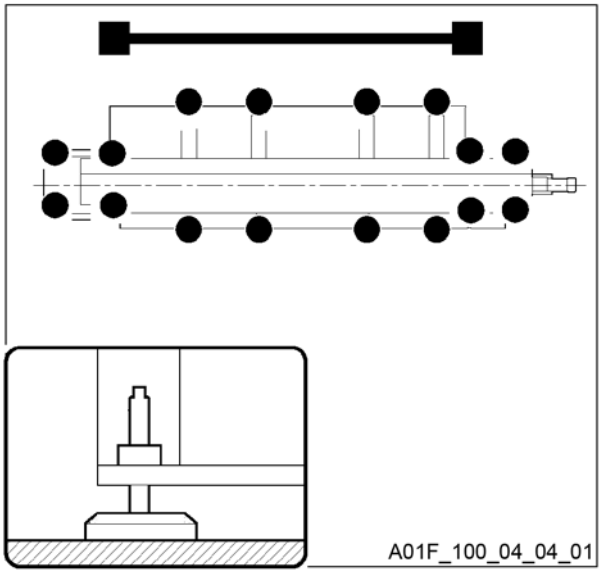


LEVELLING

- Rest the special shelf on the supports.
- Check the levelling by positioning the level crosswise and lengthwise.



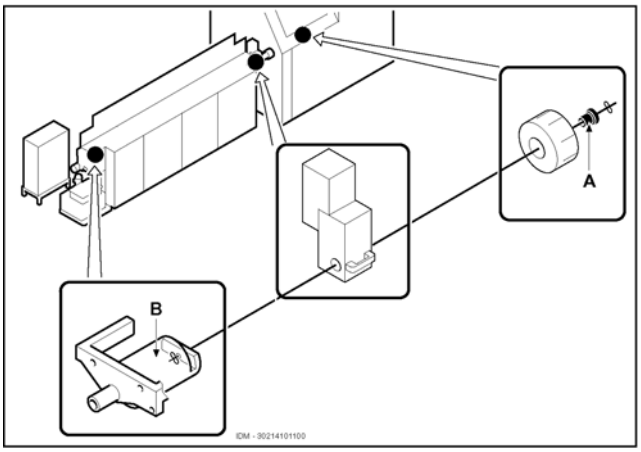
- Carry out the required corrections by turning the support feet screws.



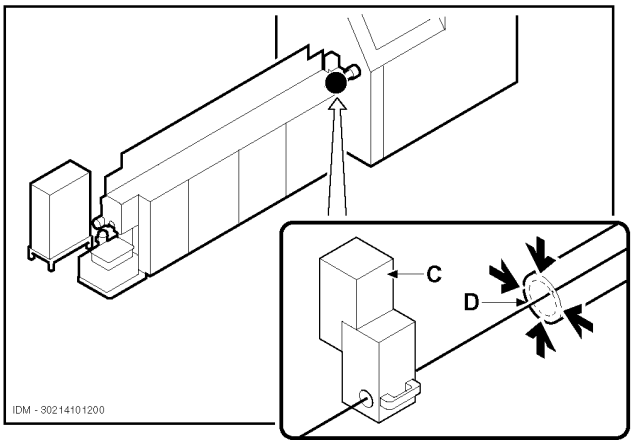
ALIGNMENT

The alignment is obtained by fitting a nylon thread (ø 1 mm) between the lathe collet and the first feeding carriage, proceeding as follows:

- place a drilled bush (A) in the lathe collet;
- stretch the thread between the bush and the hole in the first feeding carriage (B).

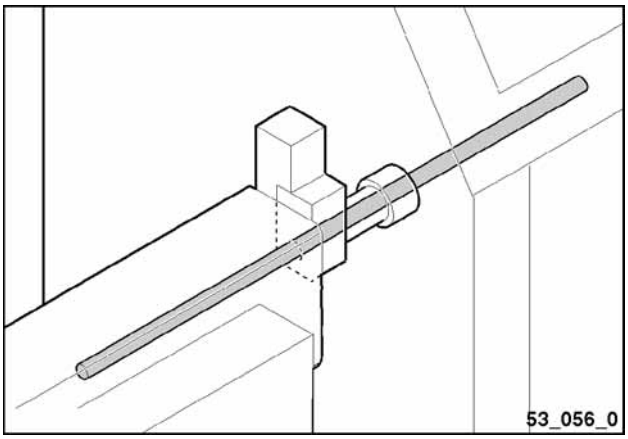


- check with a sliding caliper, the alignment near the bush (C) and the spindle (D); use a tolerance of ± 0.15 mm in the four directions.



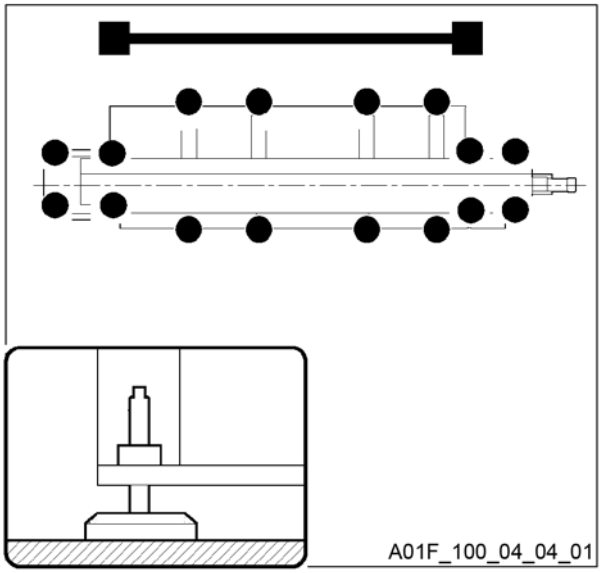
It is also possible to carry out the alignment by placing a bar in the guide channels. Proceed as follows:

- prepare a perfectly straight ground bar, with an external diameter equal to the maximum spindle bar passage and with a length equal to the double coupling distance (see (B) in section 4.4.3);
- place the bar in the guide channel and cause it to slide forwards and backwards in the spindle, until the lathe collet area is reached.



POSITIONING ADJUSTMENTS

After checking the alignment of the bar feeder with either the thread or the bar, any required corrections should be carried out.
Adjust the height by turning the support feet screws.
During this phase, any adjustment carried out during the levelling phase should be preserved; therefore, in most cases, it is necessary to find the correct adjustment of the bar feeder position.

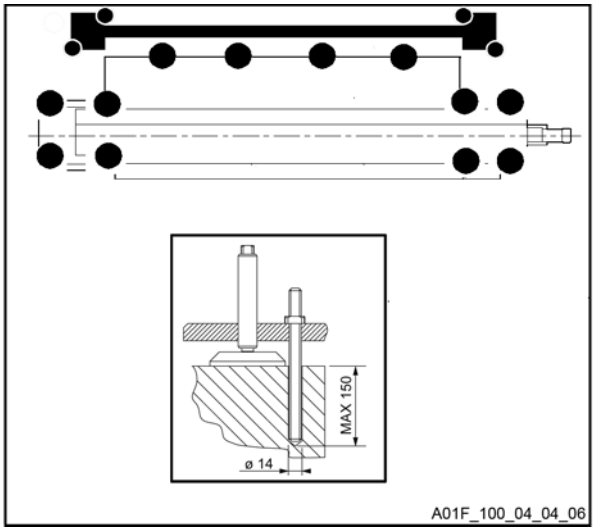


4.4.6 Bar feeder fastening

WARNING – CAUTION:

failure to perform or a wrong bar feeder fastening to the ground may be the major cause of a bad operation of the bar feeder and of its consequent damage.

- Drill the floor and fix the backing plates with expansion plugs. Use the higher number of expansion plugs to ensure a correct fastening.
- Check the levelling and alignment once more.
- Remove all the equipment used for the levelling and alignment phases and restore the initial bar feeder conditions.

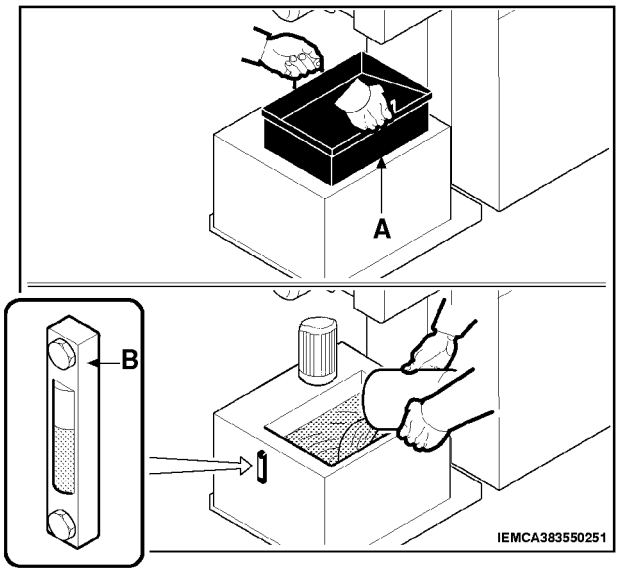


4.5 LUBRICATION OIL - FILLING

WARNING – CAUTION:
wear personal protections according to the regulations in force.

- Remove cover (A).
- Pour the oil directly into the tank and check the level through the relevant indicator (B).

Oil features: Class (C) - CKB 150, quantity 80 l.

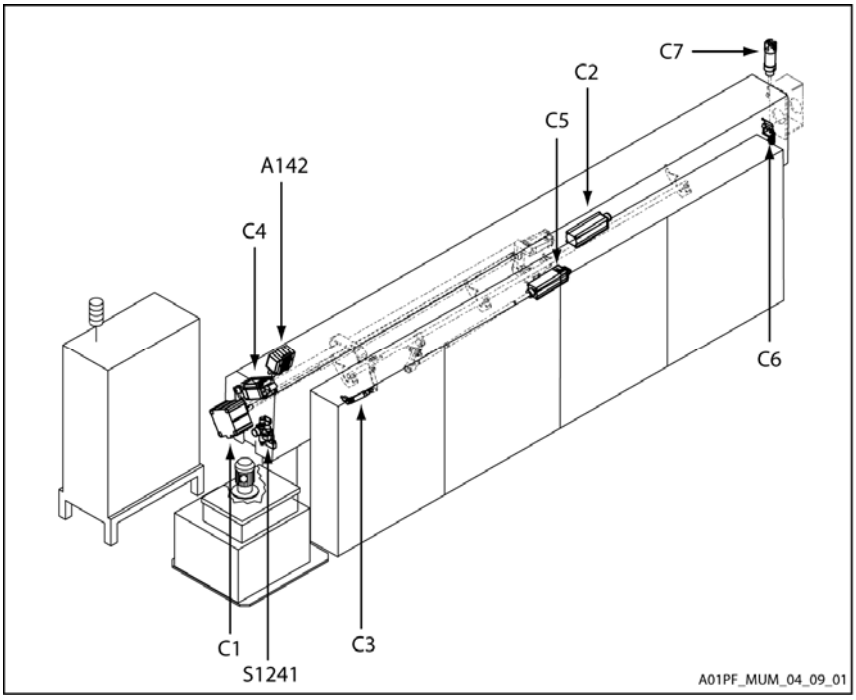


4.6 ELECTRICAL CONNECTION

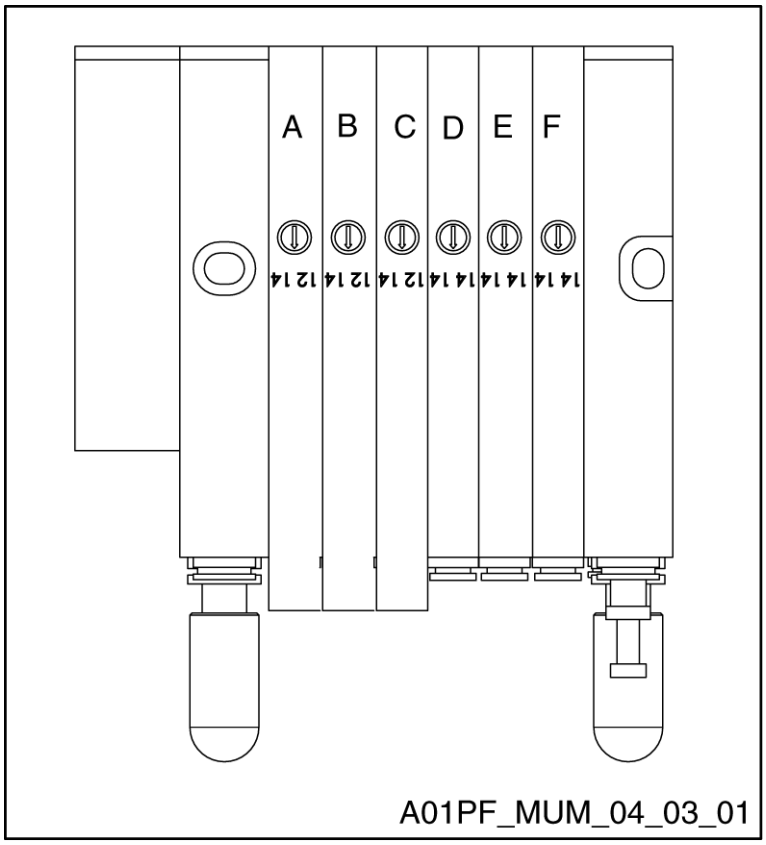
DANGER - WARNING:
this type of operation should only be entrusted to skilled personnel with precise technical competence and specific abilities to comply with the applicable standards and regulations in force. The feeder must be electrically connected to the lathe, which in turn, must be connected to the electrical installation in compliance with the applicable regulations in force.

The bar feeder is normally equipped with a multiple plug to be inserted into the special lathe socket; refer to the "Wiring diagram" if necessary.

4.7 PNEUMATIC DEVICE LAYOUT



ABBREVIATION	DESCRIPTION	FUNCTION
C1	Cylinder	Enables the clamp opening and closing
C2	Cylinder	Enables the guide channel downstroke for the remnant drop
C3	Cylinder	Enables the guide channel locking
C4	Cylinder	Enables the guide channel upstroke and downstroke
C5	Cylinder	Controls the bar drop control devices upstroke and downstroke
C6	Cylinder	Resets the short feed gate
C7	Cylinder	Enables the bush opening and closing
A142	Solenoid valve unit	Cylinder or piston control device (see description Solenoid valve box)
S1241	Distributor + pressure switch	Dispenses and adjusts the supply flow inside the pneumatic system

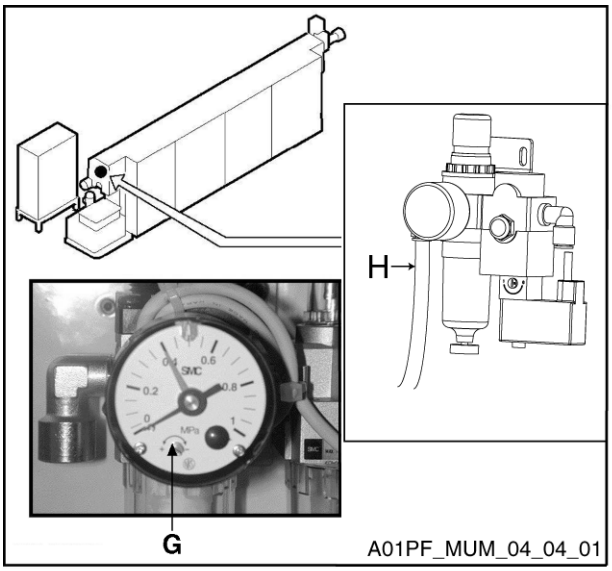


ABBREVIATION	DESCRIPTION	FUNCTION
A (12)	Remnant drop solenoid valve	Remnant drop upstroke
A (14)	Remnant drop solenoid valve	Remnant drop downstroke
B (12)	Guide channel control solenoid valve	Guide channel opening
B (14)	Guide channel control solenoid valve	Guide channel closing
C (12)	Bar drop control device solenoid valve	Bar drop control devices downstroke
C (14)	Bar drop control device solenoid valve	Control device upstroke
D	Guide channel locking solenoid valve	Guide channel locking
E	Clamp control solenoid valve	Clamp closing
F	Flag control solenoid valve	Flag upstroke

4.7.1 PNEUMATIC CONNECTION

- Connect pipe H of the pneumatic network as shown in the figure.

WARNING – CAUTION:
to adjust the pressure follow the instruction manual.

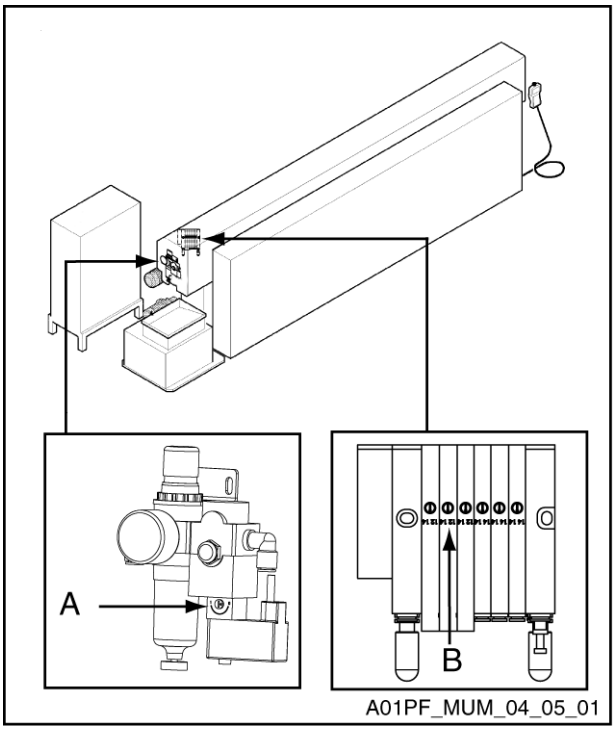


4.7.2 BAR FEEDER HANDLING WITHOUT POWER SUPPLY

Without power supply or in case of an emergency it is possible to move the pneumatic units using the solenoid valves manually:

- By means of a small screwdriver turn switch A to position 1.
- With the same tool turn switches B, placed on each solenoid valve, to move the unit.

INFORMATION:
For the movement description of each solenoid valve, refer to the "Pneumatic device layout" section.



4.8 SOFTWARE PARAMETERIZATION

The bar feeder software should be correctly parameterized according to the working needs and the lathe type.
For further information on how to carry out this operation, check the "Keyboard instruction manual".

INDEX

5.1 ADJUSTMENT AND SETUP - FOREWORD

DANGER - WARNING:

do not perform any adjustment when the bar feeder is running unless expressly requested in the manual.

This bar feeder requires, besides the ordinary adjustments necessary during its life, also adjustments depending on the bar dimensions and the magazine type.

5.2 GENERAL ADJUSTMENTS - FOREWORD

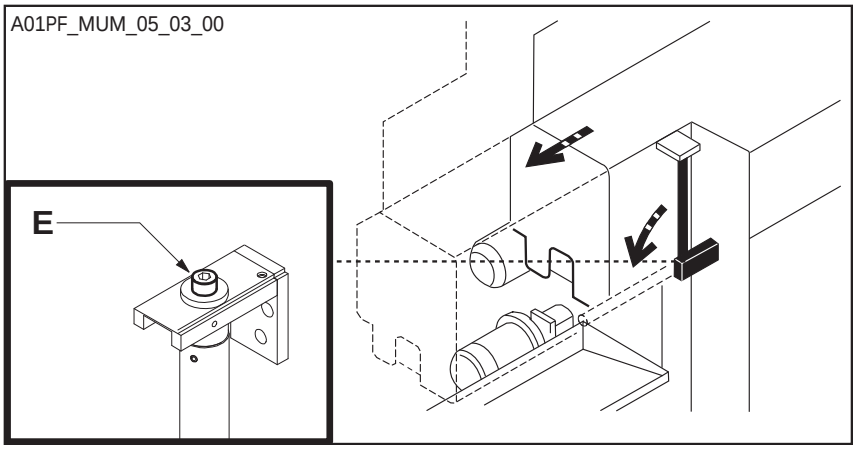
All the necessary adjustments for correct bar feeder operation are included. They may become necessary for maintenance, troubleshooting or component replacement.

5.2.1 Feeding chain - Adjustment

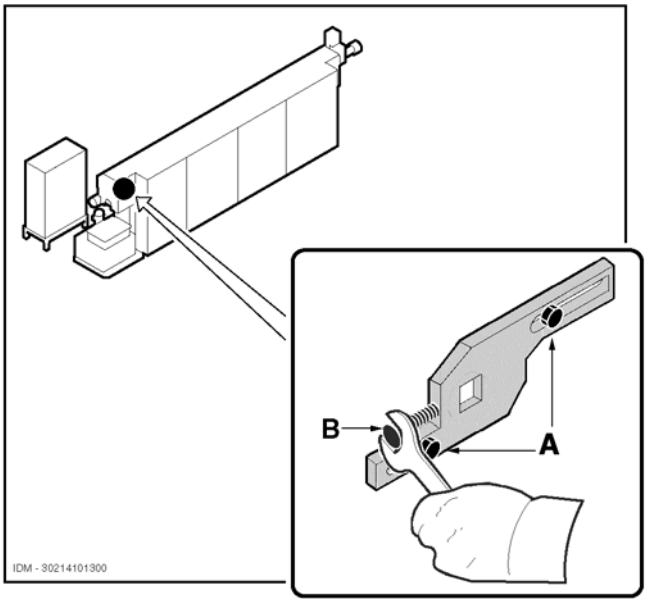
- Remove the screw (E), lower the rear lever and move the bar feeder body backwards.

WARNING – CAUTION:

before performing this operation, open the upper guard.



- Loosen both screws (A) and adjust the chain tension by turning screw (B).
- Restore the bar feeder initial operating conditions.



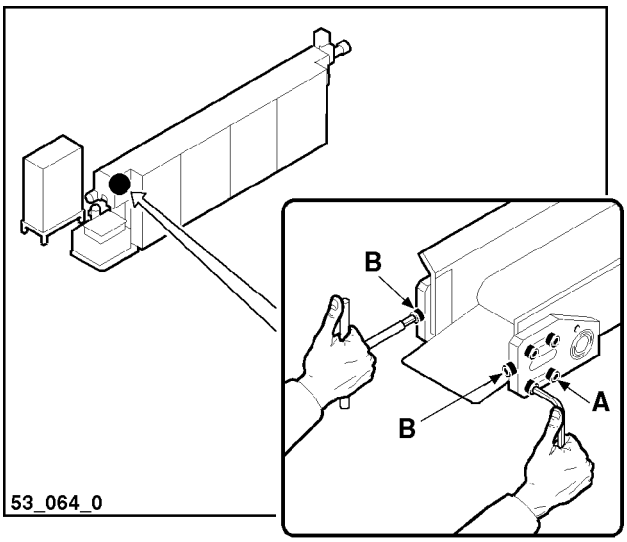
WARNING-CAUTION

Perform the chain adjustment by means of a torque wrench, tighten screw (B) by setting the torque to 4N/meter, then tighten both fixing screws (A).

5.2.2 Remnant conveyor belt - Adjustment

INFORMATION:

Check and if necessary adjust the belt tension after the first 20-30 working hours of the bar feeder.



- Move the bar feeder body backwards.
- Loosen the eight screws (A).
- Adjust the conveyor belt tension through screws (B).

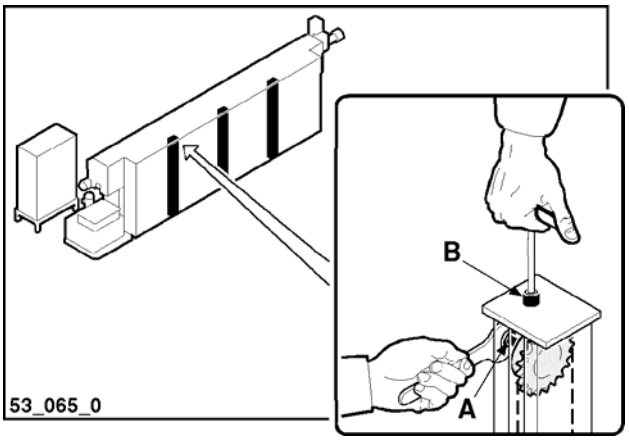
INFORMATION:

screw or unscrew the right and left screws by making the same number of turns.

- Tighten the screws (A).
- If during operation the conveyor belt does not turn in a centred way, it will be necessary to adjust the centring by using one of the two screws (B).

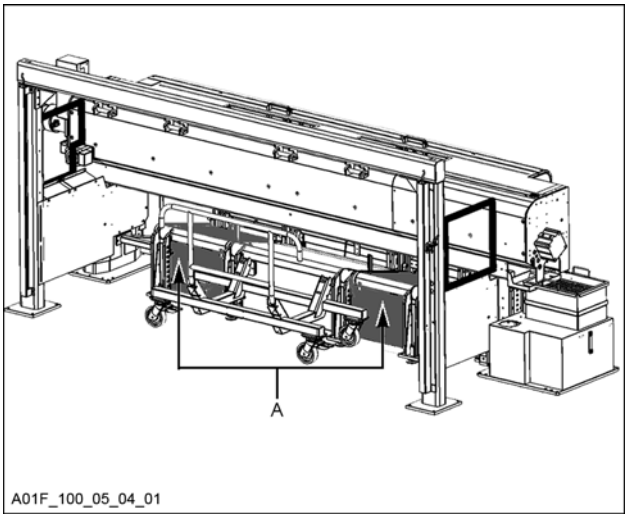
5.2.3 Elevator carriage chains - Adjustment

- Loosen screw (A).
- Act on screw (B) to adjust the chain tension.
- Tighten screw (A).
- Repeat the procedure for all elevator carriages, if necessary.

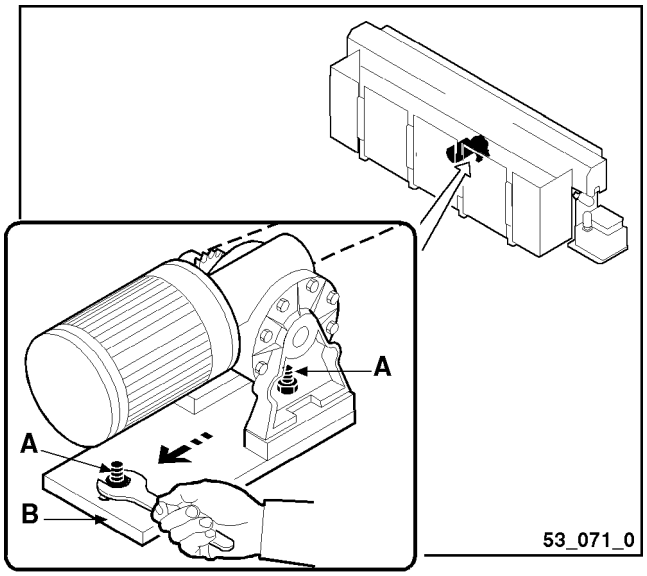


5.2.4 MASTER 100 F elevator carriage drive chain - Adjustment

- Remove the front guard (A).



