Minuteman 320^{V3}

OPERATIONS MANUAL

MINUTEMAN 320 ^{V3}

HYDRODYNAMIC AUTOMATIC BAR FEEDER

MM-320^{V3}

MANUAL FOR USE AND MAINTENANCE

REV. 1 DATE 2024/10/30 COD BMM II 703032

S/H [   ]

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1. General Information

⚠ **WARNING**

Please read and understand the manual before operating the bar feeder. Failure to do so could result in hazardous conditions that could result in severe injury or even death, and could cause material damage to the bar feeder.

1.1 Contents of This Manual

The bar feeder manufacturer has provided this manual as an integral part of the bar feeder. By adhering to the manual instructions, operators may prevent injury to themselves and/or damage to the bar feeder, as well as maximize the potential of the bar feeder and machine tool.

Throughout the manual, the following symbols denote important points of information:

⚠ **DANGER**

Exercise extreme caution. This warning indicates a high-risk level which, if not avoided, will cause death or severe injury.

⚠ **WARNING**

This symbol warns of a hazard with a medium risk level which, if not avoided, could cause death or severe injury.

⚠ **CAUTION**

Caution indicates possible hazardous conditions. It warns of a hazard with a low risk level which, if not avoided, could cause minor or moderate injury.

NOTICE

A notice indicates that misuse could cause material damage.

1.2 Machine Safety

Operators must provide proper safety equipment to safeguard the operator from harm or injury during operation or setup. It is the operator's responsibility to safeguard the bar feeder according to all federal, state, local government, and industry safety standards. Only trained personnel should operate the bar feeder. Improper use could result in equipment damage and/or personal injury.

1.3 Indemnification

The operator agrees to indemnify and hold harmless Edge Technologies from all claims or liabilities from accidents involving the bar feeder caused by failure of operators, employees, or agents to follow instructions, warnings, or recommendations furnished by Edge Technologies, or by failure of the user to comply with federal, state, and local laws applicable to such equipment, including the occupational Safety and Health Act of 1970.

1.4 Hardware and Software Changes

While Edge Technologies persists as the premier bar feeder supplier in the industry, ongoing development and upgrades to software and hardware are possible. All software noted in this manual is current to the print of this manual. For latest developments and upgrades, please visit **www.edgetechnologies.com**.

1.5 Machine Serial Plate

A. **Name of Manufacturer**

B. **Model (Type)**

C. **Serial Number**

D. **Manufacture Date**

E. **Weight of Machine**

F. **Pnuematic Pressure**

G. **Rated Voltage**

H. **Control Voltage**

I. **Full Load Current**

J. **Power**

K. **Short Circuit Rating**

L. **Wiring Drawing Number**

A	**EDGE** ○○○ TECHNOLOGIES	11600 Adie Road Maryland Heights, MO 63043 USA Phone 314.692.8388 Fax 314.692.5152 www.edgetechnologies.com edgeservice@edgetechnologies.com	CE
	A DIVISION OF HYDROMAT INC		C
B MODEL		MFG YEAR	WEIGHT	kg	E
D SERIAL NO.		PNEUMATIC PRESSURE	Bar	F
G RATRED VOLTAGE	VAC ~ 50/60 Hz	FULL LOAD CURRENT	A	I
H CONTROL VOLTAGE	Vdc	A	POWER	KW	J
K SHORT CIRCUIT RATING	KA	WIRING DWG NO.		K

Important Information: When inquiring about parts or service, please have the machine model type and serial number available. Refer to the machine data plate pictured above for information.

1.6 Customer Support

For the Parts department, contact us (314) 810-3959, or email at orderdesk@edgetechnologies.com

For the Service department, contact us (314) 810-3927, or email at edgehelp@edgetechnologies.com

2. Technical Information

2.1 Description of the Bar Feeder

The Minuteman is a PLC controlled automatic bar feeder designed for both Swiss-type and fixed headstock lathes. The bar feeder is constructed to handle a wide variety of material profiles.

The bar feeder uses hydrodynamic design to dampen vibrations caused by bar stock rotation. The bar stock spins within a polyurethane channel that is flooded with a high-viscosity circulating oil. This creates turbulence within the channel that serves to steady the material and control vibration. The end of the bar stock is supported by a bearing unit on the end of the bar pusher and the workholding system of the lathe.

An anti-vibration device is located at the front of the bar feeder. Polyurethane bearing supported wheels surround the bar, leaving a few millimeters clearance between the bar and the wheels. For Swiss-type sliding headstock lathes, a movable anti-vibration device is mounted on the rear of the lathe headstock to provide even more support and vibration dampening.

2.2 Machine Diagram and Installation Area
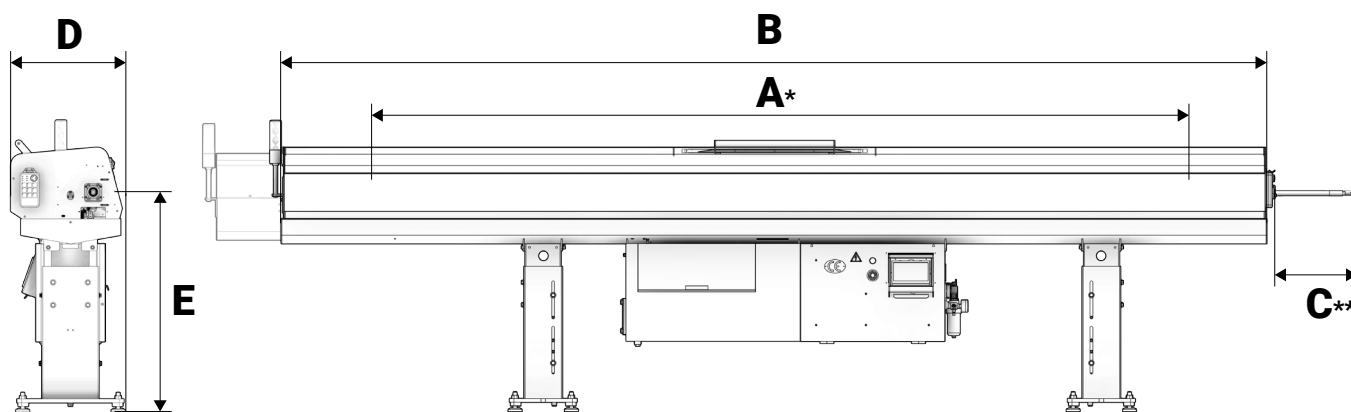
* Dimension A: Material bar length; ** Dimension C: Depending on on the pusher

Pusher length	(LL) 1435mm	(XL) 1726mm
	C1	C2

Machine type	A	B	C1	C2	D	E***
6' standard	2200	2840	1181	x		
6' extended	2200	3120	x	1472	514	850 - 1250
12' standard	3800	4370	1181	x		
12' extended	3800	4650	x	1472		

***On bar feeders with an axial shift, increase value by 70mm (920mm - 1320mm) (Axial shift max travel 160mm)

2.3 Technical Specifications

Model	Minuteman 320 V3 (12FT)	Minuteman 320 V3 (6FT)
Bar diameter capacity — no bar preparation	3 mm to 25.4 mm (0.118" to 1")	3 mm to 25.4 mm (0.118" to 1")
Bar diameter capacity — with bar preparation	3 mm to 27 mm (0.118" to 1.062")	3 mm to 27 mm (0.118" to 1.062")
Maximum bar length	3800 mm (12' 6")	2200 mm (6')
Minimum bar length	1000 mm (39.4")	1000 mm (39.4")
Maximum remnant length	355 mm (14")	355 mm (14")
Magazine rack capacity	10"	10"
Bar loading cycle time	35 seconds for 12' bar	35 seconds for 12' bar
Material straightness specification	0.007" TIR/foot of material (V blocks, 3 points equidistant)	0.007" TIR/foot of material (V blocks, 3 points equidistant)
Feed force (pusher torque)	Max 450 N, adjustable	Max 450 N, adjustable
Forward feed rate	1400 inches/minute max, adjustable	1400 inches/minute max, adjustable
Return feed rate	2360 inches/minute max, adjustable	2360 inches/minute max, adjustable
Power consumption	1.5 kW - (2 kVA)	1.5 kW - (2 kVA)
Operating voltage	230V/60Hz 3-phase	230V/60Hz 3-phase
Control voltage	24V DC	24V DC
Oil capacity	46 liters (12 gallons)	46 liters (12 gallons)
Oil viscosity	ISO 100 cST	ISO 100 cST
Compressed air supply	6 bar (90 psi)	6 bar (90 psi)
Compressed air consumption	Approx. 8 liters per loading cycle	Approx. 8 liters per loading cycle
Machine weight	1320 lbs	900 lbs

2.4 Bar Feeder Oil Requirements

Viscosity	Brand	Description
ISO 100 Oil	BP	Energol CS 100
	Castrol	Magna 100
	Cheveron	Circulating Oil 100
	Elf	Mvoixa 100
	Esso	Nuto 100
	Mobil	Vectra Oil Heavy
	Shell	Vitera 100 / Tellus C 100

2.5 Guide Channel Specifications

Guide Channel	Pusher Diameter	Minimum Bar Size	Maximum Bar Size	*Max Bar With Remnant Ejection
Ø 8	7.5 mm	3 mm (0.118")	6.4 mm (0.250")	7 mm (0.275")
Ø 11	10 mm	3 mm (0.118")	9 mm (0.354")	10 mm (0.393")
Ø 14	12 mm	3.2 mm (0.125")	11 mm (0.433")	13 mm (0.512")
Ø 16	15 mm	5 mm (0.196")	12.7mm (0.500")	15 mm (0.594")
Ø 18	16 mm	5 mm (0.196")	14.2 mm (0.562")	17mm (0.669")
Ø 20	18 mm	8 mm (0.315")	16.26 mm (0.640")	19 mm (0.750")
Ø 22	20 mm	8 mm (0.315")	19 mm (0.750")	21 mm (0.826")
Ø 24	22 mm	8 mm (0.315")	20mm (0.787")	23 mm (0.905")
Ø 28	25/27 mm	10 mm (0.395")	25.4 mm (1.000")	27 mm (1.062")

* Bar stock larger than the standard maximum diameter up to the collet diameter may be used if the bar end diameter is reduced to fit a standard collet. An ejection collet may also be used if the end of the material is chamfered to match the angle of the ejection collet. match the angle of the ejection collet.

For a complete list of available guide channels, review the Parts section at the end of this manual, or visit www.edgetechnologies.com.

2.6 Compressed Air Supply, Including Oil

When working with compressed air, proper PPE is required in accordance with federal, state, and local laws. Flying air particles can be a hazard for eyes and exposed parts of the body.

Compressed air supply must be available for machine operation.

The supply hose for compressed air supply must be larger than 8 mm.

Pressure must be over 5-7 kg/cm² 71.11 – 99.56 PSI, Consumption about 50L/H.

Connect the air supply tube into (A). Pull up and rotate knob counterclockwise (B) and set the pressure at 6kg/cm² 71.11 – 99.56 PSI.

Use an air system lubricant with a viscosity of 32, temperature 40 degrees Celsius, ISO VG type.

Oil level should be checked monthly. Use the recommended oil to avoid damage to the pneumatic system. Adjust control air lubrication from cylinder, 1 - 2 drops/1000L air if necessary.

Air Unit Lubricating Oil - ISO VG32				
BP	Castrol	Chevron	Mobil	Shell
Energol HLP 32	Hyspin VG32	Regal R&O 32	DTE 24 or Light	Tellus 32
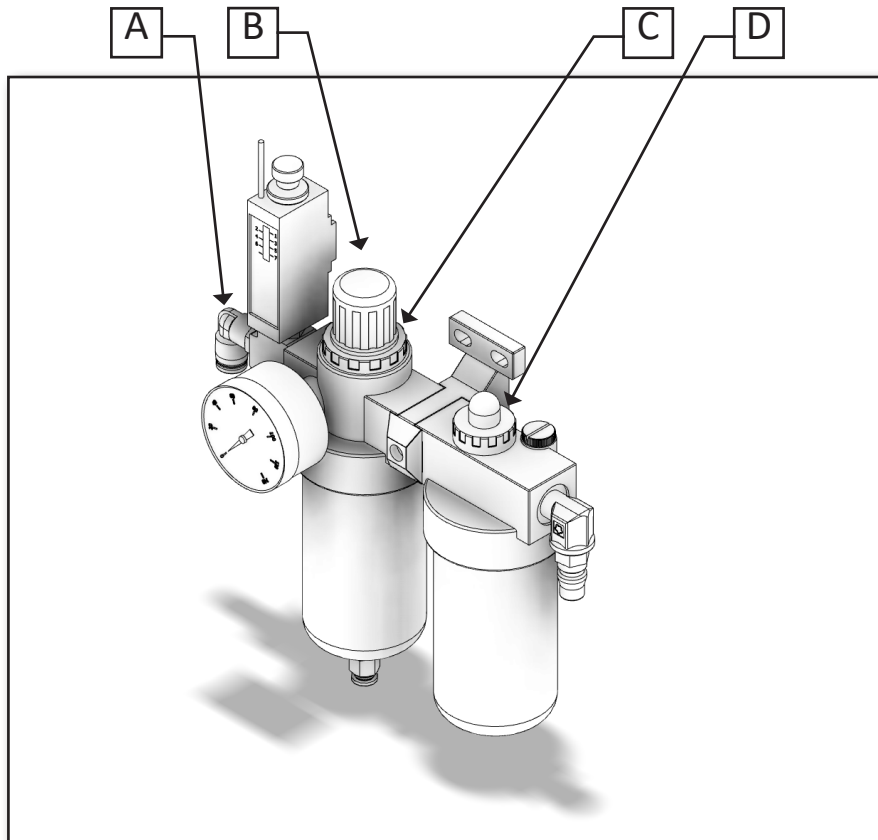
A: Air Supply Fitting

B: Air Regulator Knob

C: Lock Ring

D: Oil Supply Knob

3. Safety

⚠ **DANGER**

Safety switches should always be connected and in place during bar feeder operation.

The Minuteman is designed to be safe and reliable. Only trained personnel should operate the bar feeder. Personnel should be familiar with the operating instructions of the equipment before using it and should follow standard safety practices. The machine is equipped with safety devices to prevent accidental damage to the machine and injury to the operator. These devices must not be bypassed or tampered with.

3.1 Covers and Hood Switch

⚠ **WARNING**

Covers prevent access to moving parts during operation and should always be in place during bar feeder operation.

The hood of the machine is equipped with a safety switch to place the machine in alarm if the hood is not closed. The cover prevents access to the material on the rack and the bar separators.

3.2 Emergency Stop Buttons

⚠ **WARNING**

The Emergency Stop buttons should be tested monthly to verify the proper emergency stoppage of the lathe and bar feeder.

The Minuteman has two Emergency Stop buttons: one on the handheld pendant and one on the HMI. Button ES1 is an Emergency Stop button on the HMI control panel housing. Button ES2 is an Emergency Stop button on the remote pendant control. Pressing either Emergency Stop button disconnects the Emergency Stop circuit.

Contacts from the Emergency Stop buttons interface with the lathe Emergency Stop circuit, so the lathe can be manually placed into an Emergency Stop condition from the Minuteman control panel. The lathe Emergency Stop system will place the bar feeder into Emergency Stop as well. Some lathes during Emergency Stop will cut the supply voltage to the bar feeder. This will not allow the bar feeder to meet the Emergency Stop reset requirements of the lathe. The lathe will be stuck in Emergency Stop and the bar feeder will not power up. If this occurs, please contact Edge Technologies for appropriate instructions. Verify Emergency Stop operation between the lathe and bar feeder is operational.

When the Emergency Stop on either machine is pressed, automatic operations are stopped immediately.

3.3 Electrical Safety

⚠ **DANGER**

Only a qualified electrician or serviceman should perform electrical troubleshooting or maintenance.

⚠ **DANGER**

Do not perform maintenance, repairs or adjustments without first locking out all electrical controls in accordance with all federal, state, and local safety codes.

⚠ **DANGER**

Personnel should be trained in OSHA-compliant lock-out/tag-out and electrical safety procedures.

⚠ **DANGER**

Make certain that the power supply is disconnected before attempting to service or remove any components.

⚠ **DANGER**

Never should adjustments, maintenance or cleaning be performed without following proper safety procedures in accordance with local, state, and national safety codes.

Before making any electrical connections, verify the voltage that the bar feeder requires from the lathe with a voltmeter at the power supply connector. Verify that this voltage matches the required voltage of the bar feeder. Failure to do so may result in injury or damage to the equipment.

Normally, a bar feeder is ordered from Edge Technologies to be used with a specific lathe model. The wiring interface is set in accordance with the most current information received by Edge Technologies. The lathe manufacturer may update and change the main connector pin locations and circuits. It is important this is verified with the schematics of the lathe and bar feeder. In some cases, a harness is provided that must be wired into the lathe. All previous safety advisories and information must be adhered to. This form of connection allows for quick unplugging to clean or service without having to disconnect "hardwired" connections. Before starting the bar feeder, ensure no tools, packing, or other material have been left in the machine or lathe.

3.4 Electrical Connection

⚠ DANGER

The power supply voltage for the Minuteman 320 V3, the input, and the output signals between the bar feeder and lathe are supplied through the interface cable. The interface cable is pre-wired for the lathe application when shipped from Edge Technologies. Verify the connection to the lathe before applying voltage to the system. The lathe must support a bar feeder interface for the two machines to be connected. The power supply output on some lathes may be higher than the required 230V. If this is the case, an additional transformer will be required to step down the lathe voltage for the bar feeder.

4. Transportation and Handling

Without packaging, the Minuteman V3 weighs approximately 1,200 lbs. Only trained operators are to use lifting equipment. Improper handling can result in an operator being crushed. Verify that the equipment to be used for moving the machine is rated to safely lift the weight of the bar feeder plus the packaging material. Make special note that the machine is top heavy and take proper precautions.
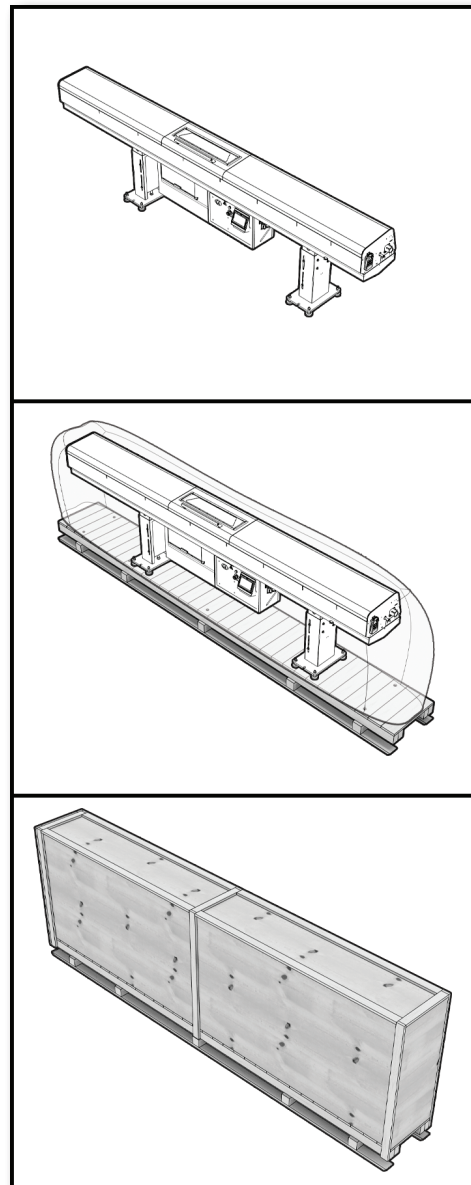
4.1 Unpacking the Bar Feeder

Lifting and moving the bar feeder by forklift is the preferred method of handling the machine. The forks must extend past the machine cabinet. Lift the machine from the side opposite the magazine and maintain sufficient clearance from the forklift mast to avoid contact. Take care to keep the load balanced. Do not lift the machine any higher than necessary.
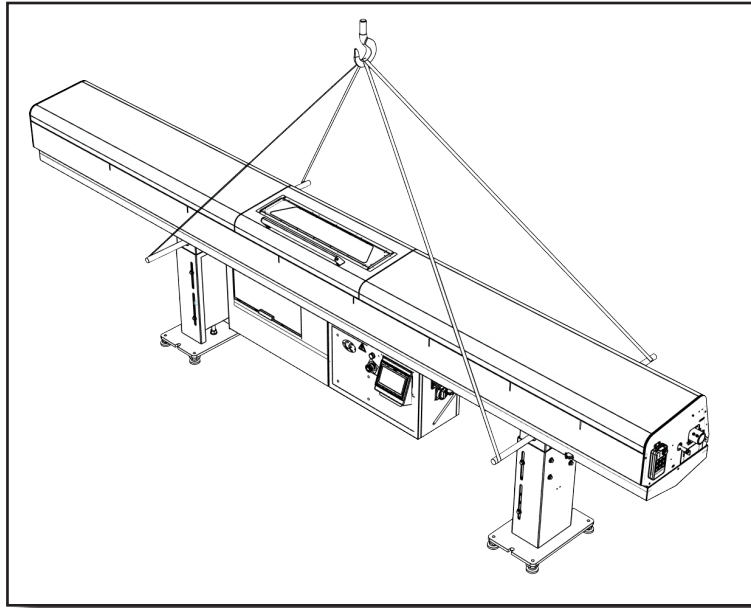
Packaging of the Bar Feeder

The bar feeder will arrive in one of three ways:

A: Without Packaging
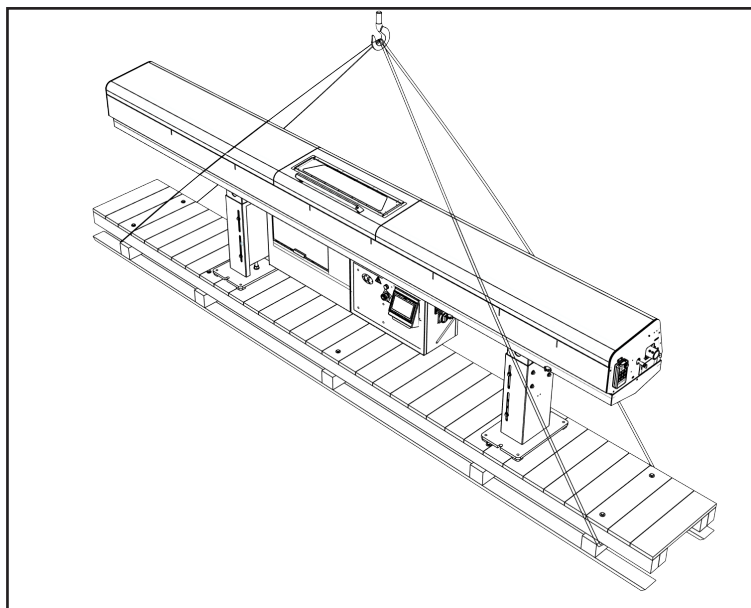
B: Attached to a skid or Pallet

C: Crated in a wooden box

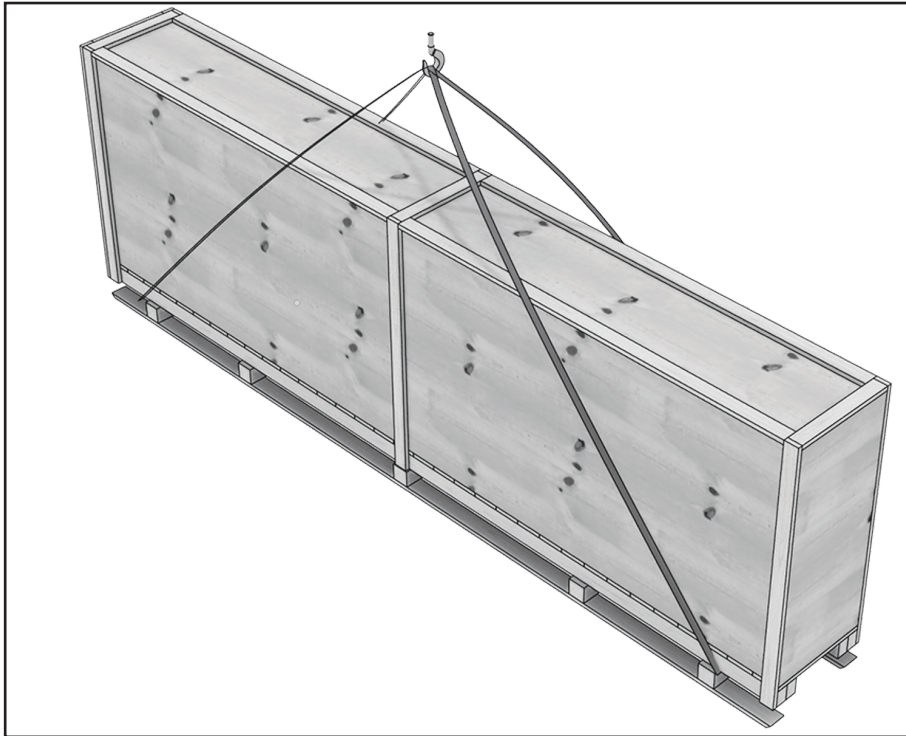## 4.2 Transportation and Hoisting

Hoisting the bar feeder

Place two steel bars (Diameter: 30mm, length: 1M) under the bar feeder outside of the stands. Using suitable lifting straps, hoist the bar feeder.

Hoisting with bar feeder on pallet

Position suitable lifting straps under the pallet near the stands.