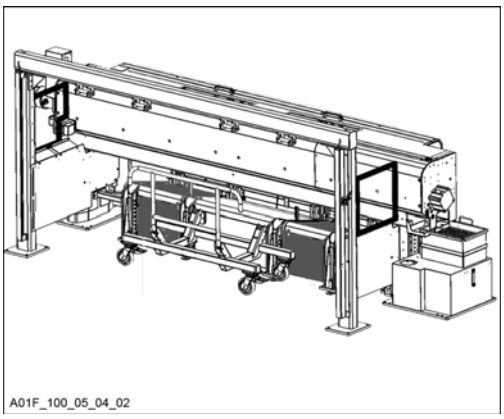
- Loosen nuts (A).
- Move plate (B) in the direction of the arrow and tighten nuts (A).
- Reassemble the previously removed guard.



5.2.5 MASTER 100 F lifting belt control cams - Adjustment

At the bar end, the lifting belts have to be completely stretched to allow all bars to be unloaded. During operation the belts may lengthen; it is therefore necessary to adjust the cams controlling the stop microswitches.
Adjust as follows:

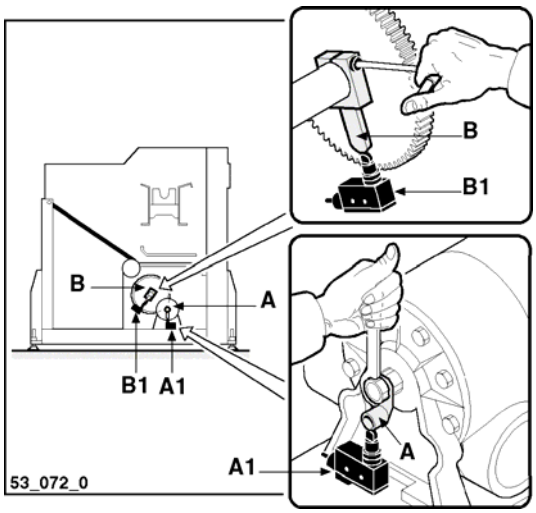
- remove the front guard.



- adjust the position of cams (A) and (B) so that microswitches A1 and B1 are simultaneously activated when the belts are completely tensioned.

WARNING – CAUTION:

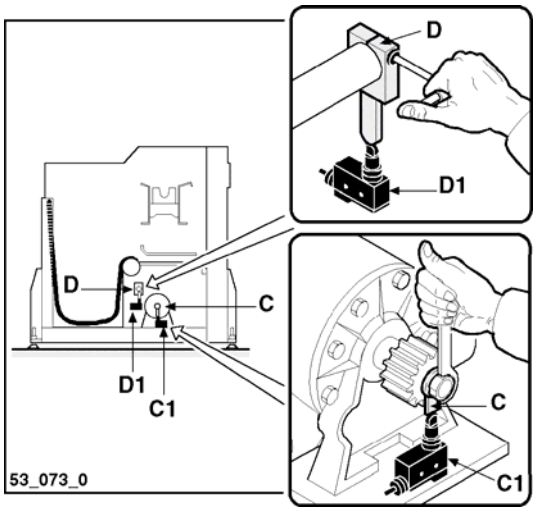
if the upper belts are too tight, the relevant supports may bend. If high belts are not tight enough, not all bars are unloaded.



- Adjust the position of the cams (C) and (D) so that the microswitches C1 and D1 are activated simultaneously when the belts are unwound.

WARNING – CAUTION:

if the lower belts are too unwound, each loading cycle is longer than necessary. If the lower belts are not sufficiently unwound, the bars, instead of resting on the supports, will continue to be supported by the belts, thus submitting them to unnecessary stress.



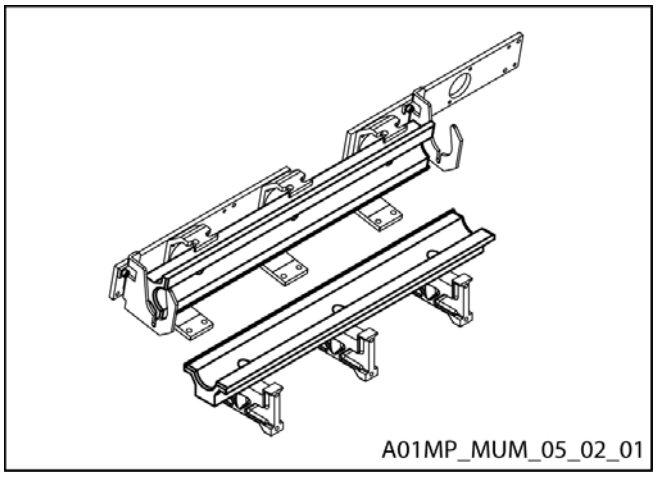
- Reassemble the previously removed guard.

5.3 BAR FEEDER SETUP

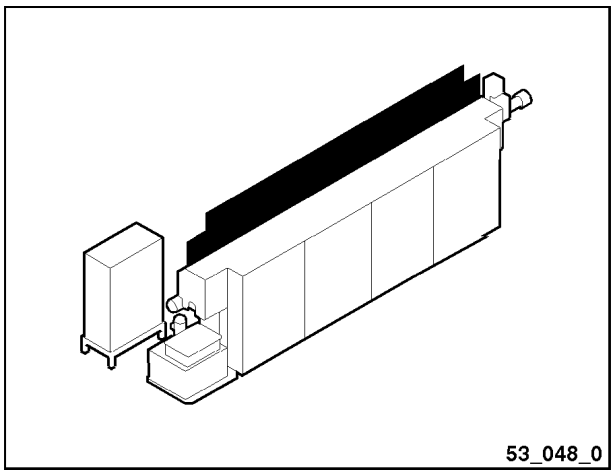
If the diameter of the bars to be machined changes, it may be necessary to perform adjustments on the machine.
Refer to table "Guide channel, bar pusher, bar and pipe diameter" section 2.

5.3.1 Guide channels, half bushes, bar pusher and collet - Replacement

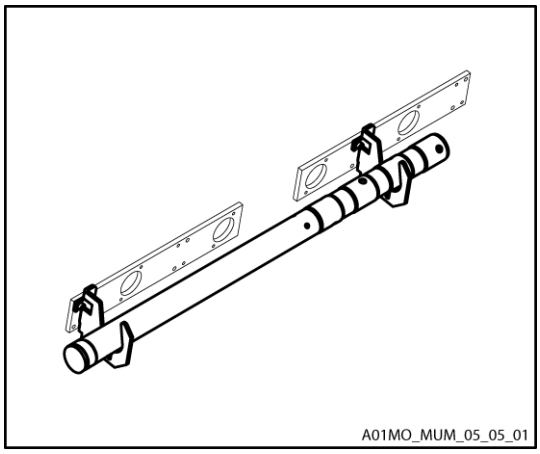
- Press  to start the bar feeder.
- Press  then  to select the semiautomatic function.
- Press  several times until the upper guide channels open; "GUIDE CHANNEL FULL OPENING" should appear on the display.



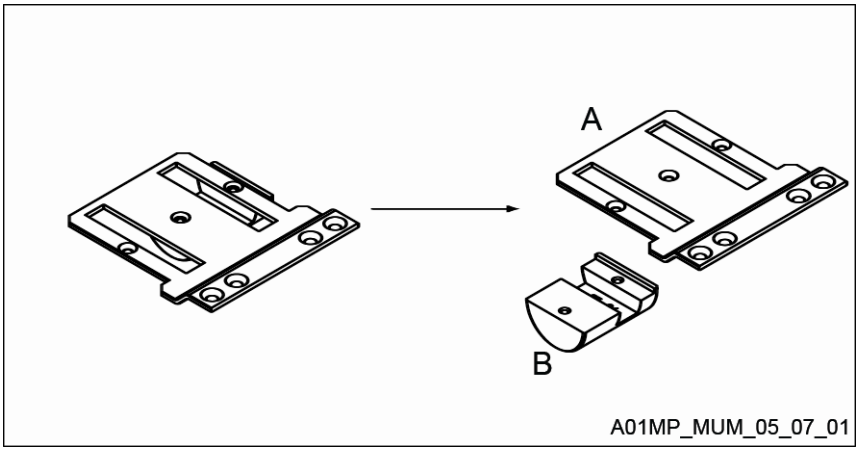
- Press  and open the upper guard.



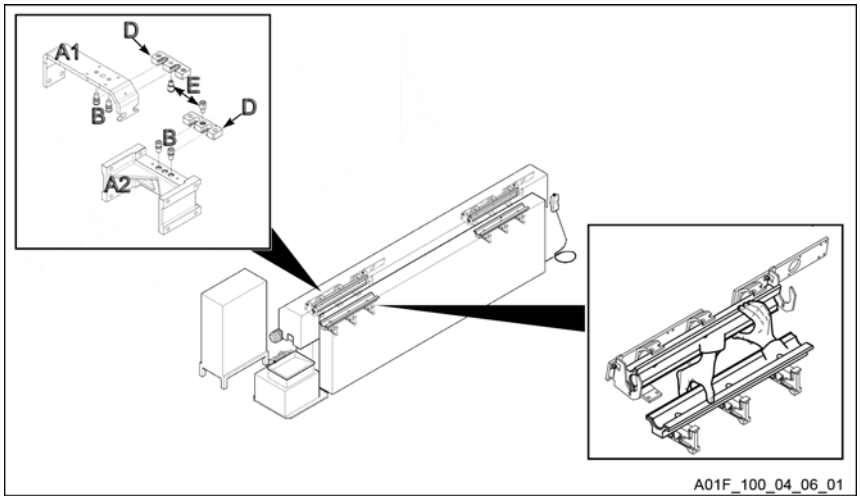
- Remove the bar pusher from both supports.
  For the bar pusher replacement refer to the next section.



- Disassemble the first feeding pin (B) from the flag (A).



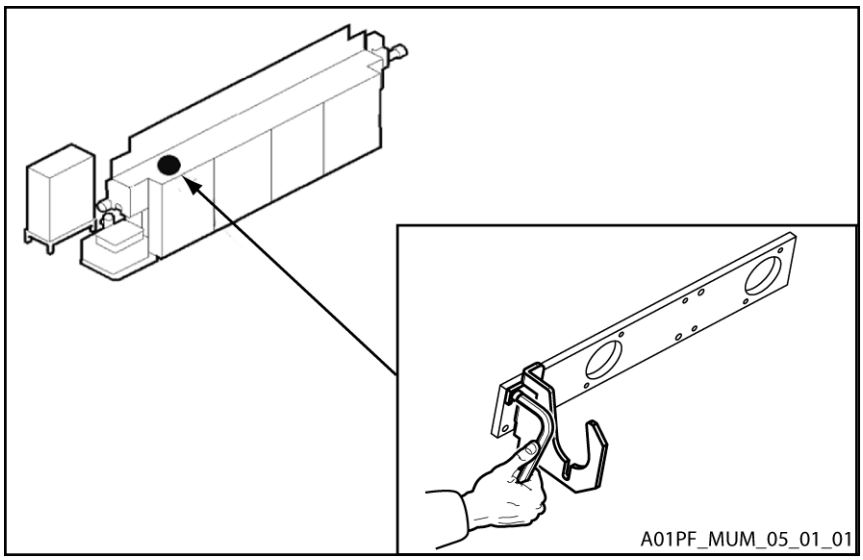
- Remove the lower guide channels using the special wrench provided.



WARNING – CAUTION:

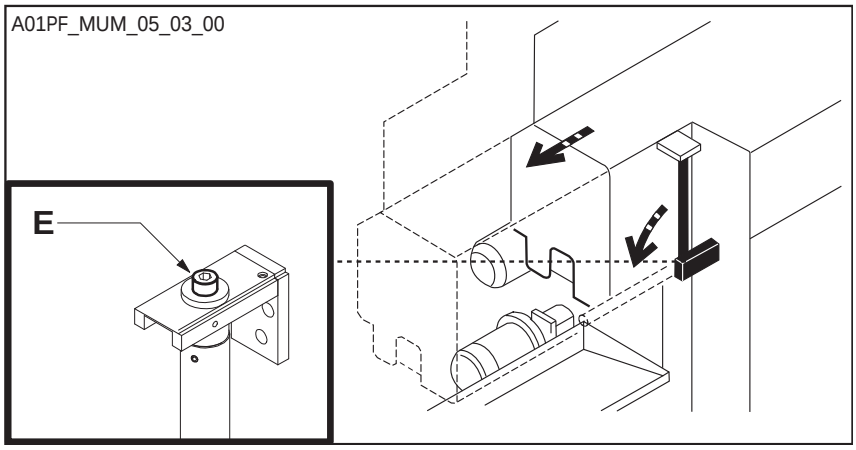
With guide channels having a smaller than 86 mm insert the shims (D) in the supports (A1/A2) and fix the guide channels in the pins (E). With guide channels having a larger than 86 mm follow the opposite procedure in comparison to the one described above.

- Replace the bar pusher supports with those of "new" diameter.

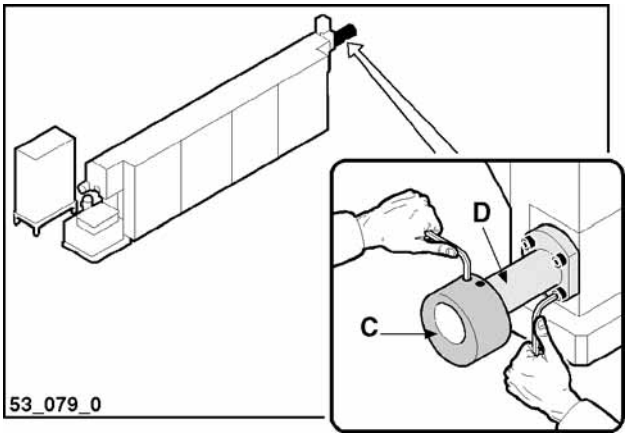


- Remove the screw (E), lower the rear lever and move the bar feeder body backwards.

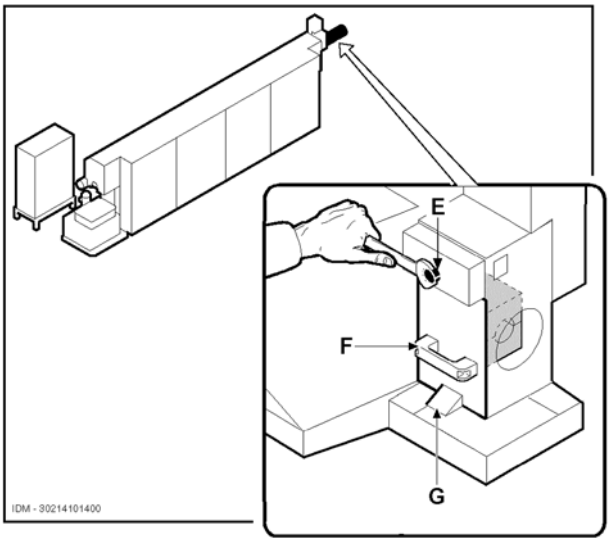
WARNING – CAUTION:
before performing this operation, open the upper guard.



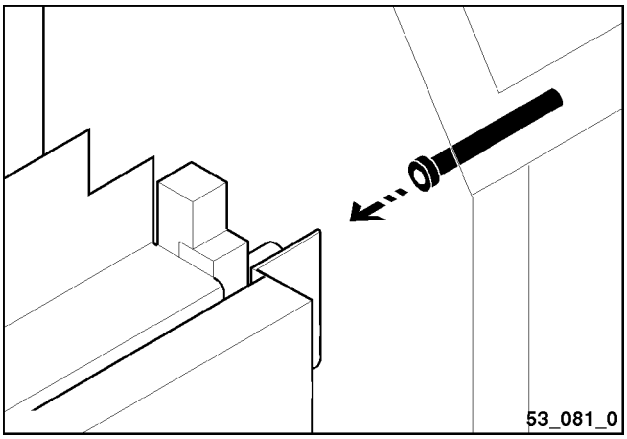
- Remove the oil recovery device (C) and sleeve (D).



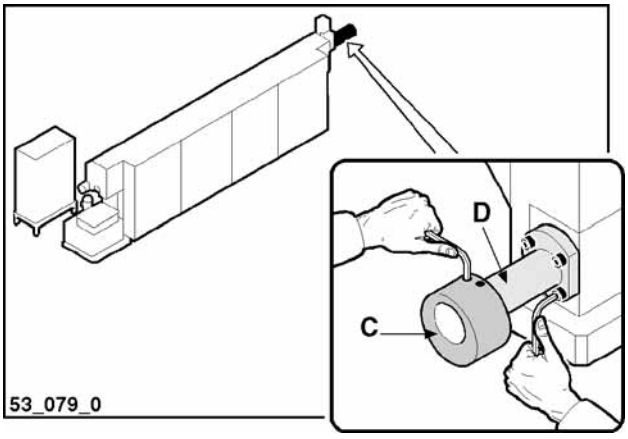
- Lower spring (G) and remove cover (F), completely open the two half-bushings by manually turning shaft (E) and remove the lower half-bushing.
- Close the upper half-bushing by turning the shaft again then replace it.
- Turn the shaft and fit the lower half-bushing.
- Close the half bushes completely and install the cover.



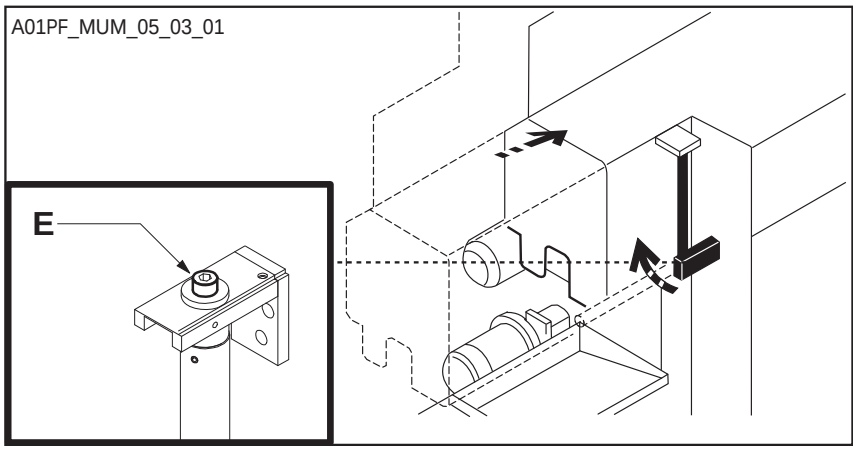
- Remove the lathe spindle liner if required and install a suitable liner for the "new" diameter, if necessary.



- Assemble sleeve (D) of the "new" diameter and the oil recovery (C).

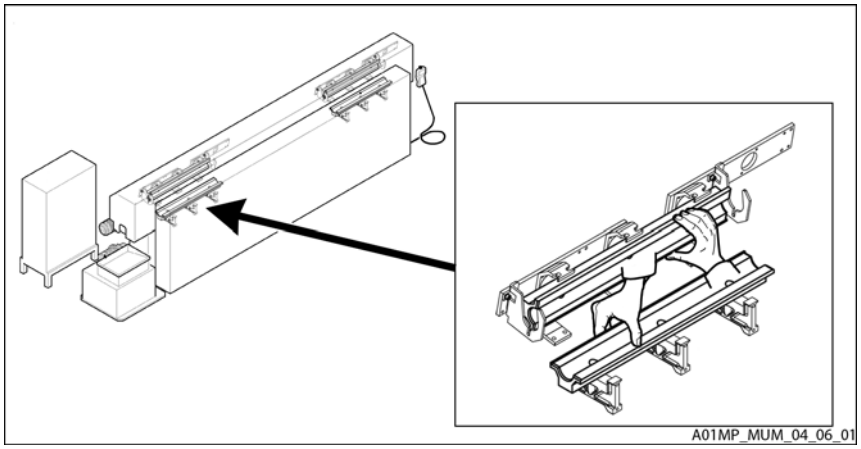


- Move the bar feeder body forwards and lift the rear lever, turn screw (E) clockwise to block the lever.

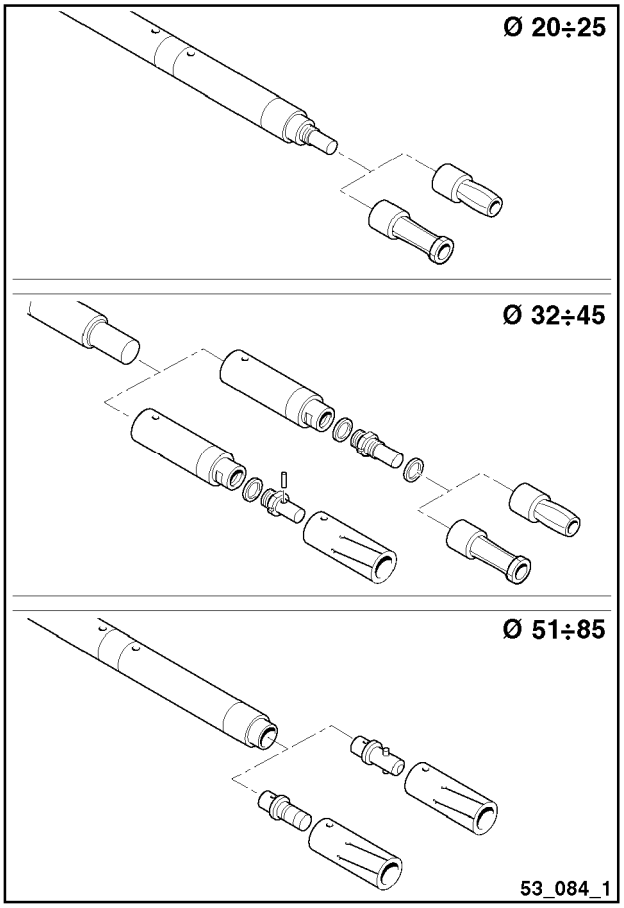


WARNING – CAUTION:
gradually bring the bar feeder body up to the stop placed on the tank, thereby eliminating the risk of damaging the displacement device.

- Assemble the lower guide channels of the "new" diameter.



- Choose an appropriate collet for the bar diameter and profile; see "GUIDE CHANNELS-BAR PUSHER-REVOLVING TIPS" and "COLLETS" section.

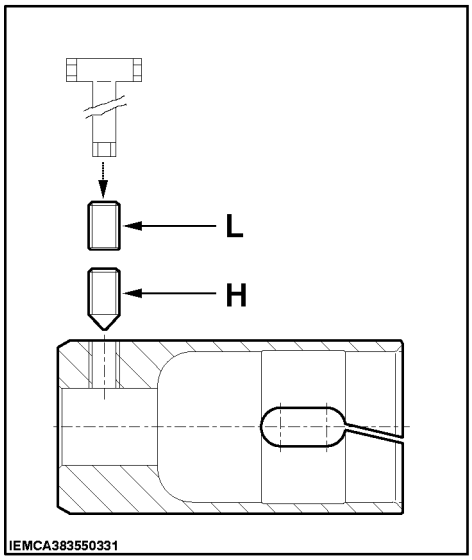


INFORMATION:

contact IEMCA service department for further information.

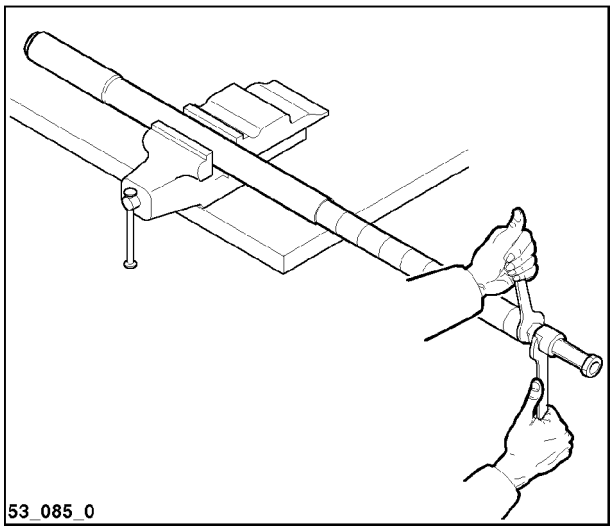
WARNING – CAUTION:

At every collet change (model 381p, 381p..011, 381p..021 e 386p) it is necessary to install the grub screw H and the counter screw L.



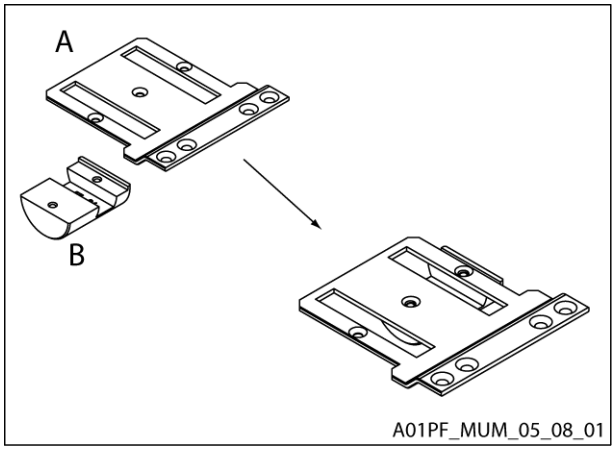
WARNING – CAUTION:

the collet external diameter should be at least 0.5 mm smaller than the bar pusher external diameter.



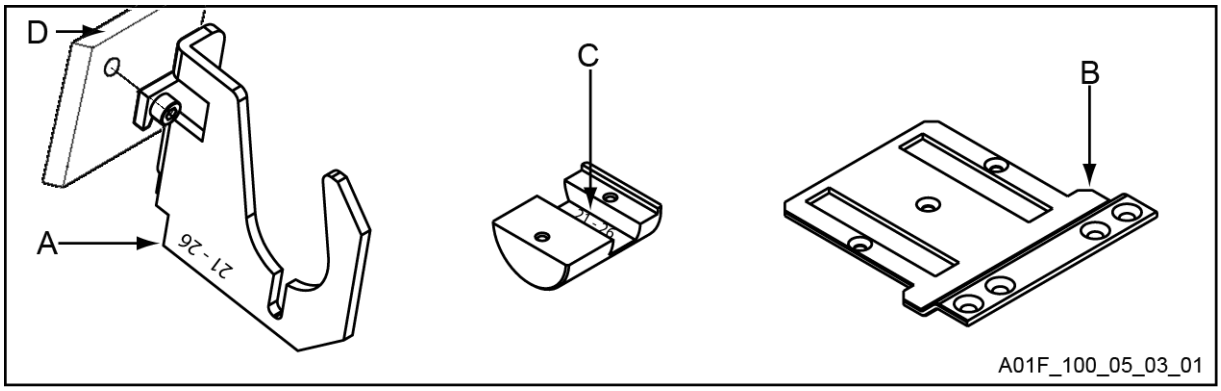
- Install the collet in the bar pusher and make sure that the rings are riveted in their special recess to prevent accidental loosening of the collet and/or its connection.

- Assemble the first feeding pin (B) of the "new" diameter on the flag (A).



Guide channel diameter	Code Bar Pusher Support (A)	Code Flag (B)	Code Flag Pin (C)	Bar pusher support spacers < Ø 86 mm (D)
21 – 26	381019641	380A00231	380600141	381019661
33 – 38	381019631	380A00231	380600151	381019661
43 – 52	381019621	380A00231	380600161	381019661
57 – 86	381019611	380A00231	380600171	381019661
87 – 116	381019651	380A00221	380600251	

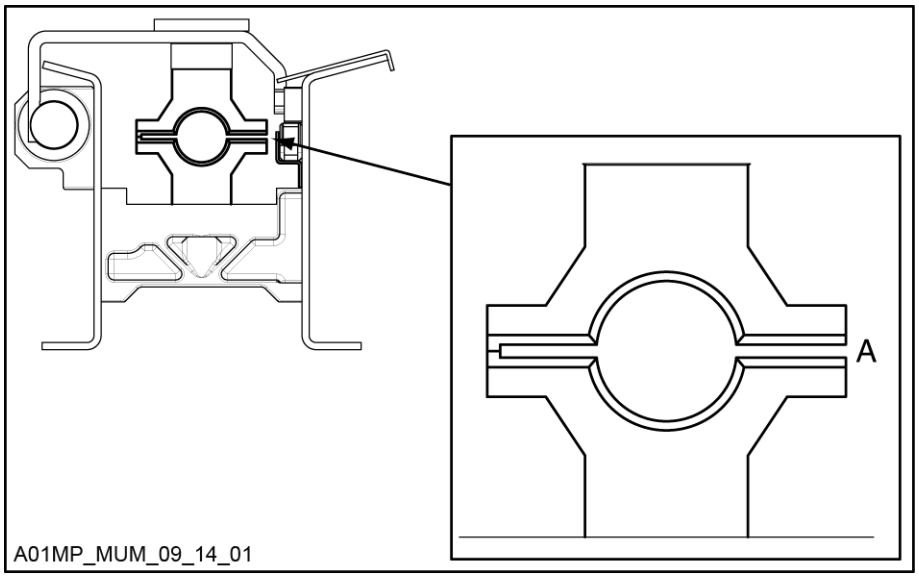
- The bar pusher supports and the driving flag of the bar pusher are used for guide channels with different diameters. The following table indicates the diameter field of each component type.



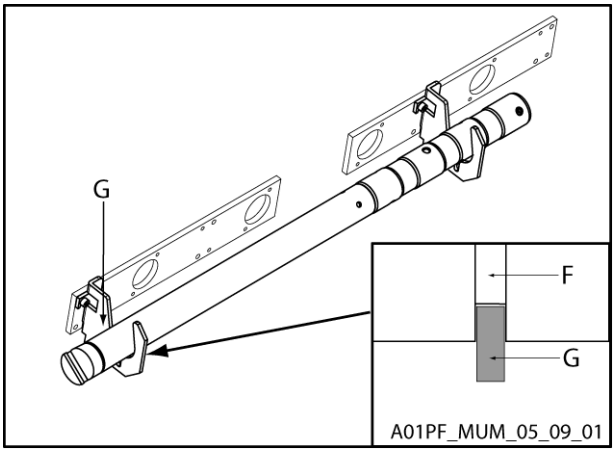
- **For an easier identification, each single component indicates the operation field.**

- Assemble the upper guide channels, then the lower ones according to the attached diagrams
- For a correct assembly it is necessary to make sure that the guide channel is completely inserted in the quick coupling pins (Snap-In).

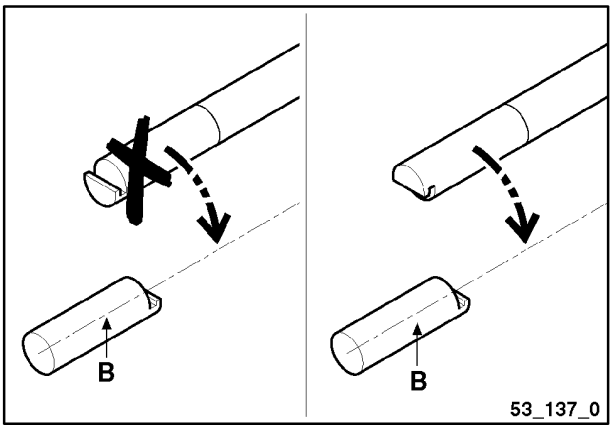
- Assemble the guide channels as shown in the figure. The slot (A) for the flag passage must be on the side of the bar pusher displacement carriage.



- Insert the bar pusher into both supports. Properly position the bar pusher in the axial direction, so that (F) groove matches support (G).



- Properly position the bar pusher in the radial direction so that in the next phase of the upper guide channel closing, the coupling between the bar pusher and the first feeding carriage (B) occurs correctly.

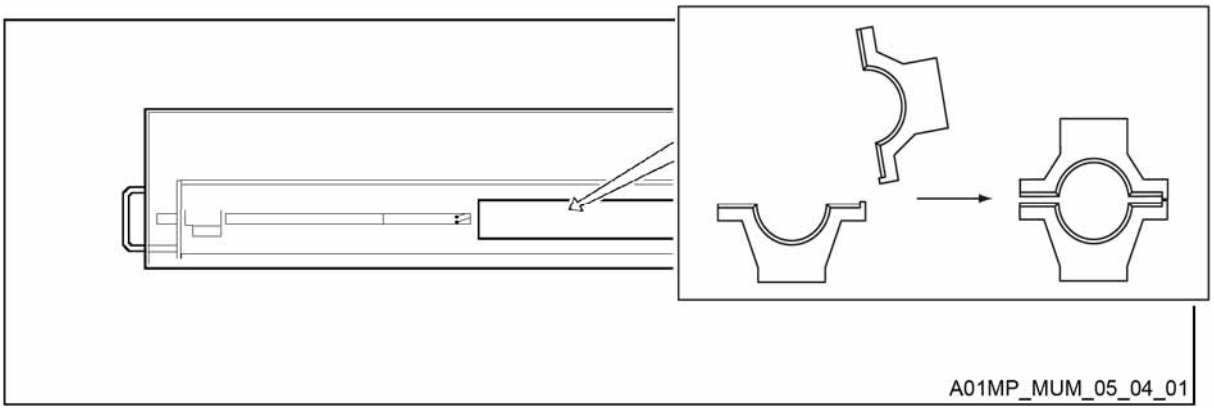


WARNING – CAUTION:

the above mentioned positioning has to be always assured. Therefore during the setup or maintenance operations, if the bar pusher is struck involuntarily, it has to be correctly repositioned.

- Press the start buttons together with 

to close the guide channels.
The machine is now ready to load the bar.
Perform a cycle in the "STEP by STEP" function.



5.3.2 BAR PUSHER REPLACEMENT PROCEDURE

WARNING - CAUTION

Never perform the following procedure when a bar is detected in the bar pusher collet!

The replacement of the bar pusher, for a working cycle change or maintenance, may be performed as follows:

- bring the bar pusher in manual mode 

, with close guide channels;
- press  , holding it, to start the automatic procedure which allows the bar feeder to move to the appropriate condition for the bar pusher replacement.
- In particular, by pressing  , the bar pusher is positioned past the clamp device, the guide channels open, the bar pusher moves to the completely backwards position and the control devices are lifted allowing the bar pusher removal.

INFORMATION

If during the abovementioned operations  ***is released, the procedure will stop. By pressing the button again, the procedure will start from where it was paused.***

NEW BAR PUSHER INTRODUCTION

- To load a new bar pusher, position it on the control devices and press  until the relative LED turns on.

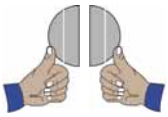
WARNING - CAUTION

Check if the bar pusher has been correctly introduced into the first feeding carriage housing.

- Close the bar feeder guard, restore the start button  , enter in manual mode 

and by pressing 

, move the bar pusher forwards until the clamp position is exceeded of at least 200 mm.

- Close the guide channels  and 

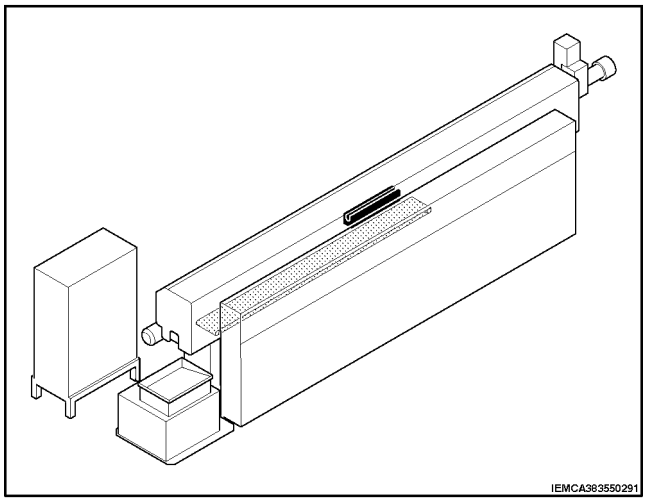
.

- Restore the machining cycle of the bar feeder.

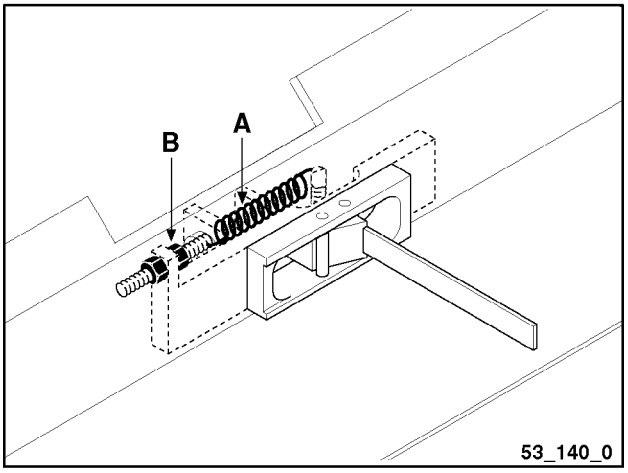
5.3.3 Remnant passage door spring - Adjustment

The remnant passage door is kept closed by a spring. The remnant passage has to win the spring resistance, so that the door may intercept the detection sensor.
The bar feeder is normally supplied with the spring adjusted for large diameter bars; with small diameter bars it could be necessary to reduce the spring preload proceeding as follows.

- Remove the lower guide channel in correspondence to the door.

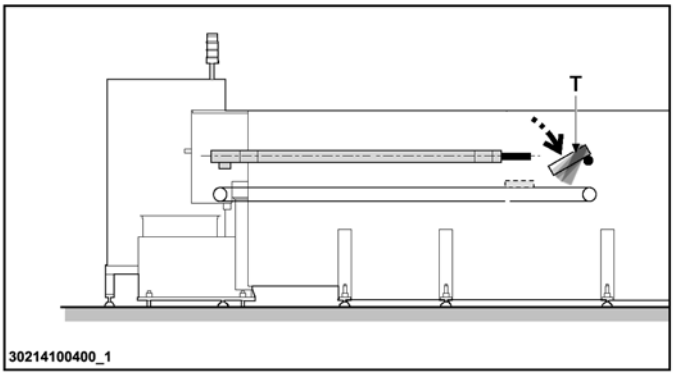


- Adjust the preload of spring (A) by turning nuts (B).
- Restore the bar feeder initial operating conditions.



5.3.4 REMNANT DROP CHUTE – ENABLING

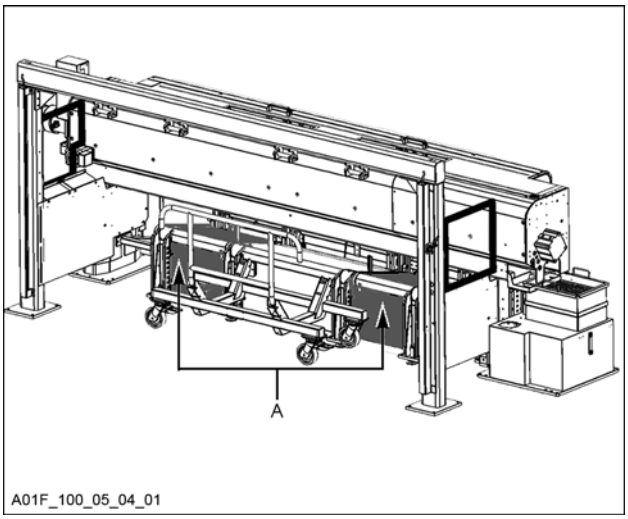
If a remnant does not drop onto the remnant conveyor belt after the guide drop (T), parameter 45 can be enabled (see description in the instruction manual) so that the guide starts vibrating and the remnant drops.



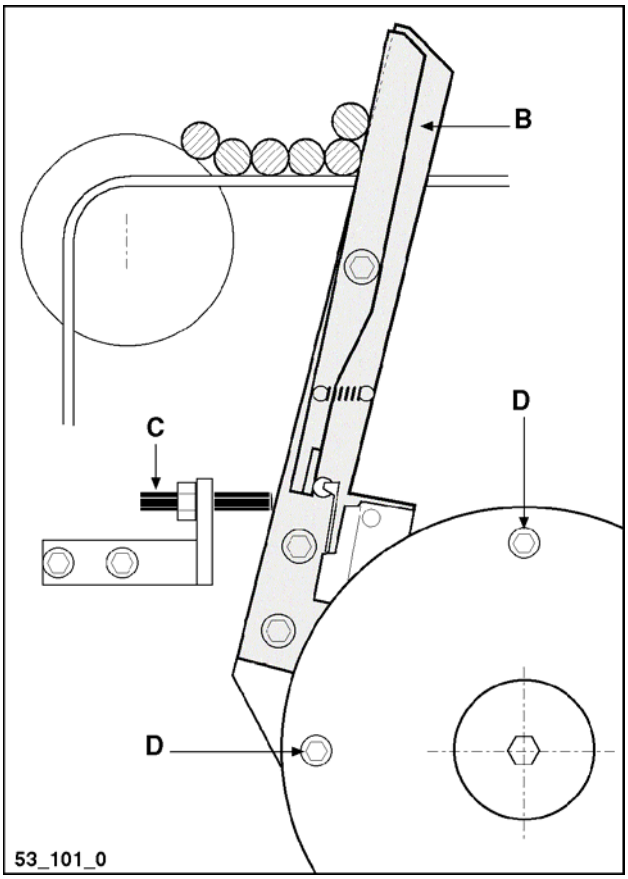
5.4 BAR BUNDLE MAGAZINE SETUP - MASTER 100 F

5.4.1 Bar stop levers - Adjustment

- Remove guards (A).



- Adjust the stop point of levers (B) by turning screws (C), in order to stop a certain number of bars when they are unloaded from the lifted belts. The bar amount has to be checked during the first working cycles. If during the unloading phase the levers (B) yield and slip backwards due to the bar thrust, it will be necessary to adjust the stop clutch using screws (D).
- Reassemble the previously removed guards.



5.4.2 Bar selection – Setup

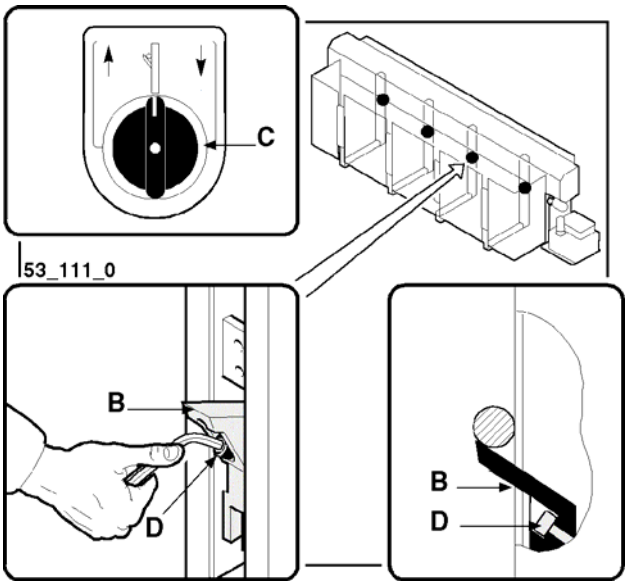
BARS FROM 21 TO 100 MM

Bars with diameter over 20 mm are quite aligned on the magazine rack and can be taken directly by the elevator carriages; it is therefore possible to disable the selection programme in the following way:

- adjust the position of the bar gripping lever (B) according to the bar diameter.

Adjust as follows:

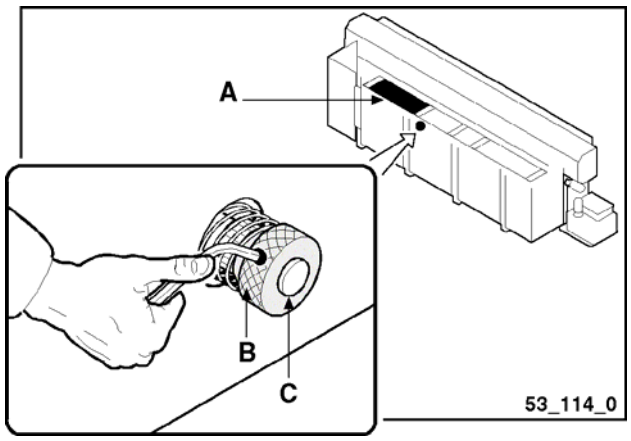
- bring the elevator carriages at about half-stroke by means of selector switch (C) to make the operation easier;
- tighten or loosen screw (D);



5.4.3 Elevator drive - Adjustment

The safety joint has to be adjusted so that the bar is lifted and, at the same time, the motor drive is deactivated when the bar cannot be lifted for whatever reason.
Adjust as follows:

- remove guard (A);
- loosen screw (B);
- tighten or loosen ring nut (C);
- tighten screw (B);
- reassemble the previously removed guard.



WARNING – CAUTION:
do not screw the ring nut too much; the joint could be locked.

INDEX

6.1 CONTROL DESCRIPTION

INFORMATION:

From the hand-held keyboard it is possible to automatically start the bar feeder, even when the Lathe 'MAN/AUT' signal is in Manual mode.

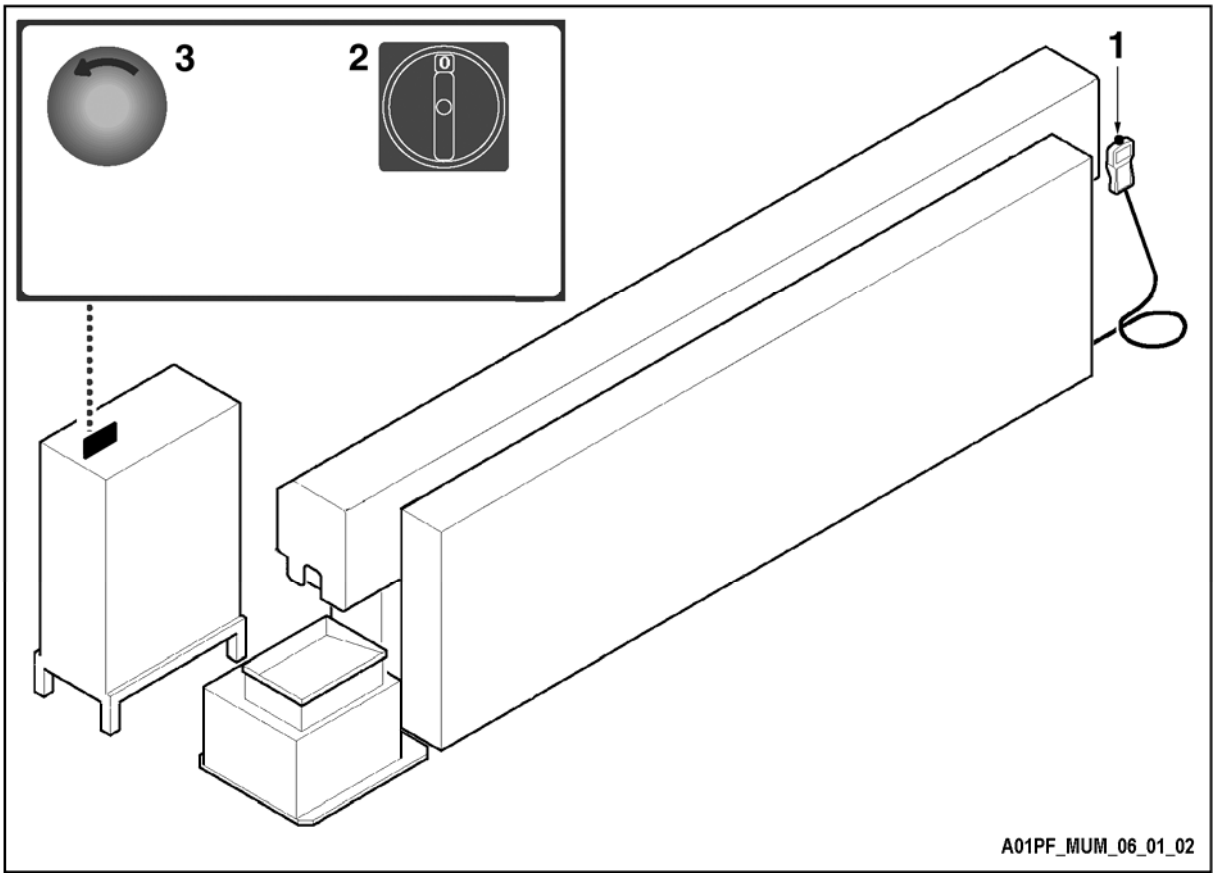
INFORMATION:

When the bar feeder is in Automatic mode, the bar feeding is possible only when the Lathe 'MAN/AUT' signal is in Automatic mode.

INFORMATION:

By pressing the Manual mode button on the hand-held keyboard it is possible to prevent the bar feeder Automatic start by the lathe.

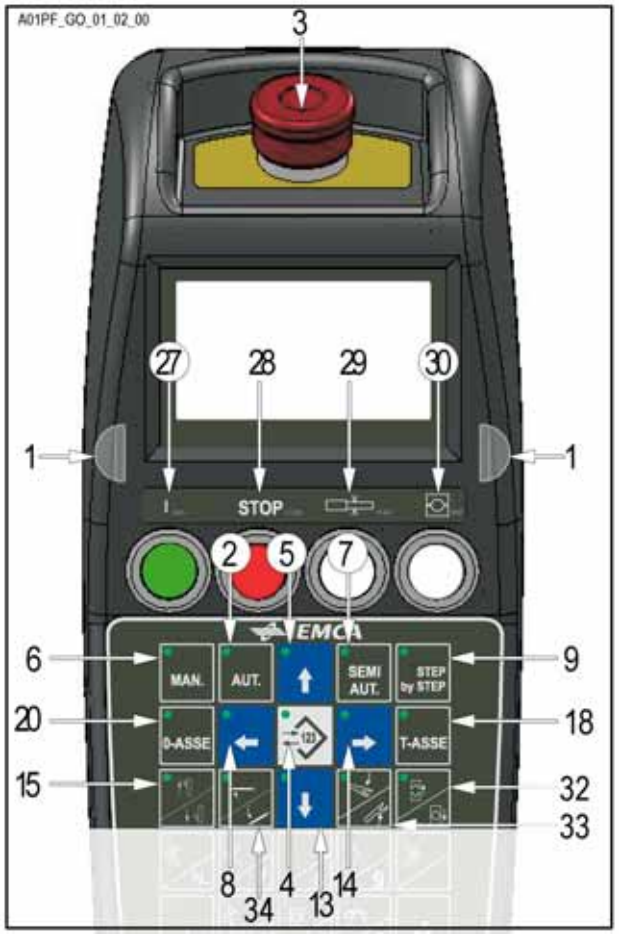
The figure indicates the positions of both the electrical and hand-held keyboard "1" controls.



2 MAIN SWITCH: turns the power supply on and off.
- Position 0 (OFF) the machine is not powered.
- Position I (ON) the machine is powered.

3 EMERGENCY STOP PUSH-BUTTON: stops the bar feeder in case of emergency. For restart release the push-button manually.

6.2 KEYBOARD CONTROL DESCRIPTION



1 Start buttons: opposite buttons enabling the keys for some functions. Press both buttons and simultaneously the button corresponding to the desired function.
2 Selects the automatic function.
3 It stops the bar feeder: for restart, manually release the push-button.
4 Selects the keyboard modes:

- with LED off  ; selects the "message display" mode.
- with LED on  ; selects the "parameter display" mode.

5 Multifunction
- Allows scrolling the page upwards.
- Moves the selection cursor upwards.
- Increases by one the value set in the date and time programming mode.

6 Selects the manual mode.
7 Selects the semiautomatic function.
Press to select, press again to unselect.
8 Multifunction
- Selects the previous parameter.
- Moves the selection cursor leftwards.

9 Activates the "step by step" operating cycle: every time the button is pressed one step is performed.
10 Multifunction
- Sets the font.
- Turns on/off the oil pump.
Press to turn on the pump and press again to turn it off.

11 Multifunction
- Sets the numerical value.
- Loads the program from the PLC (entering default values in the parameters).