Hoisting the bar feeder in a crate

Position suitable lifting straps under the pallet near the stands.

5. Installation

5.1 Lathe Preparation

Prior to installing the bar feeder, the lathe installation must be completed and ready to produce parts. If no lathe spindle workholding is installed and if no compressed air is supplied, the bar feeder cannot be installed.

⚠ DANGER
Only qualified electricians or servicemen should perform any electrical troubleshooting or maintenance to this equipment.

| ⚠ WARNING |
| --- |
| **Be sure the lathe and bar feeder Emergency Stops are engaged when performing the manual alignment procedure.** |

The lathe must be operational to perform the alignment and installation with the proper chucking package.

Some lathe models have covers for the spindle area. These covers may or may not be on the lathe when the lathe is ready for bar feeder installation. Review with lathe personnel to identify the related covers. If the covers are off the lathe, this may become an issue if the bar feeder is positioned close enough that it would interfere.

5.2 Installation Area

The floor on which the bar feeder is placed must be designed to bear the loads. Non-observance can lead to material damage. The Minuteman must be bolted to a sound, level floor using anchor bolts. The area surrounding the machine must allow sufficient clearance for the operator to access both sides and the rear of the machine, as shown in the diagram below.
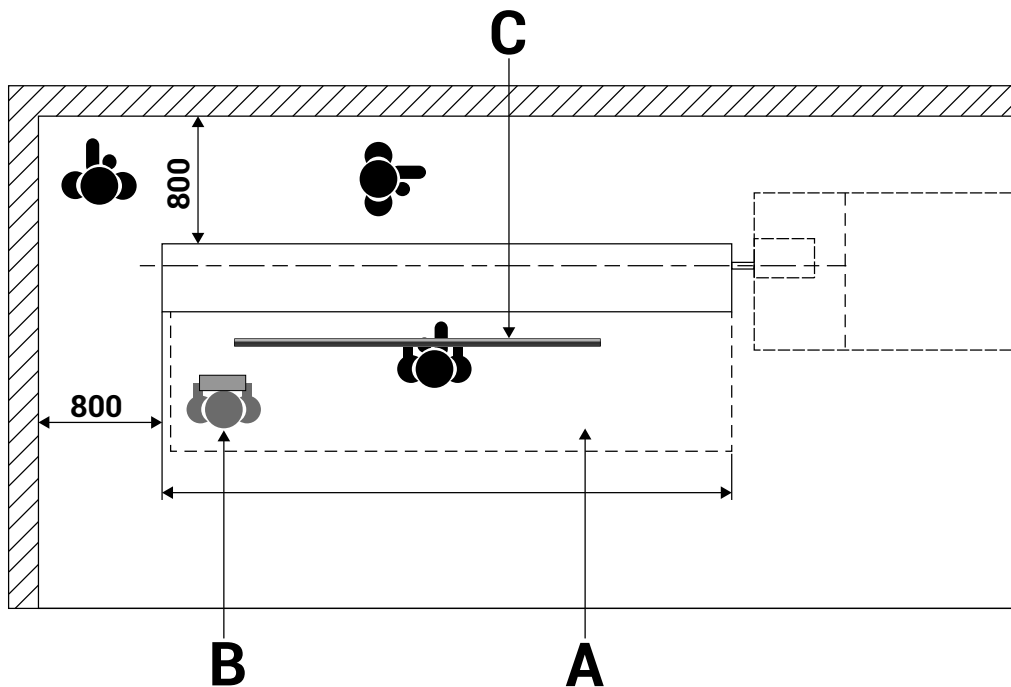
The area surrounding the installation area must allow sufficient clearance for the following:

A - Operator area

B - Remnant material area

C - Supply area

This ensures an adequate working area. All values are in metric.

⚠️ **WARNING**

The following steps are to be performed by a trained technician.

Step 1: Inspect the bar feeder for damage.

• Carry out a detailed inspection of the bar feeder to ensure no components have been physically damaged.

Step 2: Make sure the location has all required items they will need.

• Communicate directly with the person in charge, so decisions can be made in a timely fashion.

• Ask to be made aware of any special regulations or safety requirements to adhere to while working in the facility.

• Ask and be introduced to the employee(s) that will require training.

• Request the required oil be prepared for the bar feeder.

Step 3: Check inventory.

• Adaption kit. Verify that all components are present (refer to picklist supplied with the bar feeder).

• Guide channel, pushers, collets, noses. Ensure that all parts are there and are correct.

• If spindle liners are required, ensure they are correct for the lathe, and test load them.

• Verify that all hardware required for the alignment, anchoring and installation are present.

5.4 Bar Feeder Installation Process

1. Inspect the bar feeder for any shipping or handling damage, and report as necessary.

2. Verify the lathe installation condition.
   - Lathe is level for operation.
   - Lathe will power up.
   - Lathe has a collet or chuck package.
   - Lathe is free of any alarms.

3. Verify components of the pre-installation checklist are complete.
   - Ensure access to compressed air to the bar feeder installation location.
   - Bar feed oil is available and correct for the application.
   - Material for parts is available.
   - Spindle liner is available if required.

4. Verify bar feeder components are present.
   - Required bar feed level pads and associated nuts, washers and bolts
   - Anchor bolts
   - Headstock adaptors
   - Correct channel set installed
   - Threader rod, bracket, and nuts
   - Telescopic nose or hard nose
   - Hard nose insert, if required
   - Bushing blocks or rollers
   - MAVD, if equipped

5. Calculate bar feeder positioning.
   - Consider lathe headstock stroke.
   - Consider bar feeder reach capability.
   - Determine distance based on manual specifications.
   - Consider axial shift requirements.
   - Verify collapsibility of telescopic nose.
   - Verify reach of telescopic nose.

6. Install laser or string components for alignment, and targets to bar pusher.
   - Lathe collet/chuck
   - Lathe guide bushing as required
   - Lathe spindle
   - Verify bar pusher reach and headstock stroke.
   - Verify axial shift reach and stroke.

7. Drill and anchor bar feeder to floor.
   - Verify floor is not heated.
   - Drill holes complete through floor using an entire 12-inch drill stroke.
   - Drive anchors completely into floor with associated fender and washers installed.
   - Tighten anchors fully.

8. Verify alignment, adjust as necessary.
   - Verify bar pusher reach and headstock stroke.
   - Verify axial shift reach and stroke.

9. Install MAVD as required.
   - Align MAVD.
   - Adjust as required.

10. Install telescopic or hard nose.
    - Install required inserts.
    - Align as required.
    - Cut the telescopic or hard nose as required.
    - Verify collapsibility of telescopic nose.
    - Verify reach of telescopic nose.

11. Connect synchronization rod.
    - Cut threaded rod, as required.
    - Adjust the stroke of the synch rod on the bar feed.
    - Verify the axial shift synch switch adjustment, and adjust as required.

12. Cut lathe sheet metal.
    - If additional machines are present, review for consistent appearance.

13. Verify lathe signals.
    - Emergency Stop from lathe
    - Emergency Stop from bar feeder
    - Door signal
    - Torque stop
    - Bar change
    - Auto cycle/cycle start
    - Collet open/close

14. Perform Auto Bar Change with lathe.

15. Add Bar Change program to the lathe.

16. Add oil to bar feeder.
    - Verify the oil on and off positions.
    - Test running the oil for about 30 minutes to ensure proper flow.

Spindle liner: The spindle liner reduces the spindle internal diameter to support the pusher. Some applications do not require a spindle liner. This is true when the spindle bore diameter is the same as the pusher.

MAVD: This is used only on Swiss-type lathes. The MAVD is attached to the end of the spindle of the lathe. The device aids in material support between the headstock and bar feeder. This is always installed unless a special condition is present that would keep the pusher from reaching the required maximum pusher travel. Contact Edge Technologies for more information.

Telescopic nose: For lathes with a sliding headstock, the telescopic nose bridges the gap between the front of the bar feeder and the back end of the lathe. It acts as a protective cover and prevents rotating parts from coming out. The telescopic tube extends and collapses with the movement of the headstock. The telescopic nose is matched to the size of the channel set. Any time a channel set is changed, the nose must be changed as well.

Hard nose and insert: For lathes with a fixed headstock, the guide tube bridges the gap between the front end of the loading magazine and the back end of the lathe. It serves as a protective cover and prevents rotating parts from coming out. Hard nose inserts need to be cut to the length of the nose.

Synchronization rod: The synchronization rod is connected at the MAVD. For more information, see the Parts section.

Oil tray drip pan: This is used under the telescopic nose to collect any oil that leaks out of the telescopic nose and back into the bar feeder.

Oil gathering: This is a unit that will go over the end of the hard nose to gather oil that leaks out the front.

6. Systems and Adjustments

6.1 Axial Shift

⚠ **CAUTION**

Incorrect bar feeder placement may cause catastrophic damage to the lathe or bar feeder.

NOTICE

All axial shift safeties must be adjusted and set correctly.

NOTICE

Minuteman axial shift equipped machines may be shipped with stands in opposite positions. The stands must be in the same configuration prior to installation.

The Minuteman may be equipped with an axial shifting option. Normally, lathes that require an axial shifting option are equipped with a non-guide bushing feature. When the guide bushing is removed from the lathe, the stroke of the headstock will be closer to the machining space. The distance of headstock movement forward into non-guide bushing mode will be the same distance the bar feeder shifts forward. When the guide bushing is removed, the bar feeder must reach further into the lathe, and therefore must be shifted forward.

During the installation process it is important to place the bar feeder in the correct position. On some applications a very small window will exist being too close or too far.

Conditions to consider

In guide bushing mode, the bar feeder long pusher, with a pusher collet installed must be able to reach the back of the lathe collet when the headstock is full forward or Z positive over travel.

In guide bushing mode the maximum loading length is the magazine length of 12 feet 6 inches. From the gripper jaws to the face of the guide bushing are the typical measurement points.

In non-guide bushing mode when the bar feeder is shifted the bar feeder long pusher, with a pusher collet installed must be able to reach the back of the lathe collet when the headstock is full forward or Z positive over travel.

In non-guide bushing mode, the maximum loading length is the magazine length of 12 feet 6 inches. From the gripper jaws to the face of the lathe collet are the typical measurement points.

The telescoping nose must be short enough to collapse without bottoming out and extend without over-extending.

The synchronization safety switches must be set so the normal working range will allow for operation. When the stroke is overextended or collapsed, the switch must be set just before either condition occurs.

The drip pan must be functional between Swiss and chucker positions.

6.2 Axial Shift Instructions

Between the leg stands and the upper magazine is a mechanism called the axial track. Each axial shift contains two guide rails (A). The axial track is locked in place with 2 – 8mm socket head bolts that are 25mm long (B). A position stop sets the distance the axial shift moves (C). When the upper magazine is pushed, the axial shift moves the Minuteman fore and aft.

Additional safety switches are installed on the machine. Two synchronization limiting switches and one axial stand position switch are wired in series to the emergency stop circuit. The synchronization switches must be set to the proper position during installation. If the switches are not set correctly, mechanical interference will occur. See section 6.3
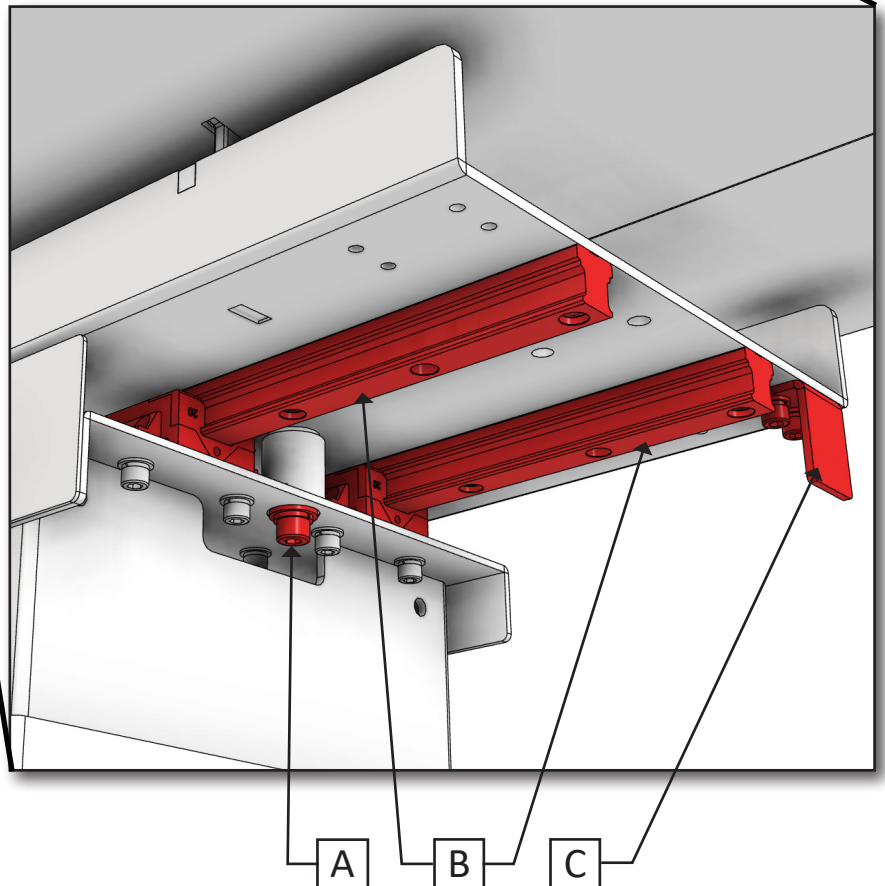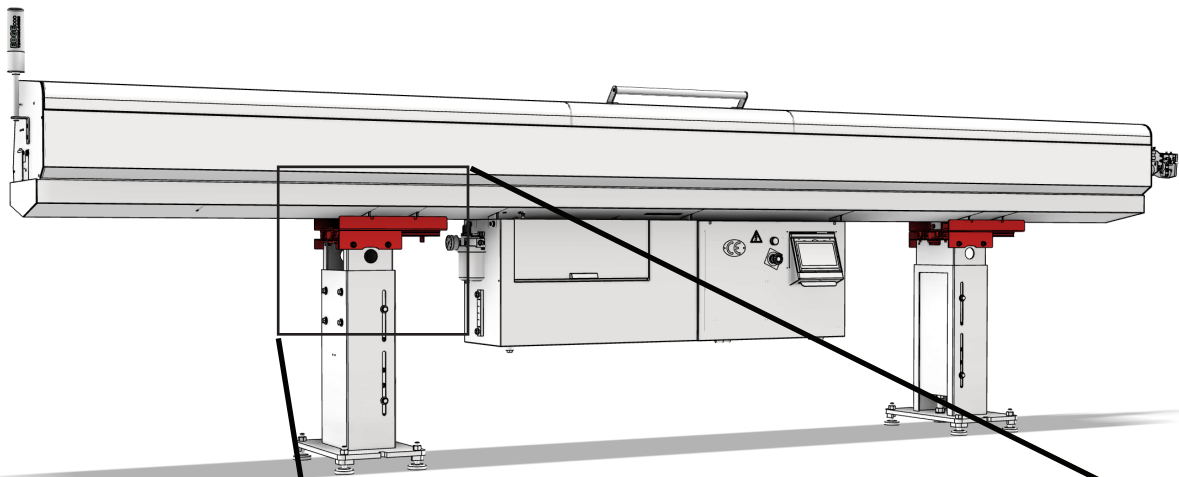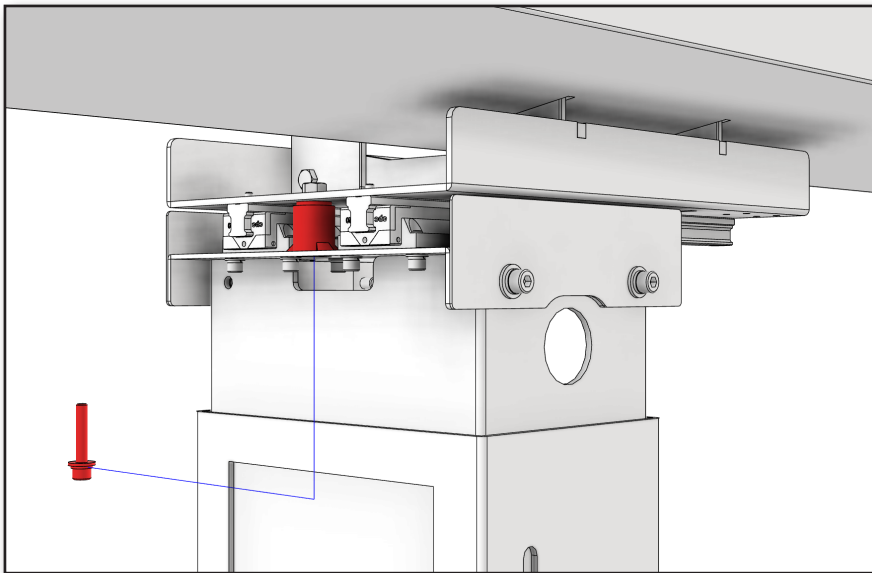

Axial Shift

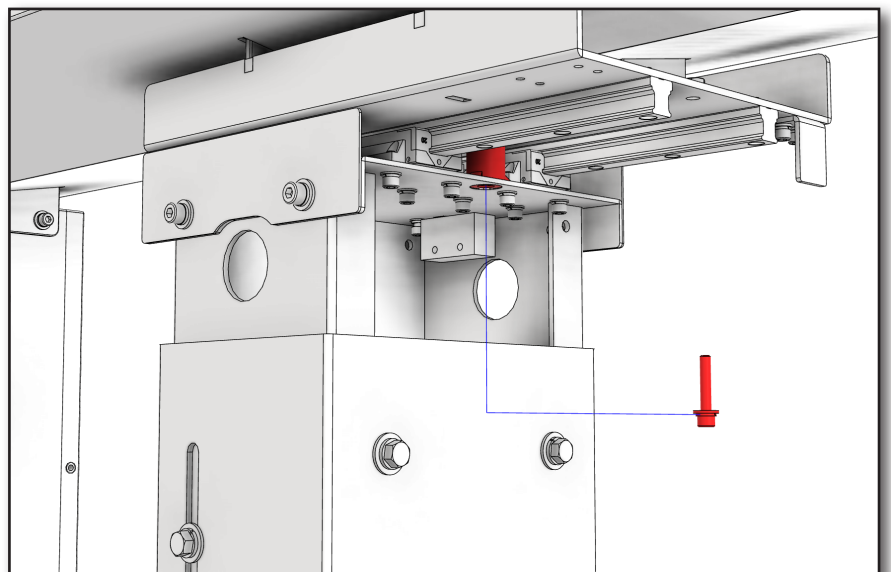A: Guide Rails

B: 8mm Locking Bolts

C: Position stop

A   B   C

The Minuteman must be in emergency stop prior to axial shifting.

Remove the 4 - 8mm socket head bolts (2 for each axial track). This will allow the upper magazine to move freely.

8mm socket head bolt

8mm socket head bolt

Changing the axial stroke distance once it has been set by the installer will result in damage to bar feeder and lathe.

Once the bar feeder has been installed, changes to this screw position must not be made. The position will be determined by the lathe model. The position stop allows an axial stroke to be set to 2 positions. Position (A) has a 160mm stroke and position (B) has a 120mm stroke.

A   B
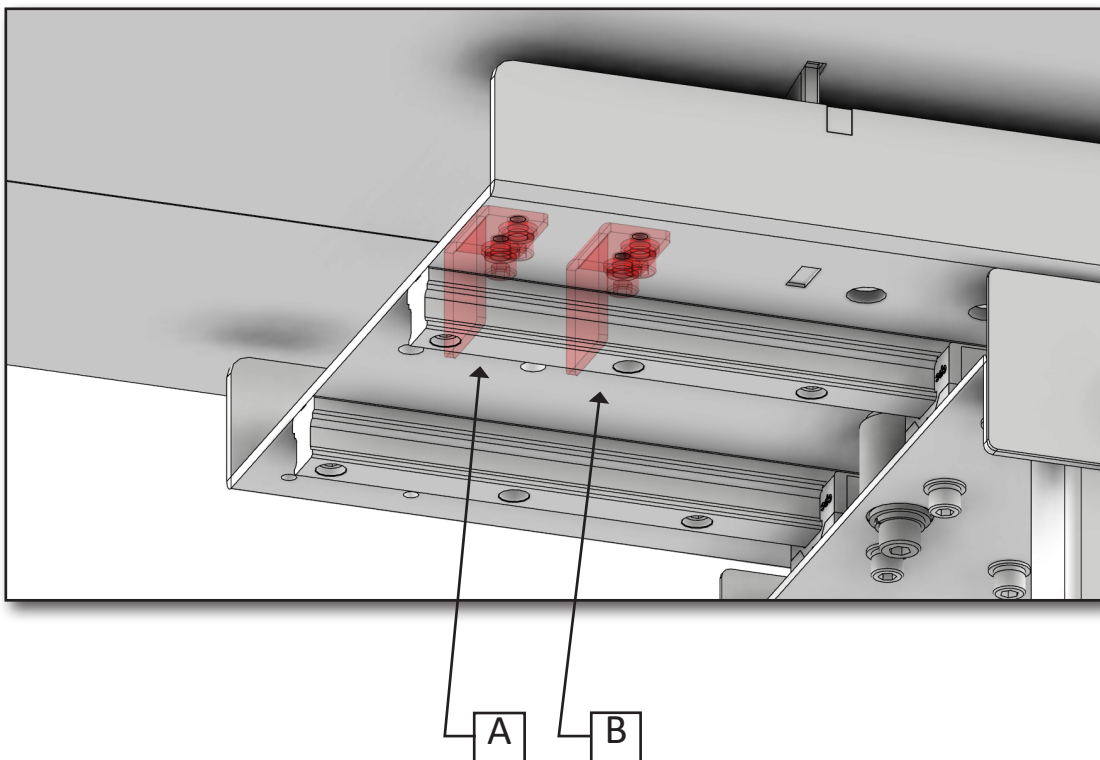
Stroke position stops

A: 160mm

B: 120mm

6.3 Guide Bushing Mode to Non-Guide Bushing Mode

Failure to follow the instructions to shift the Minuteman 320 V3 when it is equipped with the axial shift option may cause damage to the bar feeder or lathe.

All attaching components must be installed and tightened prior to production.

Follow the lathe manufacturer's instructions for converting to non-guide bushing mode.

1. With the bar feed in manual operation, ensure there are no active faults.

2. Place lathe headstock in the forward overtravel condition.

3. Place bar feed into Emergency Stop condition (press E-Stop button).

4. Place lathe into Emergency Stop condition (press E-Stop on lathe).

5. Disconnect bar feeder synch rod and telescopic nose from lathe headstock at the MAVD.

6. Underneath the axial track, remove two socket head bolts from both stands.

7. Push bar feeder forward to shift it to non-guide bushing mode. The hand crank can also be used to shift the bar feeder.

8. Reinstall two locking bolts into the side of the axial track of both stands.

9. Be sure the lathe headstock is in the non-guide bushing mode before proceeding to Step 13.

10. Reattach telescopic nose and sync rod to headstock.

11. Reset Emergency Stop conditions on both bar feeder and lathe.

12. Move lathe headstock to the forward overtravel position.

13. The factory menu parameter values below must be checked and changed as necessary:

   • Max end-of-bar position

   • Facing Distance

   • MAVD opening position (if used)

   • Verify proper operation of head stock movement and bar feeder response.