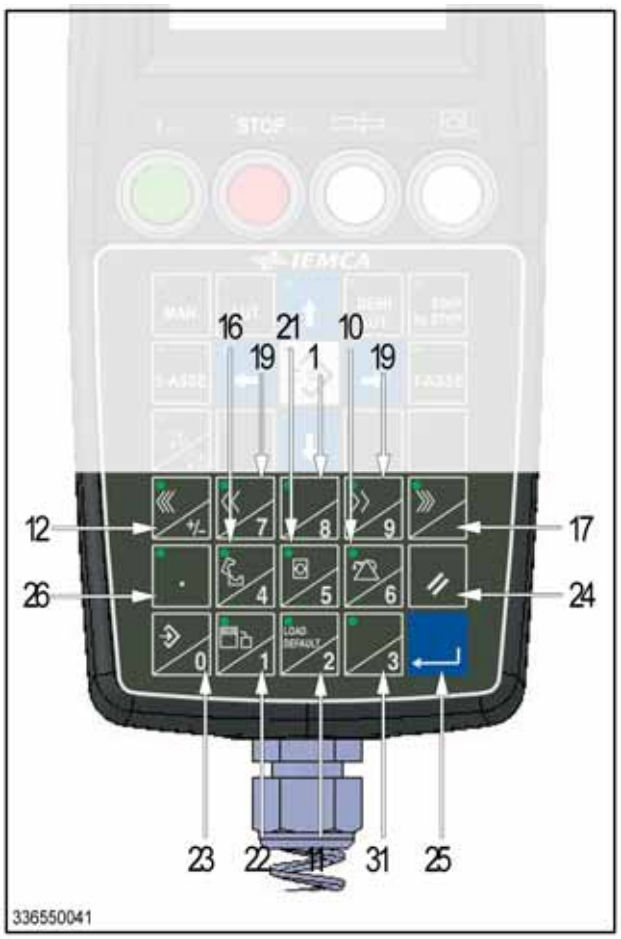
12 Multifunction
- Sets the font.
- Moves the bar pusher at a high speed.

13 Multifunction
- Allows scrolling the page downwards.
- Moves the selection cursor downwards.
- Decreases by one the value set in the date and time programming mode.

14 Multifunction
- Selects the next parameter
- Moves the selection cursor rightwards.

15 Bar elevator upstroke/downstroke (LED on when the elevators are in their high position).

34 Lifts/lowers the remnant dropping chute (LED on with chute in "up" position).



16 Multifunction
- Sets the numerical value.
- Opens the guide channels.
- Push both start buttons and then the key; release both buttons and the key only when the movement is finished.

17 Moves the bar pusher at high speed.

18 Sets the carriage movement motor.
During the daily use of the bar feeder this function must never be used.

19 Multifunction
- Sets the numerical value.
- Moves the bar pusher at a low speed.

20 Resets the "BAR FEEDER ZERO SETTING" of the carriage.
Hold down both start buttons and then the key; release both buttons and the key when the carriage starts moving towards the "BAR FEEDER ZERO SETTING" position.

21 Multifunction
- Sets the numerical value.
- Closes the guide channels.
Push both start buttons and then the key; release both buttons and the key only when the movement is finished.

22 Multifunction
- Sets the numerical value.
- Recalls the main menu (MAIN MENU).

23 Multifunction
- Sets the numerical value.
- Recalls the selection cursor.

24 Multifunction
- Stops the selection function.
- Restores the value prior to the non-confirmed modification.

25 Confirms the entered data.

26 Sets the comma.

27 Bar feeder start button (green light): press the button to start the bar feeder and hold it down until the button lights up.

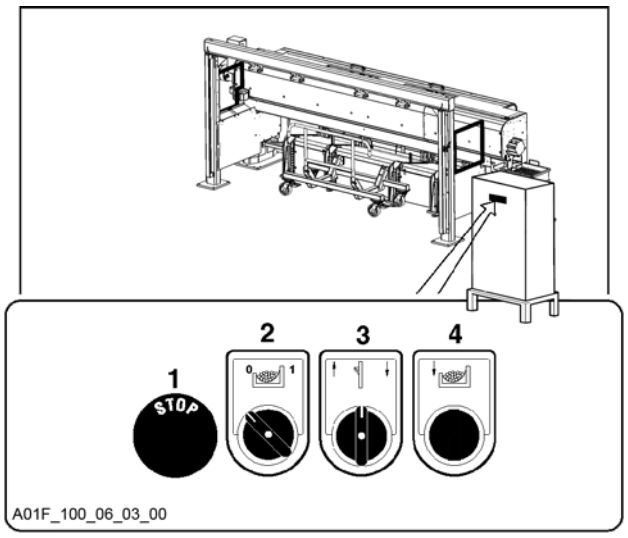
28 Bar feeder stop button (red light): press this button to stop the bar feeder and reset the "Errors".

29 Remnant detection disabling button (white light)
Press the button to feed a "new" bar without the detection of bar remnant in the bar pusher collet.

30 Half-bush opening and closing button (white light)
- In "Manual" mode, when the bar feeder is in the required position, the half-bushes will close when this button is pressed. If pushed again, the half-bushes will open.

- In "Automatic" mode, if pressed, the half-bushes will open and close, according to the selected sequence. If pressed again, the half-bushes will remain open during the entire operating cycle.

6.3 MAGAZINE PUSH-BUTTON PANEL - CONTROL DESCRIPTION



MASTER 880 F

1 Emergency button for stopping the bar feeder; it will be possible to start it again only after the button has been manually released.

2 Selector switch for setting the magazine in the manual or automatic mode.
position 0: the magazine is set for the manual lowering of the lifting belts;
position 1: the magazine is preset for the automatic function.

3 Selector switch for controlling the elevator carriages upstroke and downstroke.
position ↕: elevator carriages upstroke;
position ↕: elevator carriages downstroke;

4 Button for controlling the manual lowering of the magazine belts.
press: the belts lower;
release: the belts stop.

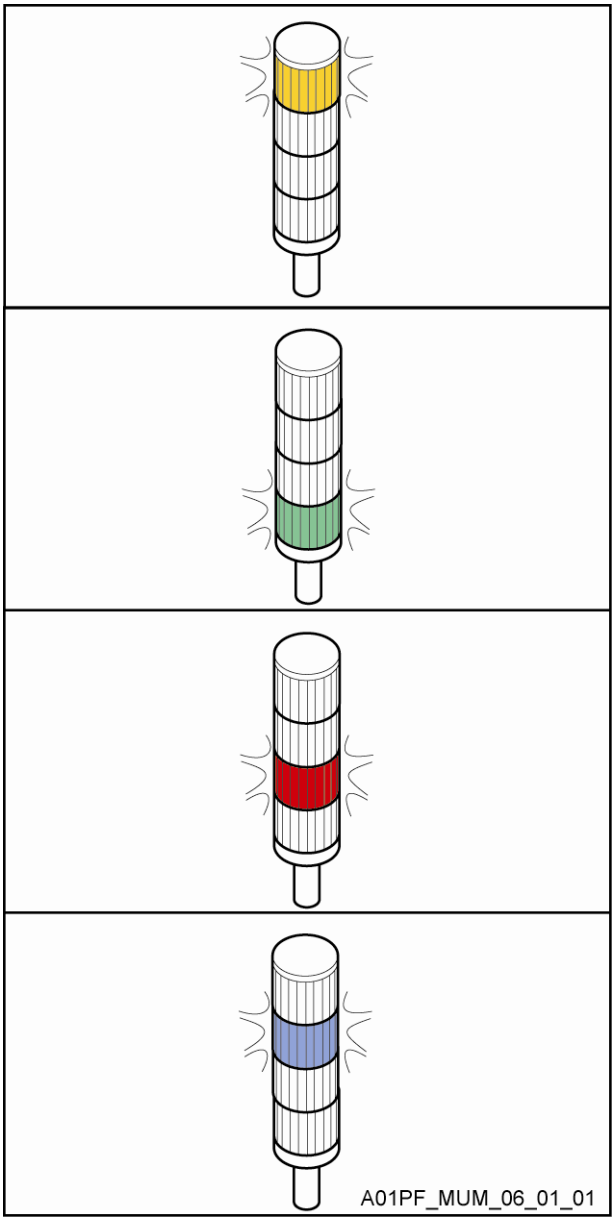
6.4 LIGHT INDICATOR - SIGNAL DESCRIPTION

BLINKING ORANGE LIGHT; indicates that the photoelectric barrier beam has been interrupted.
BLINKING ORANGE LIGHT; indicates that, with the bar feeder in automatic mode, the magazine is in manual mode.
BLINKING ORANGE LIGHT; (for Master 100-100r F only) indicates that the magazine is empty and the bundle belts are tensioned.

FIXED GREEN LIGHT; indicates that the bar feeder is in the automatic mode.

FIXED RED LIGHT; indicates that the bar feeder is not operating, or that it is in the manual mode. (OPTIONAL)

BLINKING BLUE LIGHT; indicates that the bar feeder is carrying out the bar change.
FIXED BLUE LIGHT; indicates that the PLC battery is exhausted. (OPTIONAL)



6.5 BAR FEEDER TOOLING

This is a list of all the bar feeder tooling phases, assuming that the bar feeder is started for the first time.

- Perform the bar feeder setup according to the bar to be machined.
- Prepare the bar to be machined.
- Load the bar magazine.
- Start the automatic cycle.
- Adjust the lubricating oil flow.

6.6 BARS TO BE MACHINED - FEATURES AND PREPARATION

WARNING – CAUTION:

do not insert bars having different sizes than the ones set by the manufacturer. For maximum lenght of the bar see section "VERSION DESCRIPTION" in Chapter 2.

INFORMATION:

With the bundle magazine the bars of the minimum allowed length (see § "TECHNICAL DATA") are to be loaded at the centre of the magazine

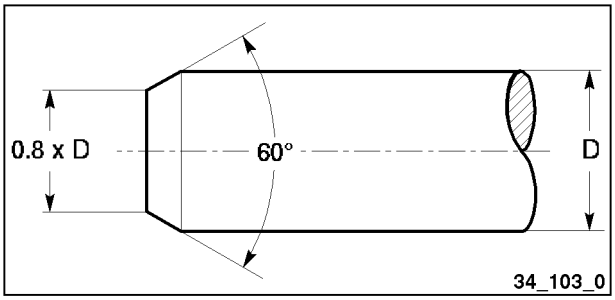
INFORMATION:

the bar must not have a straightness defect above 0.5 per 1,000.

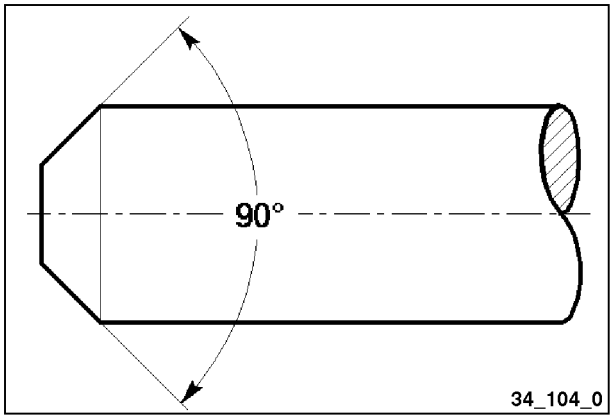
Please find hereafter some advices to optimise the bar feeder performances.
Usually it is not necessary to perform preliminary operations on the bar ends, but to obtain optimum results during loading, it is advisable to chamfer them.

SOLID BARS

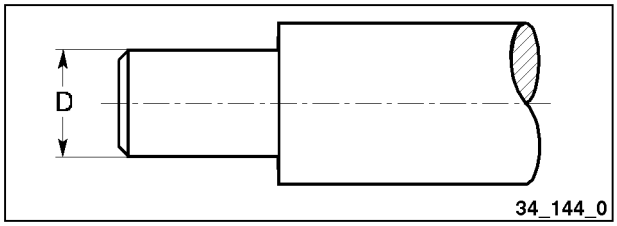
Make sure that there is not too much rag on the front end, which might hinder from entering the lathe collet.
The bar rear end must be chamfered as indicated in the figure.



If bars with front remnant ejection have to be machined, we advise to chamfer the bar rear end as shown in the figure.

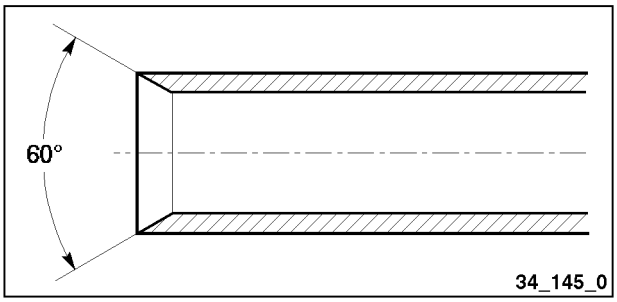


When machining bars having a diameter equal to or only slightly smaller than the bar pusher diameter, it is necessary to turn the bar rear ends; diameter "D" should be suitable for the collet installed in the bar pusher.



PIPES

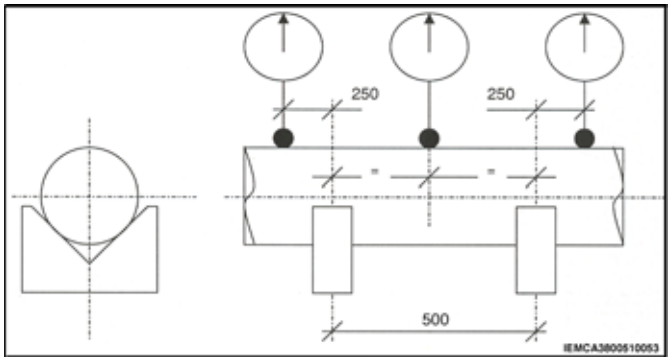
If pipes are to be machined, the rear end of the pipe must be chamfered as shown in the figure.



6.6.1 BAR STRAIGHTNESS - Measurement

The bar vibrations are partially due to the state of the bar itself: if the bar is not perfectly straight, it can cause vibrations.

Round bars



As stated also in the UNI-10233/2 regulation, the bar straightness can be measured by positioning the bar on two V-supports and controlling its straightness. In that case, the measurement can be carried out as shown in the figure.
It is necessary to rotate the bar on itself and measure the three indicated sections. In this case, the S-max value (difference between maximum and minimum value on the comparator) should be interpreted as follows:

S max	Quality
< 0,25 mm	Good
0,25 < S max < 0,5 mm	Average
> 0,5 mm	Problematic

In order to obtain a reliable value it is necessary to repeat the measurements on the whole bar length by positioning it on a series of supports at a distance of 500 mm from each other and comparing the values between the different prisms.

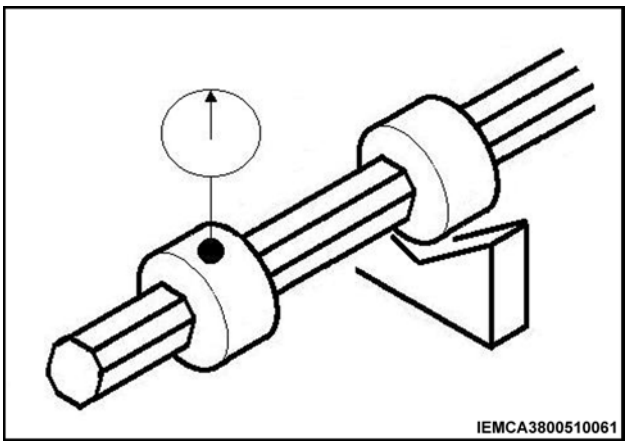
INFORMATION:

The bar straightness is obviously proportional to the rigidity of the material and to the number of revolutions (RPM) to which the lathe must operate. The lack of bar straightness highly influences the maximum number of revolutions that may be reached: the bigger the diameter the greater the influence. The data concerning the bar linearity or straightness refer to the bar constant bending and not to the localized inflection and/or deformation that the bar shall not absolutely show.

INFORMATION:

For a correct operation of the bar feeder do not use rolled material.

Hexagonal, square and section bars



With shaped bars, insert some bushes on the bar to be controlled.
Position 2 bushes on both V-supports.
In that case, the measurement can be carried out as shown in the figure.
Rotate the bar on itself and carry out the measurement on a bush external to both V-supports.

INFORMATION:

The use of the bar feeder for polygonal bar machining (hexagonal, square bars, etc.) is allowed, accepting that this will lead to:

-higher wear of the guide channel (in comparison to round bars).

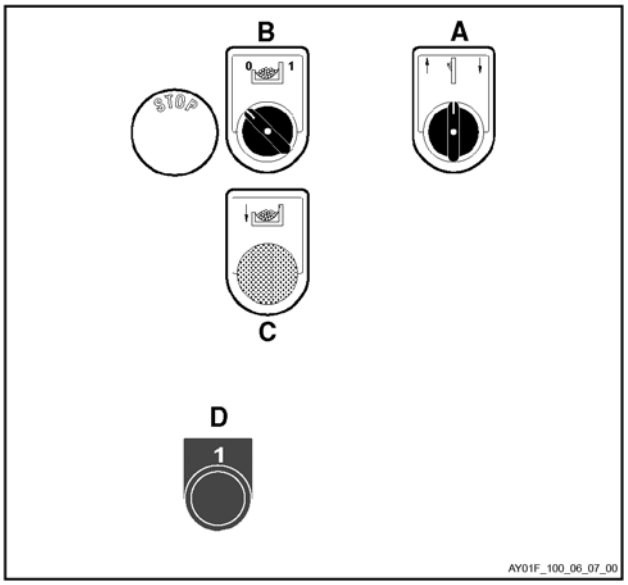
-bar rotation speed decrease (in comparison to round bars).

The higher wear of the guide channel is due to the shape of the bars as well as to the material straightness and rigidity.

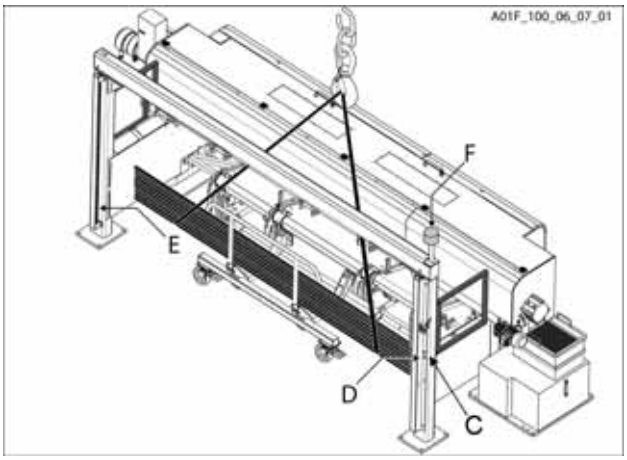
6.7 BAR MAGAZINE - LOADING

BAR BUNDLE MAGAZINE - MASTER 100 F

- Position the elevator carriages to the bottom limit stop by using the selector switch (A).
- Turn selector switch (B) to position 0 and lower the lifting belts through selector switch (C).



- Go beyond the safety enclosure (E); the orange light of the light indicator starts blinking.
- Place the bars on the belts.



WARNING – CAUTION:
do not load bars with a total weight over 2,500 kg.

- Disengage the safety enclosure; the orange light continues to blink.
- Reset by pressing button (D); the orange light stops blinking.
- Select the magazine automatic cycle bringing the selector switch (B) to position 1.

6.8 AUTOMATIC CYCLE START

- Power the lathe on.
- Turn the main switch to position I (ON).
- Press  to start the bar feeder.
- Press  , to select the manual mode.
- Carry out a "bar feeder zero setting" in the following way:

  -press the start buttons and  ;

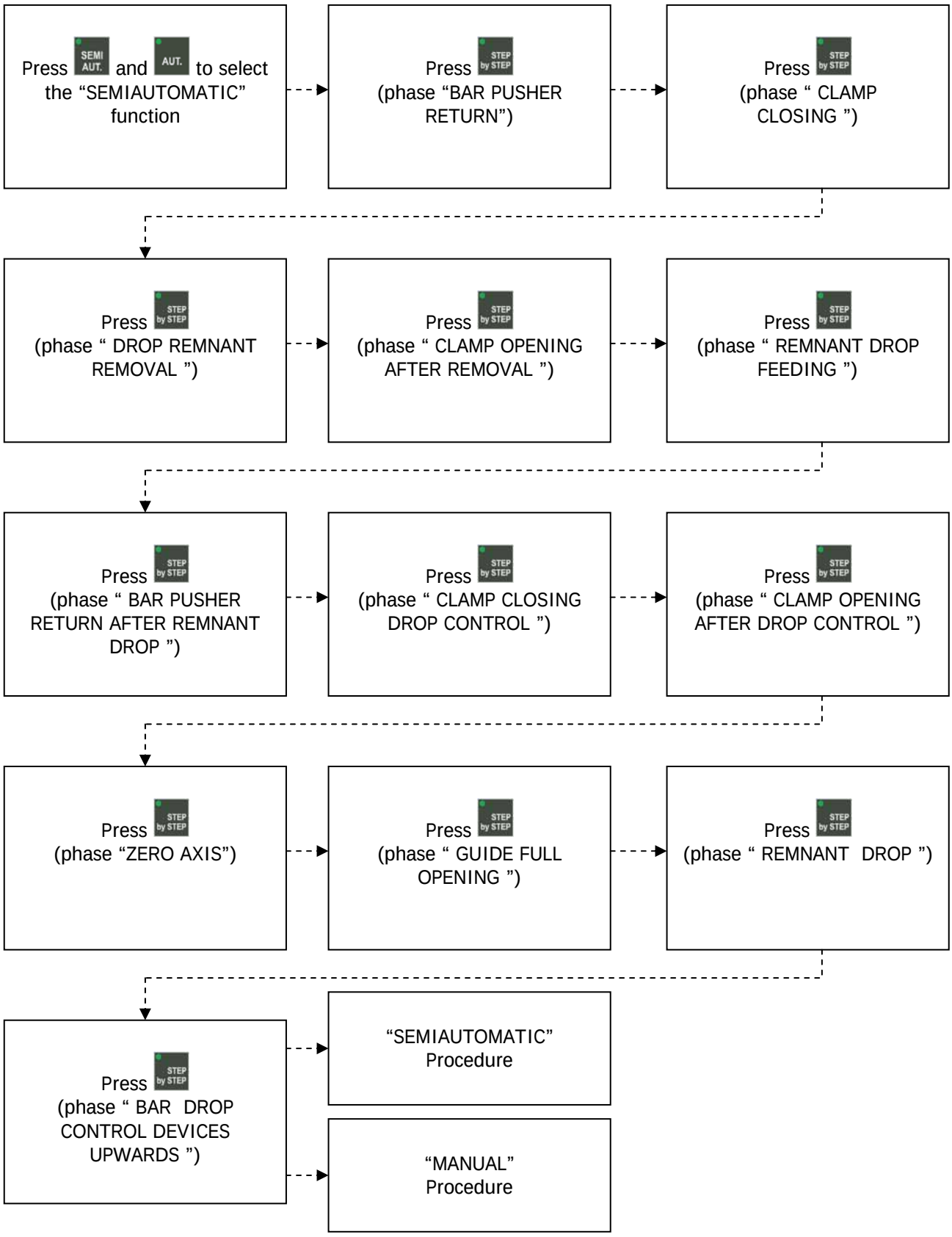
INFORMATION:

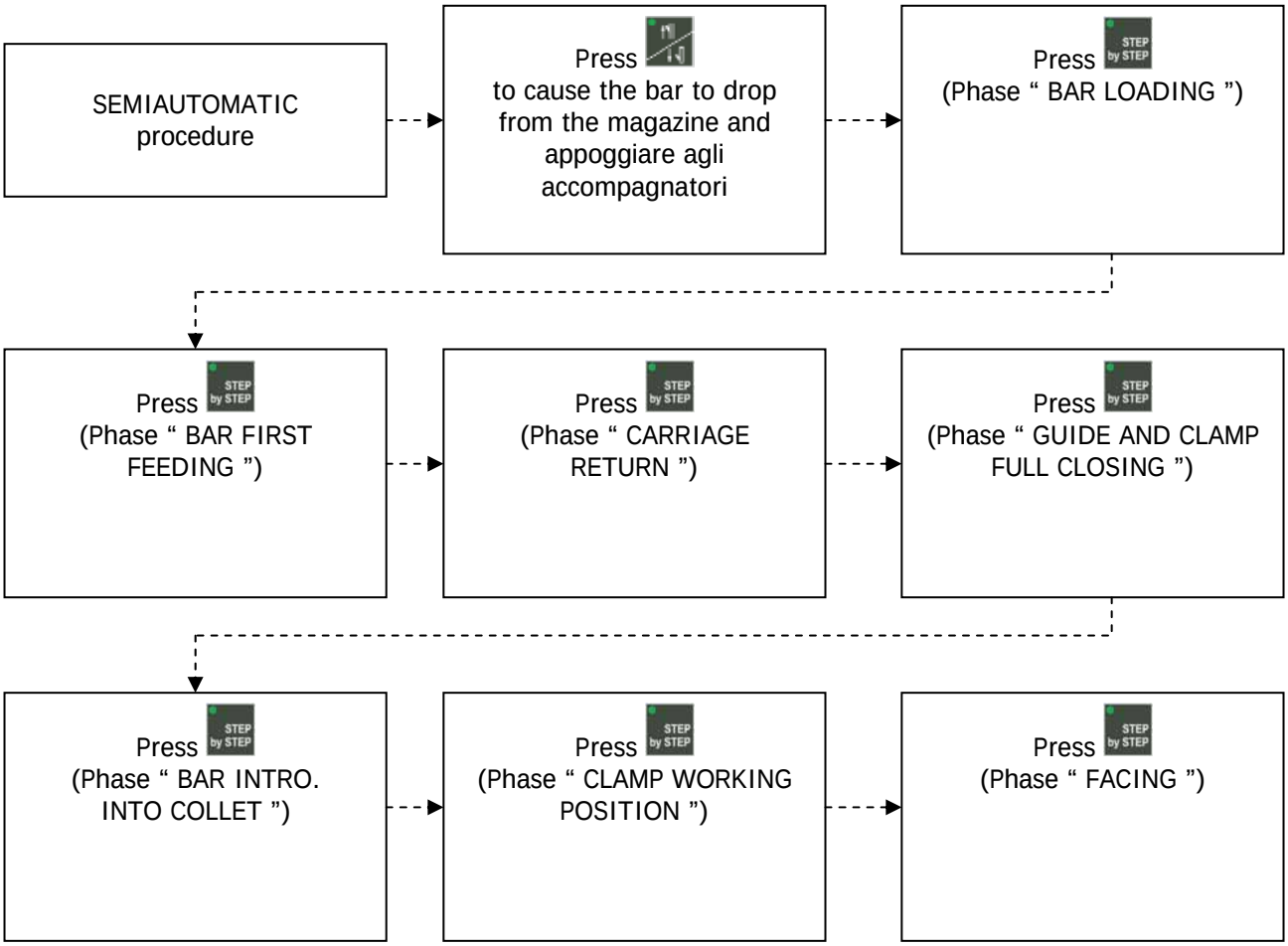
The zero axis can be performed with open or closed guide channels.