6.4 Axial Shift Instructions – Non-Guide Bushing Mode to Guide Bushing Mode

1. With the bar feeder in manual operation, be sure there are no active faults.

2. Place lathe headstock in forward overtravel position Swiss mode.

3. Place the bar feed into the Emergency Stop condition.

4. Place the lathe into the Emergency Stop condition.

5. Disconnect the bar feed synchronous rod and telescopic nose from the lathe headstock at the MAVD.

6. From the side of the stand cabinets, remove two axial track locking bolts from both stands.

7. Push bar feed magazine rearward to the Swiss position. The hand crank can also be used to shift the bar feeder.

8. Reinstall two locking bolts into the side of the axial track on both stands.

9. Be sure lathe headstock is in the Swiss mode position before proceeding to Step 13.

10. Reattach telescopic nose and synch rod to headstock.

11. Reset Emergency Stop conditions previously set.

12. Move lathe headstock to the forward overtravel position.

13. The factory menu parameter values below must be checked and changed as necessary:

   - Max end of bar position
   - Facing distance
   - MAVD opening position (if used)

14. Verify proper operation of headstock movement and bar feed response. Follow lathe manufacturer's instructions for Swiss mode setup (installation of guide bushing).
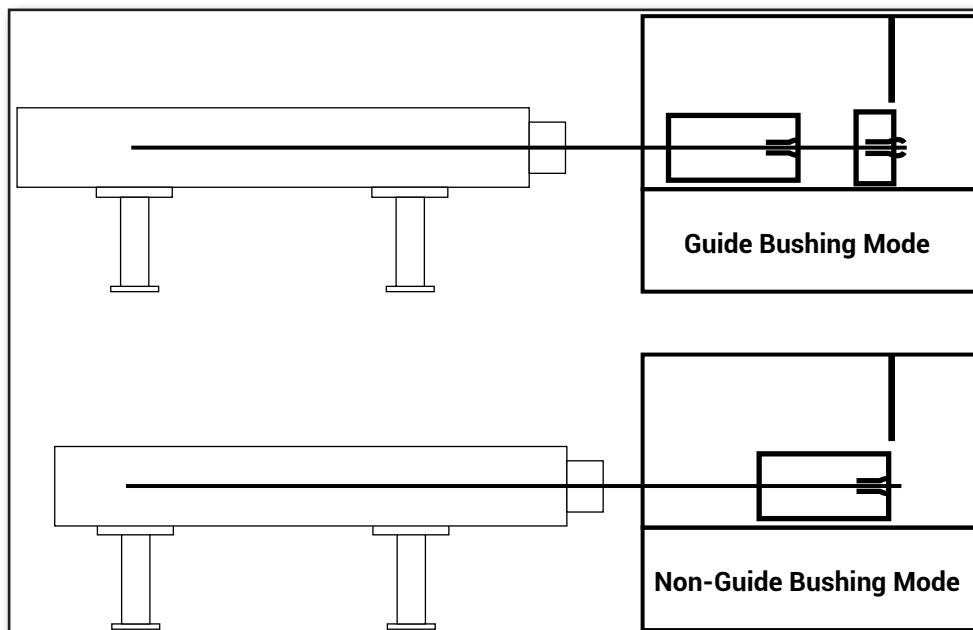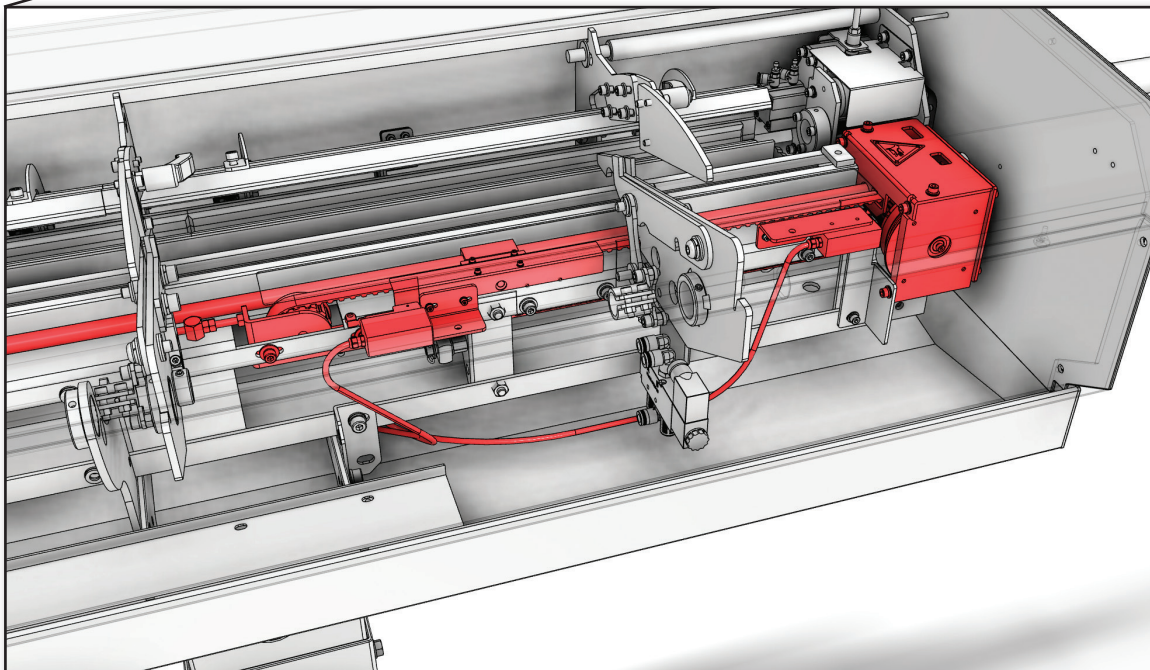

Guide Bushing Mode

Non-Guide Bushing Mode

6.5 Synchronization System

In sliding headstock lathes, a synchronization device connects the lathe's headstock to the bar pusher, ensuring both move together. The bar is held in place by the lathe collet, and the bar pusher must support and move the bar at the same speed and distance. If they don't stay synchronized, the bar and pusher will separate.

To avoid this, a synchronization device is used. A rod connects the lathe spindle to a piston inside the bar feeder. The piston grips a timing belt, which links to the bar pusher's drive system. When the lathe collet closes, an air valve activates the piston to grip the belt, keeping the bar pusher aligned with the headstock's movements.

Synchronization System

⚠ WARNING

The synchronization belt adjustment should only be performed when the bar feeder electrical power has been removed. Follow local, state and federal lockout/tagout standards.

⚠ CAUTION

Synchronization System Covers prevent access to moving parts during operation and should always be in place during bar feeder operation.

Bar feeders equipped with the axial shift feature have two additional electrical switches to limit the total synchronization stroke. The switches are tied to the Emergency Stop circuit and are normally closed. When they are opened, the bar feeder will be in Emergency Stop. The final positioning of the switches is performed during the bar feeder installation process. Once set, the switch locations should not be moved.

Synchronization System Covers

A
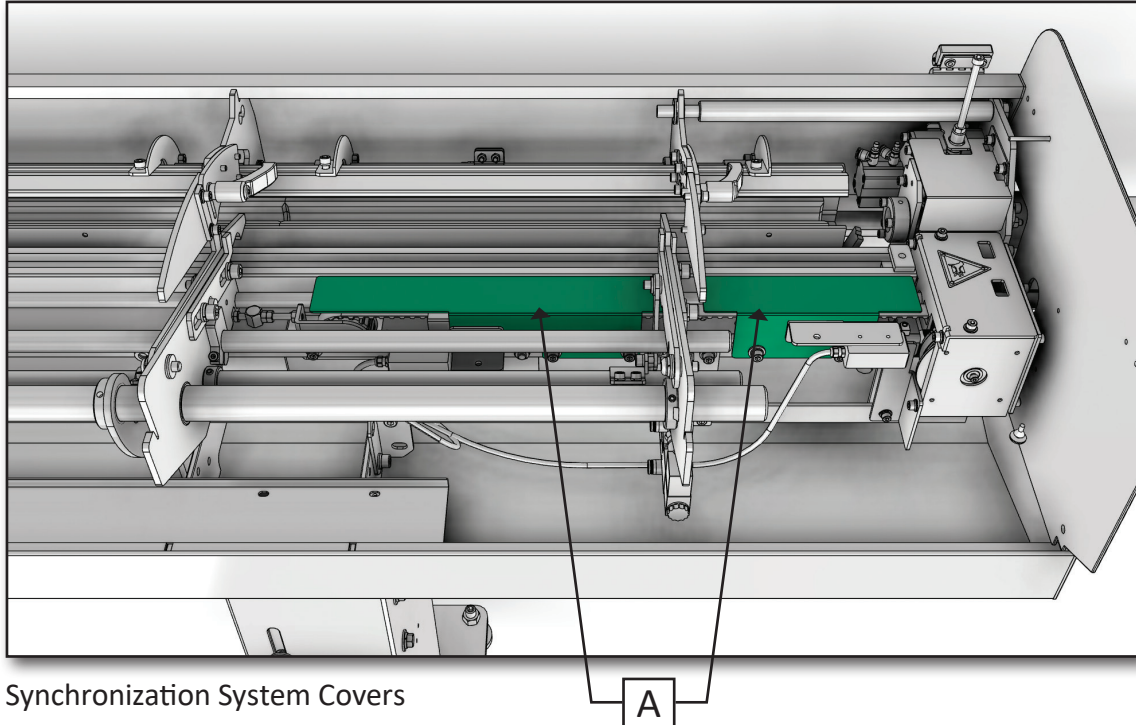
Setting the axial synchronization emergency stop switches (F) is critical during the installation. The adjustments will come from trimming the synch switch plate (B) as required. The switches must be set so that, if the headstock was moved, no over-collapse or overextension of the telescoping nose would occur.

1. The synch belt covers (A) must be removed to gain access to the switch plate (B).

2. The switch plate (B) is fastened with 2 screws. Remove the 2 screws and plate.

3. Perform the required material removal.

4. Reinstall the switch plate and synch belt covers (A) and check for bar feeder placement.

Synchronization System Components

Synchronization System Components

B: Belt Adjustment Screw

C: Synchronization Belt

D: Switch Plate

E: Synchronization Bar

F: Limit Switches

6.7 Adjusting the Synchronization Belt

⚠ CAUTION

Synchronization System Covers prevent access to moving parts during operation and should always be in place during bar feeder operation

⚠ WARNING

The synchronization belt adjustment should only be performed when the bar feeder electrical power has been removed. Follow local, state and federal lockout/tagout standards.
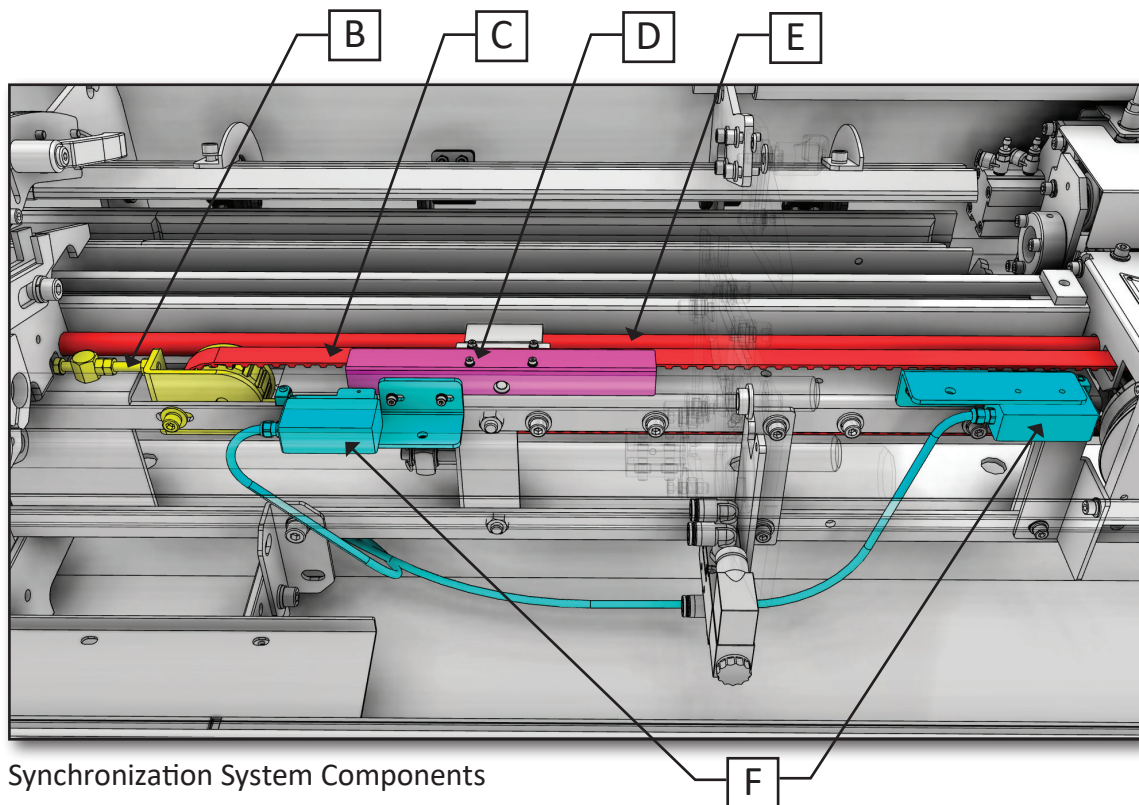
1. Place bar feeder in Emergency Stop.

2. Open the bar feeder hood.

3. Remove synch belt cover (A).

4. Loosen 2 adjustment plate socket head screws (I).

4. Loosen adjustment screw lock nut (H).

5. Rotate the adjustment screw (B) clockwise to tighten belt tension/rotate counterclockwise to loosen the belt.

6. Adjust belt tension to no more than 10mm of deflection. *(Overtightening the belt may result in premature failure of the belt.)*

7. Once the adjustment has been made, secure the adjustment plate lock screws (I).

8. Tighten the adjustment screw lock nut (H).

9. Check belt deflection, and readjust as required.

10. Reinstall belt cover (A).

11. Verify all tools have been removed and all machine guarding is in place prior to resetting the Emergency Stop.

Synchronization Adjustment
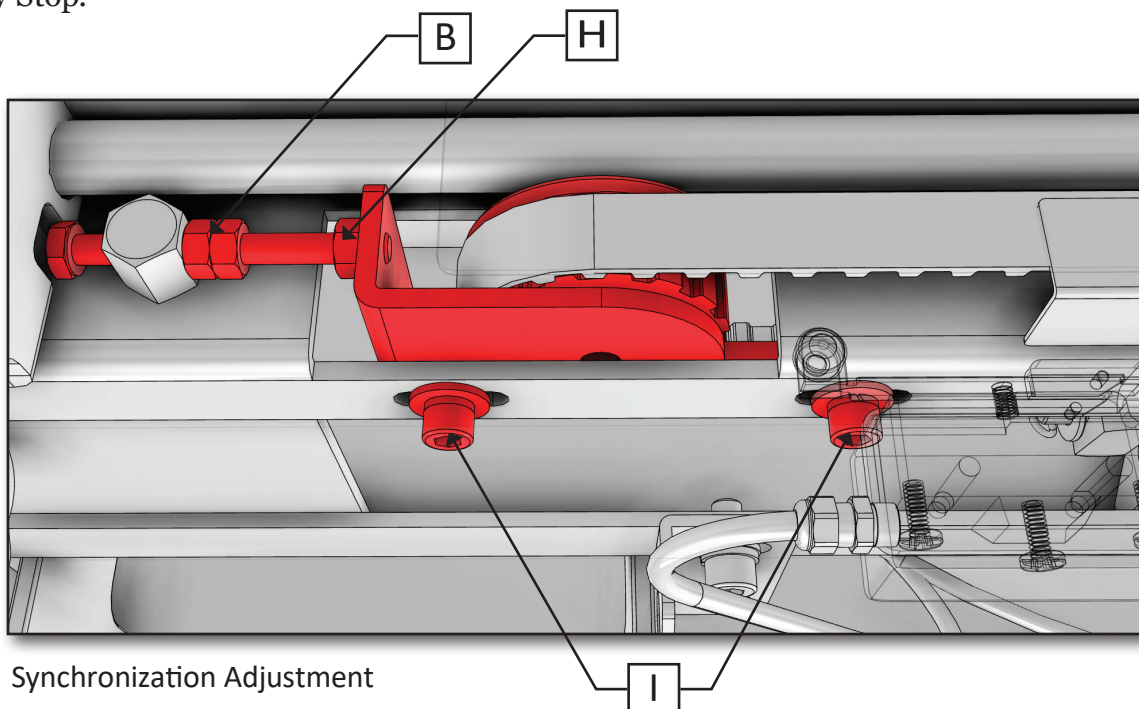
6.8 Light Tower

The indicator light provides quick visual indication of bar feeder status. The bar feeder PLC directly controls the operation of the tower light.

Status conditions include:

Red light is on: The bar feeder is in alarm.

Green light is on: The bar feeder is in Automatic mode.

No light is on: The bar feeder is in manual mode with no alarms.
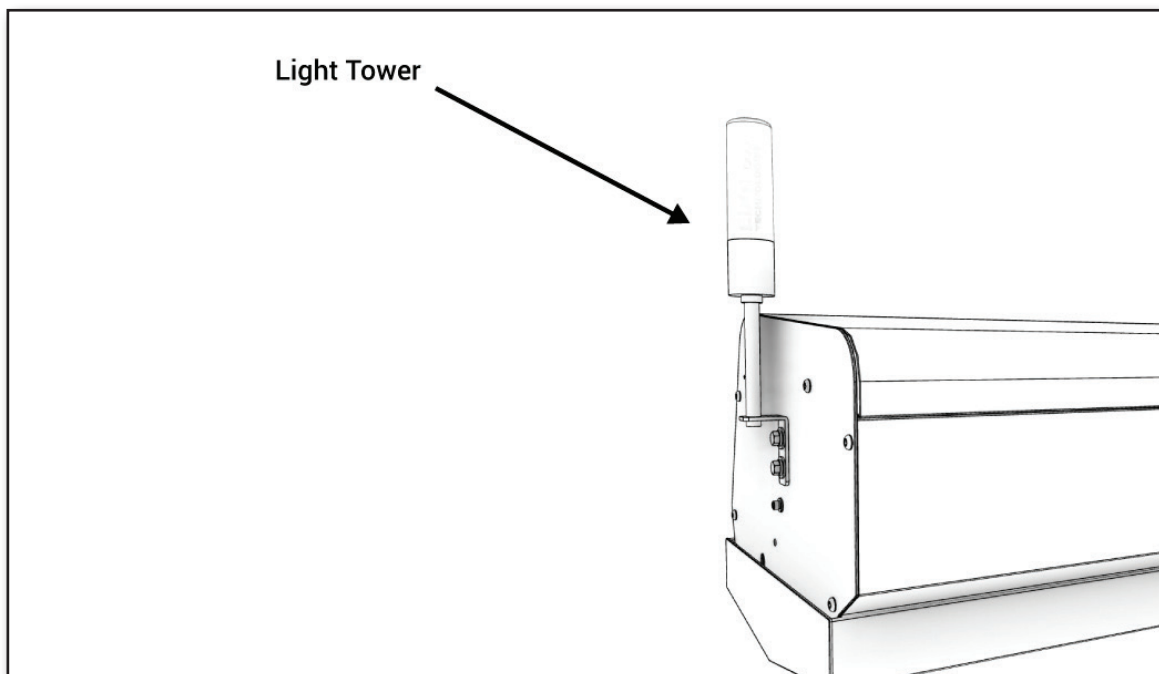
6.9 Pusher Drive Belt Adjustment

⚠ WARNING

The pusher drive belt adjustment should only be performed when the bar feeder electrical power has been removed. Follow local, state and federal lockout/tagout standards.

The pusher drive belt is connected to the carriage. The belt runs the length of the machine contained inside of a channel. The belt is driven by a servo drive motor via gear reduction system opposite of the lathe for adequate torque production.
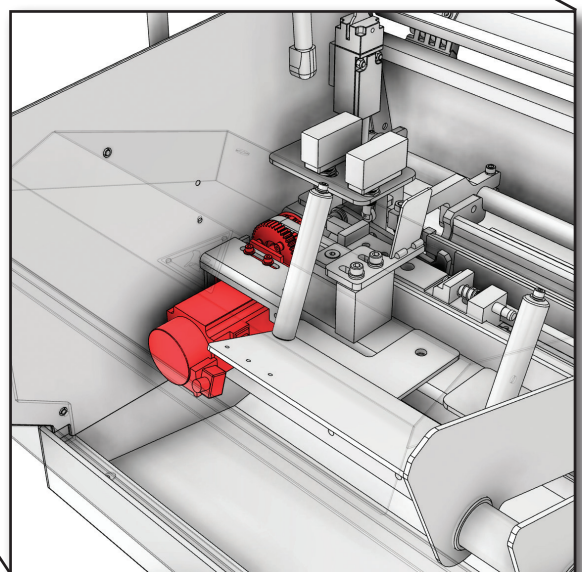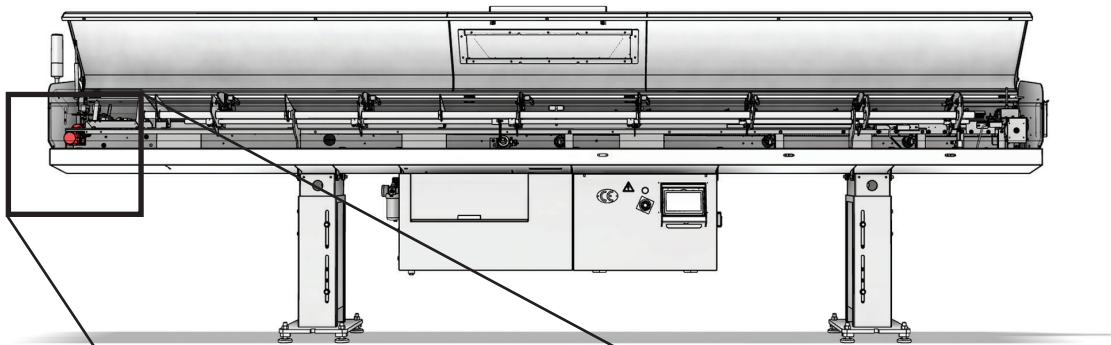
Pusher Drive Belt Assembly

If belt replacement is required, make sure the carriage mounting screws and holes are clean, and dry off any oils. A medium thread lock is required.

Any time the drive belt requires adjustment, follow the procedure below:

1. Place the bar feeder and lathe into Emergency Stop.

2. Material may need to be removed from the channel if the pusher cannot be moved without obstruction.

3. Open the bar feeder hood.

4. Remove the 2 socket head screws (A) and cover (B).

5. Loosen the 2 socket head screws (C) for the tensioner.
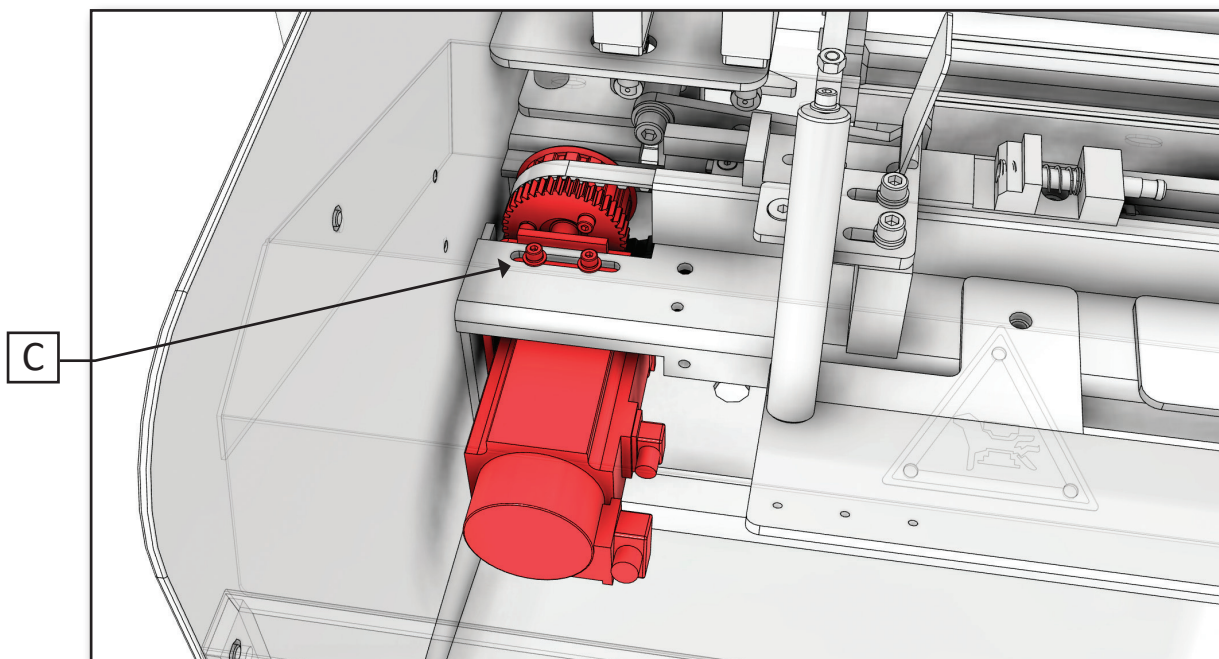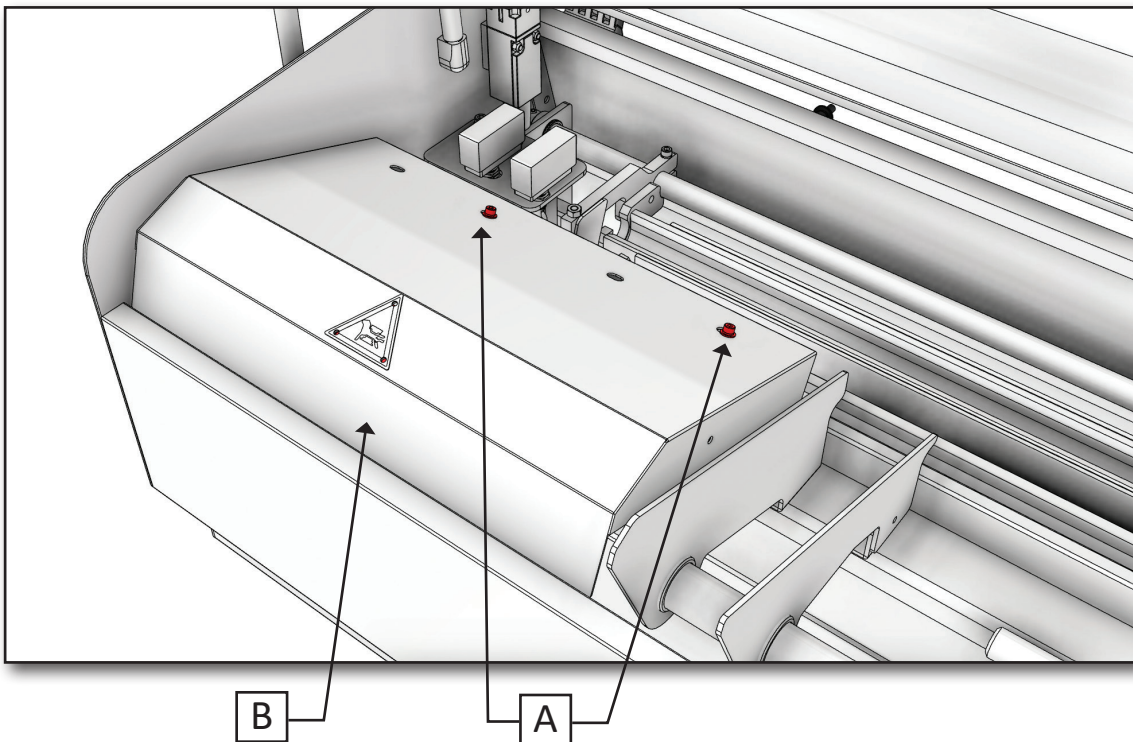
Do not set belt tension too tight, as this will stretch the belt and potentially lead to belt failure.

6. Move the motor assembly to the desired tension by rotating the socket head screw (D). (Rotating the screw counterclockwise tightens the belt, and rotating it clockwise loosens the belt.)

7. Tighten the locking screws (C).

8. Place cover (B) back on.

9. Close the bar feeder hood.

10. Reset Emergency Stop and test pusher operation with the handheld pendant.
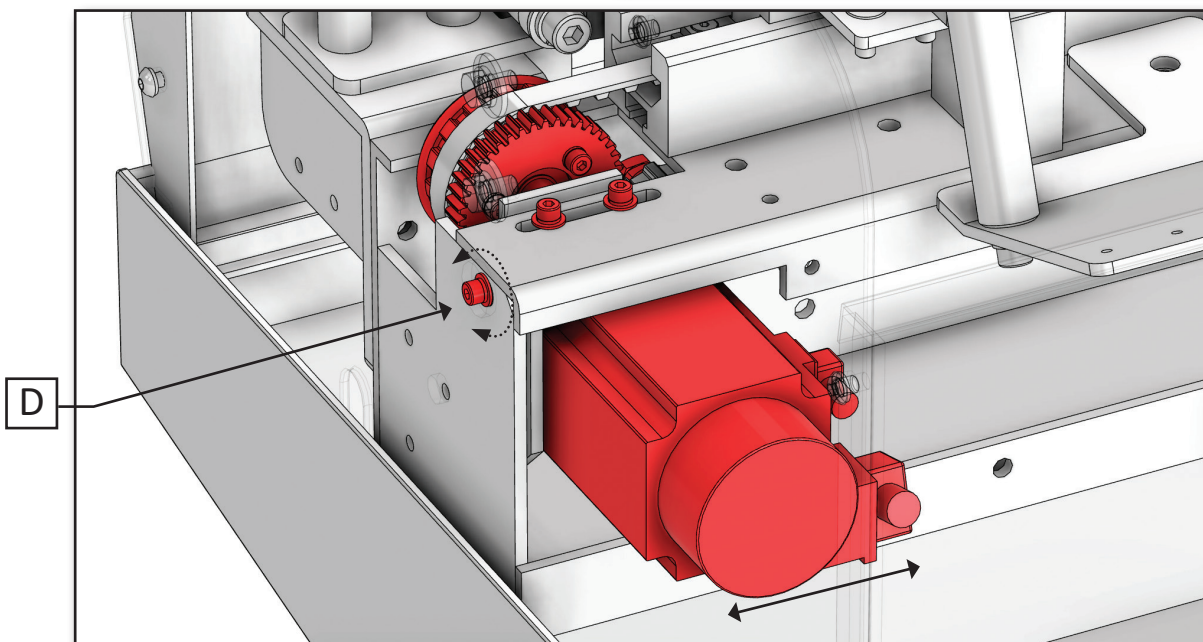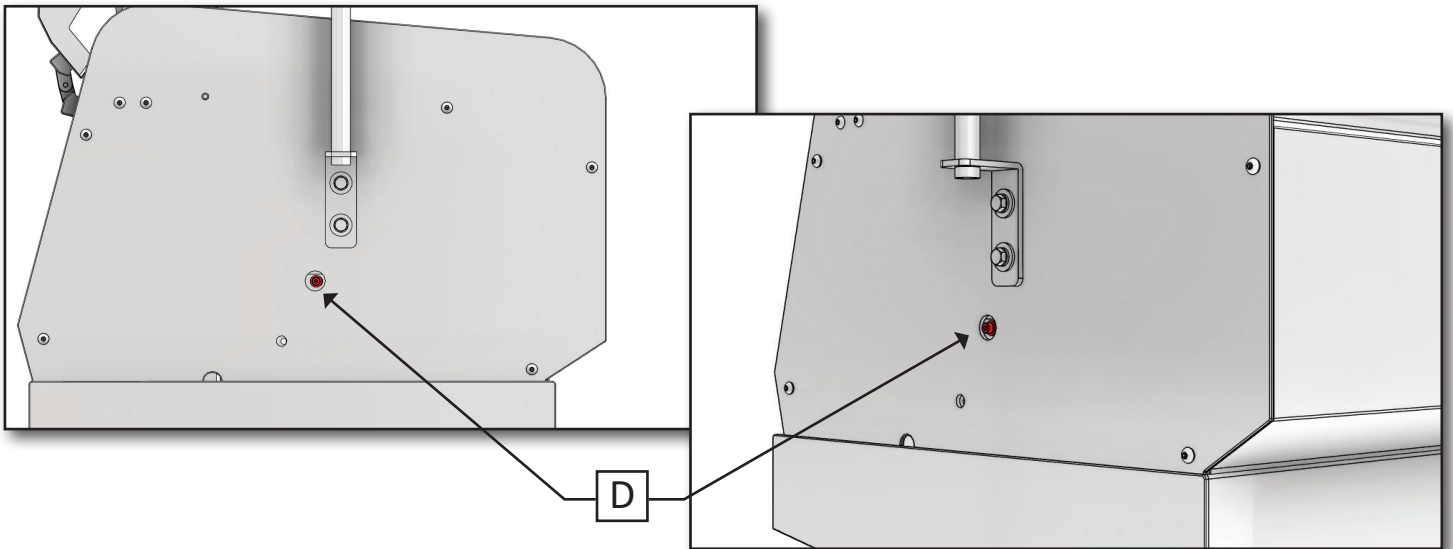
6.10 Gripper Blade Adjustment

⚠ **CAUTION**

The gripper is a pinch hazard. Its assembly is a moving component that should always be serviced with electrical power and air supply removed.

⚠ **CAUTION**

Place the lathe and bar feeder into Emergency Stop when replacing gripper jaws.

The gripper device is used to press material onto the bar feeder collet and remove remnants from the collet. Gripping force is determined by the air supply and is not adjustable to the assembly. The gripper jaws can be replaced as needed.

The gripper assembly is stationary, and the amount of material inserted into the pusher collet is based on the pre-feed positioning of the material. If the pre-feed position is not set such that the material is placed the proper distance from the gripper, the correct amount of material will not be inside the pusher collet. This may lead to a servo alarm upon material insertion, or could cause the material and pusher collet to separate.
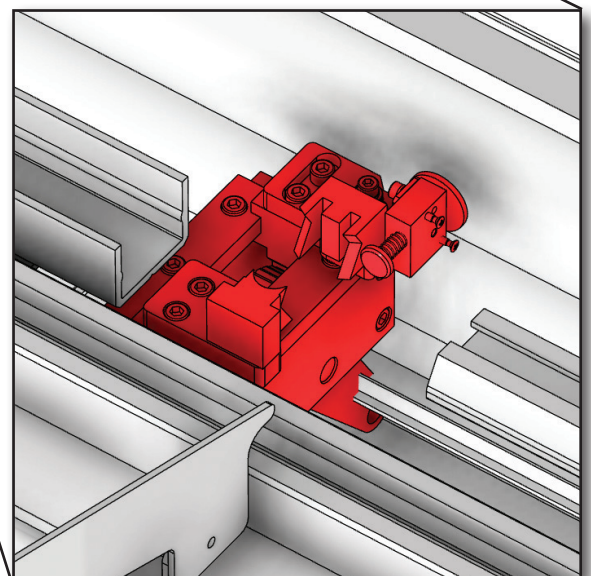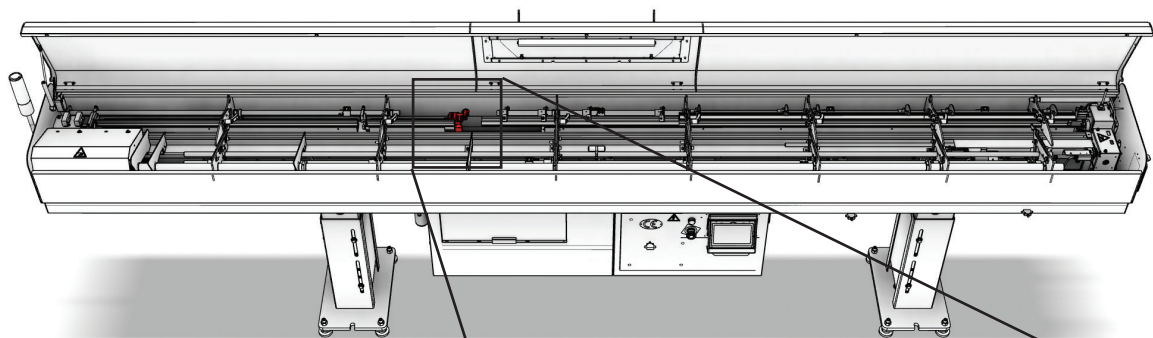
Gripper Assembly

To replace the grippers, remove the socket head screws (A,C).

If the gripper needs to be adjusted, perform the following steps:

1. Loosen socket head screw (C).

2. Adjust upper gripper (D) until there is clearence for the bar sensor to properly function.
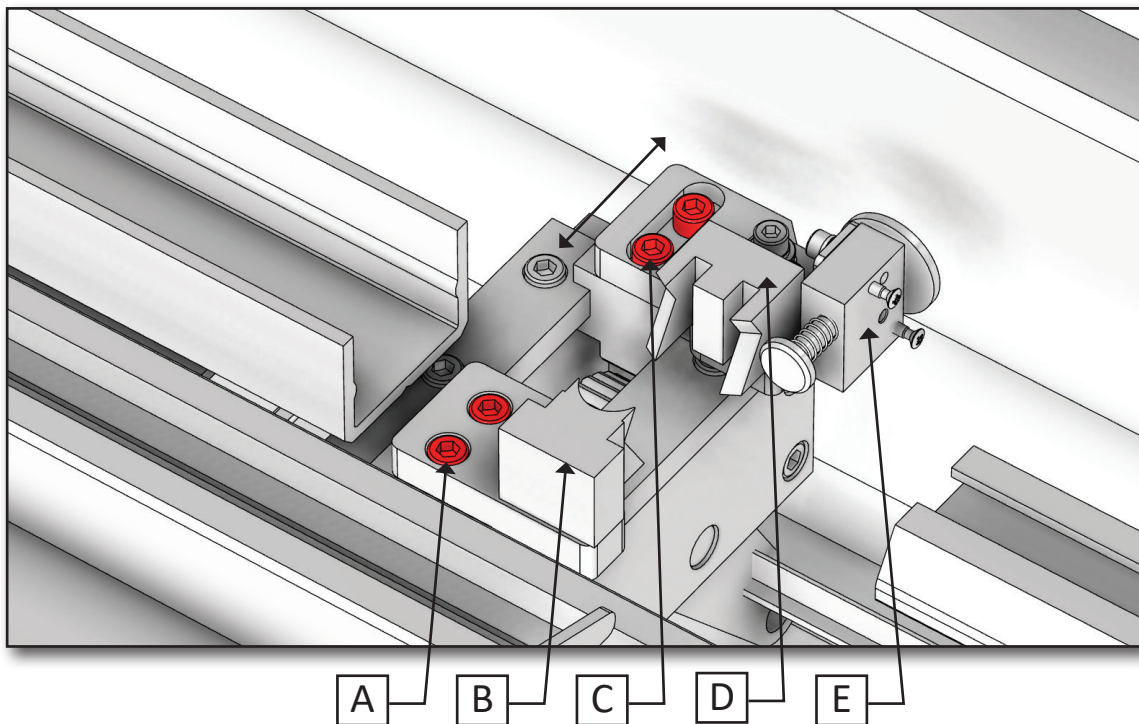
Gripper System Components

A: Socket Head Screws

B: Lower Gripper

C: Socket Head Screws

D: Upper Gripper

E: Bar Sensor

6.11 Spindle Liner

⚠ **WARNING**

Prior to spindle liner insertion or removal, ensure the lathe is in Emergency Stop or that power to the lathe is off. Never remove or install a spindle liner to a spindle that can be powered on during this process.

⚠ **WARNING**

Do not operate the lathe if the extended cover is off while using an extended spindle liner. Doing so could cause personal injury and machine damage.

NOTICE

Use the proper fasteners for the spindle liner retaining ring and, if equipped, for the spindle liner extension housing.

To provide the most support to the long pusher, the lathe spindle normally requires a spindle liner. This liner reduces the inner diameter of the spindle to the diameter of the pusher. The liner's inner diameter should be about 2mm larger than the pusher from the bar feeder.

When installing a spindle liner for the first time, the liner end may need to be cut. It is a normal practice for the liner to be longer, because various chucking packages are available. The end of the liner should be about 13mm from the rear of the chuck jaws or collet. Any further and this could cause remnant ejection issues.

6.12 Rotating Tip

The rotating tip should match the diameter of the pusher. Running too small or too large of a rotating tip diameter will cause damage.

Rotating tip operating life may be significantly reduced without the proper bar feeder oil.

The rotating tip used in the Minuteman 320 V3 is designed for many hours of operation. It is internally lubricated by the factory and normally does not require additional lubrication. However, the rotating tip does require proper oil flow within the channel. This helps to cool it and provide lubrication between the channel and tip. Some users operate the bar feeder with lathe cutting fluid or an aqueous based fluid. Edge Technologies does not recommend using anything but the oil recommended in this manual for oil type.

Refer to the Parts section for part numbers and available sizes. The rotating tip diameter should be 1mm smaller in diameter than the guide channel set.
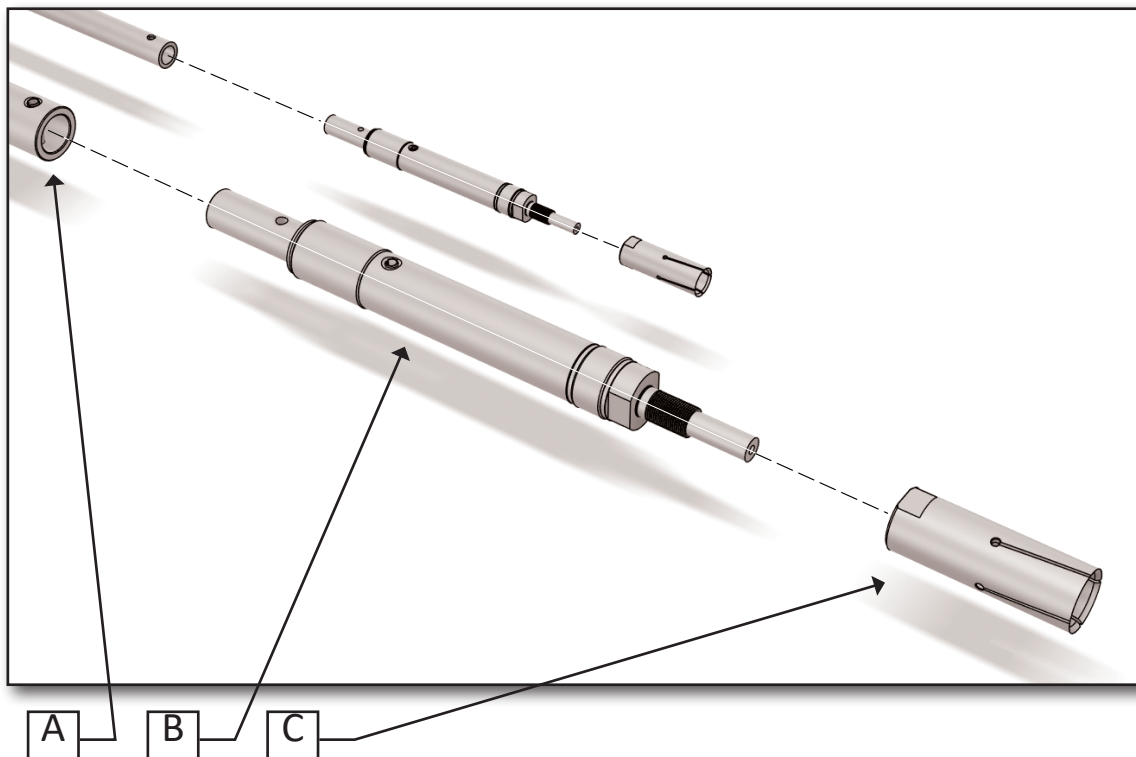
Bar Pusher Components

A: Bar Pusher

B: Rotating Tip

C: Collet

6.13 Pre-Feed Pusher and Pusher

<table>
<tr><td>⚠ WARNING</td></tr>
<tr><td>Do not replace the pusher or pre-feed pusher with electrical power applied to the lathe or bar feeder.</td></tr>
</table>

<table>
<tr><td>NOTICE</td></tr>
<tr><td>The pre-feed pusher must be the proper size to the bar channel hangers, or else damage may occur. Also, the length of the pusher must be fitted to the length of the bar feeder, or else damage may occur.</td></tr>
</table>

The pre-feed pusher drives the bar pusher and remnant forward. It is attached to a plate that is countersunk, so the attaching bolts require proper tightening. The holding torque of countersunk bolts is much greater than a socket head or buttonhead bolt. The greater surface area between the mating surfaces of the bolt acts as a locking mechanism, especially if the two surfaces are clean of any oils. Clean the bolts and threads with denatured alcohol or some type of oil-removing cleaner. A medium strength thread lock is recommended when installing the bolts. Do not overtighten the bolts. Doing so may cause issues when removing them.
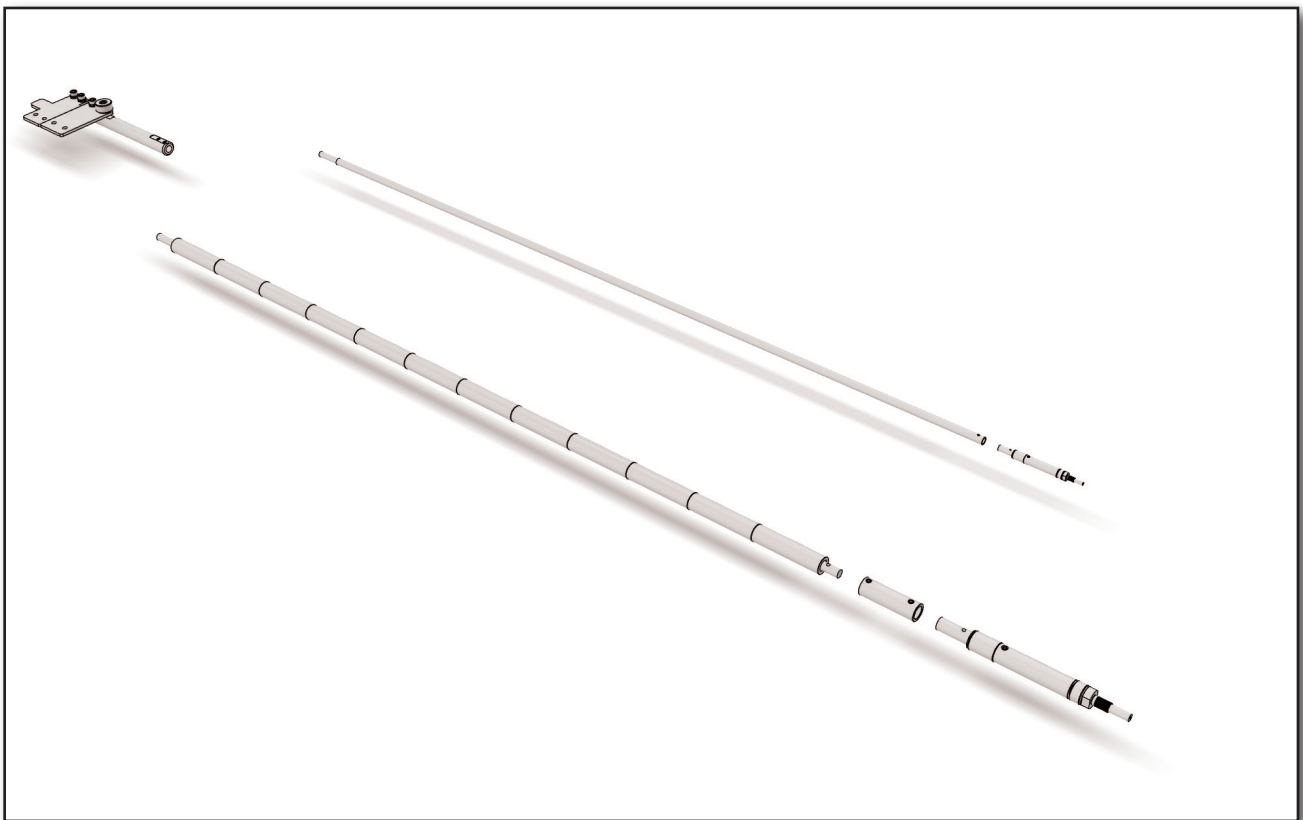
10mm and 20mm bar pusher assembly

6.14 Magazine Adjustment

----Follow the procedure below any time the bar diameter requires changing.----

⚠ **CAUTION**

When adjusting the magazine, be sure the lathe and bar feeder are in Emergency Stop. Adjusting the magazine can produce pinch points between magazine and material.

1. Place the lathe and bar feeder into Emergency Stop prior to adjusting magazine.

2. Remove any material from the magazine.

3. Loosen the locking lever (B) for the support plate (A) and lift the plate to the highest position. Tighten the lever back.

4. Place one bar to be loaded on the magazine.

5. Rotate the bolt (C) to adjust the bar stop so that only the first bar on the magazine will be lifted into the guide channel. While you rotate the bolt, you will see the vertical adjustment plate (D) move in the direction the bolt is rotated. The material lifter (E) will now accurately lift each piece of material one at a time.