Before performing the zero axis, make sure the bar pusher is not in the "back limit stop" position.

- Load one bar in the guide channels and start the automatic cycle.

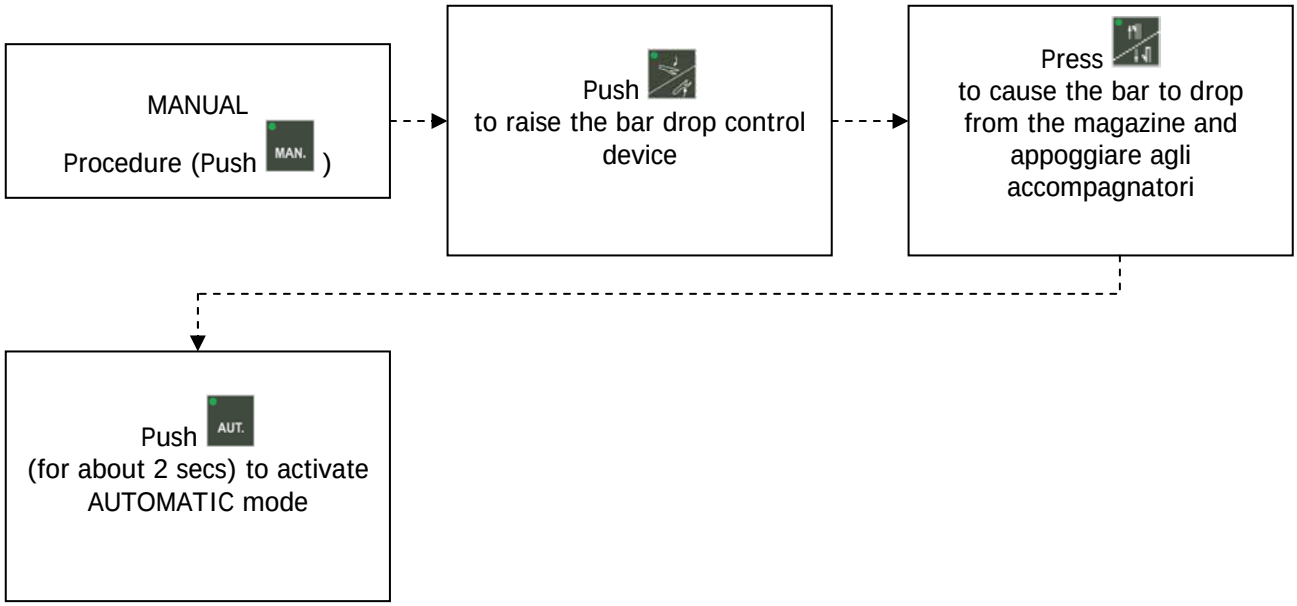
6.9 BAR LOADING - PROCEDURE





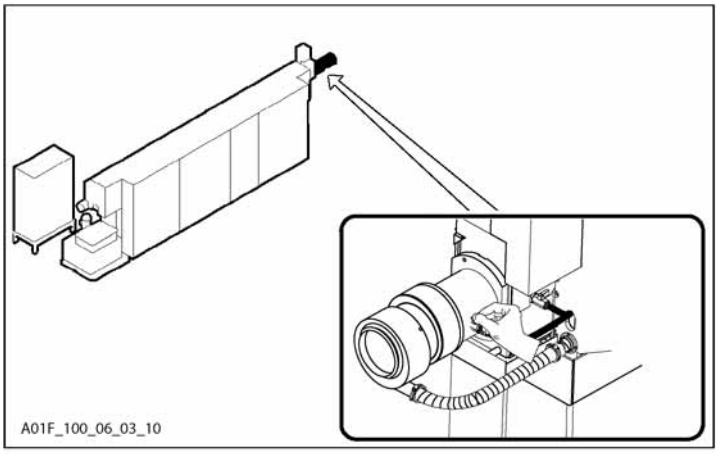
INFORMATION:

the bar drop control devices will not go up if, during the "GUIDE CHANNEL FULL OPENING" phase there is a bar in the guide channels that has prevented the short feed gate resetting.


MANUAL
Procedure (Push MAN.)
Push
to raise the bar drop control device
Press
to cause the bar to drop from the magazine and appoggiare agli accompagnatori
Push AUT.
(for about 2 secs) to activate AUTOMATIC mode

6.10 LUBRICATING OIL - FLOW ADJUSTMENT

The oil flow in the guide channels and bush holder device is automatically controlled during the bar feeder automatic cycle. The pump is started when the bar feeder has completed the bar change and stops when the bar pusher approaches the bush holder device.
It is necessary to adjust the oil flow in the bush holder device according to the bar diameter and profile.



6.11 BAR FEEDER STOP

BAR FEEDER EMERGENCY STOP

WARNING – CAUTION:
if the emergency stop is activated whilst the lathe is working, before restarting the working cycle, check that no dangerous conditions have been created due to the sudden stop.
Example: if the tool was removing chips, before restarting the lathe, distance the tool from the piece.

- To stop the bar feeder in emergency, press one of the emergency buttons of the bar feeder or lathe.

BAR FEEDER STOP AT THE WORKING CYCLE END

WARNING – CAUTION:
when stopping the machine normally, do not use the emergency buttons.

- Complete the operations in your working schedule.
- Stop the bar feeder by pressing  .
- Stop the lathe.
- Turn the main switch to the OFF position.

6.12 CYCLE PERFORMING MODE IN THE "STEP-BY-STEP" FUNCTION

FOREWORD
This mode may be used for many reasons, as for instance:
- to check a complete bar change cycle;
- to check the bar feeder mechanics;
- etc.

Procedure

- press  to start the bar feeder;
- make sure that the remnant drop device is closed, on the contrary, press MAN. and  to close it;
- press SEMI AUT. and AUT. to select the "semiautomatic" function;
- press STEP by STEP, the bar feeder performs the first step;
- press STEP by STEP, the bar feeder performs the second step, and so on.

INDEX

7.1 MAINTENANCE – GENERAL RULES

DANGER - WARNING:
carry out the cleaning and maintenance operations when the bar feeder is off.

Regular cleaning and maintenance are essential to ensure a correct operation and a long bar feeder service life.
A regular and effective cleaning of the bar feeder, its accessories and working area, is recommended as it increases the operator safety as well.
Do not use petrol or solvents which would damage the painted and transparent parts, the cable sheaths etc.

INFORMATION:
oxidation can damage metal parts and electric equipment.

To protect the bar feeder during long inactivity periods, disconnect it from the mains voltage, remove the compressed air and cover it with a cloth of suitable material.
Any protection should not be completely closed or sealed at the base; it should be equipped with ventilation holes so as to ensure that humidity may not condense due to lack of circulation.

7.2 SCHEDULED MAINTENANCE

Scheduled maintenance

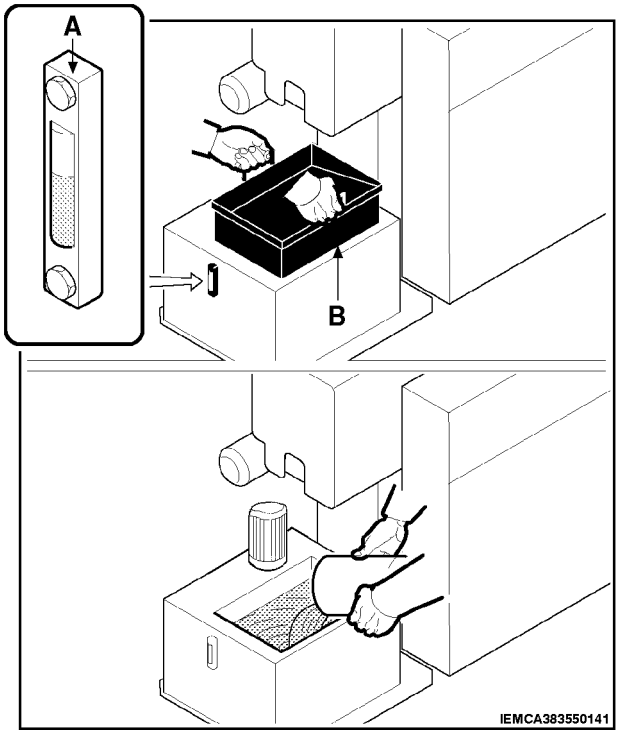
Model	Bar feeder part	Operation to carry out	Frequency					
			Hours				Every year	Periodically
			200	500	1250	2500		
MASTER 880 P MASTER 880 F	Revolving tip and collet	Wear check	•					
	Half-bushing	Wear check	•					
	Lubrication system	Oil level check	•					
		Oil change				•		
		Oil filter cleaning						•
	Guides	Repair and cleanness check			•			
	Feed chain	Lubrication	•					
		Tension check			•			
	Air filter	Check						•
	Elevator chains	Lubrication		•				
		Tension check		•				
	Remnant conveyor belt	Tension and cleanness check						•
	Keyboard battery	Replacement					•	
	PLC Battery	Replacement				•	•	
MASTER 880 P	Lift truck motorisation chain	Lubrication		•				
MASTER 880 F	Lifting belts	Wear check		•				
	Conveying belts	Tension check			•			
		Wear check				•		
	Conveying belt motorisation chain	Lubrication		•				
		Tension check				•		
	Lift truck motorisation chain Lubrication	Lubrication		•				
		Tension check				•		

7.2.1 Lubricating oil - Level check

WARNING – CAUTION:
wear personal protections according to the regulations in force.

- Wait until the bar feeder has been off for at least 6 hours.
- Check the level by means of the indicator (A).
- Remove cover (B) and pour the oil directly in the tank to fill up, if necessary.

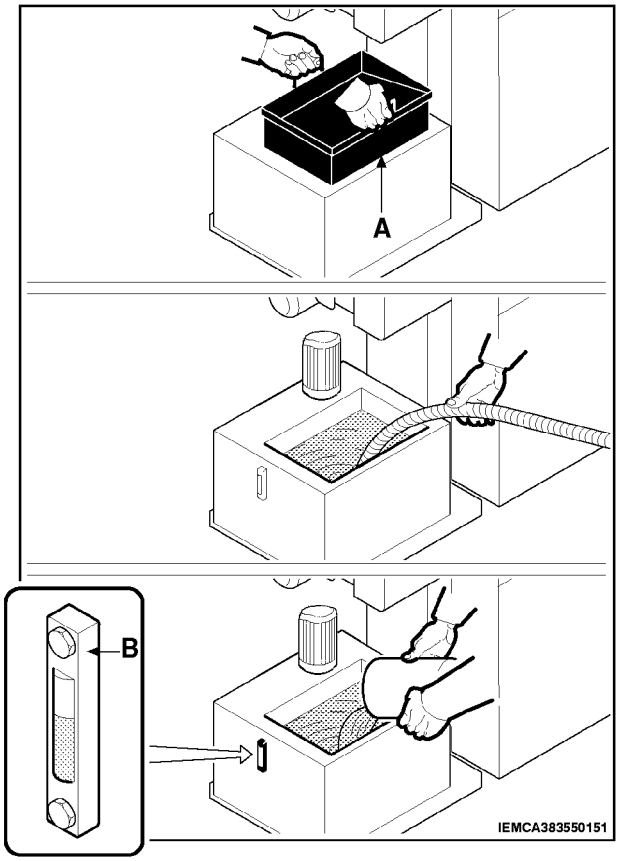
  Oil features: Class (C) - CKB 150.



7.2.2 Lubricating oil - Change

WARNING – CAUTION:
wear personal protections according to the regulations in force.

INFORMATION:
store drain oil in special containers to be delivered to companies specialised in pollutant disposal and storage. Avoid environment pollution.



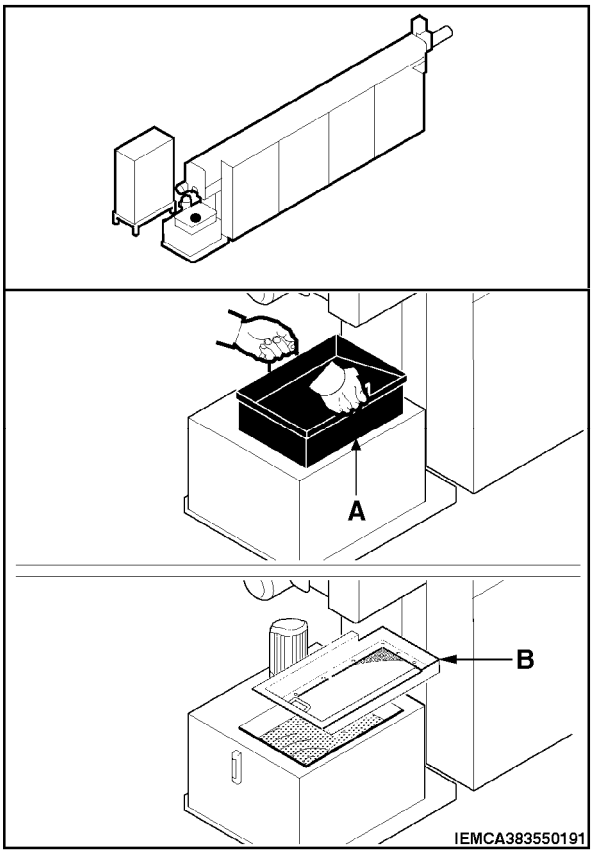
- Remove cover (A).
- Drain the tank using an auxiliary pump. Clean the tank bottom and the pump suction system.
- For the loading, pour the oil directly in the tank and check the level through the indicator (B).

  Oil features: Class (C) - CKB 150, quantity 80 l.

7.2.3 Oil filter - Cleaning

WARNING – CAUTION:
wear personal protections according to the regulations in force.

- Wait until the bar feeder has been off for at least 6 hours.
- Remove cover A.
- Remove filter B and clean the filtering mesh.
- Replace the filter and cover in their respective locations.

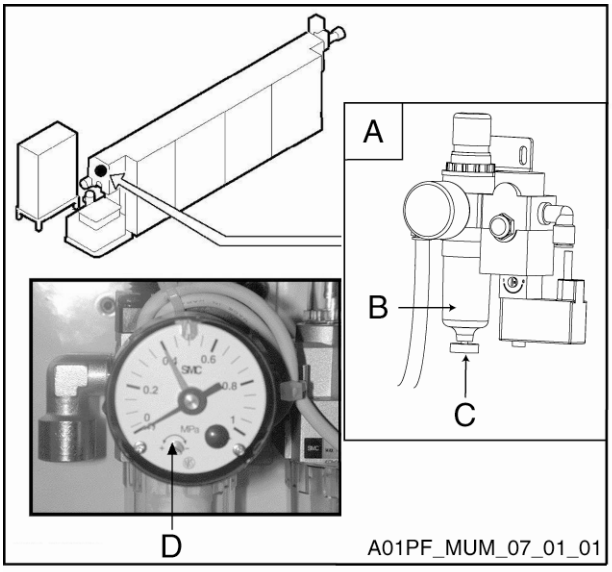


7.2.4 Air filter unit - Check

FILTER (A)

- Make sure that cup (B) is not full of condensate. Drain the condensate by means of valve (C), if necessary.

- The filter is equipped with a control pressure switch, set to a pressure of 4.5 bar.
- To adjust the pressure switch proceed as follows:
  - remove the pressure gauge glass protection;
  - turn the adjusting screw (D) counter clockwise (+) to increase pressure or clockwise (-) to decrease it;
  - once finished, replace the pressure gauge glass protection.

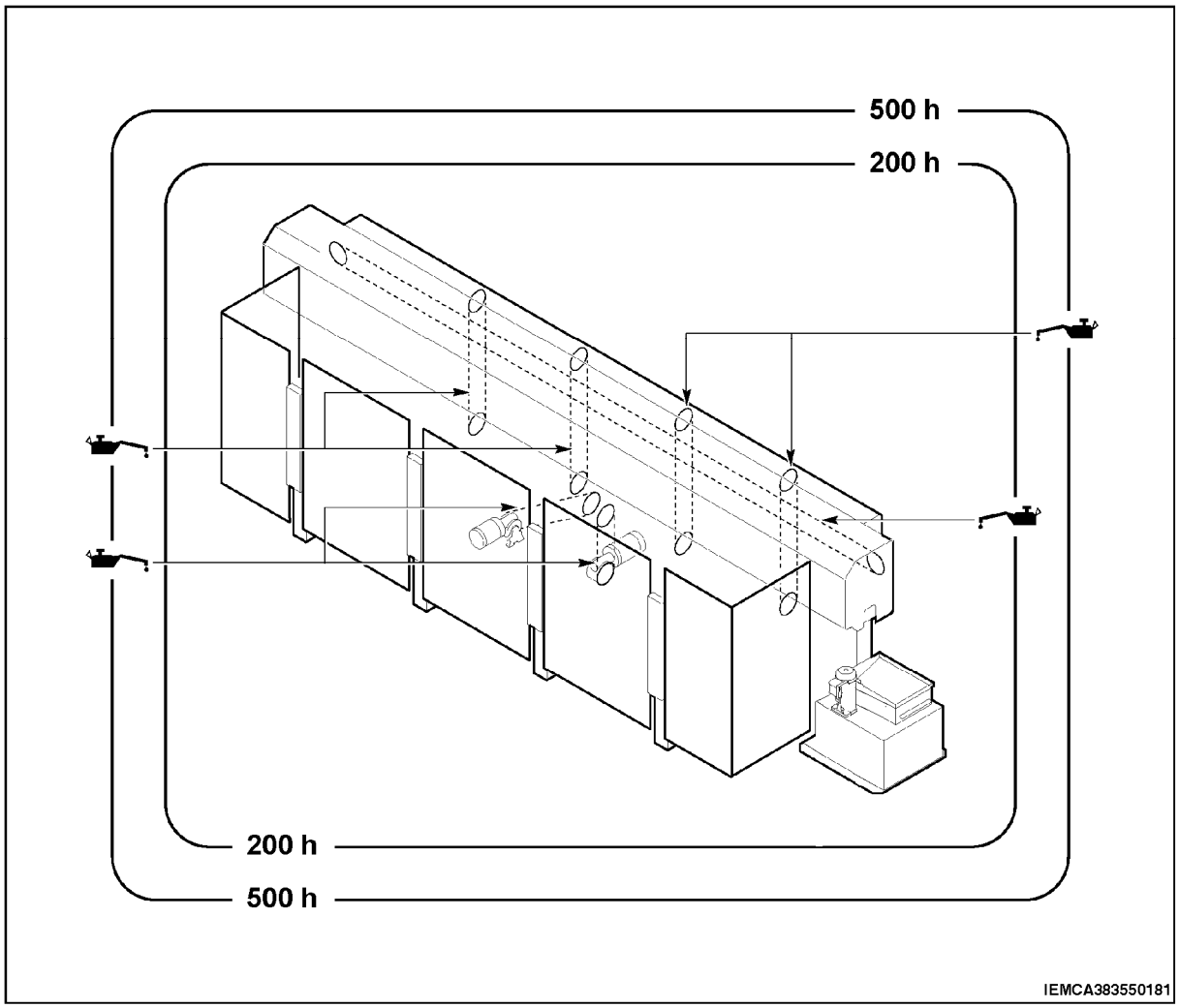


WARNING – CAUTION:

should the pressure switch pointer show a Pressure = 0, do not absolutely turn the adjusting screw (D) clockwise (-), as it may cause the pressure switch breakage.

7.3 LUBRICATION POINT DIAGRAM

MASTER 880 F



Oil

INDEX

Errore. Nessuna voce di sommario trovata.

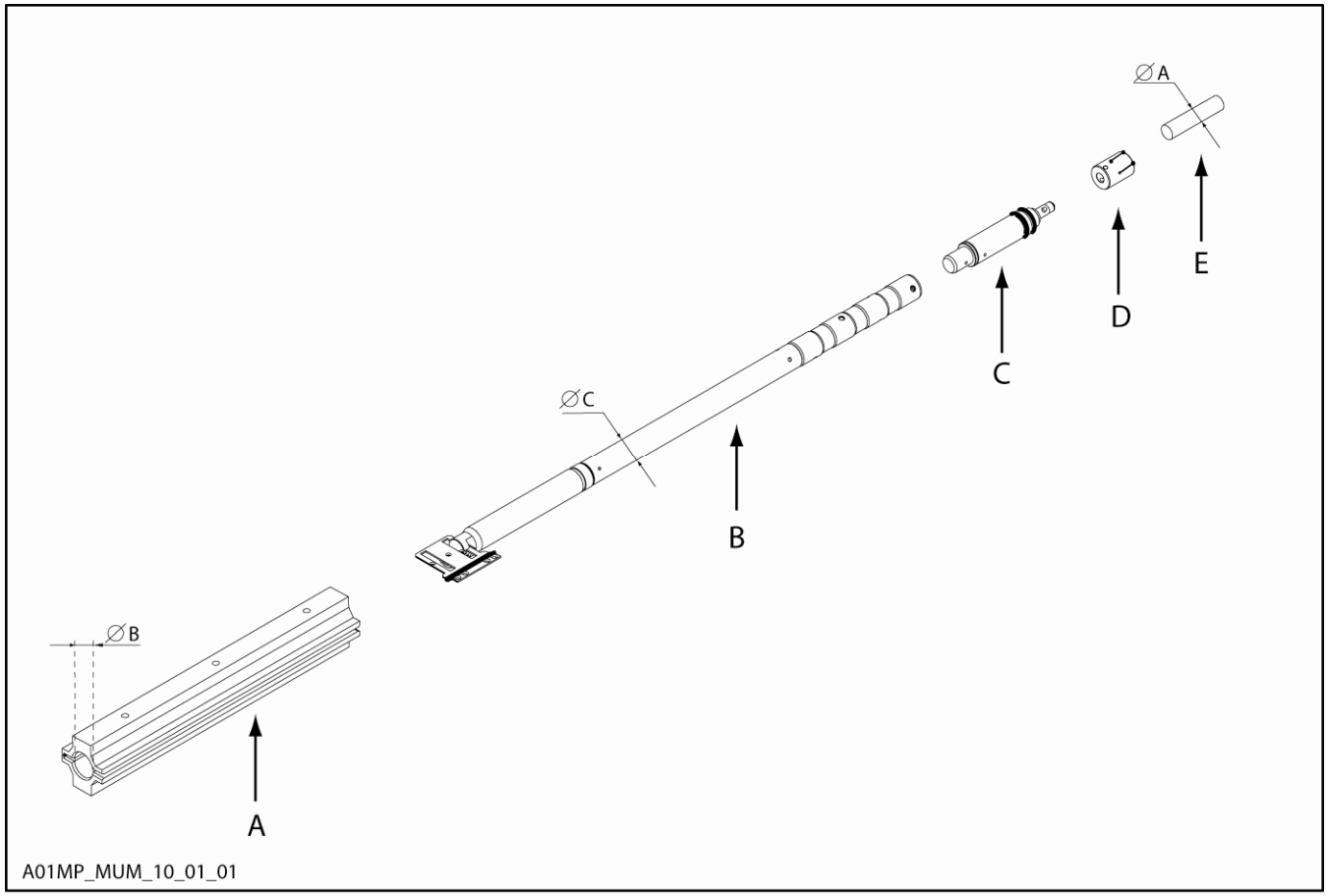
INDEX

Errore. Nessuna voce di sommario trovata.

INDEX

10.1 GUIDE CHANNELS AND BAR PUSHER

The choice of the guide channels and the bar pusher must be made according to the diameter of the bar to be machined. The bar feeder is usually supplied with a bar pusher whose diameter is equal to the maximum bar passage of the lathe. Sometimes, in order to ensure the best working conditions, it may be necessary to use a bar pusher with a smaller diameter.



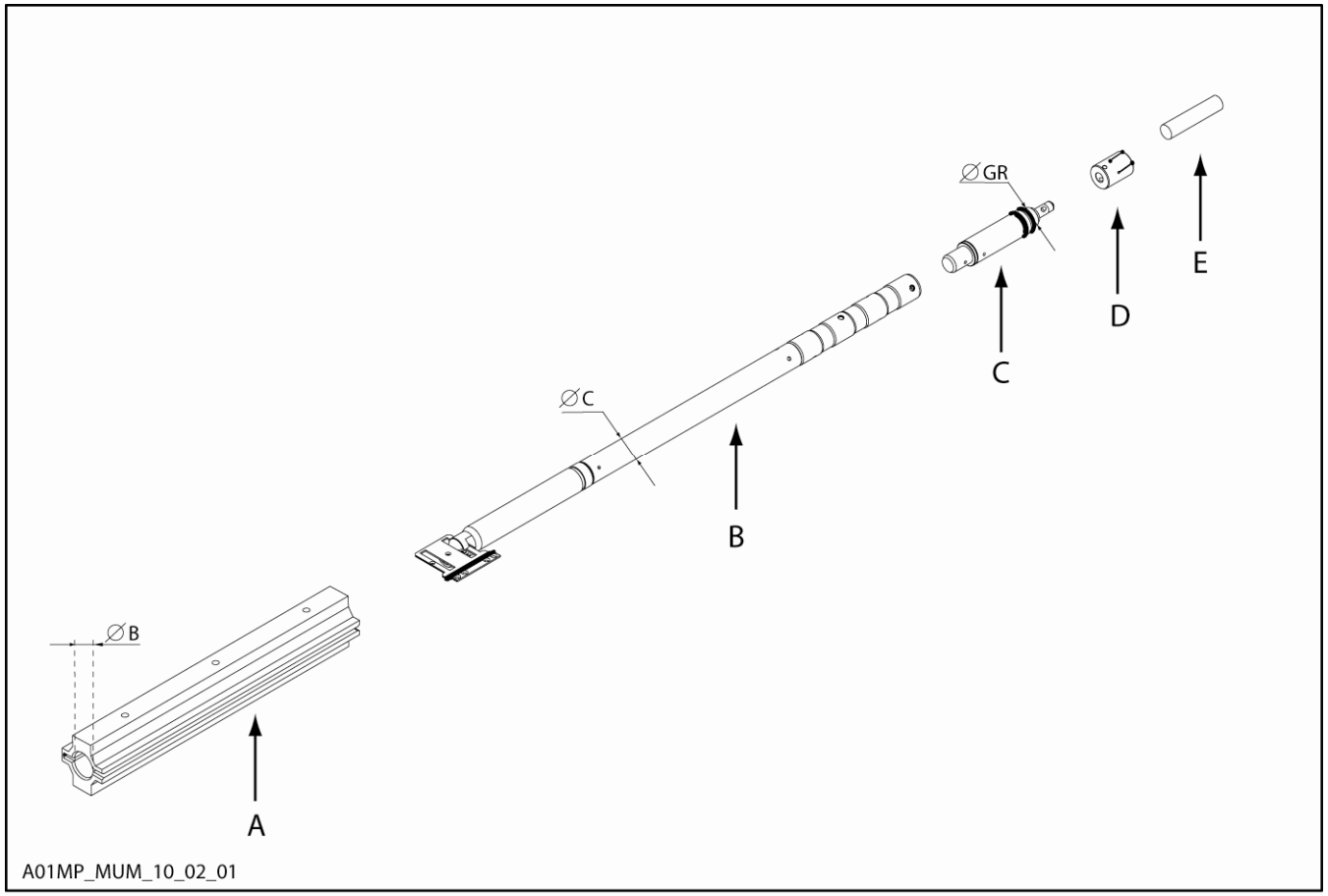
A Guide channels
B Bar pusher
C Revolving tip
D Collet
E Bar

INFORMATION:

upon customer's request and according to the internal diameter of lathe spindle hole, the bar pusher and the revolving tips may be supplied with dimensions other than the ones indicated in the table.

10.2 REVOLVING TIP - TABLE

The choice of the revolving tip depends on the diameter of the guide channel, and bar pusher and on the version of the collet coupling.



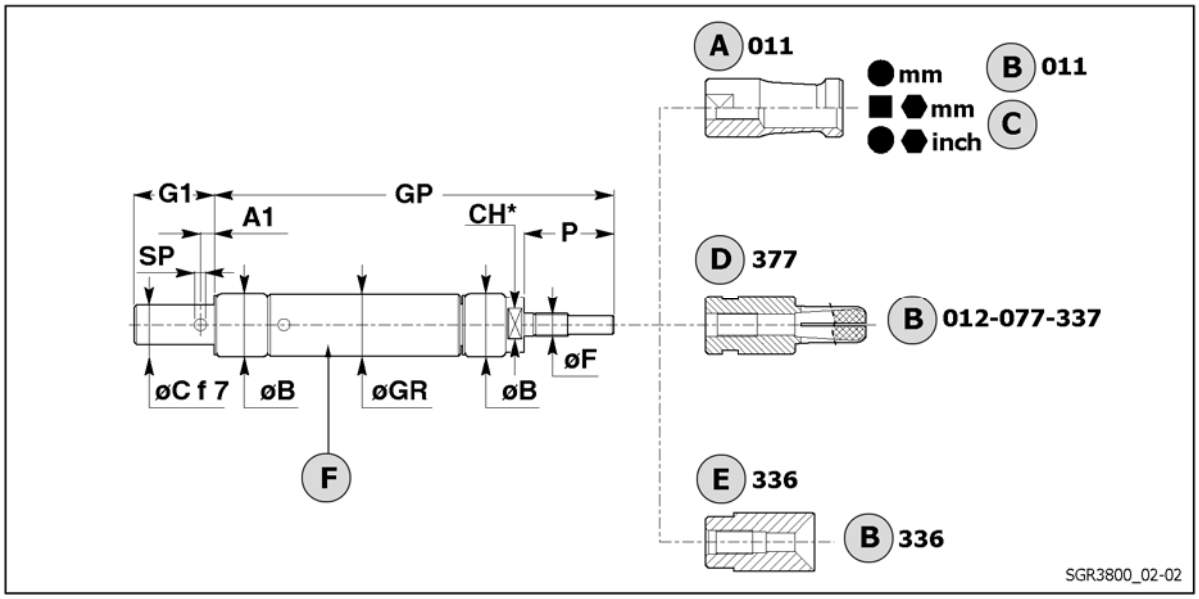
A Guide channels
B Bar pusher
C Revolving tip
D Collet
E Bar

øB (mm) Guide channel diameter	**øC** (mm) Bar pusher diameter	Collet version **– D** (type of coupling)	**øGR** (mm) Revolving tip diameter	Revolving tip code
21	20	Threaded (IEMCA)	20	D71152010
		With quick coupling pin		D71152011
26	25	Threaded (IEMCA)	25	D71152510
		With quick coupling pin		D71152511
33	32	Threaded (IEMCA)	32	D70153210
		With quick coupling pin		
36	35	Threaded (IEMCA)	35	D70153510
		With quick coupling pin		
38	37	Threaded (IEMCA)	37	D70153710
		With quick coupling pin		
43	42	Threaded (IEMCA)	42	D70154210
		With quick coupling pin		
46	45	Threaded (IEMCA)	45	D70154510
52	51	With quick coupling pin (IEMCA) With quick coupling screw (IEMCA) Threaded “OPTIONAL”	51	D77155110
57	56		56	D77155610
61	60		60	D77156000
66	65		65	D77156500
69	68		68	D77156800
71	70		70	D77157000
73	72		72	D77157200
76	75		75	D77157500
81	80		80	D77158000
86	85		85	D77158500
95	94		94	D02159450
103	102		102	D0215A250

IMPORTANT: the single components of the bar pusher and revolving tips are showed in the spare parts catalogue.

10.3 Revolving tips øGR 20÷25 - Table

- **For collets with threaded coupling (IEMCA)**



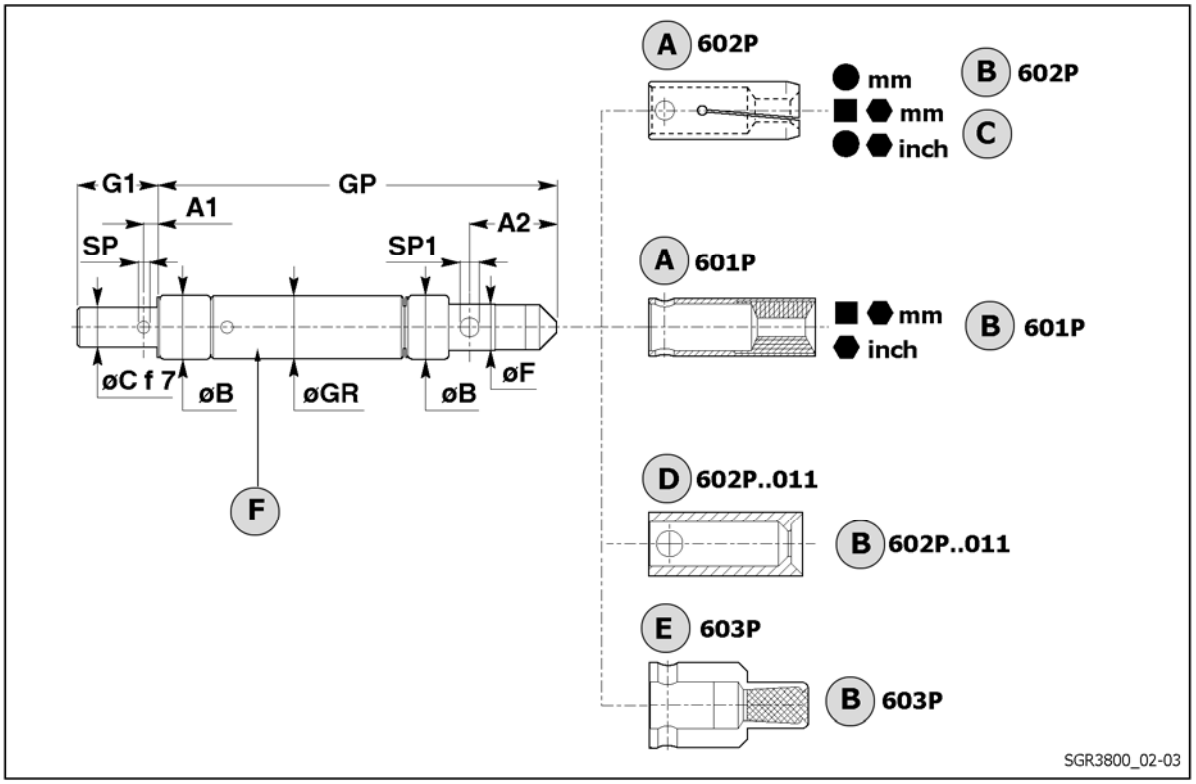
CH*: double-ended fork wrench DIN3110

A Collet
B See file
C See file 001
then 011
D Pipe collet
E Ejector
F Revolving tip

øGR (mm)	Revolving tip code	**øF**	**øB** (mm)	**GP** (mm)	**G1** (mm)	**C** (mm)	**A1** (mm)	**øSP** (mm)	**P** (mm)	**CH** (mm)
20	D71152010	M10x1	20.5	172.5	35	14	6	4	38.5	15
25	D71152510	M10x1	25.5	172.5	35	17	6	5	38.5	21

10.4 Revolving tips øGR 20÷25 - Table

- **For collets with quick coupling pin "OPTIONAL"**

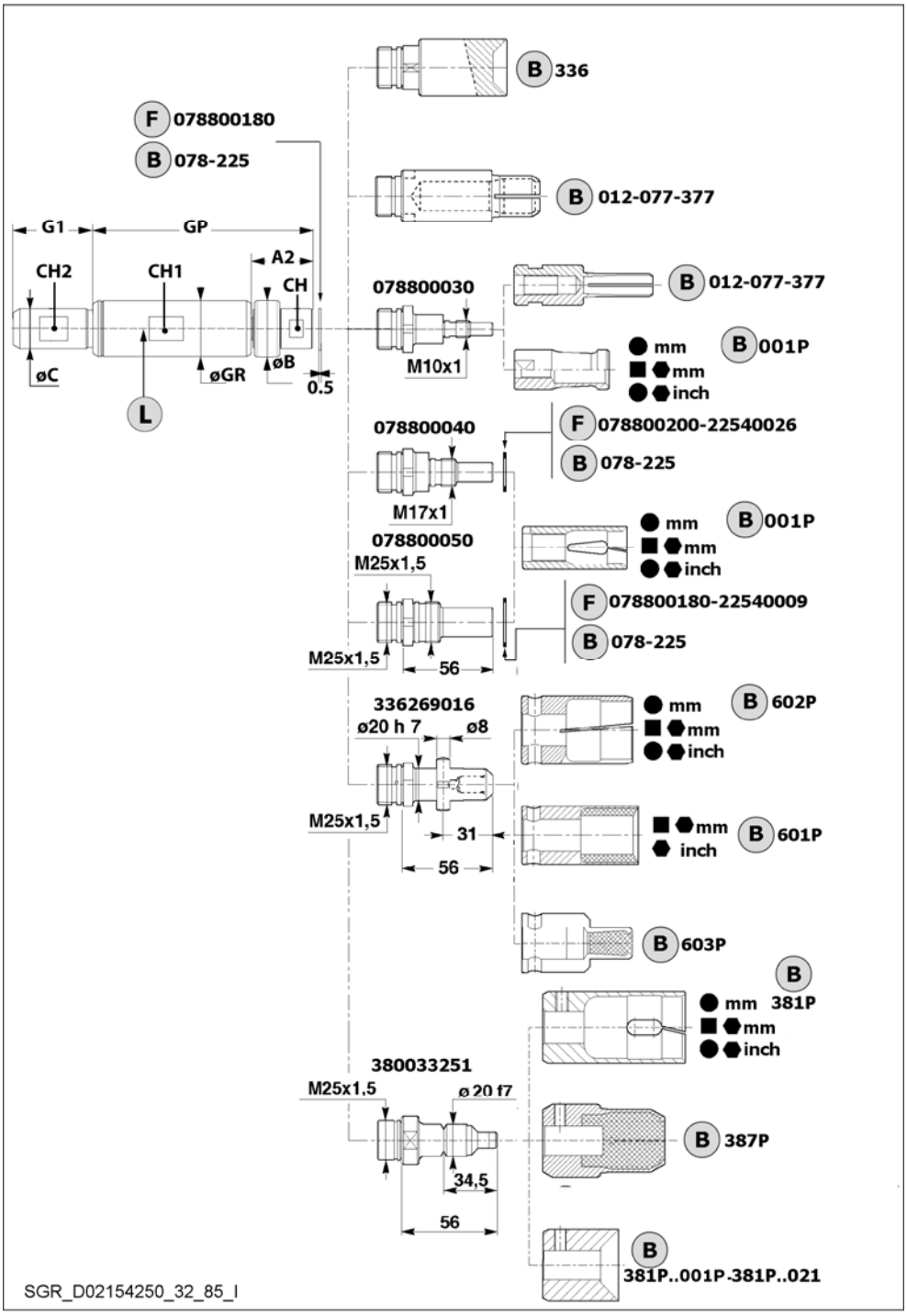


A Collet
B See file
C See file 001
then 602P
D Ejector
E Pipe collet
F Revolving tip

øGR (mm)	Revolving tip code	øF (mm)	øB (mm)	GP (mm)	G1 (mm)	C (mm)	A1 (mm)	øSP (mm)	A2 (mm)	øSP1 (mm)
20	D71152011	14	20.5	172.5	35	14	6	4	37.5	8
25	D71152511	20	25.5	172.5	35	17	6	5	37.5	8

10.5 Revolving tips øGR 32÷81 - Table

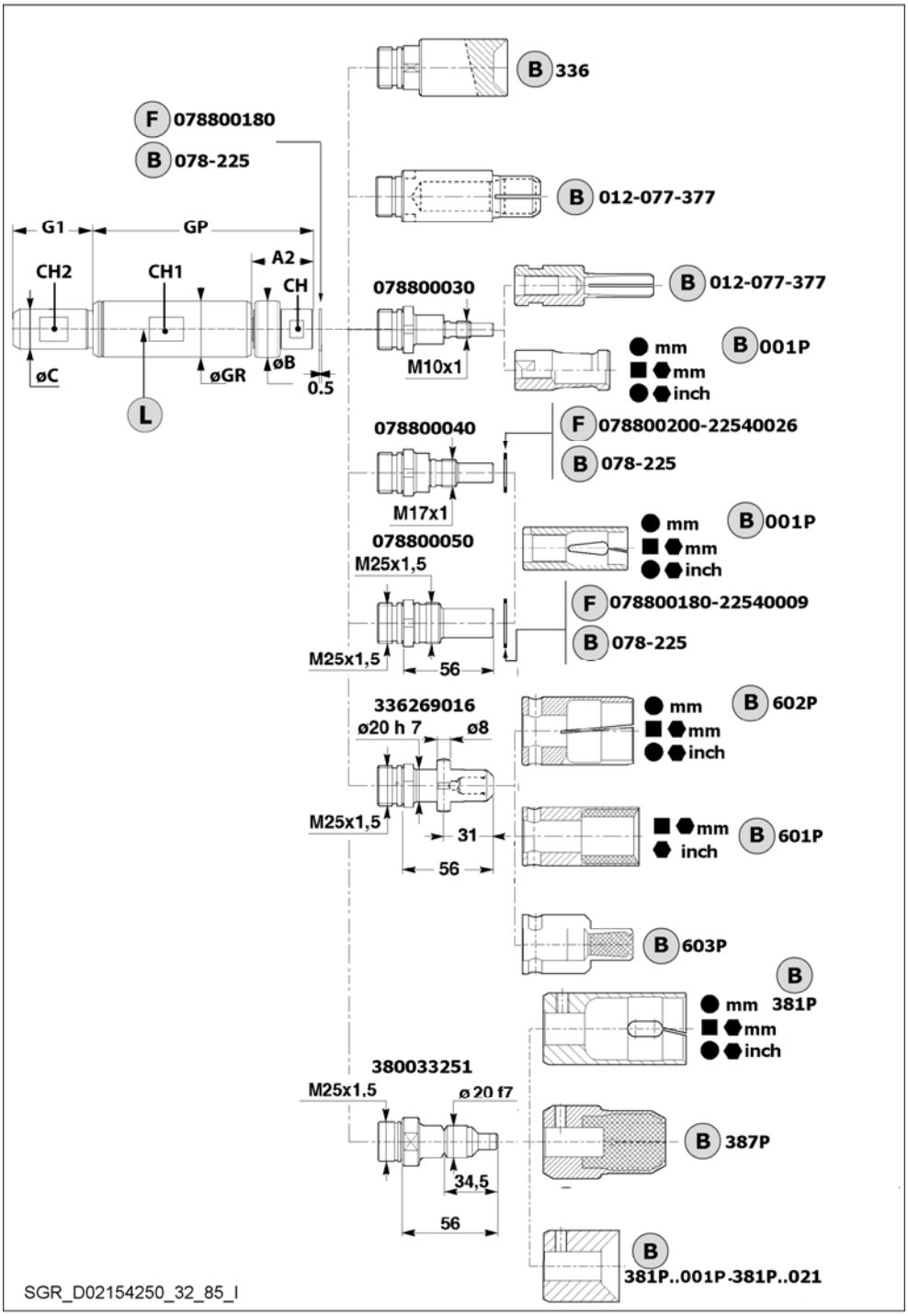
- **For collets with threaded coupling (IEMCA)**



CH*: double-ended fork wrench DIN3110
B See conversion table therefore collet table
F Ring
L Revolving tip

øGR (mm)	Revolving tip code	**CH** (mm)	**CH1** (mm)	**CH2** (mm)	**øB** (mm)
32	D02153250	27	30	20	32,5
35	D02153550	27	32	20	35,5
37	D02153750	27	32	20	37,5
42	D02154250	24	38	24	42,5
45	D02154550	26	42	26	45,5
51	D02155150	32	45	38	51,5
56	D02155650	32	50	38	56,5
60	D02156050	32	55	40	60,5
65	D02156550	32	55	46	65,5
68	D02156850	32	64	48	68,5
70	D02157050	32	65	46	70,5
72	D02157250	32	68	50	72,5
75	D02157550	32	72	54	75,5
80	D02158050	32	75	58	80,5
85	D02158550	32	82	58	85,5

øGR (mm)	Revolving tip code	**øC** (mm)	**G1** (mm)	**GP** (mm)	**A2** (mm)
32	D02153250	M24X2	50,75	165	46
35	D02153550	M24X2	50,75	165	46
37	D02153750	M24X2	50,75	165	46
42	D02154250	M30X2	60	165	46
45	D02154550	M30X2	60	165	46
51	D02155150	M42X2	60	181	50
56	D02155650	M42X2	60	181	43
60	D02156050	M45X2	60	202	43
65	D02156550	M50X2	60	202	43
68	D02156850	M54X2	60	202	50
70	D02157050	M54X2	60	202	50
72	D02157250	M54X2	60	202	50
75	D02157550	M60X2	60	202	50
80	D02158050	M64X2	60	202	50
85	D02158550	M64X2	60	202	50


B 336
F 078800180
B 078-225
B 012-077-377
G1
GP
A2
CH2
CH1
CH
078800030
B 012-077-377
mm
mm
inch
B 001P
øC
øGR
øB
0.5
L
M10x1
078800040
F 078800200-22540026
B 078-225
M17x1
mm
mm
inch
B 001P
078800050
M25x1,5
F 078800180-22540009
B 078-225
M25x1,5
56
336269016
ø20 h 7
ø8
mm
mm
inch
B 602P
M25x1,5
31
56
mm
inch
B 601P
B 603P
B
mm
mm
inch
381P
380033251
M25x1,5
ø 20 f7
B 387P
34,5
56
B
381P..001P-381P..021
SGR_D02154250_32_85_I

øGR (mm)	Revolving tip code	**CH** (mm)	**CH1** (mm)	**CH2** (mm)	**øB** (mm)
94	D02159450	36	90	75	94,5
102	D0215A250	36	96	85	102,5

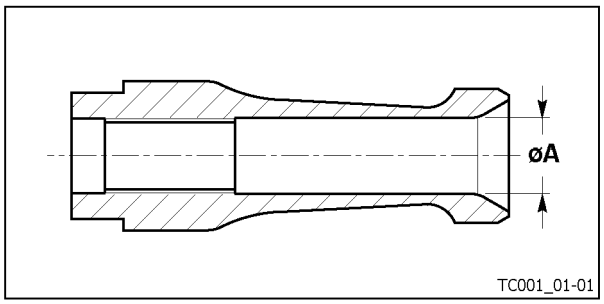
øGR (mm)	Revolving tip code	**øC** (mm)	**G1** (mm)	**GP** (mm)	**A2** (mm)
94	D02159450	M80x2	60	222,5	50,5
102	D0215A250	M90x2	60	222,5	50,5

INDEX

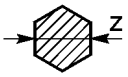
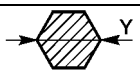
11.1 CONVERSION TABLES 001

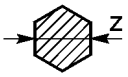
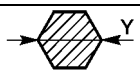
11.2 HEXAGONAL BARS (unit of measurement "millimetres") - Table

Before selecting the steel collet, define the internal diameter øA by referring to the table below.



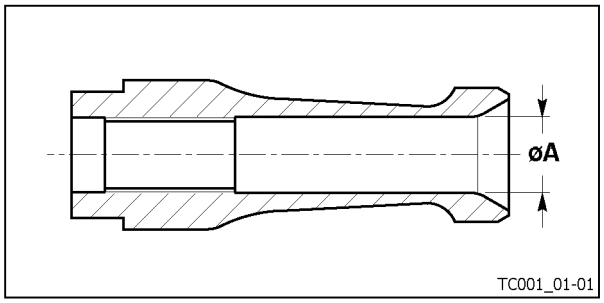
Z	Y	ØA	Z	Y	ØA
	Y=Zx1,154			Y=Zx1,154	
mm	mm	mm	mm	mm	mm
1.5	1.73	1.7	28	32.33	32
2	2.31	2.2	29	33.48	33.2
2.5	2.89	2.8	30	34.64	34.5
3	3.48	3.25	31	35.79	35.5
3.5	4.04	3.8	32	36.95	36.8
4	4.61	4.5	33	38.10	37.8
4.5	5.19	5	34	39.25	39
5	5.77	5.5	35	40.41	40.2
5.5	6.35	6.2	36	41.56	41.3
6	6.92	6.8	38	43.87	43.5
6.5	7.50	7.3	39	45.03	44.8
7	8.08	7.8	40	46.18	46
7.5	8.66	8.5	41	47.34	47
8	9.23	9	42	48.49	48.2
9	10.39	10.2	43	49.65	49.5
10	11.54	11.3	44	50.80	50.5
11	12.70	12.5	45	51.96	51.8
12	13.85	13.5	46	53.11	52.8
13	15.02	14.8	48	55.42	55
14	16.16	16	50	57.73	57.5
15	17.32	17.2	52	60.04	59.5
16	18.47	18.3	55	63.50	63
17	19.62	19.5	57	65.78	65.25
18	20.78	20.6	60	69.24	68.75
19	21.93	21.8	62	71.55	71
20	23.09	22.8	65	75	74.5
21	24.24	24	67	77.3	76.75
22	25.40	25.2	70	80.78	80.25

		ØA
mm	Y=Zx1,154 mm	mm
23	26.55	26.2
24	27.71	27.5
25	28.86	28.5
26	30.02	29.8
27	31.17	31

		ØA
mm	Y=Zx1,154 mm	mm
72	83.08	82.5
75	86.55	86
80	92.32	91.75
85	98.1	97.5

11.3 SQUARE BARS (unit of measurement "millimetres") - Table

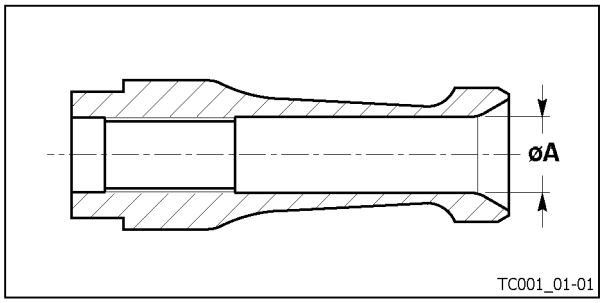
Before selecting the steel collet, define the internal diameter øA by referring to the table below.



Z	Y	ØA	Z	Y	ØA
	Y=Zx1,414			Y=Zx1,414	
mm	mm	mm	mm	mm	mm
1	1.41	1.3	20	28.28	27.5
1.5	2.12	2	22	31.10	30.5
2	2.82	2.7	23	32.52	32
2.5	3.53	3.4	24	33.93	33
3	4.24	4	25	35.35	34.5
4	5.65	5.5	26	36.76	36
4.5	6.36	6.2	27	38.17	37.5
5	7.07	6.8	28	39.59	38.5
5.5	7.77	7.5	30	42.42	41.5
6	8.48	8.3	32	45.24	44.5
6.5	9.19	9	34	48.07	47
7	9.89	9.7	35	49.49	48.5
8	11.31	11	36	50.90	50
8.5	12.01	11.8	37	52.31	51.5
9	12.72	12.5	38	53.73	52.5
10	14.14	13.8	39	55.15	54.5
10.5	14.84	14.5	40	56.56	55.5
11	15.55	15	41	57.97	57
12	16.97	16.5	42	59.38	58.5
12.5	17.67	17	43	60.08	59
13	18.38	18	44	62.21	61
14	19.79	19.5	45	63.63	62.5
15	21.21	20.8	46	65.04	64
16	22.62	22	50	70.7	69.5
17	24.04	23.5	55	77.77	76.75
18	25.52	25	60	84.84	83.75
19	26.86	26	65	91.91	91

11.4 HEXAGONAL BARS (unit of measurement "inches") - Table

Before selecting the steel collet, define the internal diameter øA by referring to the table below.