6. Loosen the lever (B) and slide the support plate (A) down to 1mm over the bar to be machined.

7. Tighten the lever (B).

8. Load the desired material requirement.

9. Close the bar feeder hood.

10. Reset Emergency Stops on the lathe and bar feeder.
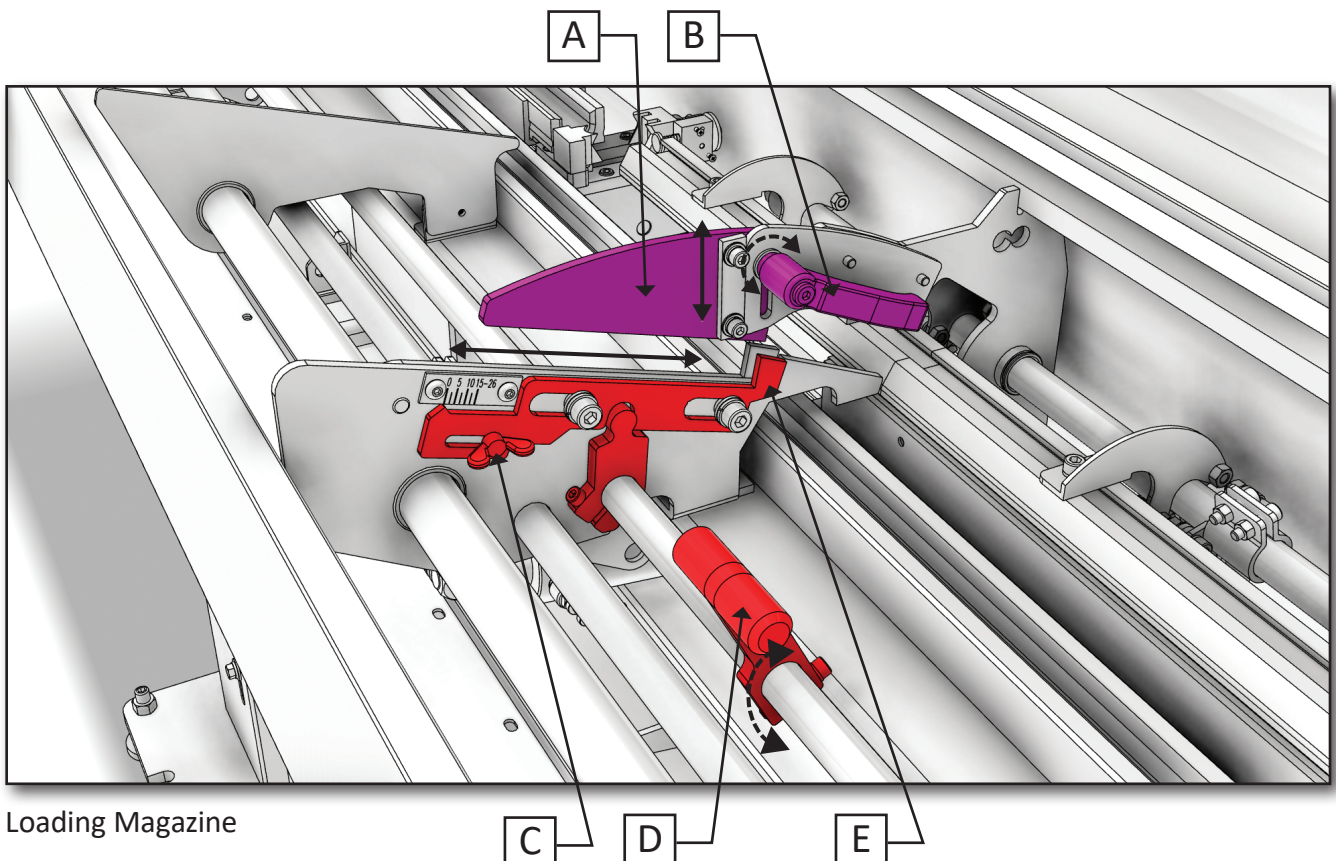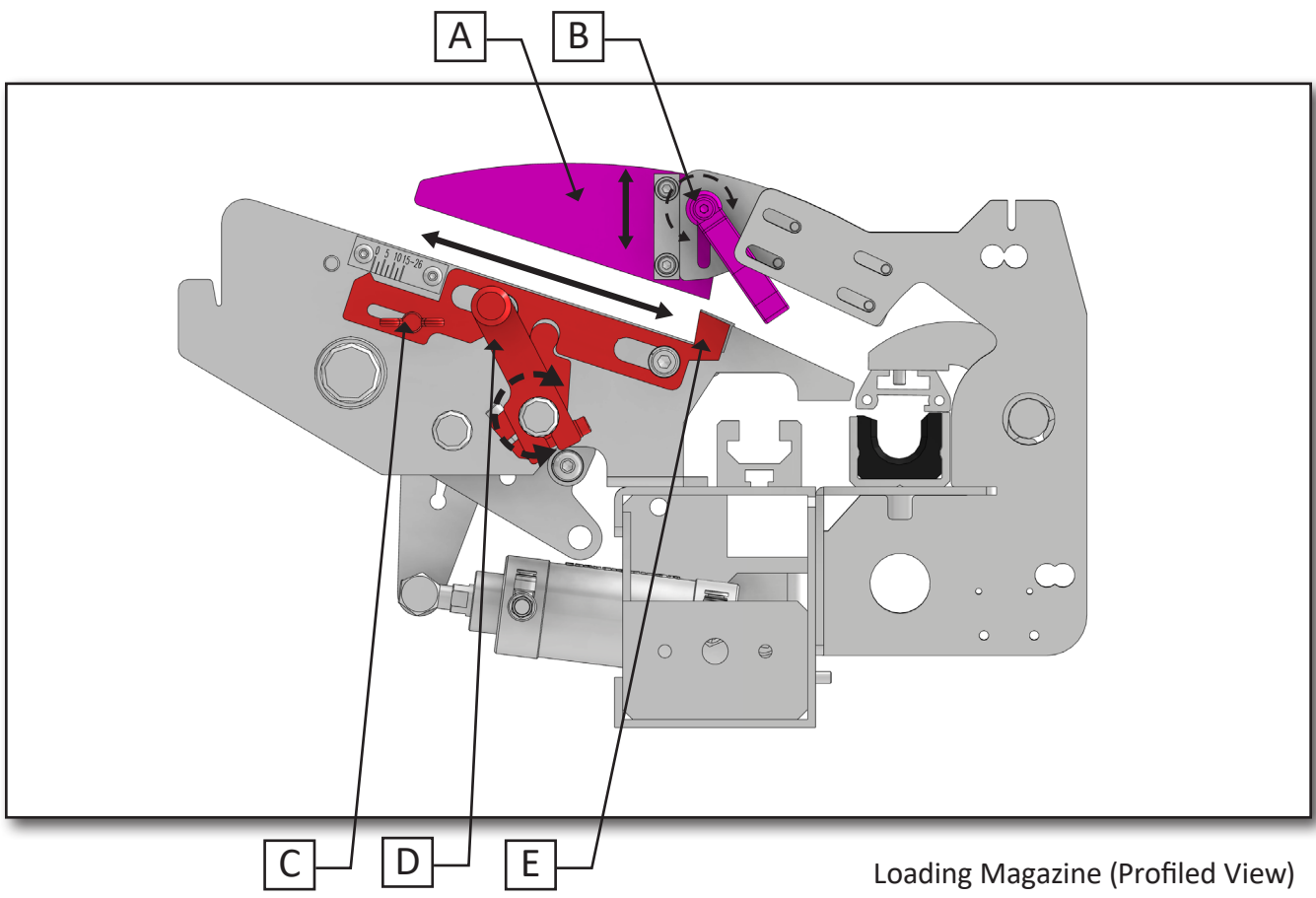
Loading Magazine

Loading Magazine (Profiled View)

Loading Magazine Components

A: Support Plate

B: Locking Lever

C: Adjustment Screw

D: Bar Seperation Lever

6.15 AVD/MAVD Adjustment

Proper adjustment of the Anti-Vibration Device **(AVD)** and Movable Anti-Vibration Device **(MAVD)** is important for proper machine operation. Proper adjustment will help support the bar and possibly reduce vibrations during production.

⚠ **WARNING**

Lathe and bar feeder must be in manual mode during the adjustment of the MAVD. Only operators properly trained should adjust the MAVD.

NOTICE

Improper adjustment may cause failure on the machined part.

NOTICE

When loading a bar for the first time, make sure the MAVD rollers are open. Roller damage may occur if material or pusher is moved into the rollers.

The AVD/MAVD is normally adjusted at the same time. Follow the adjustment process for both devices.

If the device is open when the bar feeder hood is open, the hood switch will need to be deactivated for the duration of the adjustment process. Once the adjustment has been completed, reactivate the hood switch.
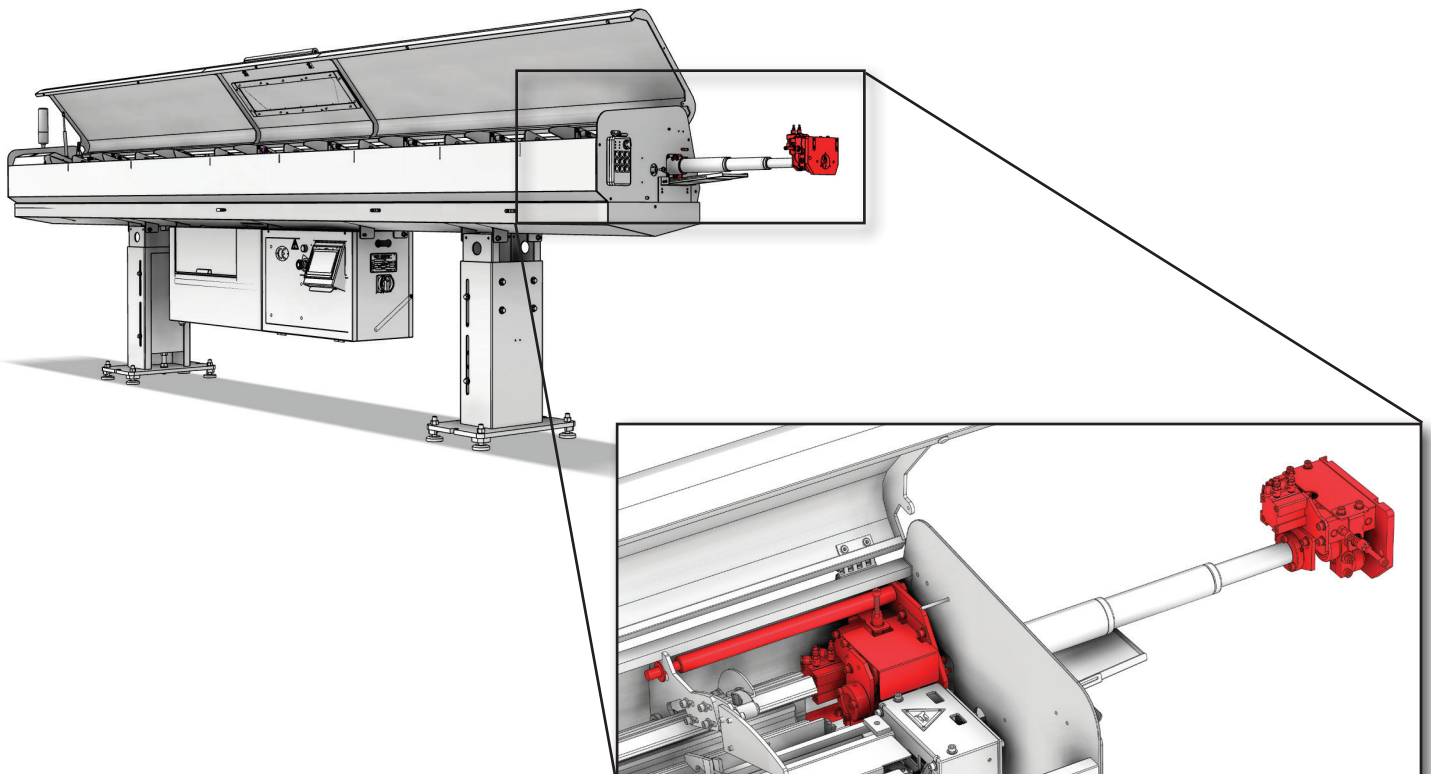
AVD and MAVD System

1. Using the bar feeder, load a bar into the lathe and close the lathe collet.

2. Open the bar feeder hood

3. Loosen the locking nut (A) and back adjustment bolt (B), moving counterclockwise until no resistance is felt when turning the bolt. Rollers will be opened from the material centerline.

4. On the handheld pendant press the Pre-Auto button. Both the AVD and MAVD will close.

5. Turn the adjustment bolt clockwise until resistance is met. Then rotate the bolt one more full turn clockwise. Tighten the locking nut.

6. Press the Manual button. The AVD/MAVD should open. Then press the Pre-auto button again.

7. Verify that the rollers are not clamped directly on the material but are very close to it.

8. Press Manual button again to open the AVD/MAVD.
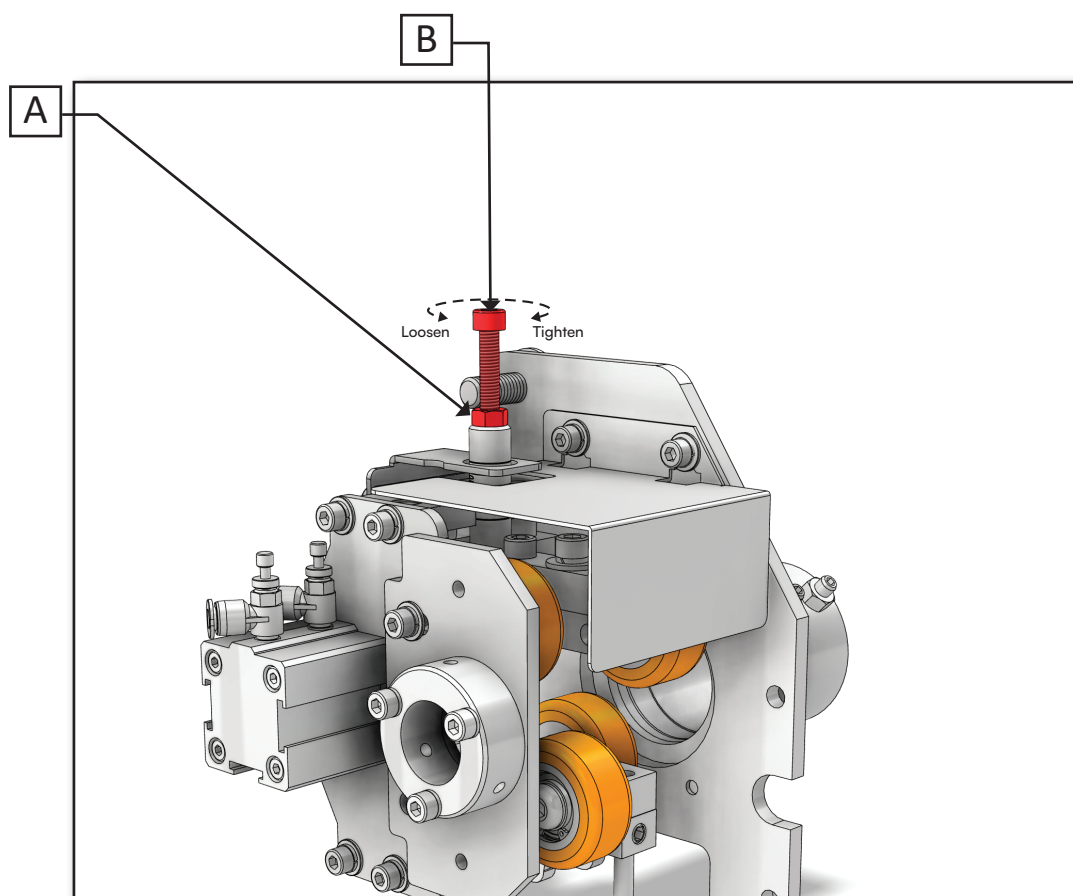
Anti-Vibration Device **(AVD)**

AVD Components

A: Locking Nut

B: Adjustment Bolt

Adjustment to the open and close speed of the MAVD/AVD is by way of the thumb screws (C,D) on the cylinder. Be sure the air supply lines are installed on the correct valve for correct operation.

When the lathe collet is closed, the MAVD/AVD rollers/blocks will be closed if the parameter is set to operate this way. Press the Pre-Auto button to command the MAVD/AVD to close as well. Adjust as required.

Movable Anti-Vibration Device **(MAVD)**
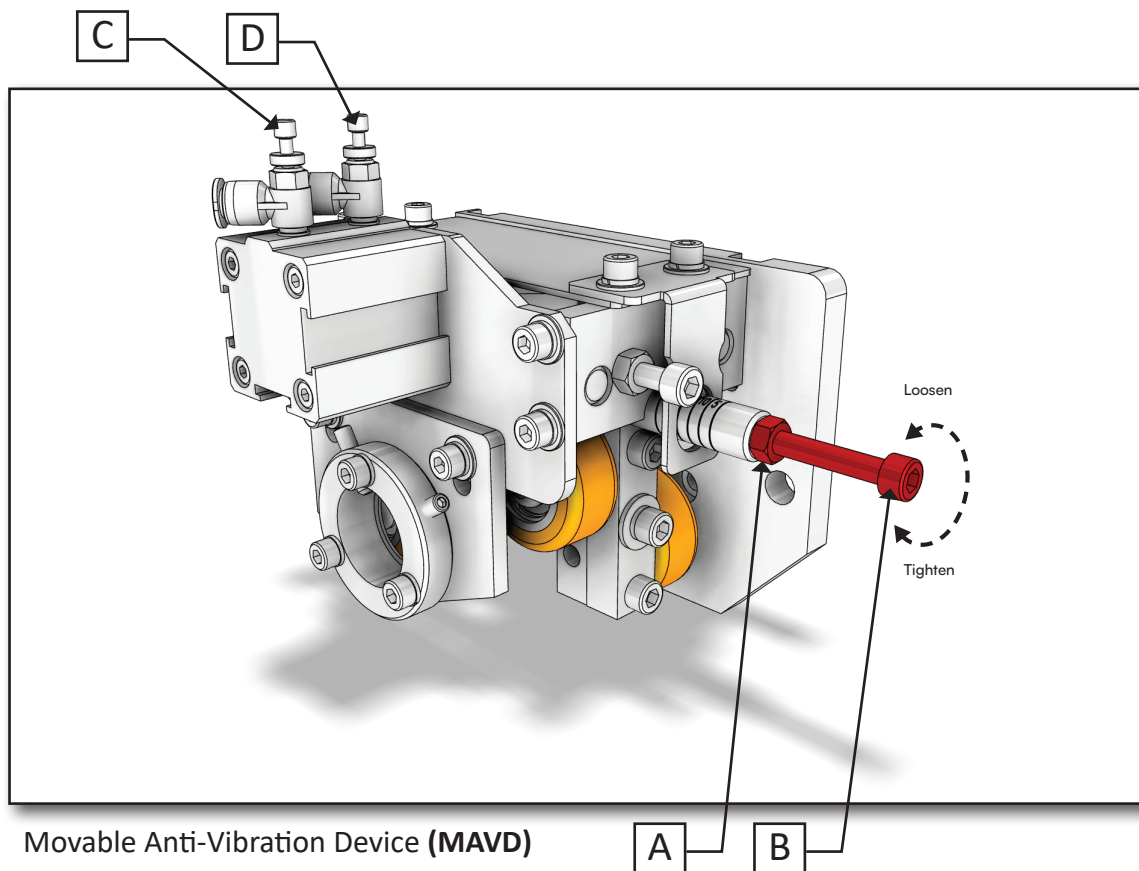
MAVD Components

A: Locking Nut

B: Adjustment Bolt

C: Closed Speed Valve

D: Open Speed Valve

⚠ **WARNING**

Never adjust the air valves without being properly trained. Personal injury could result.

The Minuteman is equipped with a robust extraction and insertion system designed to provide exceptional durability. The operation of this cylinder is known as the shuttle.

When the bar feeder collet is introduced onto the bar end, the servo drive motor is engaged, with the shuttle (air cylinder) moving simultaneously. The process is the same during the extraction step. The movement between extraction and introduction should always be fluid with the servo drive motor.
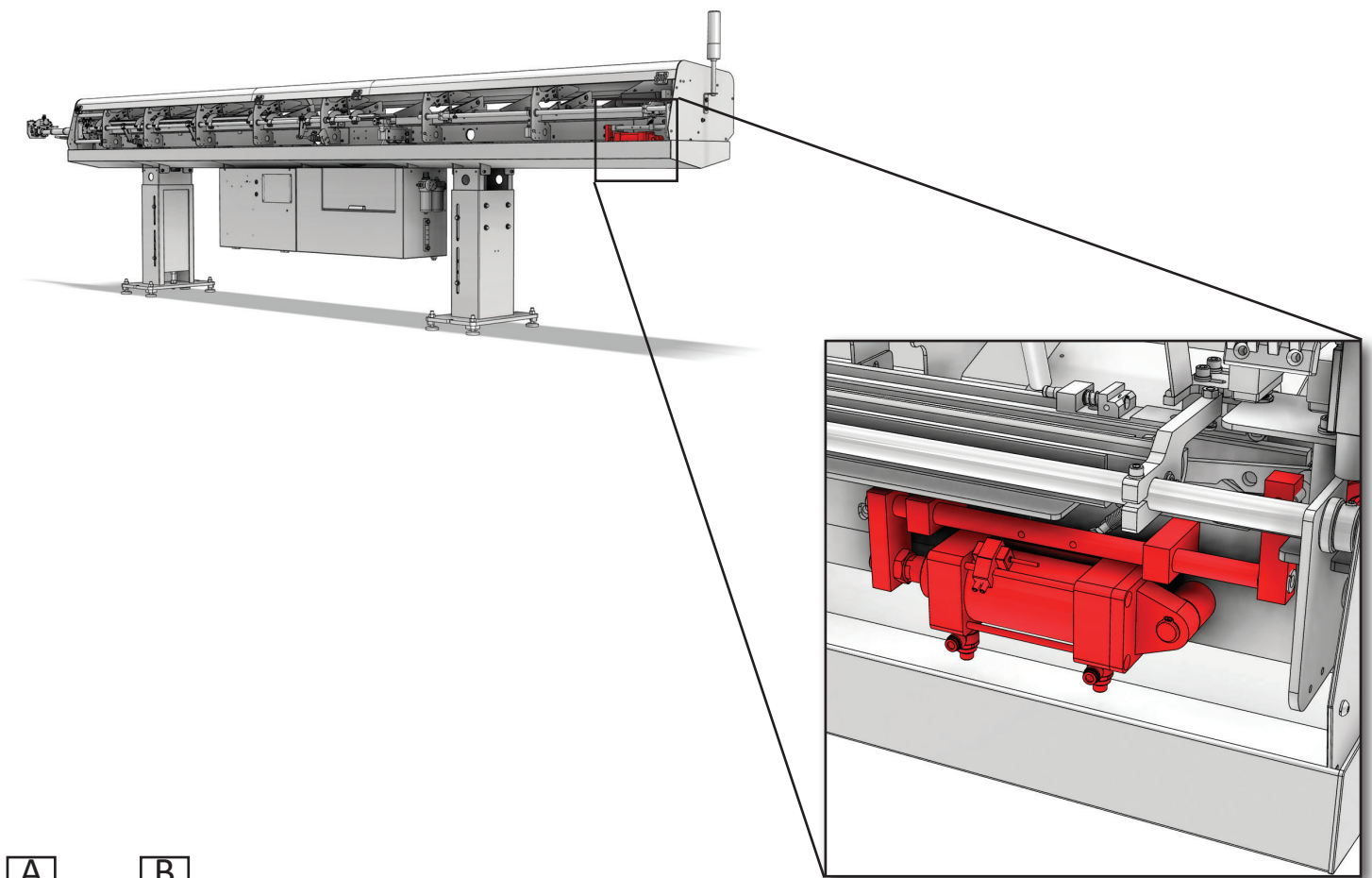
Shuttle-Extraction Component
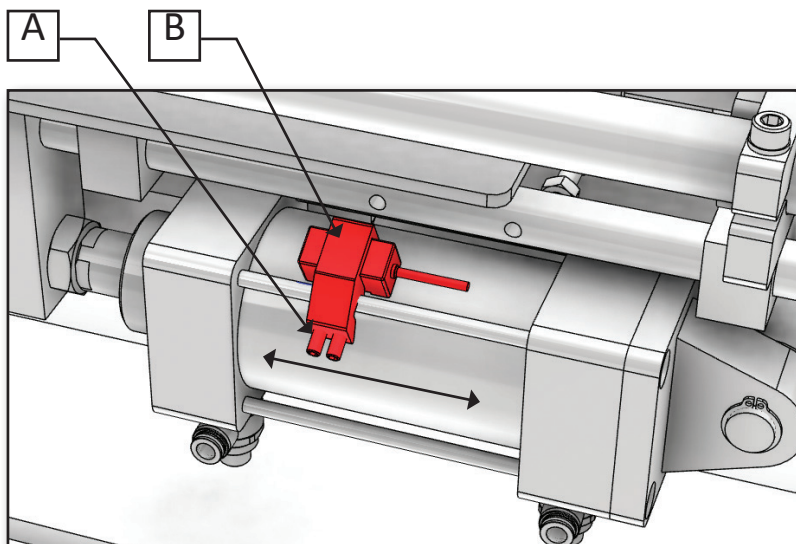
The magnetic sensor (B) for the shuttle may get misaligned. This can be adjusted by loosening the set screws (A) and sliding the sensor (B) as needed.

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6.17 Guide Channel System

⚠ CAUTION

When changing the channel set, be sure the electrical power to the bar feeder is off.

⚠ CAUTION

The proper channel set to material diameter is important. Damage to the bar feeder and or the lathe may result.

⚠ WARNING

All channel sections must be in position prior to operation. Machine damage will occur if channel sections are not in the proper position.

The channel sets on the Minuteman may be changed to a variety of sizes. Make sure the material diameter in the bar feeder fits in the proper channel set. Channel set components are specific to each channel set. Contact Edge Technologies for additional channel sizes and sets.

The channel sets for the standard length Minuteman contains 2 sets of pieces that must be placed in a specific orientation. All components within a channel set are specific to the size of that channel set. Combined channel sets will not work properly and will result in poor bar feeder performance.
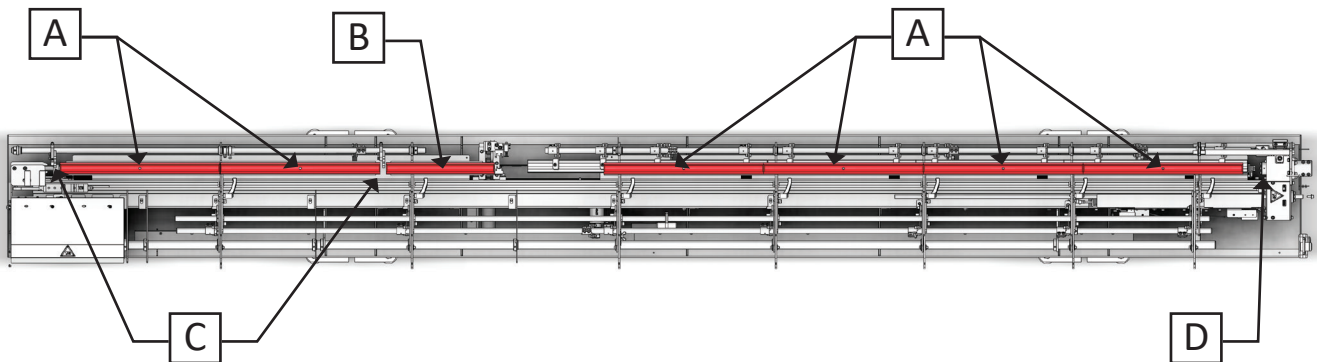
Minuteman 320 V3 Guide Channel Components

A: Standard MM Guide Channel

B: Remnant Guide Channel

C: Bar Pusher Lifts

D: Anchor

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The guide channel is closed by an automated movable cover when the bar feeder is in operation. Hydraulic oil is injected into the channel and distributed all along the bar, which keeps it at the center of the guiding axis.
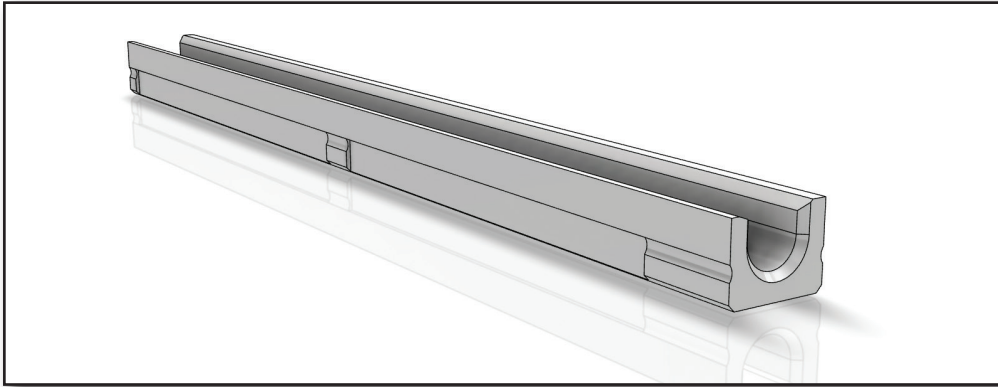
Standard Guide Channel
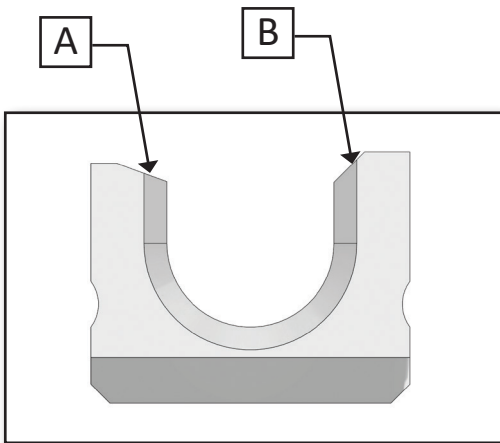
The guide channel is profiled for material to be gravity fed. The lower profile is the front of the channel (A). This should face toward the front of the bar feeder. The higher profile is the back of the channel (B). When installing the channels, place them in the correct orientation.