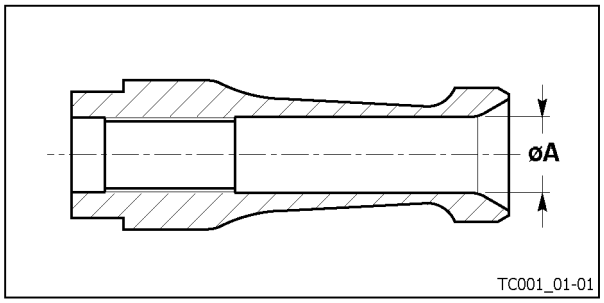


Z	ØA	
inches	mm	inches
1/8	3.5	9/64
3/16	5.25	13/64
1/4	7	9/32
5/16	8.75	11/32
3/8	10.75	27/64
7/16	12.5	31/64
1/2	14.25	9/16
9/16	16.25	41/64
5/8	18	45/64
11/16	19.75	25/32
3/4	21.75	55/64
13/16	23.5	59/64
7/8	25.25	63/64
15/16	27.25	1”5/64
1”	29	1”9/64
1”1/16	30.75	1”13/64
1”1/8	32.5	1”9/32
1”3/16	34.25	1”11/32
1”1/4	36.25	1”27/64
1”5/16	38	1”1/2

Z	ØA	
inches	mm	inches
1”3/8	39.75	1”9/16
1”7/16	41.75	1”41/64
1”1/2	43.5	1”23/32
1”9/16	46.5	1”53/64
1”5/8	47.25	1”55/64
1”11/16	49	1”15/16
1”3/4	50.75	2”
1”13/16	52.75	2”5/64
1”7/8	54.5	2”9/64
1”15/16	56.25	2”7/32
2”	58	2”9/32
2”1/16	59.75	2”11/32
2”1/8	61.5	2”27/64
2”3/16	63.5	2”1/2
2”1/4	65.25	2”37/64
2”1/2	72.5	2”55/64
2”3/4	79.75	3”9/64
3”	87	3”27/64
3”1/4	94.25	3”23/32

11.5 ROUND BARS - (unit of measurement "inches") - Table

Before selecting the steel collet, define the internal diameter øA by referring to the table below.



inches	ØA mm
1/32	0.8
3/64	1.2
1/16	1.6
5/64	2
3/32	2.4
7/64	2.8
1/8	3.2
9/64	3.6
5/32	4
11/64	4.4
3/16	4.8
13/64	5.2
7/32	5.6
15/64	6
1/4	6.4
17/64	6.8
9/32	7.2
19/64	7.6
5/16	8
21/64	8.4
11/32	8.8
23/64	9.1
3/8	9.6
25/64	10
13/32	10.4
27/64	10.8
7/16	11.25
29/64	11.5
15/32	12
31/64	12.5
1/2	12.75
33/64	13.25

inches	ØA mm
17/32	13.5
35/64	14
9/16	14.25
37/64	14.75
19/32	15
39/64	15.5
5/8	16
41/64	16.25
21/32	16.75
43/64	17
11/16	17.5
45/64	18
23/32	18.25
47/64	18.75
3/4	19
49/64	19.5
25/32	19.75
51/64	20.25
13/16	20.75
53/64	21
27/32	21.5
55/64	21.75
7/8	22.25
57/64	22.75
29/32	23
59/64	23.5
15/16	24
61/64	24.25
31/32	24.75
63/64	25
1	25.5
1”1/16	27

inches	ØA mm
1”1/8	28.5
1”3/16	30.25
1”1/4	31.75
1”5/16	33.25
1”3/8	35
1”7/16	36.25
1”1/2	38
1”9/16	39.75
1”5/8	41.25
1”11/16	43
1”3/4	44.5
1”13/16	46
1”7/8	47.75
1”15/16	49.25
2”	50.75
2”1/16	52.5
2”1/8	54
2”3/16	55.5
2”1/4	57.25
2”5/16	58.75
2”3/8	60.5
2”7/16	62
2”1/2	63.5
2”9/16	65
2”5/8	66.75
2”11/16	68.25
2”3/4	70
2”13/16	71.5
2”7/8	73
2”15/16	74.75
3”	76.25

11.6 CONVERSION TABLE Inches/Millimetres

Inch fraction		Inch fraction			
		1	2	3	4
		Millimetres			
0	**0**	0	25,400 0	50,800 0	76,200 0
1/64	**0,015 625**	0,396 9	25,796 9	51,196 9	76,596 9
1/32	**0,031 25**	0,793 8	26,193 8	51,593 8	76,993 8
3/64	**0,046 875**	1,190 6	26,590 6	51,990 6	77,390 6
1/16	**0,062 5**	1,587 5	26,987 5	52,387 5	77,787 5
5/64	**0,078 125**	1,984 4	27,384 4	52,784 4	78,184 4
3/32	**0,093 75**	2,381 2	27,781 2	53,181 2	78,581 2
7/64	**0,109 375**	2,778 1	28,178 1	53,578 1	78,978 1
1/8	**0,125**	3,175 0	28,575 0	53,985 0	79,375 0
9/64	**0,140 625**	3,571 9	28,971 9	54,371 9	79,771,9
5/32	**0,156 25**	3,968 8	29,368 8	54,768 8	80,168 8
11/64	**0,171 875**	4,365 6	29,765 6	55,165 6	80,565 6
3/16	**0,187 5**	4,762 5	30,162 5	55,562 5	80,962 5
13/64	**0,203 125**	5,159 4	30,559 4	55,959 4	81,359 4
7/32	**0,218 75**	5,556 2	30,956 2	56,356 2	81,756 2
15/64	**0,234 375**	5,953 1	31,353 1	56,753 1	82,153 1
1/4	**0,25**	6,350 0	31,750 0	57,150 0	82,550 0
17/64	**0,265 625**	6,746 9	32,146 9	57,546 9	82,946 9
9/32	**0,281 25**	7,143 8	32,543 8	57,943 8	83,343 8
19/64	**0,296 875**	7,540 6	32,940 6	58,340 6	83,740 6
5/16	**0,312 5**	7,937 5	33,337 5	58,737 5	84,137 5
21/64	**0,328 125**	8,334 4	33,734 4	59,134 4	84,534 4
11/32	**0,343 75**	8,731 2	34,131 2	59,531 2	84,931 2
23/64	**0,359 375**	9,128 1	34,528 1	59,928 1	85,328 1
3/8	**0,375**	9,525 0	34,925 0	60,325 0	85,725 0
25/64	**0,390 625**	9,921 9	35,321 9	60,721 9	86,121 9
13/32	**0,406 25**	10,318 8	35,718 8	61,118 8	86,518 8
27/64	**0,421 875**	10,715 6	36,115 6	61,515 6	86,915 6
7/16	**0,437 5**	11,112 5	36,512 5	61,912 5	87,312 5
29/64	**0,453 125**	11,509 4	36,909 4	62,309 4	87,709 4
15/32	**0,468 75**	11,906 2	37,306 2	62,706 2	88,106 2
31/64	**0,484 375**	12,303 1	37,703 1	63,103 1	88,503 1
1/2	**0,5**	12,700 0	38,100 0	63,500 0	88,900 0
33/64	**0,515 625**	13,096 9	38,496 9	63,896 9	89,296 9
17/32	**0,531 25**	13,493 8	38,893 8	64,293 8	89,693 8
35/64	**0,546 875**	13,890 6	39,290 6	64,690 6	90,090 6
9/16	**0,562 5**	14,287 5	39,687 5	65,087 5	90,487 5
37/64	**0,578 125**	14,684 4	40,084 4	65,484 4	90,884 4
19/32	**0,593 75**	15,081 2	40,481 2	65,881 2	91,281 2
39/64	**0,609 375**	15,478 1	40,878 1	66,278 1	91,678 1
5/8	**0,625**	15,875 0	41,275 0	66,675 0	92,075 0
41/64	**0,640 625**	16,271 9	41,671 9	67,071 9	92,471 9
21/32	**0,656 25**	16,668 8	42,068 8	67,468 8	92,868 8
43/64	**0,671 875**	17,065 6	42,465 6	67,865 6	93,265 6

Inch fraction		Inch fraction			
		1	2	3	4
		Millimetres			
11/16	**0,687 5**	17,462 5	42,862 5	68,262 5	93,662 5
45/64	**0,703 125**	17,859 4	43,259 4	68,659 4	94,059 4
23/32	**0,718 75**	18,256 2	43,656 2	69,056 2	94,456 2
47/64	**0,734 375**	18,653 1	44,053 1	69,453 1	94,853 1
3/4	**0,75**	19,050 0	44,450 0	69,850 0	95,250 0
49/64	**0,765 625**	19,446 9	44,846 9	70,246 9	95,646 9
25/32	**0,781 25**	19,843 8	45,243 8	70,643 8	96,043 8
51/64	**0,796 875**	20,240 6	45,640 6	71,040 6	96,440 6
13/16	**0,812 5**	20,637 5	46,037 5	71,437 5	96,837 5
53/64	**0,828 125**	21,034 4	46,434 4	71,834 4	97,234 4
27/32	**0,843 75**	21,431 2	46,831 2	72,231 2	97,631 2
55/64	**0,859 375**	21,828 1	47,228 1	72,628 1	98,028 1
7/8	**0,875**	22,225 0	47,625 0	73,025 0	98,425 0
57/64	**0,890 625**	22,621 9	48,021 9	73,421 9	98,821 9
29/32	**0,906 25**	23,018 8	48,418 8	73,818 8	99,218 8
59/64	**0,921 875**	23,415 6	48,815 6	74,215 6	99,615 6
15/16	**0,937 5**	23,812 5	49,212 5	74,612 5	100,012 5
61/64	**0,953 125**	24,209 4	49,609 4	75,009 4	100,409 4
31/32	**0,968 75**	24,606 2	50,006 2	75,406 2	100,806 2
63/64	**0,984 375**	25,003 1	50,403 1	75,803 1	101,203 1

11.7 COLLETS FOR BARS 011

11.8 COLLET FOR BARS - Table

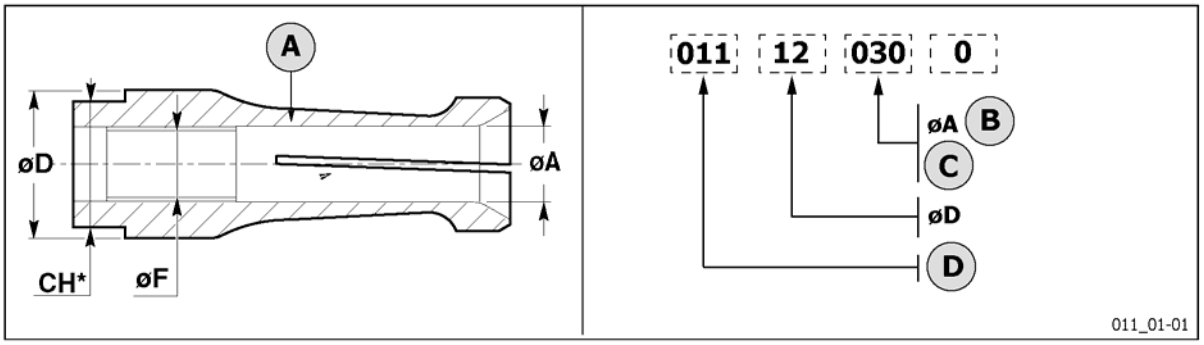
WARNING – CAUTION:

the collet external diameter should be at least 0.5 mm smaller than the bar pusher external diameter.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.

Code structure



CH*: double-ended fork wrench DIN3110

A Collet
B Bar diameter
C Example:
0.8 mm = 008
3 mm = 030
12.25 mm = 122
12.5 mm = 125
D Category

External diameter (mm) **øD**	Diameter (mm) **øF**	Internal diameter (mm) **øA**	
		MIN	MAX
7,5	M5x0,5	0,8	6,7
10	M6x0,75	1	9
12	M7x0,75	1	11,4
15	M8x1	2	14
16	M8x1	3	15
17	M8x1	14	16
18	M8x1	5	16,7
19	M8x1	16	18
20	M10x1	3	19
23	M10x1	8	22
25	M10x1	7,3	23,5
27	M10x1	8	26
29	M10x1	24	26
30	M10x1	23	28,5
32	M10x1	20	30,5

11.9 PIPE COLLETS 012-077-377

11.10 PIPE COLLETS - Table

WARNING – CAUTION:

the collet external diameter should be at least 0.5 mm smaller than the bar pusher external diameter.

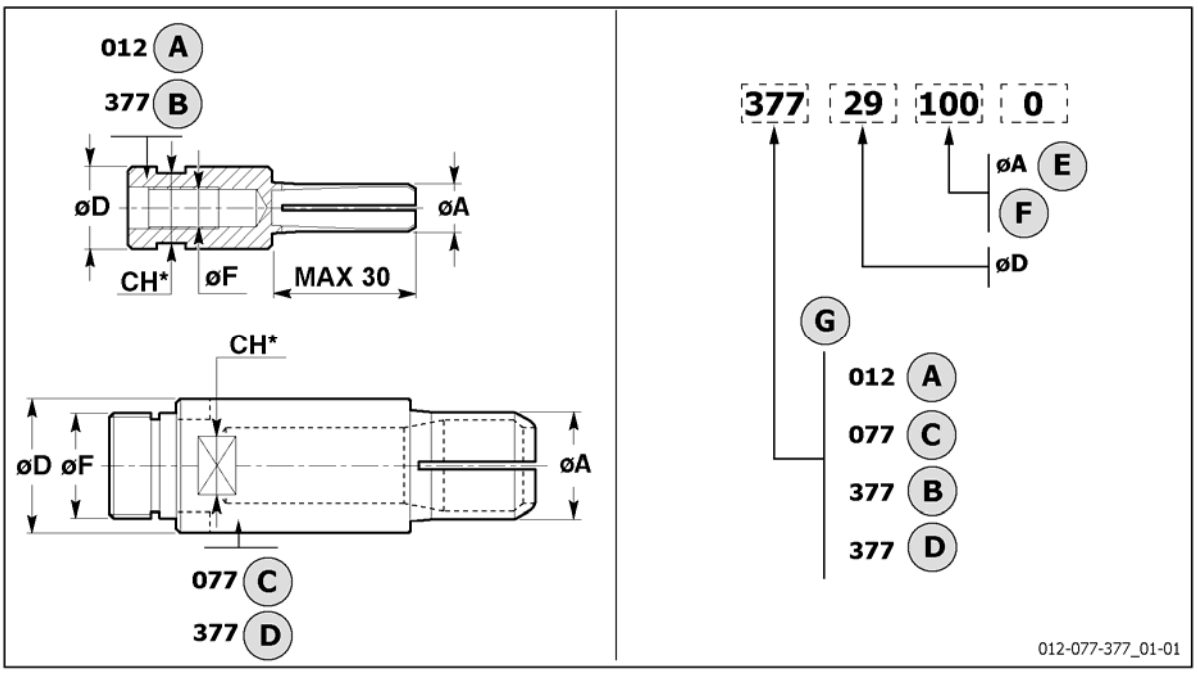
INFORMATION:

the collets 377... (bar feeder BOSS) with øF M10x1 have been designed to be assembled on lower revolving tips with ø28; if mounted on the revolving tips with greater diameter as ø30 and with nipples 078800030, it is necessary to lengthen the bar pusher carriage first feeding value of 7.5 mm.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.

Code structure



CH*: double-ended fork wrench DIN3110

A Collets for pipe (type AS) øF M7x0.75 - M8x1
B Collets for pipe (type BOSS) øF M10x1
C Collets for pipe (type T560) øF M17x1 - M25x1
D Collets for pipe (type T560) øF M25x1.5
E Bar diameter
F Example:
5 mm = 060
10 mm = 100
12.5 mm = 125
G Category

External diameter (mm) **øD**	Diameter (mm) **øF**	External diameter (mm) **øA**	
		MIN	MAX
10	M6x0,75	5,9	6
12	M7x0,75	5	9,5
15	M8x1	5	13
16	M8x1	13,5	14
20	M10x1	6	18
23	M10x1	8	21,75
24	M17x1	6	23,5
25	M10x1	14	23,5
27	M17x1	23	25,5
29	M17x1	22	27
29	M25x1,5	8	27
30	M25x1,5	25	26,75
32	M25x1,5	27	30,25
35	M25x1,5	29	33
37	M25x1,5	33,5	33,5
38	M25x1,5	32	33
40	M25x1,5	33,25	37

External diameter (mm) **øD**	Diameter (mm) **øF**	External diameter (mm) **øA**	
		MIN	MAX
42	M25x1,5	37,5	40
44-45	M25x1,5	40	42,5
49	M25x1,5	43	46,5
54-55	M25x1,5	46,5	52,5
59	M25x1,5	52,5	56
64	M25x1,5	56,5	61
68	M25x1,5	61,5	66

11.11 EJECTOR 336

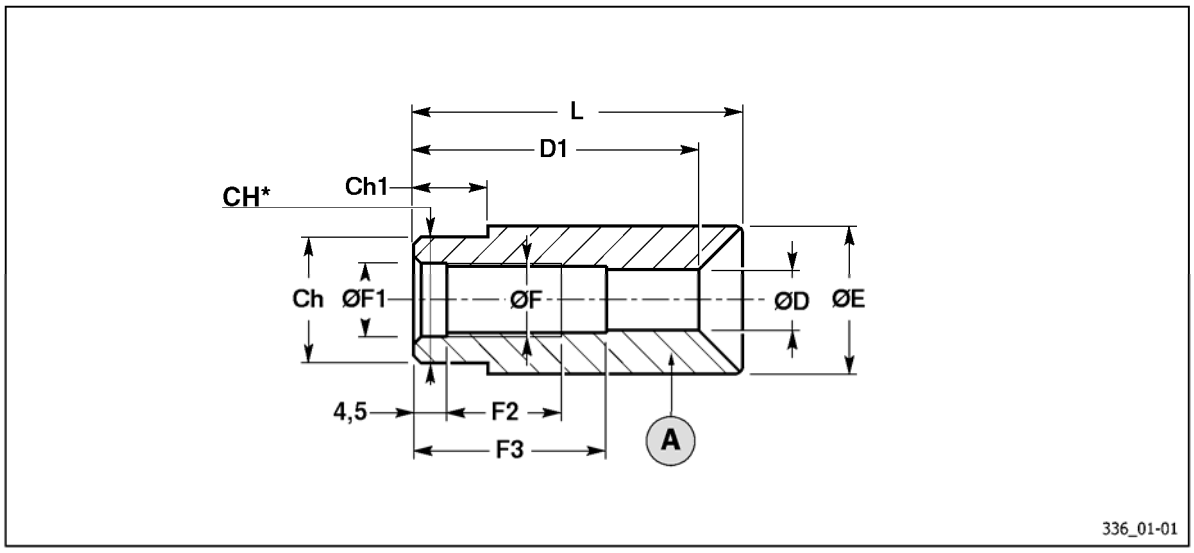
11.12 EJECTOR – Guide channels ø<30 - Table

WARNING – CAUTION:

the external diameter of the ejector must be at least 0.5 mm less than the external diameter of the bar pusher.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.



CH*: double-ended fork wrench DIN3110

A Ejector

øF	F1 (mm)	F2 (mm)	F3 (mm)	øE (mm)	L (mm)	øD (mm)	D1 (mm)	Ch (mm)	Ch1 (mm)	Code no.
M7x0.75	7	12	18	12	29.75	5.5	26.5	10	6	336803120
M8x1	8	12	18	15	30.75	6.5	26.5	13	10	336803150
M8x1	8	12	18	18	32	6.5	26.5	15	10	336803180
M10x1	10	15.5	26	20	44.4	8.2	38.5	17	10	336803200
M10x1	10	15.5	26	23	46	8.2	38.5	19	10	336803230
M10x1	10	15.5	26	25	47	8.2	38.5	22	12	336803250
M10x1	10	15.5	26	27	48	8.2	38.5	24	12	336803270
M10x1	10	15.5	26	29	49	8.2	38.5	27	12	336803290

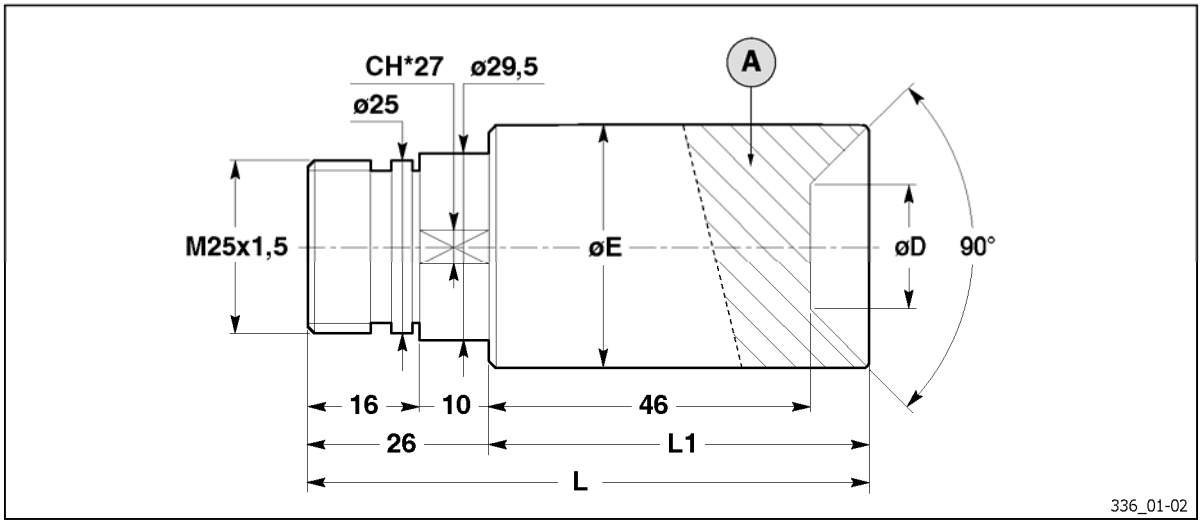
11.13 EJECTOR – Guide channels ø>32 - Table

WARNING – CAUTION:

the external diameter of the ejector must be at least 0.5 mm less than the external diameter of the bar pusher.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.



CH*: double-ended fork wrench DIN3110

A Ejector

øE (mm)	øD (mm)	L (mm)	L1 (mm)	Code no.
31	10	82.5	56.5	336803310
32	14	81	55	336803320
35	18	80.5	54.5	336803350
40	18	83	57	336803400
42	18	84	58	336803420
44	20	84	58	336803440
45	21	84	58	336803450
50	23	84	58	336803500
52	25	84	58	336803520
55	28	84	58	336803550
60	33	84	58	336803600
65	38	84	58	336803650
70	43	84	58	336803700

11.14 COLLETS FOR BARS 602P

11.15 COLLET FOR BARS - Table

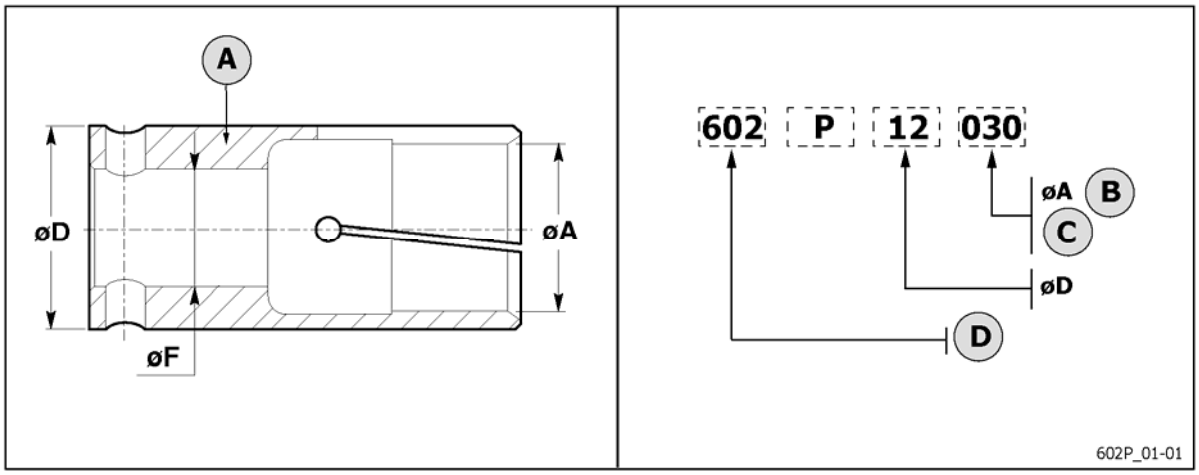
WARNING – CAUTION:

the collet external diameter should be at least 0.5 mm smaller than the bar pusher external diameter.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.

Code structure



A Collet
B Bar diameter
C Example:
3 mm = 030
3.5 mm = 035
12.5 mm = 125
12.75 mm = 127
D Category

External diameter (mm) **øD**	Diameter (mm) **øF**	Internal diameter (mm) **øA**	
		MIN	MAX
10	Ø7 G6	3	8
12	Ø8 G6	3	10
15	Ø11 G6	4	13
16	Ø11 G6	11	14
18	Ø11 G6	8	16
20	Ø14 G6	6	18
21	Ø14 G6	16,5	19
23	Ø14 G6	14	21
25	Ø20 G6	4,3	23
27	Ø20 G6	21	25,5
29	Ø20 G6	22,75	27
32	Ø20 G6	6	30
35	Ø20 G6	27	32
36	Ø20 G6	26	34
39	Ø20 G6	32	37
42	Ø20 G6	31	40
45	Ø20 G6	33	42
51	Ø20 G6	39,75	47
52	Ø20 G6	44	49
56	Ø20 G6	47	52

11.16 BORING COLLETS FOR BARS 601P

11.17 BORING COLLETS FOR SQUARE AND HEXAGONAL BARS - Table

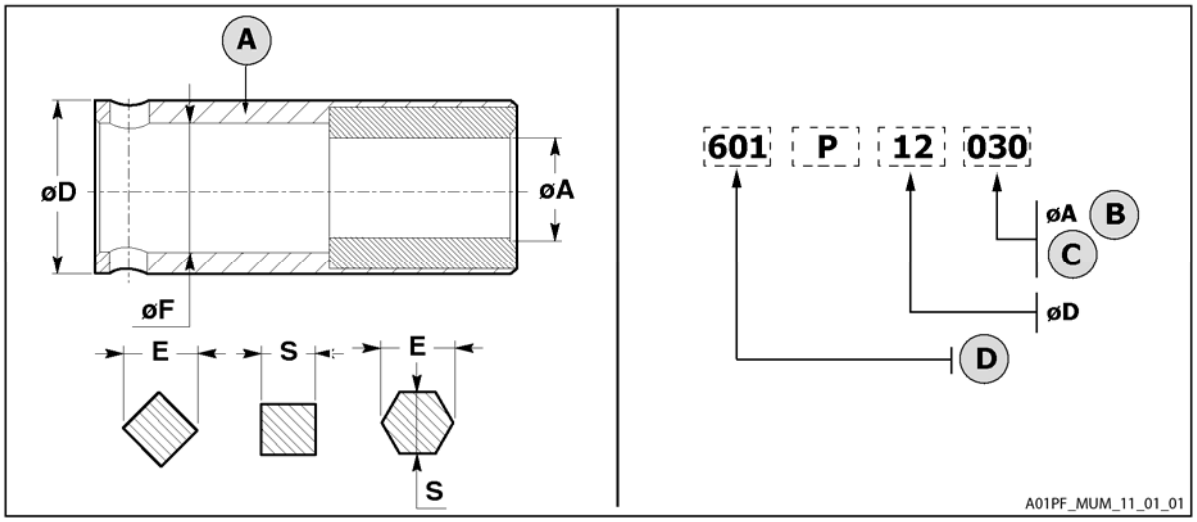
INFORMATION:

to determine the internal diameter øA, do not refer to file "001 - Conversion Tables", but refer directly to the table below.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.