Under the guide channels are inserts that are placed over bolts in the channel bed.
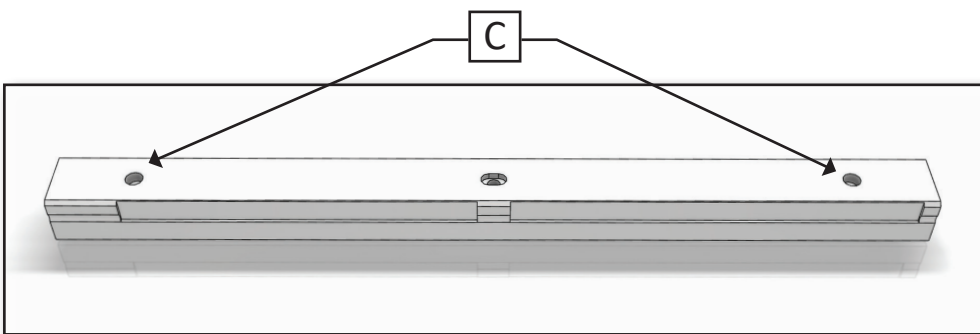
A: Front Channel

B: Back Channel

C: Guide Inserts

6.18 Installing the Guide Channel System

Install the guide channels from first to last represented here.

(Note, longer machines will have more guide channels.)

This illustration shows you how to properly install the guide channels for the bar pusher. Make sure to place the channel inserts over the socket head bolts in the channel bed (A).
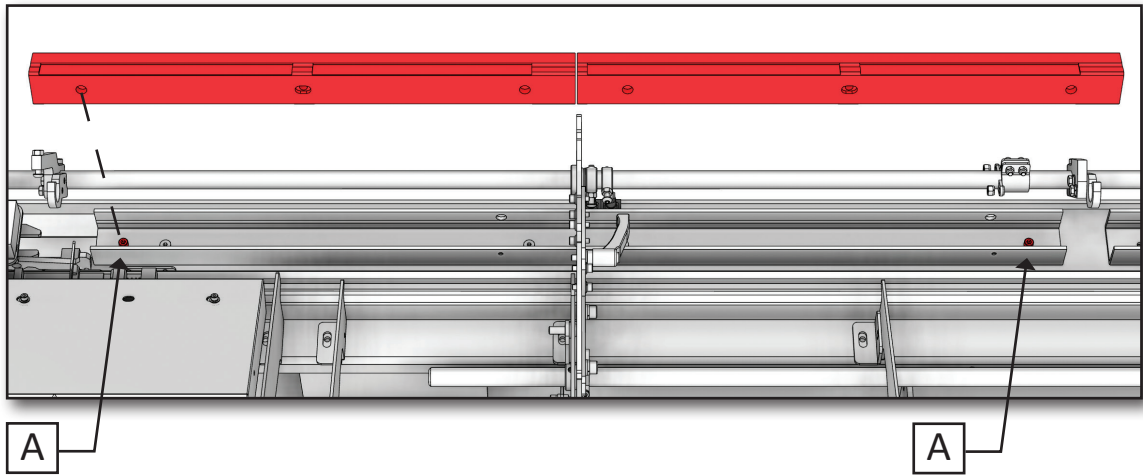
The remnant channel is molded to fit universally for left to right and right to left Minuteman 320 V3 bar feeders. A recess (B) for the gripper is placed on both sides as well as guide inserts (C).

Remnant Guide Channel
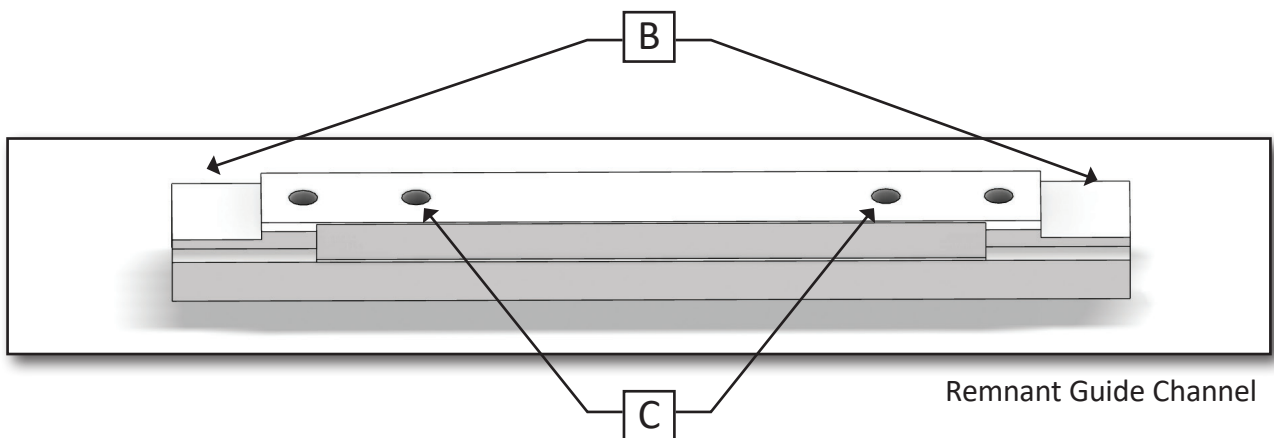
A: Channel Bed Bolts

B: Remnant Channel Recess

C: Guide Inserts

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For the remnant channel, place the channel inserts over the socket head bolts in the channel bed (C).

C
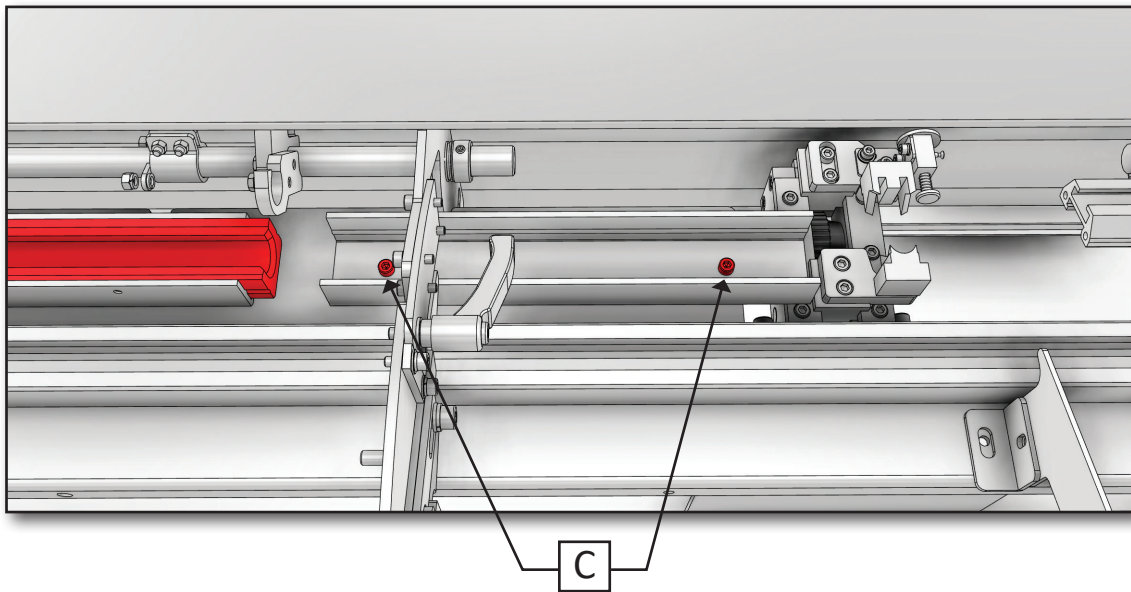
For the channels on the nose side of the bar feeder, a 4mm socket head bolt keeps them in place. This bolt must be removed in order to slide the guide channels in the channel bed. Place the bolt back in after the channels are installed.
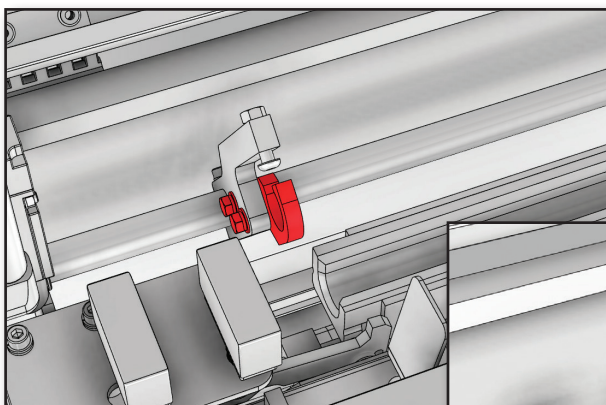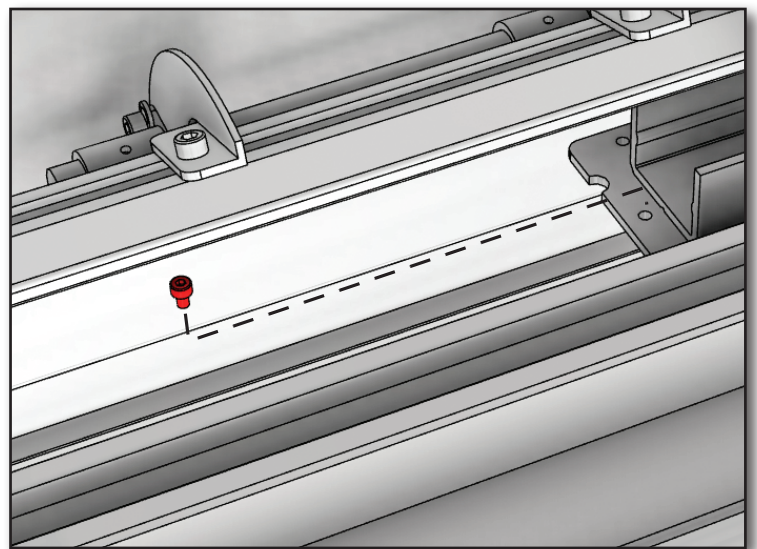
A set of bar pusher lifters come with each channel set. Install them in their respective locations.
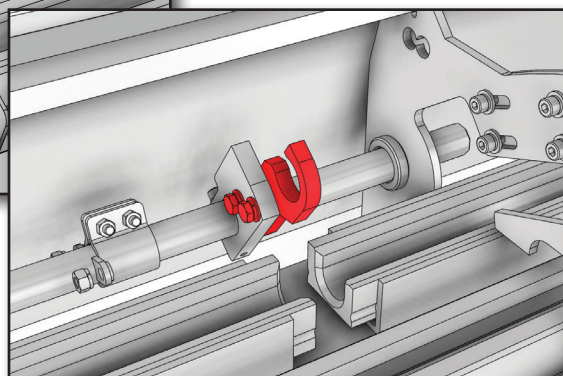
6.19 Material Standards and Requirements

NOTICE

The ends of the bar should be relatively straight to ensure proper positioning as the bar reaches the facing position and to keep the bar pusher from sliding off while feeding the material. In most cases, chamfering the front end of the bar is required. Using a spindle rotation of approximately 50 RPM during bar change maximizes reliability.

Material should be relatively straight and clean. Excessive chips, burrs or dirt may cause premature wear to the bar feeder channels. Clean bars will extend the life of the guide channel set and bearing unit of the pusher, as well as the oil pump impeller.

Bar ends should be relatively square to the length of the bar. Chamfer both ends of the bar stock to be machined. Profiled material such as hex and square stock should have a generous chamfer on the bar feeder end of the bar. This chamfer will help negate the offset of the bar centerline to that of the bar pusher when the stock falls differently into the channel (corners up versus flats up).

Bent bar stock may prevent loading of a new bar into the lathe spindle.

The procedure for bar straightness is:

1. Find a suitable surface to allow the bar to rest on V-blocks without any rocking movement.

2. Using a dial indicator, rotate the bar 360°. Record the readings at each location.

3. Calculate both the tolerance for each meter increment and the tolerance over the entire length of bar.

4. Compare the recorded values to the required tolerances to determine the bar suitability for operation with a bar feeder.
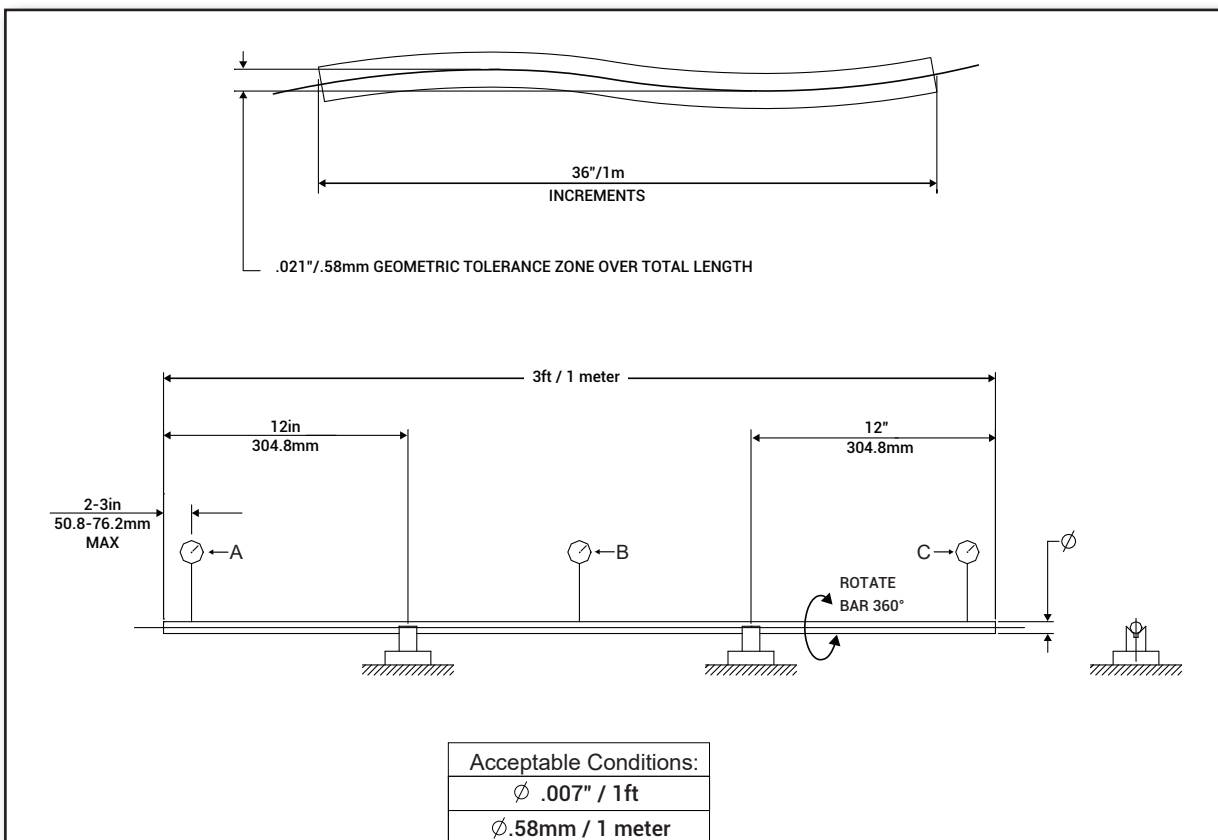
Straightness Requirements

Optimum performance of the bar feeder can only be achieved if the material meets specifications for straightness. The maximum allowable bend in a bar is 0.021" Total Indicated Run-off (T.I.R.) per 3' section (0.58mm T.I.R. in a 1m section). This tolerance assumes a curvature over the length of the section and not a short kink. This tolerance is not accumulative.

Certain conditions may limit the lathe to less than full speed rotation of the spindle. Among these conditions are:

• Bent bars (bar stock with straightness of less than 0.5mm/1 meter)

• Bars with an irregular profile or shaped material

• Improperly sized guide channel in relation to the bar stock diameter

• Incorrect sizing of bushing blocks or incorrect adjustment of steady rollers

• Lack of support in the lathe spindle for the bar pusher

• Inherent characteristics of the type of bar stock (copper, brass, plastic etc.)

• Improper viscosity lubricant in the oil tank of the bar feeder

• Unbalanced bar stock

• Sheared bar ends rather than saw cut

• Non-concentric chamfered bar end when using an ejection collet

These factors may work alone or in combination to cause a vibration that requires a reduction in the lathe spindle speed.

6.20 Vibration Troubleshooting Check List

VIBRATION TROUBLESHOOTING CHECK LIST		
Bar Feeder Model	**Serial Number**	**Lathe Model**

TESTS TO BE CONDUCTED AND RECORDED		
	Comments and Feedback	
Bar Feeder Alignment		
1. Bar Feeder Alignment and Fastened		☐
2. Spindle Adapter Alignment and Condition		☐
3. Nose Alignment & Insert Conditions		☐
4. Stady Alignment		☐
5. MAVD Alignment		☐
Guide Channel Diameter		
1. Revolving Tip Condition		☐
2. Pusher-Collet Runout		☐
3. Pusher Straightness		☐
Material Type and Diameter		
1. Bar Straightness (See attached .007"/ft)		☐
2. Surface Finish		☐
Spindle Liner		
1. Tube Concentric to Journals (Max .004" or .1mm TIR)		☐
2. Fit with Spindle I.D.		☐
Other		
1. Confirm Oil Pump is on		☐
Lathe Influencing Factors		
1. Lathe Stability (not rocking on its pads)		☐
2. Work-Holding Runout & Chuck Pressure		☐
3. Guide Bushing Condition (Swiss Lathe)		☐
Additional Comments		

Technician's Name and Signature _____

Recording Table

Procedure for checking bar straightness (Reference ASTM B249):

1. Find a suitable surface such that the bar can rest on the V-blocks without any rocking movement.
2. Rotate the bar 360°. Record the dial indicator readings at each location.
3. Calculate both the tolerance for each meter increment and also the tolerance over the entire length of the bar. Compare recorded values to required tolerances to determine the bar suitability for operation with a bar feeder.

.021"/.58mm GEOMETRIC TOLERANCE ZONE OVER TOTAL LENGTH

INCREMENTS

36"/1m

2-3in
50.8-76.2mm
MAX

12in
304.8mm

3ft / 1 meter

ROTATE
BAR 360°

12"
304.8mm

A

B

C

∅

Acceptable Conditions:
∅ .007" / 1ft
∅ .58mm / 1 meter

BAR #	READING "A"	READING "B"	READING "C"	ANALYSIS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

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7. Control Operations

7.1 HMI Description

> ⚠ **WARNING**
>
> **Only trained personnel should operate the bar feeder.**

The Minuteman bar feeder features a 7" full touchscreen HMI.

The HMI is a microprocessor-based, touchscreen unit that receives user input commands directly through the touchscreen. Understanding the function of the HMI is essential in operating the bar feeder.

> **NOTICE**
>
> Do not use harsh cleaning chemicals on the HMI screen. Use of a microfiber cloth towel and denatured alcohol is permissible. Clean the screen with the power off.

7.2 Manual and Auto Screen Layouts

Manual Screen

1	Mode status = Manual or Automatic mode	
2	Status of interface signals	
3	Current pusher position	
4	Auto Check. When green all conditions to go into auto are made. When red, press to see what conditions are missing.	
5	Current part program	
6	Current unit of measurement. Tap to change between metric and inches. This can be done at any time	
7	Servo on/off indicator	
8	Hood opening allowed indicator	
9	Bar on button	
10	Automatic button	
11	Bar off button	
12	Jog pusher buttons	
13	Home Reference button	

Automatic Screen

1	Mode status = Manual or Automatic mode	
2	Status of interface signals	
3	Current pusher position	
4	Current script item	
5	Current part program	
6	Current unit of measurement. Tap to change between metric and inches. This can be done at any time	
7	Servo on/off indicator	
8	Hood opening allowed indicator	
9	Parts remaining indicator	
10	Material remaining indicator	
11	Material remaining visual indicator	
12	Manual mode button	
13	Current step number	

7.3 Handheld Pendant Layout

NO.	Function
1.	Emergency Stop
2.	Alarm Light
3.	Cycle Start Light
4.	Bar End Light
5.	Collet Open Light
6.	Bar Change Light
7.	Feed Stop Light
8.	Automatic Start Light
9.	Automatic Start
10.	Manual Mode Light
11.	Manual Mode
12.	Pre Auto Light
13.	Pre Auto
14.	Channel Down Light
15.	Manual Loading
16.	Pusher Extracted
17.	Manual Insert/Extract
18.	Grippers Closed Light
19.	Manual Loading
20.	Pusher Home
21.	Manual Retreat (Left)
22.	Channel Open Light
23.	Manual Channel Open/Close
24.	Pusher Home (reversed)
25.	Manual Advance (Right)

7.4 Power Up

Improper use of the electrical cabinet can result in electrocution and damage to the machine.

1. Have the bar stock in the bar feeder magazine and the lathe ready for production to power up and place the bar feeder in Automatic mode.

2. Turn the main breaker switch on from the bar feeder electrical cabinet.

3. Make sure the Emergency Stop buttons on the pendant and the main control panel are released.

4. Press and hold the green On button on the main control cabinet. The green button will light when the bar feeder is on.

5. Close the collet on the lathe.

6. Press the Automatic button on the touchscreen to place the bar feeder in Automatic mode. Reference the Auto Check screen for all conditions that must be met before pressing the Automatic button.

7.5 Advance / Retreat at Low Speed

To advance at low speed, press and .

To retreat at low speed, press and .

7.6 Automatic Work Operation

Press the automatic button on the touchscreen, or press Pre-Auto and then Auto on the handheld pendant, to place the bar feeder in Automatic mode. Reference the Auto Check screen for all conditions that must be met before pressing the automatic button.

7.7 Resetting the Bar Feeder Home Position

Press the Home reference button.

Once the Home switch turns on, the Home reference indicator will turn from red to green. It is still possible to reference when the indicator is green.

This procedure should be done any time the bar feeder fails to properly reach a position, or the Home Reference Lost alarm occurs.

NOTICE

Do not use Bar On if a bar is already in the bar feeder. Doing so will cause damage to the machine.

Bar On

A new bar can be loaded by using the Bar On button. The lathe collet must be open for Bar On to function. The channel must be open, the chuck must be open, and the pusher must be extracted.

1. Press the Bar On button.

2. The grippers will close on the bar, but only if a bar is present. There need not be a bar in the channel at this step.

3. A new bar will fall into the guide channel.

4. The pre-feed pusher will move the bar forward ahead of the pusher collet.

5. The pre-feed pusher will retract and the channel will close.

6. The grippers will hold the bar as the pusher collet is forced over the material.

7. The grippers will open and the bar will move forward to the facing position and stop.

8. Manually close the lathe collet. The bar feeder can now be placed in Automatic, and machining may begin.

Bar Off

If the material in the channel is too long to drop through the remnant slot, use the Bar Off button.

1. Press Bar Off.

2. The bar pusher will retract to the Home reference position.

3. The grippers will close on the bar, and the pusher will pull off the material.

4. The grippers will open.

5. The grippers will reclose to check for material.

6. The grippers will reopen.

8. Parameters

8.1 Parameter Pages and Definitions: Part Menus

Manual	Chuck Close	Bar Change	POS	0.000	Inch

Manual

Part Menu

Factory Menu

Admin

Alarm Log

Currently Loaded Part

Feedout 1 — 0.000 IN

Feeding Type — Position

Facing Type — Position

Save And Load Part   Restore Unsaved Changes

?   ?

Commonly Used | Additional Feed Lengths | Lengths / Distance | Torques / Speeds | Misc   Part Selection
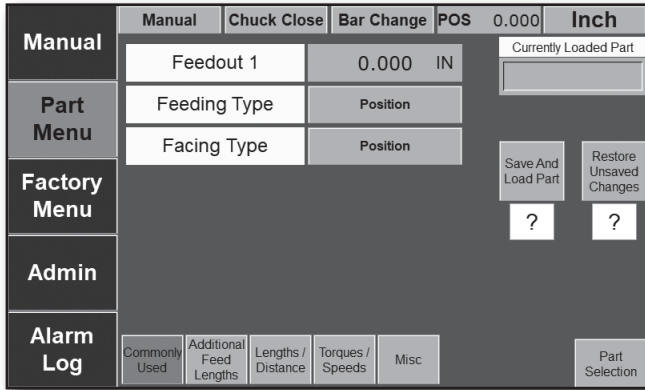
Feedout 1: When only using one feedout, this is the part length. If you wish to use multiple feedouts, modify the values in the Additional Feed Lengths screen. Calculate the proper setting by adding the length of part + width of cut-off tool + facing stock. Used with Max End of Bar Position, Feedout 1 generates an end-of-bar signal (Max Feed Position – Part Length 1).