Code structure



A Collet
B Bar diameter
C Example:
3 mm = 030
3.5 mm = 035
12.5 mm = 125
12.75 mm = 127
D Category

S square bars (S=E/1,414)		**S hexagonal bars** (S=E/1,154)		External diameter (mm) **øD**	Diameter (mm) **øF**
MIN	MAX	MIN	MAX		
3	3	3	4	7,5	M5x0,5
4	6	5	7	12	Ø8 G6
6	10	6	13	18	Ø11 G6
7	12	* 5/16”	15	21	Ø14 G6
10	12	8,5	19	25	Ø20 G6
13	15	/	/	25	M5x0,5
16	17	/	/	29	Ø8 G6
/	/	17	* 7/8”	29	Ø20 G6
18	20	/	/	32	Ø11 G6
/	/	20	25	32	Ø20 G6
		21	* 1” 1/8	36	Ø20 G6
21	23	/	/	36	Ø14 G6
/	/	* 1” 1/16	* 1” 1/16	40	Ø20 G6

WARNING: Values indicated with * are expressed in inches.

11.18 EJECTORS 602P..011

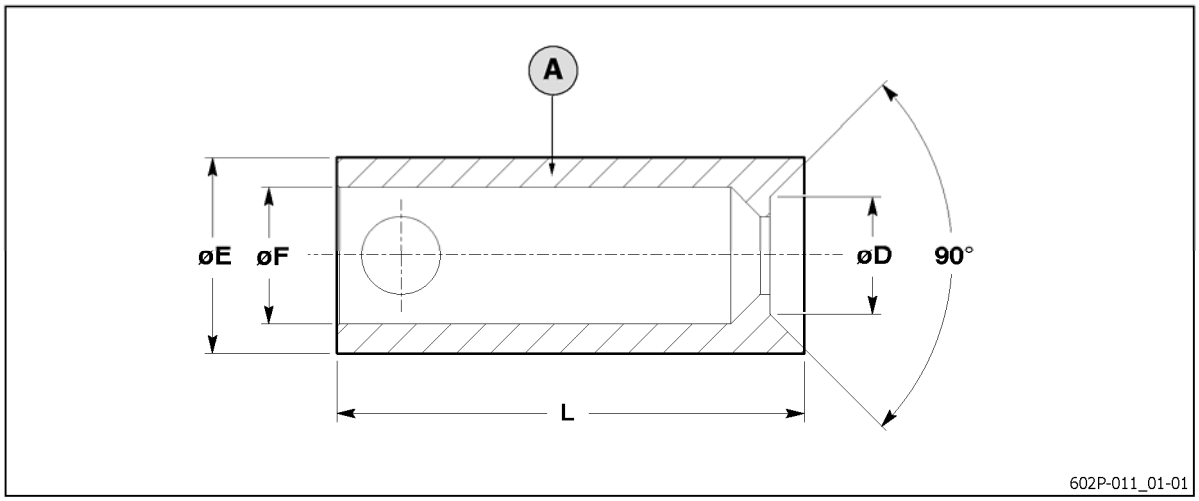
11.19 EJECTORS - Guide channels ø13÷28 - Table

WARNING – CAUTION:

the external diameter of the ejector must be at least 0.5 mm less than the external diameter of the bar pusher.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.



A Ejector

øE (mm)	øF (mm)	øD (mm)	L (mm)	Code no.
12	8	8	24	602P12011
15	11	11	26	602P15011
16	11	12	26	602P16011
18	11	12	27.5	602P18011
19	11	12	28	602P19011
20	14	12	47.5	602P20011
23	14	12	49	602P23011
25	20	12	50.5	602P25011
27	20	12	51.5	602P27011
29	20	14	51.5	602P29011
30	20	15	51.5	602P30011
35	20	18	51.5	602P35011
40	20	18	55	602P40011
45	20	19	56	602P45011
51	20	25	56	602P51011

11.20 PIPE COLLETS 603P

11.21 PIPE COLLETS - Table

WARNING – CAUTION:

the collet external diameter should be at least 0.5 mm smaller than the bar pusher external diameter.

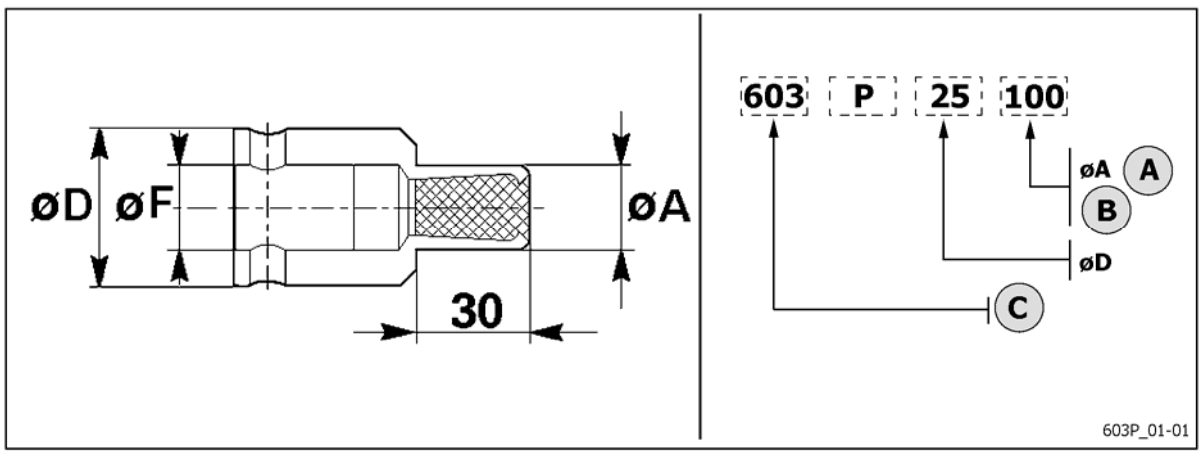
INFORMATION:

For the 603P collets..... fitted with a quick coupling, allowing the assembly on the revolving tips, are designed with an oversized length. Therefore, the first feeding value of the bar pusher carriage shall be increased of 7.5 mm with respect to the standard value.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.

Code structure



A Bar diameter
B Example:
5 mm = 060
10 mm = 100
12.5 mm = 125
C Category

External diameter (mm) **øD**	Diameter (mm) **øF**	External diameter (mm) **øA**	
		MIN	MAX
12	Ø8 G6	5	9,5
15	Ø11 G6	5	11
15-16	Ø11 G6	11,5	14
20	Ø14 G6	6	18
25	Ø20 G6	10	23
27	Ø20 G6	21.5	25
29	Ø20 G6	25,5	27
32	Ø20 G6	15	30
35	Ø20 G6	23	33
40	Ø20 G6	34	37
42	Ø20 G6	23	40
44-45	Ø20 G6	39,5	42,5
49	Ø20 G6	30	45

11.22 COLLETS FOR BARS 076

11.23 COLLET FOR BARS - Table

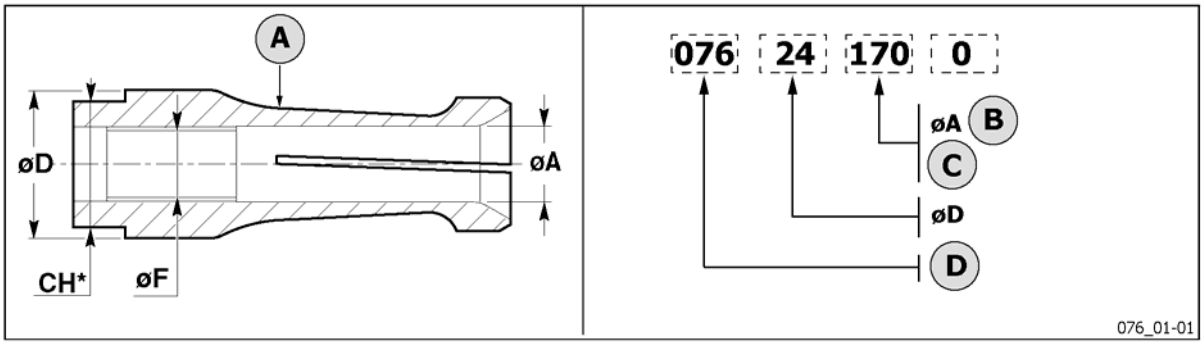
WARNING – CAUTION:

the collet external diameter should be at least 0.5 mm smaller than the bar pusher external diameter.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.

Code structure



CH*: double-ended fork wrench DIN3110

A Collet
B Bar diameter
C Example
17 mm = 170
22.5 mm = 225
39.75 mm= 397
D Category

External diameter (mm) **øD**	Diameter (mm) **øF**	Internal diameter (mm) **øA**	
		MIN	MAX
22	M10x1	15	15,7
23	M10x1	16	16,5
24	M17x1	16,5	17,7
25	M17x1	18	22,8
27	M17x1	19,5	25
28	M17x1	21,5	21,7
29	M17x1	22	27
30	M25x1,5	16,9	28,5
32	M25x1,5	10	30
34	M25x1,5	27	32
35	M25x1,5	28,5	33,5
36	M25x1,5	29	34
37	M25x1,5	30,2	35,51
38	M25x1,5	31	36
40	M25x1,5	24	38
42	M25x1,5	23,7	40
43	M25x1,5	37	38,5
44	M25x1,5	38	42
45	M25x1,5	39	42,2
46	M25x1,5	40	40,5
48	M25x1,5	41	43,5
49	M25x1,5	43	43,5

External diameter (mm) **øD**	Diameter (mm) **øF**	Internal diameter (mm) **øA**	
		MIN	MAX
50	M25x1,5	44	46
52	M25x1,5	45	48
54	M25x1,5	48	50
55	M25x1,5	50	52
56	M25x1,5	50	51,5
57	M25x1,5	51	51,5
58	M25x1,5	47,5	53,5
59	M25x1,5	53	53,5
60	M25x1,5	54	58
62	M25x1,5	56	57,5
64	M25x1,5	57	59,5
65	M25x1,5	59	62
66	M25x1,5	60	61
68	M25x1,5	61,5	63,5
69	M25x1,5	63,5	66
70	M25x1,5	41	68
72	M25x1,5	66	68
74	M25x1,5	67,5	69
76	M25x1,5	69,5	70

11.24 COLLETS FOR BARS 381P

11.25 COLLET FOR BARS - Table

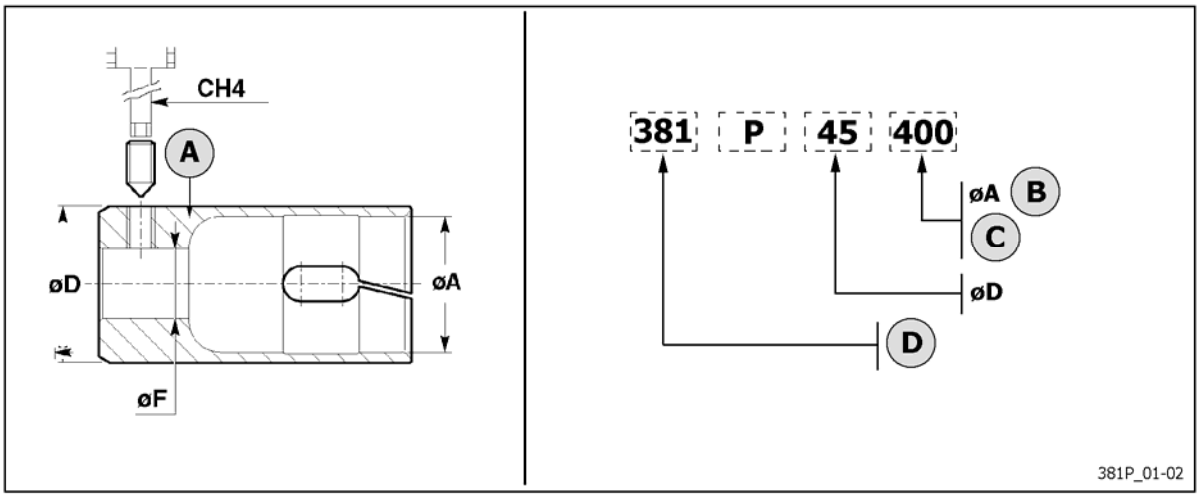
WARNING – CAUTION:

the collet external diameter should be at least 0.5 mm smaller than the bar pusher external diameter.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.

Code structure



A Collet
B Bar diameter
C Example:
40 mm = 400
39.75 mm = 397
D Category

CH4: T Allen wrench - DIN911

External diameter (mm) **øD**	Diameter (mm) **øF**	Internal diameter (mm) **øA**	
		MIN	MAX
32	Ø20 G6	10	29
35	Ø20 G6	27	32
37	Ø20 G6	29	34
40	Ø20 G6	30	33
42	Ø20 G6	33,25	39
44	Ø20 G6	38	38,75
45	Ø20 G6	39	42
48	Ø20 G6	40	42,75
49	Ø20 G6	43	43,75
50	Ø20 G6	44	47
51	Ø20 G6	45	47
52	Ø20 G6	45	47,75
54	Ø20 G6	48	49,75
56	Ø20 G6	49,75	52
58	Ø20 G6	51	52,75
59	Ø20 G6	53	53,75

External diameter (mm) **øD**	Diameter (mm) **øF**	Internal diameter (mm) **øA**	
		MIN	MAX
60	Ø20 G6	54	56
62	Ø20 G6	56	56,75
64	Ø20 G6	57	60
65	Ø20 G6	59	61
66	Ø20 G6	60	62
68	Ø20 G6	61,25	63,75
70	Ø20 G6	64	65,75
72	Ø20 G6	65,25	67
74-75	Ø20 G6	67,25	70
76	Ø20 G6	69	70
78	Ø20 G6	70,25	72
80	Ø20 G6	69,75	76,75
85	Ø20 G6	74	80

11.26 EJECTORS 381P..011 - 381P..021

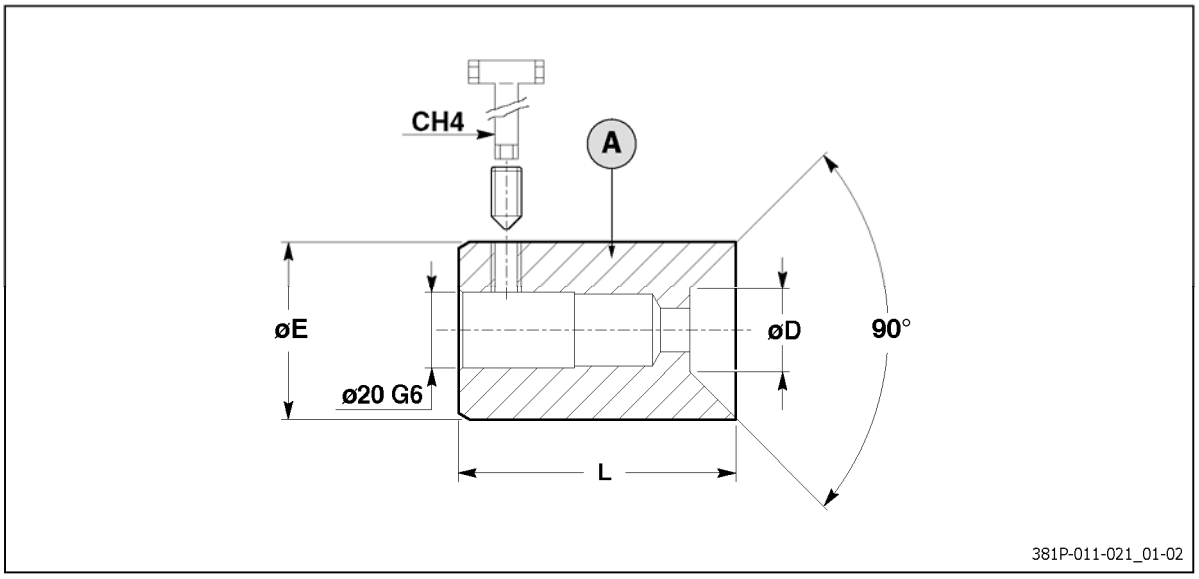
11.27 381P..021 EJECTORS - Guide channels ø33÷46 - Table

WARNING – CAUTION:

the external diameter of the ejector must be at least 0.5 mm less than the external diameter of the bar pusher.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.



CH4: T Allen wrench - DIN 911

A Ejector

øE (mm)	**øD** (mm)	**L** (mm)	Code no.
30	12	69	381P30021
31	13	70	381P31021
32	14	71	381P32021
35	18	69	381P35021
37	18	70	381P37021
40	18	71.5	381P40021
42	18	72.5	381P42021
45	21	72.5	381P45021

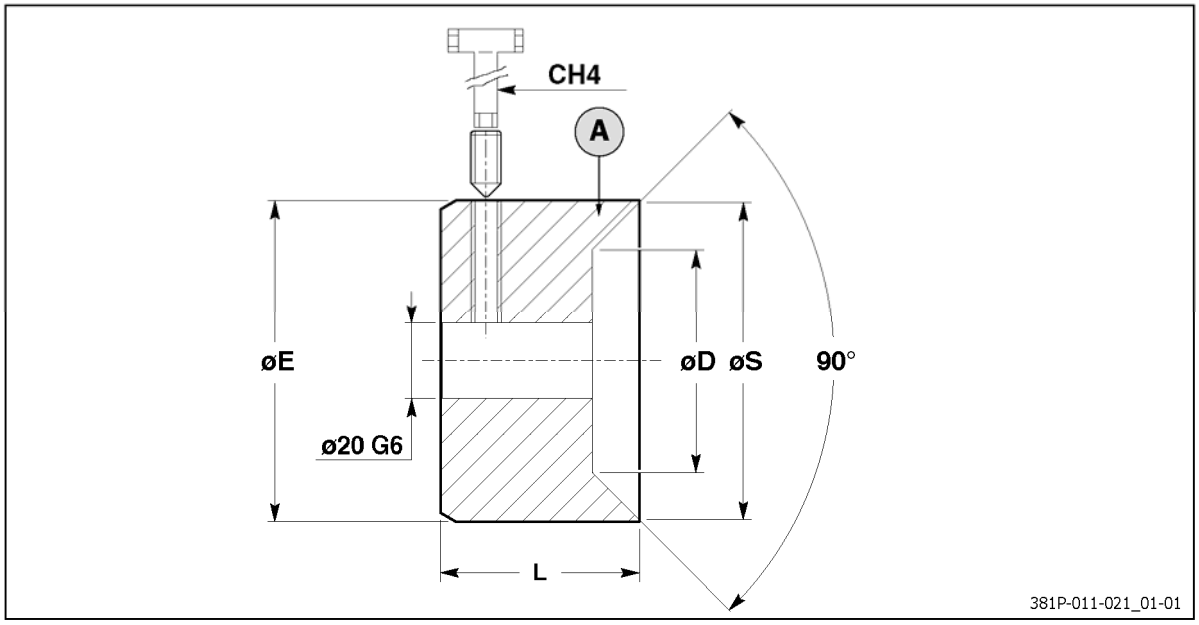
11.28 381P..011 EJECTORS - Guide channels ø52÷86 - Table

WARNING – CAUTION:

the external diameter of the ejector must be at least 0.5 mm less than the external diameter of the bar pusher.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.



CH4: T Allen wrench - DIN 911

A Ejector

øE (mm)	L (mm)	øS (mm)	øD (mm)	Code no.
51	52.5	50	25	381P51011
56	52.5	55	30	381P56011
60	52.5	59	34	381P60011
65	52.5	64	39	381P65011
68	52.5	67	42	381P68011
70	52.5	69	44	381P70011
72	52.5	71	46	381P72011
75	52.5	74	50	381P75011
80	52.5	79	55	381P80011
85	52.5	84	60	381P85011

11.29 PIPE COLLETS 386P

11.30 PIPE COLLETS - Table

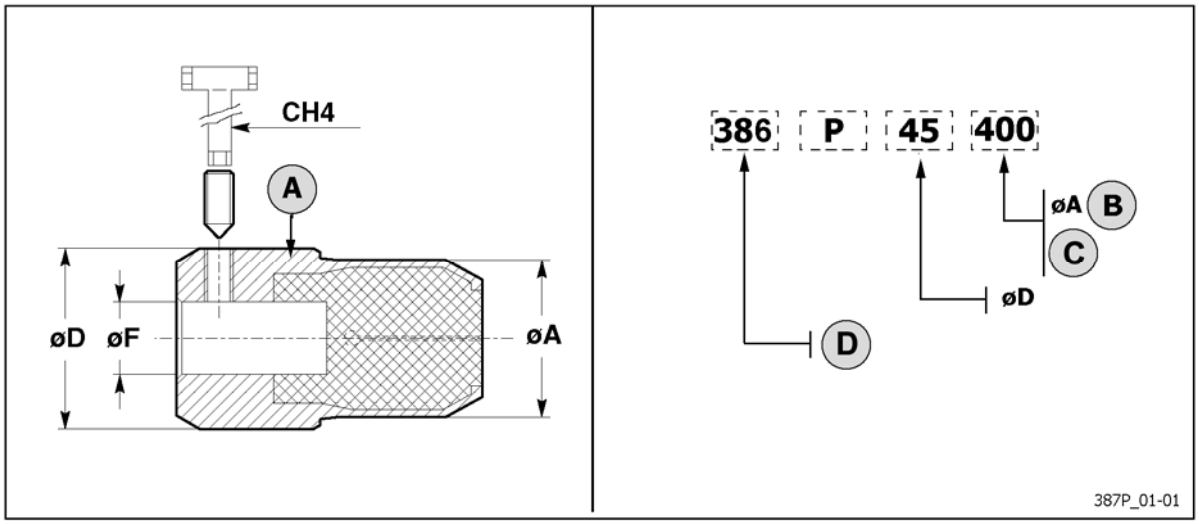
WARNING – CAUTION:

the collet external diameter should be at least 0.5 mm smaller than the bar pusher external diameter.

INFORMATION:

upon specific request, non standard collets with reduced thickness (which are not mentioned in this table) may be supplied as well. Their durability is however below the durability of standard collets.

Code structure

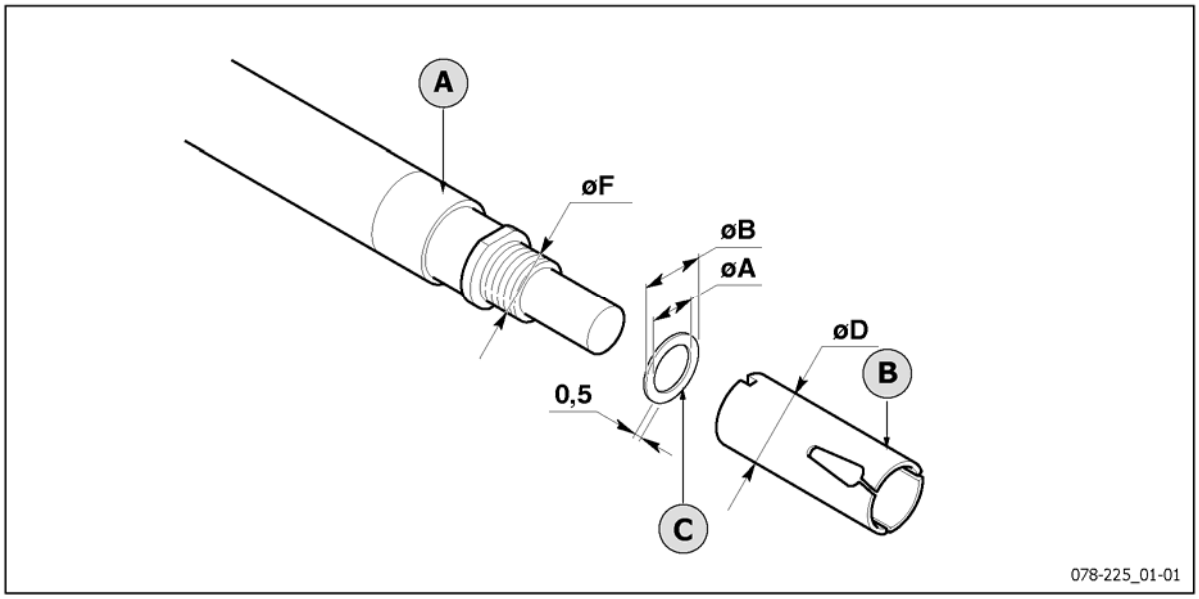


A Collet
B Bar diameter
C Example:
40 mm = 400
39.75 mm = 397
D Category
CH4: T Allen wrench - DIN911

External diameter (mm) **øD**	Diameter (mm) **øF**	External diameter (mm) **øA**	
		MIN	MAX
40	Ø20 G6	23	34,75
41	Ø20 G6	35	37
44	Ø20 G6	36	40
45	Ø20 G6	40,25	42
49	Ø20 G6	42	45,5
50	Ø20 G6	43	47
54	Ø20 G6	46	50
56	Ø20 G6	49	52,25
59	Ø20 G6	52,5	54,75
60	Ø20 G6	54	56,75
64	Ø20 G6	57	58,75
65	Ø20 G6	59	60,75
68	Ø20 G6	61	63,75
70	Ø20 G6	64	65,75
71	Ø20 G6	66	66,75
75	Ø20 G6	67	70
80	Ø20 G6	70	77,5
85	Ø20 G6	74,25	76

11.31 RINGS FOR COLLETS 078-225

11.32 RINGS FOR COLLETS - Table



A Revolving tip
B Collet
C Ring

øA *(mm)*	**øB** *(mm)*	**øD** *(mm)*	**øF**	*Ring p/n.*
8	14	16		22540008(*)
12	18	20		22540004(*)
12	25	25		078800220(*)
17	24	30	M17x1	22540026
17	30	35		078800200
25	30	30	M25x1.5	078800220
25	35	40		22540009
25	45	51		078800230

(*) Only for collets 316 (TAL)