Feeding Type: Feeding Type selects the mode for feeding material in Automatic mode. If you select Position, the bar feeds to positions specified by part lengths. Turret Stop feeds until the bar feeder detects the bar has hit At Feed safeties, for higher reliability.

Facing Type: The Position selection feeds the bar to a position. This position is controlled by Facing Position (Factory Menu), Facing Length (Part Menu), and Chuck Jaw Length (Part Menu). Turret Stop feeds the bar until the bar feeder detects the bar has hit a hard stop.

Manual	Chuck Close	Bar Change	POS	0.000	Inch

Manual

Part Menu

Factory Menu

Admin

Alarm Log

Currently Loaded Part

Total Feed Length — 0.000 IN

? Feedout 1 ▾

Feedout Length — 0.000 IN

Longfeed Safety — 0.000 IN

Shortfeed Safety — 0.000 IN

Check Facing Position — NO

Save And Load Part   Restore Unsaved Changes

?   ?

Number of Feedouts

1 ▾

Commonly Used | Additional Feed Lengths | Lengths / Distance | Torques / Speeds | Misc   Part Selection

Total Feed Length: This sets the total length of the part to be machined. This value is not entered but calculated from the sum of each feedout and is used to calculate parts remaining.

Feedout 1: Select which feedout you wish to modify. The bar feeder will feed these out in order.

Feedout Length: The length will feed out for the feedout number selected above.

Longfeed Safety: This is an incremental value. If the bar feeder attempts to feed a part but exceeds the position it expected to feed out by this amount, the bar feeder will alarm out.

Shortfeed Safety: This is a decremental value. If the bar feeder attempts to feed a part but comes up less than the expected feedout position by this value, the bar feeder will alarm out.

Check Facing Position: This uses the longfeed and shortfeed safeties to check that the new bar was fed to the correct facing position (Factory Menu). With this option disabled, the bar feeder will still alarm out if the position is off by more than an inch.

Facing Length: The additional length the bar will be fed after the facing position is reached.

Min Bar Length: If a bar is measured at less than this length, the bar feeder will alarm out. Setting this properly will help with process reliability.

Max Bar Length: If a bar is measured at more than this length, the bar feeder will alarm out. Setting this properly will help with process reliability. This value also allows the bar to be measured faster, as the bar feeder will quickly push the bar to a calculated distance before the flag, at which point it will slow down to the bar measurement speed.

First Pull of New Bar Distance: When a new bar is loaded, the bar feeder will expect the bar to be pulled this distance for Swiss-type applications. This is useful, as the lathe can load the bar into the guide bushing without requiring the distance to be the same as the part length. On fixed headstock machines, the bar feeder makes the first feed of the new bar this distance for position/torque mode feeding before feeding out parts.

Open Collet Feeding Torque: This represents the maximum possible torque when feeding the bar into the lathe. Larger bars may need higher torque. If the torque is set too high for thin bars, it is possible to bend the bar and subsequently break a tool during machining.

Open Collet Speed: This represents the speed that the bar will be fed into the lathe.

Manual	Chuck Close	Bar Change	POS	0.000	Inch

Manual

Open Collet Timeout — 0.00 Sec

Remnant Check — Check For Remnant

Check First Feedout — No

Currently Loaded Part

Save And Load Part   Restore Unsaved Changes

?   ?

Part Menu

Factory Menu

Admin

Alarm Log

Commonly Used | Additional Feed Lengths | Lengths / Distance | Torques / Speeds | Misc | Part Selection
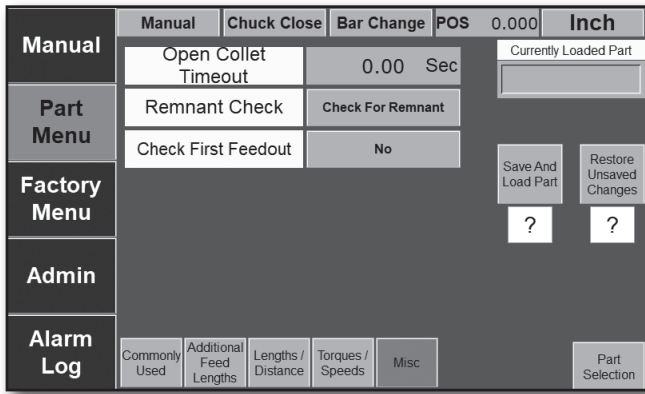
Open Collet Timeout: When the bar feeder is in automatic, if the lathe collet is open for longer than the open collet timeout, the bar feeder will alarm out.

Remnant Check: By choosing Check for Remnant, when the pusher returns to do a bar change, the grippers will verify that a remnant is left in the bar feeder collet and not in the lathe or channel. Do Not Check For Remnant is used when either a loose-fitting collet or no collet is used to eject the part out of the front of the lathe with a new bar. The bar feeder will not alarm out when no bar is detected by the grippers.

Check First Feedout: Ignores longfeed and shortfeed safeties on the very first feedout when going intoo automatic. This is mostly intended for swiss machines that do an initial cutoff when going into automatic after the z axis was moved. This option is disabled when feeding into position.

8.2 Parameter Pages and Definitions: Factory Menus

Manual	Chuck Close	Bar Change	POS	0.000	Inch

Manual

MCode No — ?

Headstock Type Swiss — ?

Do Not Feed After EOB — ?

End of Bar Type (Off at Bar Change) — ?

Feed Confirm Type (Not Used) — ?

MAVD With Collet — ?

AVD With Collet — ?

Part Menu

Factory Menu

Admin

Alarm Log

Factory Modes | Positions | Speeds | Torques | AVD/ MAVD | Pulses/ Delays | MISC | Save / Delete Changes
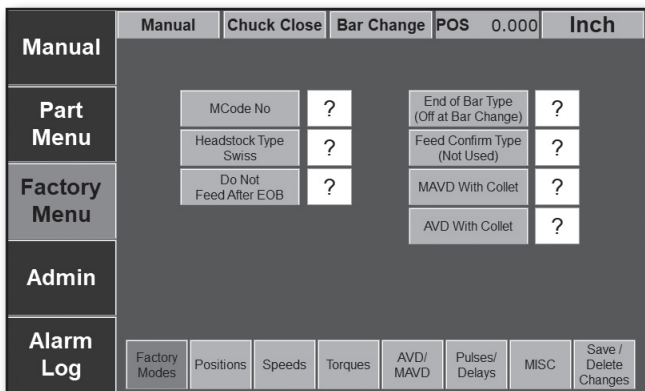
MCode Yes/No: MCode Feed commands the bar feeder to feed the bar. If MCode is set to yes, when the collet opens, the bar feeder will require the MCode feed signal (sent from the lathe) to feed a part. If MCode is set to no, the bar feeder will feed as soon as the collet opens (as long as the feed stop signal is off).

Headstock Type Swiss/Fixed: This sets the type of lathe the bar feeder is connected to, enabling/ disabling the synchronization system, and makes other changes to the bar feeder.

Do Not Feed After EOB: When set to Feed After EOB, this leaves the lathe in charge of when to change the bar. The bar feeder will keep feeding parts until the lathe sends the bar change signal. This is normally not recommended but can be useful if the lathe does not have a second EOB signal.

End of Bar Type: Pulse enables the pulse timer for the end of bar. Latch, which is used for most lathes, turns the end-of-bar signal on until the bar change is complete. Double Pulse does 2 pulses instead of one to improve signal reliability on lathes where a single pulse is unreliable (extending the pulse timer can also help). Off at Bar Change sends the signal until the lathe responds with a bar change signal, then shuts off the end-of-bar signal.

MAVD With/Without Collet: MAVD With Collet indicates the MAVD will open and close with the lathe collet signal. MAVD Without Collet indicates the MAVD will always remain closed.

AVD With/Without Collet: AVD With Collet indicates the AVD will open and close with the lathe collet signal. AVD Without Collet indicates the AVD will always remain closed.

Max End of Bar Position: This is the maximum position of the pusher when feeding the bar into the lathe. It is used to ensure that the chuck jaws are gripping enough material to machine a new part.

Facing Distance: This is the distance from the measurement flag to the face of the lathe collet or chuck. If there is a value entered in Facing Length (Part Menu), that will extend this position.

Prefeed Position: This is the position to which the prefeed pusher will advance each new bar to be gripped and pressed onto the pusher collet.

Facing Slowdown Distance: At this position, the bar will start feeding slower before tripping the measurement flag to ensure a more accurate position of the bar in the spindle, and to help with feeding reliability.

Pullout From Lathe Distance: This is the distance the pusher will retract in a slower and higher torque state to get the bar sufficiently out of the spindle before pulling back at bar change return speed.

Oil Pump Shutoff Position: This is the position to shut off the oil pump. This position should be after the pusher collet has moved past the guide channels. Setting this position too far could result in undesired oil transfer to the lathe.

Front of Prefeed to Measure Flag Distance: This is the distance between the front of the prefeed pusher at the prefeed position and the measurement flag. This value is needed to calculate the bar length. This can be adjusted by small amounts if the bar length is slightly off to compensate for differences in sensors.

Prefeed Slowdown Distance: This is the distance before the prefeed position where the bar feeder will slow down the prefeed pusher to prevent the bar sliding in the channel. This helps to ensure the accurate measurement of a newly loaded bar.

Pusher Length: This parameter is the length of the pusher. It is used to help make the bar measurement more accurate. This value is measured from the tip of the pusher to the front of the prefeed pusher.

Pushback Collet Open: When the collet is open, if the pusher is forced back more than this amount, the bar feeder will alarm out. A value of zero will ignore this alarm. It is mostly used for Swiss-type applications.

Pushback Collet Closed: When the collet is closed, if the pusher is pushed back further than this amount, the bar feeder will alarm out. A value of zero will ignore this alarm. It is used exclusively for fixed headstock applications.

Manual Speed: While in manual mode, this is the speed the pusher will move when the left/right arrow buttons on the handheld pendant are pushed.

Bar Change Return Speed: After the lathe sends the bar change command, the pusher will travel to the Home reference position at this speed.

Bar Measure Speed: This parameter controls the speed at which the bar will be measured as it trips the measurement flag. Slower is more accurate. After the bar is measured, the (prefeed) pusher will change to the facing speed.

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Manual	Chuck Close	Bar Change	POS	0.000	Inch

Facing Speed	0	%
Homing Speed	0	%
Pullout From Lathe Speed	0	%

Factory Modes | Positions | Speeds | Torques | AVD/ MAVD | Pulses/ Delays | MISC | Save / Delete Changes

Manual | Part Menu | Factory Menu | Admin | Alarm Log

Facing Speed: This is the pusher speed before the bar reaches a point it can be measured (controlled by maximum bar length) and after a bar has been measured.

Homing Speed: This is the speed the pusher travels when trying to find the Home reference position. Slower speed prevents the pusher from slamming into the back of the machine.

Pullout From Lathe Speed: When executing a bar change, the bar feeder will pull out the remnant from the lathe at this speed before moving at the bar change return speed. This ensures that the remnant does not come off the pusher collet during remnant extraction.

Manual	Chuck Close	Bar Change	POS	0.000	Inch

Manual Pusher Torque	0	%
Pullout From Lathe Torque	0	%
First Insert Torque	0	%
Return Torque	0	%
Insertion / Extraction Torque	0	%

Factory Modes | Positions | Speeds | Torques | AVD/ MAVD | Pulses/ Delays | MISC | Save / Delete Changes

Manual | Part Menu | Factory Menu | Admin | Alarm Log

Manual Pusher Torque: This is the max torque the pusher will exert when doing manual moves.

Insertion / Extraction Torque: This is the torque used to assist the cylinder during insertion and extraction.

Pullout From Lathe Torque: When pulling the remnant out of the lathe, the bar feeder will use this torque until the pusher has pulled back the distance entered in the pullout from the lathe distance parameter (see Factory Menu).

First Insert Torque: This is the torque used when a new bar is pushed through the lathe collet after a bar change.

Return Torque: This is the torque used when the pusher is returning home.

Anti-Vibration Opening Position: At this position, the first AVD will open. This position should be before the pusher collet reaches the first anti-vibration device.

Anti-Vibration Reclose Position: At this position, the AVD will reclose on the pusher. This stabilizes the pusher and helps reduce vibration. This position should be after the pusher collet passes fully through the AVD.

Moveable Anti-Vibration Opening Position: At this position, the MAVD will open. This should be before the pusher collet reaches the MAVD.

Moveable Anti-Vibration Reclose Position: At this position, the MAVD will reclose on the pusher. This stabilizes the pusher and helps reduce vibration. This position should be after the pusher collet passes fully through the MAVD.

1st Channel Opening Position: Set the opening position of the first channel.

2nd Channel Opening Position: Set the opening position of the second channel.

3rd Channel Opening Position: Set the opening position of the third channel.

Manual					
Part Menu	Cycle Start Pulse Timer (0 = Latch)		0.0	Sec	
	Feed Confirm Pulse Timer		0.0	Sec	
Factory Menu	End of Bar Pulse Timer		0.0	Sec	
	Collet Open Signal Delay		0.0	Sec	
Admin	Collet Close Signal Delay		0.0	Sec	
Alarm Log					
	Factory Modes	Positions	Speeds	Torques	AVD/ MAVD	Pulses/ Delays	MISC	Save / Delete Changes

Cycle Start Pulse Timer: This sets the amount of time to keep on the cycle start signal. 0 is latch. The bar feeder will wait for the collet to close before turning the signal off.

Feed Confirm Pulse Timer: This sets the amount of time to keep on the feed confirm signal. 0 is latch. The bar feeder will wait for the collet to close before turning the signal off.

End of Bar Pulse Timer: This sets the amount of time to keep on the end-of-bar signal. Most lathes use a latch and not a pulse, so this should usually be 0 (latch). When set to 0, the bar feeder will wait for the collet to close before turning the signal off.

Collet Open Signal Delay: The bar feeder will delay the collet open signal it receives from the lathe.

Collet Close Signal Delay: The bar feeder will delay the collet close signal it receives from the lathe.

Manual					
Part Menu	Max Pecking Cycles		0	Cycles	
Factory Menu					
Admin					
Alarm Log					
	Factory Modes	Positions	Speeds	Torques	AVD/ MAVD	Pulses/ Delays	MISC	Save / Delete Changes

Max Pecking Cycles: When feeding the bar into the spindle, if the bar feeder detects the bar is stuck, it will "peck" the bar the number of times in this parameter by repeatedly backing up and pushing again. If the bar is still stuck after pecking this many times, the bar feeder will alarm out.
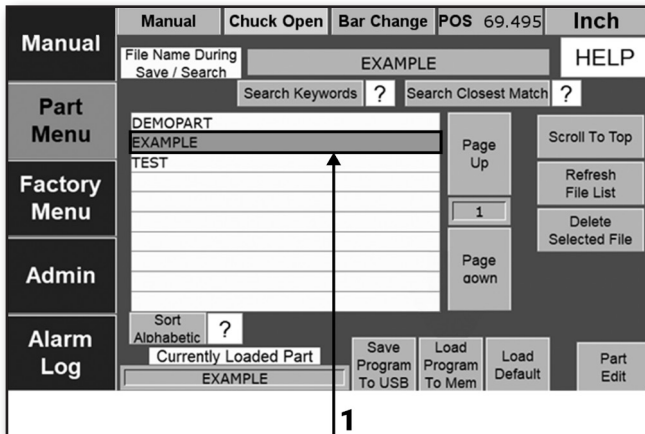
Select a part from the Part Menu. (**1**)
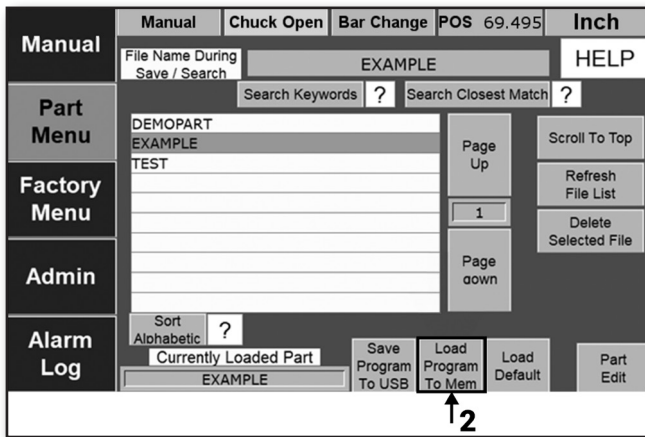
Press "Load Program to Mem." This copies the part from the USB drive into the PLC memory. (**2**)
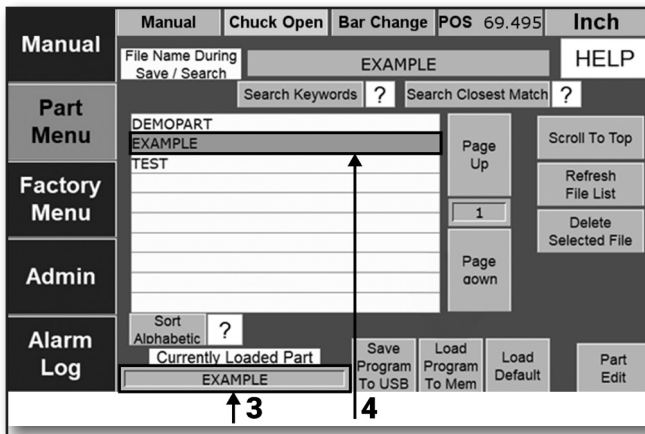
The "Currently Loaded Part" (**3**) will update to show the part that was just loaded. (**4**)
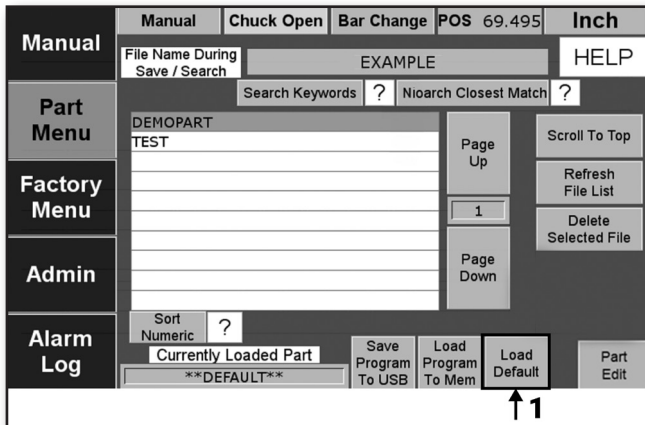
Press "Load Default." This will load parameters for the default part that was created after the machine was installed. The default part can be changed from Admin -> Save Default Part. (**1**)
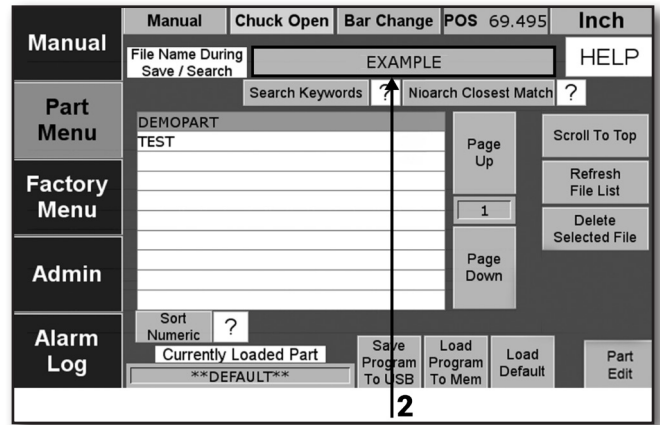
Enter the name you want the part to be called. (**2**)
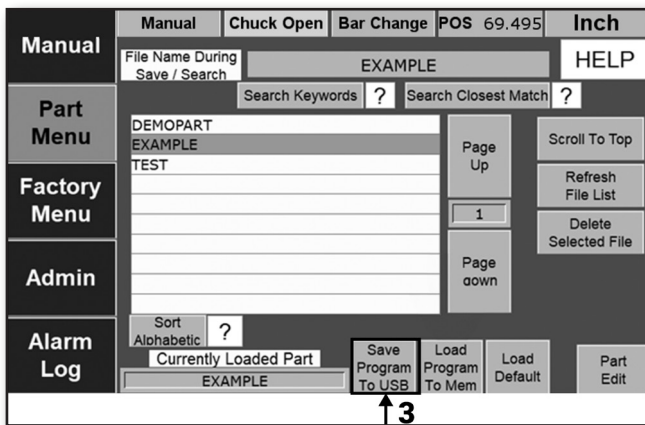
Press "Save Program to USB." This will create a part file on the USB drive with the name entered. (**3**)
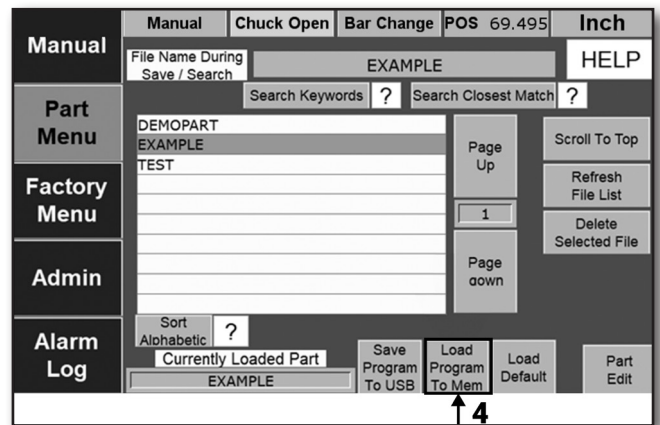
Press "Load Program to Mem." This will load the newly created part file into the PLC. (**4**)
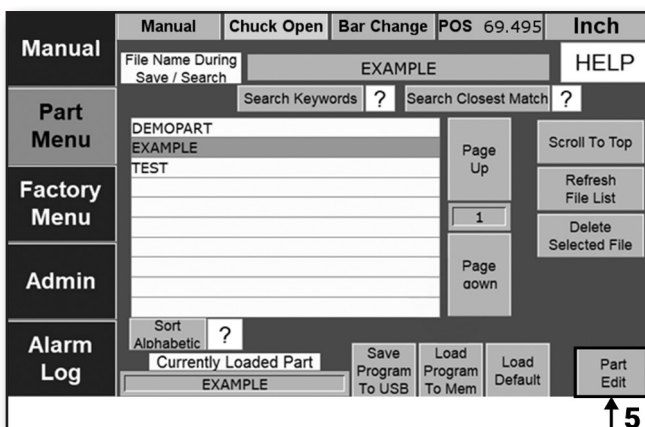
Press "Part Edit." (**5**)
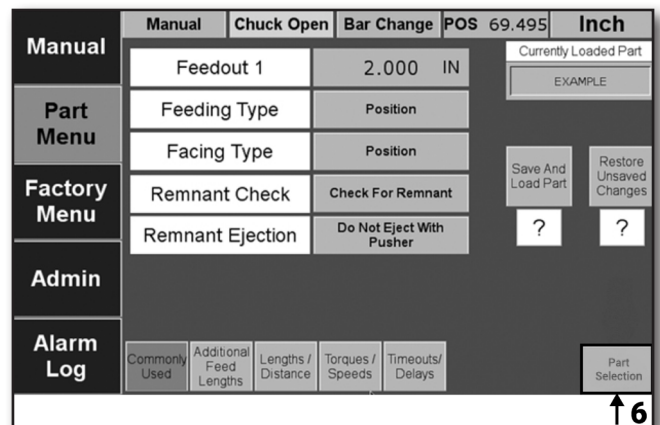
Edit your part parameters. Notice a red message "Current Part Not Saved." Press the "Save and Load Part" button. This will save the part to the USB drive as well as update the part in the PLC. (**6**)
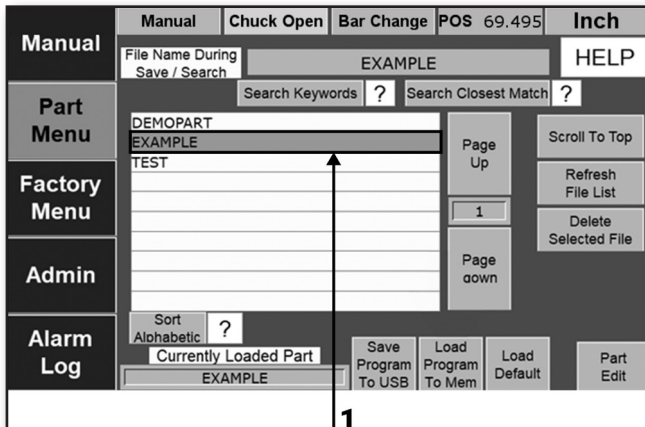
Select a part from the Part Menu. (**1**) If the part is already loaded, skip to step 4.
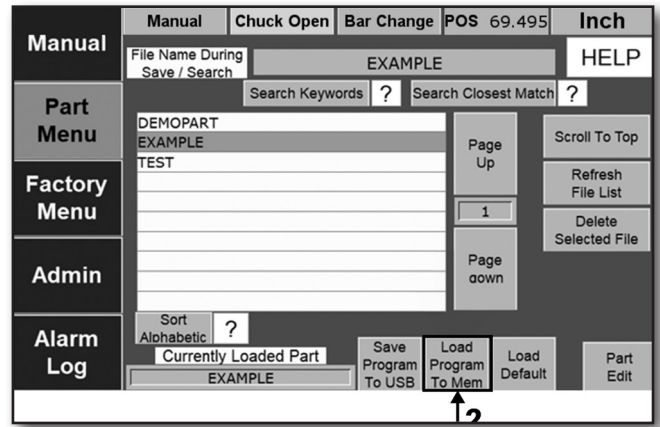
Press "Load Program to Mem." This copies the part from the USB drive into the PLC memory. (**2**)
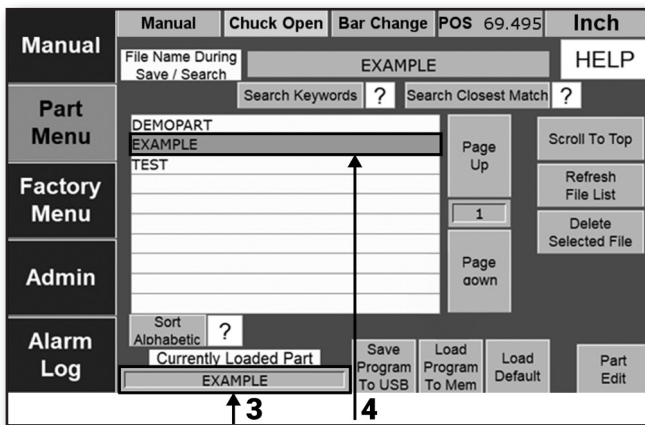
The "Currently Loaded Part" will update (**3**) to show that the part that was just loaded. (**4**)
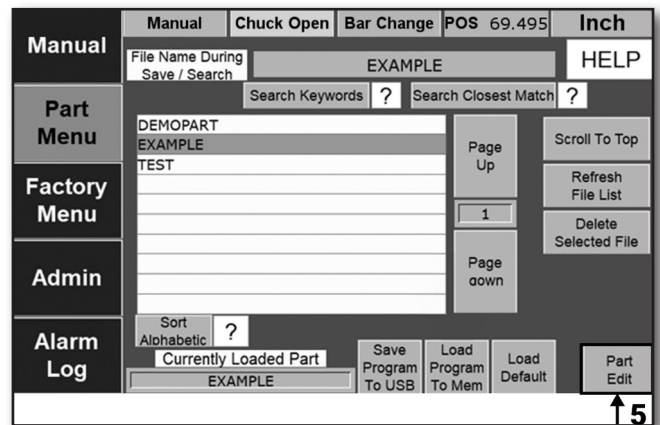
Select Part Edit. (**5**)
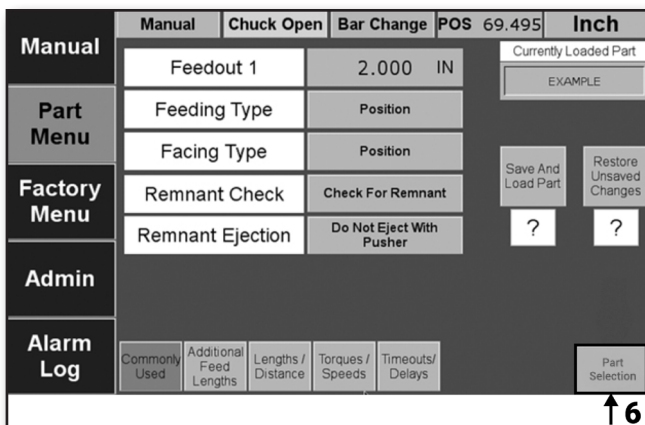
Edit your parameters. Select Part Selection. (**6**)
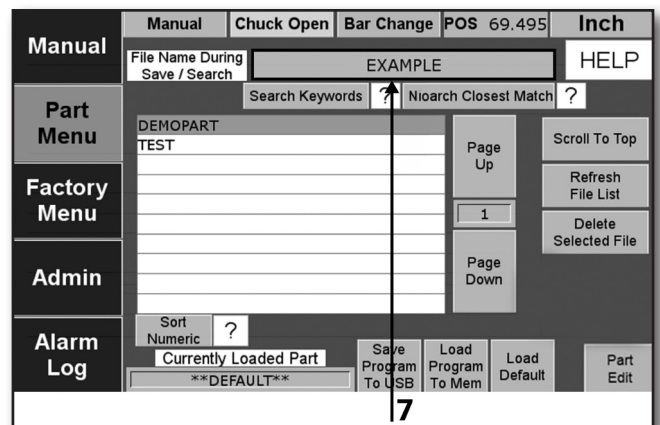
Enter the name of your new part. (**7**)
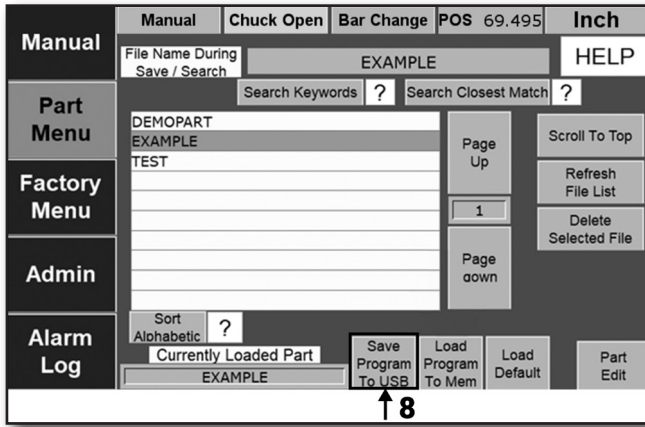
Press "Save Program to USB." (**8**)
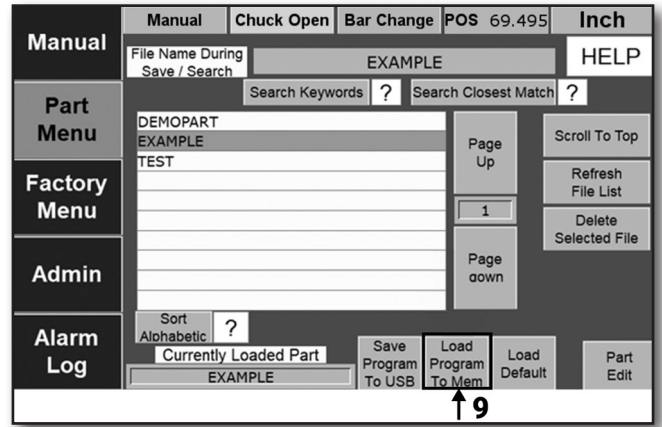
Press "Load Program to Mem." (**9**)

8.6 Parameter Pages and Definitions: Admin Menus

Level	Password
0	00000000
1-Part Loading	258
2-Part Edit	235
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10. Alarms

10.1 Alarm Table

<div style="border:1px solid">⚠ DANGER</div>

Only a qualified electrician or serviceman should perform electrical troubleshooting or maintenance to this equipment.

Alarm Name	Possible Cause	Sensor
Emergency Stop	The E-stop is pressed in, or the green button has not been pressed since power up. • Make sure the lathe is not in alarm other than a bar feeder alarm. • Release E-stop on the bar feeder pendant. • Release E-stop on the bar feeder control panel. • Press green button. • Ensure synchronization switches are not pressed. • Some applications require power cycling both machines to clear Emergency Stop.	E-stops ES1 and ES2. Synchronization Switches LS41 and LS51.
Bar Too Long	The bar feeder measured a bar that was longer than the maximum bar length parameter (see Part Menu, Section 8.1). • Ensure the measurement sensor is working properly. • Verify the Max Bar Length parameter is set correctly.	Measurement flag sensor S02.
Pusher Stall	In manual operation, the pusher has stalled. • Press E-stop and clear the jam. Release E-stop and press green button.	
Lathe Alarm	The lathe is in alarm. • Attempt to clear the lathe's alarm condition.	
No Bar Detected	No bar was detected by the grippers, or by the measurement flag. • If a bar is present, but not being detected, remove air pressure, and then check functionality of gripper sensor or measurement flag sensor.	Measurement flag sensor S02 Gripper sensor S07
Pusher Could Not Find Home Switch	During the Home reference, the pusher moved home and hit the hard stop, but the home sensor did not detect it. • Check functionality of home sensor. • If the pusher is stuck, remove air pressure. Then investigate the jam and increase homing torque if needed.	Home sensor S01
Home Could Not Be Reached	The pusher tried to move home, but the home sensor did not detect it. • Check functionality of home sensor. • Remove air pressure, then check for a jam. Possibly increase the return torque (see Factory Menu, Section 8.2).	Home sensor S01

Alarm Name	Possible Cause	Sensor
Servo Alarm…	This alarm indicates the Servo drive is in alarm. The alarm message will also display the script item that was executed when this alarm occurred. For example, "Servo alarm move facing" indicates an alarm occurred during the move to facing position. This is useful for troubleshooting. • On the alarm screen, select the alarm and then press the alarm info button for more information about the specific reason a given Servo alarm occurred.	
HMI Script Not Running	The HMI script has crashed, please contact Edge Technologies	
No USB Drive Plugged In	The HMI requires a USB drive to function.	
Illegal Character in File Name	Revise the file name with acceptable characters.	
Lathe Alarm	The lathe is in alarm. • Attempt to clear the lathe's alarm condition.	
Failed to Load Default Part	There is no default part saved on the USB drive. • To save a default part, press "save default part" in the Admin Menu (see Admin Menu, Section 8.3).	
Feed Length Is Zero	No value has been entered for the feed length parameter. • Enter a value for the feed length parameter.	
Remnant Did Not Drop	A bar is still being detected in the grippers after the remnant extraction. • Check for a tight pusher collet, material slipping in the grippers, or inadequate air pressure. • Ensure that Part Length (see Part Menu, Section 8.1) and Max End of Bar (see Factory Menu, Section 8.2) are set correctly. • Check functionality of gripper sensor.	Gripper sensor S07
No Material Detected by Grippers	Material should be detected by grippers but wasn't. • Ensure a remnant is not left in the spindle or in the guide channel. • If the magazine is empty, put more bars in the magazine. • If there is material present which is not being detected, remove air from the machine and check the functionality of gripper switch. • When using a front eject collet, this alarm can be disabled during remnant extraction by setting the remnant check parameter to "Do Not Check For Remnant" (see Part Menu, Section 8.1).	Gripper sensor S07
Bar Too Short	The bar measured is shorter than the value entered in the minimum bar length parameter (see Part Menu, Section 8.1), or less than 3". • Ensure the measurement flag sensor is working properly.	Measurement flag sensor S02
Set Position Error	PLC could not command a set position to the Servo drive. Please contact Edge Technologies.	
Script Search Failed	There's a problem with the script. Please contact Edge Technologies.	
Change Torque Failed	PLC could not command a torque change to the Servo drive. Please contact Edge Technologies.	

Alarm Name	Possible Cause	Sensor
Change Torque Failed	PLC could not command a torque change to the Servo drive. Please contact Edge Technologies.	
Failed to Load Default Factory	Factory default does not exist on the USB drive. Please contact Edge Technologies.	
Air Pressure Too Low	The compressed air is too low on the air regulator. • Ensure adequate air pressure is applied to the machine. At least 80 PSI is required to run the bar feeder. • The dial on the side of the pressure sensor needs to be adjusted.	Air pressure sensor S09
Short Feed Safety	The pusher didn't reach the expected feedout distance.	
Long Feed Safety	The pusher exceeded the expected feedout distance.	
Failed Auto Check	Conditions to go into auto were not met. • Go to the manual screen and press the auto check button to see which conditions were not met.	
Hood Open Alarm	The hood has been opened during a movement that is not allowed with the hood open. • Close the hood or check the functionality of the hood safety switch.	Hood Safety Switch S08
Pecking Limit Exceeded	Pecking cycles have exceeded the value entered in max pecking cycles (see Factory Menu, Section 8.2). • Clear any obstruction in the spindle. Utilize slow rpm spindle rotation during bar change. • Verify collet fits in the spindle. • Verify pusher fits in the spindle.	
Machine Lockout in Less Than Five Days	Contact Edge Technologies.	
Extraction Failed	The pusher did not retract to the expected position during the remnant pull off. • Remove air pressure before investigating. • Ensure that the pusher collet is not too tight, and that no burrs are present on bar stock. • Check air cylinder functionality. • Check extraction sensor functionality.	Extraction sensor S06
Insertion Failed	Pusher did not reach expected position during insertion. • Check prefeed position (see Factory Menu, Section 8.2). • Ensure that the pusher collet is not too tight, and that no burrs are present on bar stock. • Remove air pressure and verify air cylinder functionality.	
Extraction Cylinder Forward	The bar feeder attempted to open the channel with the extraction cylinder forward. • Clear the alarm by pushing the introduction / extraction button on the pendant, then press open channel button.	
Waited Too Long for Hood to Close Bar Change	After a bar change signal is sent, if the hood is open, the bar feeder will wait two minutes before alarming out. • Close the hood. Do a bar off, bar on, and then start back in auto.	

Alarm Name	Possible Cause	Sensor
Lathe Not in Auto with Collet Open	When the lathe is taken out of auto and the collet is opened, the bar feeder will alarm out to prevent feeding. • If the lathe was in auto, verify the lathe auto signal.	
Position Lost, Home Bar Feeder	If the pusher is moved while the bar feeder is powered off, the position will be lost. This requires a Home reference. • Press the Home reference button on the manual screen.	
Servo re-enable failed	Communication between the PLC and servo motor lost. • Power cycle bar feeder. If the alarm remains, call Edge Technologies.	
Default Part File Does Not Exist	There is no default part saved on the USB drive. • To save a default part, press "save default part" in the Admin menu (see Admin Menu, Section 8.3).	
Default Factory File Does Not Exist	Factory default does not exist on the USB drive, please contact Edge Technologies.	
Failed Auto Check	Conditions to go into auto were not met. • Go to the manual screen and press the auto check button to see which conditions were not met.	
Already at Zero When Homing	The Home reference was executed while the pusher was already home. • Jog pusher forward, then hit the Home reference button.	
Lathe Alarm	The lathe is in alarm. • If the lathe is not in alarm, check the interface wiring.	
Pushback Limit Exceeded	The value in either pushback collet open or pushback collet closed has been exceeded. • Ensure proper lathe collet tension. • Check for burrs on the bar stock.	
Pusher Not at Zero When Grippers Activated	The gripper button the on pendant was pressed while the pusher was not at zero. • Jog the pusher home, then press the gripper button on the pendant.	
Measurement Flag Triggered Before Expected	The measurement flag tripped before an attempt was made to measure a bar. • Verify measurement flag sensor functionality. • Verify functionality of air cylinder for measurement flag.	
Test Alarm	The test alarm button was pressed in the admin menu (see Admin Menu, Section 8.3).	
Negative Parts Remaining	The calculated parts remaining are a negative number. This indicates improperly set parameters. Please contact Edge Technologies.	
Bar Length Longer Than Facing Length	This indicates improperly set parameters. Please contact Edge Technologies.	
Lathe Door Open	• If the lathe door is closed, check wiring. • Service parameters (see Admin Menu, Section 8.3) can disable lathe door safety if the signal is not provided by the lathe	

Alarm Name	Possible Cause	Sensor
Chuck Closed Before Feedout Finished	The chuck closed before the pusher could reach the expected position for a feedout. • Increase the dwell time in the lathe program. • Ensure the feed confirm signal is not backwards.	
Chuck Close During Bar On	Open the chuck, then press bar on.	
Attempted Production Restart with Preload Bar	This is specifically related to ethernet connectivity. Please refer to the Fanuc FOCAS manual.	
Commit Did Not Shut Off	This is specifically related to ethernet connectivity. Please refer to the Fanuc FOCAS manual.	
Lathe Command Part Number is Zero	Factory default does not exist on the USB drive, please contact Edge Technologies.	
No Part Found with Commanded Number	This is specifically related to ethernet connectivity. Please refer to the Fanuc FOCAS manual.	
No Machine Type Back-up Exists	Please contact Edge Technologies.	
No Machine Type in PLC	Please contact Edge Technologies.	
PLC IO Module Error	The PLC lost communication to the required IO module. Please contact Edge Technologies.	
Pusher Forced Movement	In manual mode, if the pusher unexpectedly moves, the Servo will turn off. • If you need to manually move the pusher by hand or with the crank handle, first press the pusher disable button in the admin menu (see Admin Menu, Section 8.3).	
Absolute Move Position Not Reached	The Servo drive was commanded to an absolute position, but it did not reach that position. • Check the torque settings. • Make sure no speeds are set to zero.	
CRC Check Failure	The file on the USB drive is corrupted. Please contact Edge Technologies.	
PLC Not in Run Mode	Check the toggle switch for run mode on the front of PLC, under the SD card flap.	
Channel Close Timeout	The channel didn't close after an attempt was made to close it. • Remove air pressure before clearing jams.	
Channel Open Timeout	The channel didn't open after an attempt was made to open it. • Remove air pressure before clearing any jams.	
Failed to Load Default IO Config	Please contact Edge Technologies.	
Change Acceleration Error	Please contact Edge Technologies.	

11. Interface Signal Definitions

Common (from lathe) – This is the 24v DC supply voltage from the lathe for signal sent to the bar feeder control. The voltage cannot be mixed with the bar feeder power supply.

Cycle start (bar change end, program start) – Typically, this is a normally open circuit controlled by the bar feeder Cycle Start/MCode Finish relay. Voltage is supplied by the lathe. This circuit lets the lathe know the bar change is completed and that the lathe should resume the program.

Automatic mode (Automatic mode on, bar feeder ready for work, spindle interlock) – Typically, this is a normally open circuit controlled by the bar feeder. Voltage is supplied by the lathe. This supplies the lathe with the bar feed automatic signal. If the bar feeder safety circuit is open, the bar feeder will not go into Automatic mode.

End of bar (bar end, block delete, program stop) – Typically, this is a normally open circuit controlled by the bar feeder end-of-bar relay. Voltage is supplied by the lathe. This circuit is closed once the bar feeder has determined the current bar is too short to produce any more parts.

Bar feeder on – Typically, this is a normally open circuit controlled by the bar feeder alarm relay. Voltage is supplied by the lathe.

Lathe Emergency Stop (MC ready) – Voltage is supplied by the bar feeder, and control is performed by the lathe. When this circuit is opened, it will stop bar feeder operation.

Common (from bar feeder) – This is the 24v DC supply voltage from the bar feeder used for signals sent to the lathe control. The voltage cannot be mixed with the lathe power supply.

Lathe manual/auto – Typically, this is a normally open circuit controlled by the lathe. Voltage is supplied by the bar feed. This circuit can be bypassed if necessary.

Bar change (end of cycle) – Typically, this is a normally open circuit controlled by the lathe. Voltage is supplied by the bar feed. This circuit is closed once the lathe has received the end-of-bar signal from the bar feed and the lathe is machining the last part from the current bar.

Chuck/collet open – Typically, this is a normally open circuit controlled by the lathe. Voltage is supplied by the bar feed common.

Feed/torque stop - Typically, this is a normally open circuit controlled by the lathe. Voltage is supplied by the bar feed common.

Door safety – Typically, this is a normally open circuit controlled by the lathe. Voltage is supplied by the bar feed common. The signal prevents the bar pusher from feeding in Automatic mode if the door is open.

Bar feeder Emergency Stop – Voltage is supplied by the bar feeder, and the control is performed by the lathe relay. When this circuit is opened, this will stop bar feeder and lathe operation.

Power supply – The power supply serves as the supply voltage to the bar feeder from the lathe, usually 3 phase 200v-220v, nominal voltage 208v. In some applications, the supply voltage at the customer may be 440v. In this application, a transformer will be required before electrical connection can be made. Catastrophic electrical damage can occur to the bar feeder if a transformer is required but not present.

Common (from lathe) - Voltage is sent from the lathe to power relays in the bar feeder.

Cycle Start - Cycle start is used to answer a latched MCode from the lathe. Typically, this signal is for acknowledging that material has been loaded during a bar change or pushed to position during feeding cycles. This MCode is usually for the bar change cycle or sometimes can be used to answer the feed stop (torque stop).

Automatic mode (Automatic mode on, bar feeder ready for work, spindle interlock) - When wired, this signal ensures that the lathe does not run without the bar feeder in Automatic mode. The lathe will react in other ways when the automatic signal from the bar feeder is not being sent. Some lathes generate an alarm when the lathe is put into "memory mode," or a spindle interlock alarm may show up when attempting to rotate the spindle, or a "bar feeder torque off" alarm may show.

End of bar (bar end, block delete, program stop) — The end-of-bar signal is sent from the bar feeder to the lathe. The lathe needs to know that the bar feeder has reached the specified limit position of the pusher. This position is set in the bar feeder factory settings. The signal can be sent multiple ways at different durations.

Bar feeder on - This signal is typically used as a bar feeder alarm to the lathe. If the lathe always receives a signal that the bar feeder is in alarm, it will show a message saying that the bar feeder is in alarm. If set correctly, the alarm state of the bar feeder and the lathe should correspond to each other.

Lathe emergency stop (MC ready) - This signal is incredibly important. The signal sends the bar feeder voltage out to a relay in the lathe. The voltage should be returned to the bar feeder unless the lathe is in Emergency Stop.

Bar feeder common - The bar feeder common will be sent to a relay in the lathe. When the lathe relay is fired it will allow the corresponding signal to be seen by the bar feeder. If no signals are coming through from the lathe to the bar feeder, it could be that the common is not being sent back. This could be because of a wiring issue. It could also be that the bar feeder interface is not turned on in the lathe.

Lathe manual/auto — Edge Technologies products typically use this to limit feeding. If the bar feeder does not see the lathe automatic signal, it will not feed material when the collet opens.

Bar change (end of cycle) - This signal typically corresponds with an MCode from the lathe. Usually, the MCode will be used to send a bar change signal to the bar feeder. When this signal is sent, if properly set up, the lathe should latch to this MCode until it receives "cycle start" from the bar feeder.

Chuck/collet open - The chuck open signal lets the bar feeder know that the main spindle clamp is open or closed. When the bar feeder is in Automatic mode and it receives the collet open signal, it will feed at a fixed speed and torque (that is, if all restrictions are satisfied, including torque stop, lathe automatic, and door safety).

Feed stop - This signal is used to stop the bar feeder from pushing when the bar feeder is in Automatic mode and the collet is open. It can also be used in the opposite way: that it does not push at all until the bar feeder is in Automatic mode, the collet is open, and the feed stop is given. In this instance, it would be used as an MCode feed. Feed stop is generally used in the bar change process so that the bar feeder does not push before it pulls remnant out of the collet.

Door safety - This signal is from the lathe door safety. If the lathe door is open, then the bar feeder should not be able to feed forward. This can also be used like a feed stop depending on the lathe and bar feeder.

Bar feeder Emergency Stop - Signal will be sent to the lathe to generate Emergency Stop on the lathe.

Power supply — Always check voltage at the lathe plug before the bar feeder is plugged in. The bar feeder plug wiring should also be checked to the wiring print supplied with the bar feeder. Check the wiring of the bar feeder plug, check that the lathe voltage is on the same pins as the plug, and check that the voltage of the lathe is proper and does not fluctuate beyond safe operating voltage.

12. Workholding or Service

Edge Technologies is proud to have partnered with Schlenker Spannwerkzeuge for nearly 15 years, supplying workholding needs for bar feeders and lathes.

View the Edge catalogue at https://edgetechnologies.com/schlenker-collets/. Contact the Edge Technologies Parts Department by calling (314) 810-3959 or emailing orderdesk@edgetechnologies.com.

Direct service questions to (314) 810-3927 or edgehelp@edgetechnologies.com.

Edge Technologies' hours of operation are Monday-Thursday, 7:30 a.m. to 5 p.m. CST, and Friday, 7:30 a.m. to 4 p.m. CST. Contact the main phone at (314) 692-8388.

For helpful tutorials, visit our Edge-U-Cation resource library at https://edgetechnologies.com/videos/.

13. Index

NO.	PART NO.	CODE	NAME
1.	J212052	MT1	SCHNEIDER SERVO MOTOR - 400W
2.	J310413	S06	EXTRACTION SENSOR
3.	J310413	S01	HOME SENSOR
4.	A12140100	S05	INTRODUCTION SENSOR
5.	J310409	S04	CHANNEL CLOSE SENSOR
6.	J310409	S03	CHANNEL OPEN SENSOR
7.	J310403	S07	GRIPPERS SWITCH
8.	P76202000	MT2	OIL PUMP
9.	J310705	S51	POWER ON
10.	J310704	ES1	EMERGENCY STOP
11.	J210519	HMI	HUMAN MACHINE INTERFACE 7"
12.	JVC01B202		HANDHELD PENDANT (OPERATION BOX)
13.	J312500	S02	MEASUREMENT FLAG SENSOR
14.	J312544		7M CABLE
15.	P43201000	CL	SYNCHRONIZATION
16.	J311801	S08	HOOD SAFETY SENSOR
16.	J630113	HL1	LIGHT TOWER

EDGE TECHNOLOGIES ○○○

BAR FEEDER TYPE					
Minuteman 320 V³					
LATHE NAME		FIRST DATE	REVISION DATE	MAIN VOLTAGE	SIGNAL VOLTAGE
####		2022/11/08	2024/05/10	220V AC 3-PHASE	24V DC
LATHE TYPE		DRAWN BY	CHECKED BY	DESCRIPTION	PAGE
####		LIN		Machine Electrical Locations	P. 01
				DRAWING NO.	VERSION
				JV-EDGE HP II AS-EG	B0

01 02 03 04 05 06
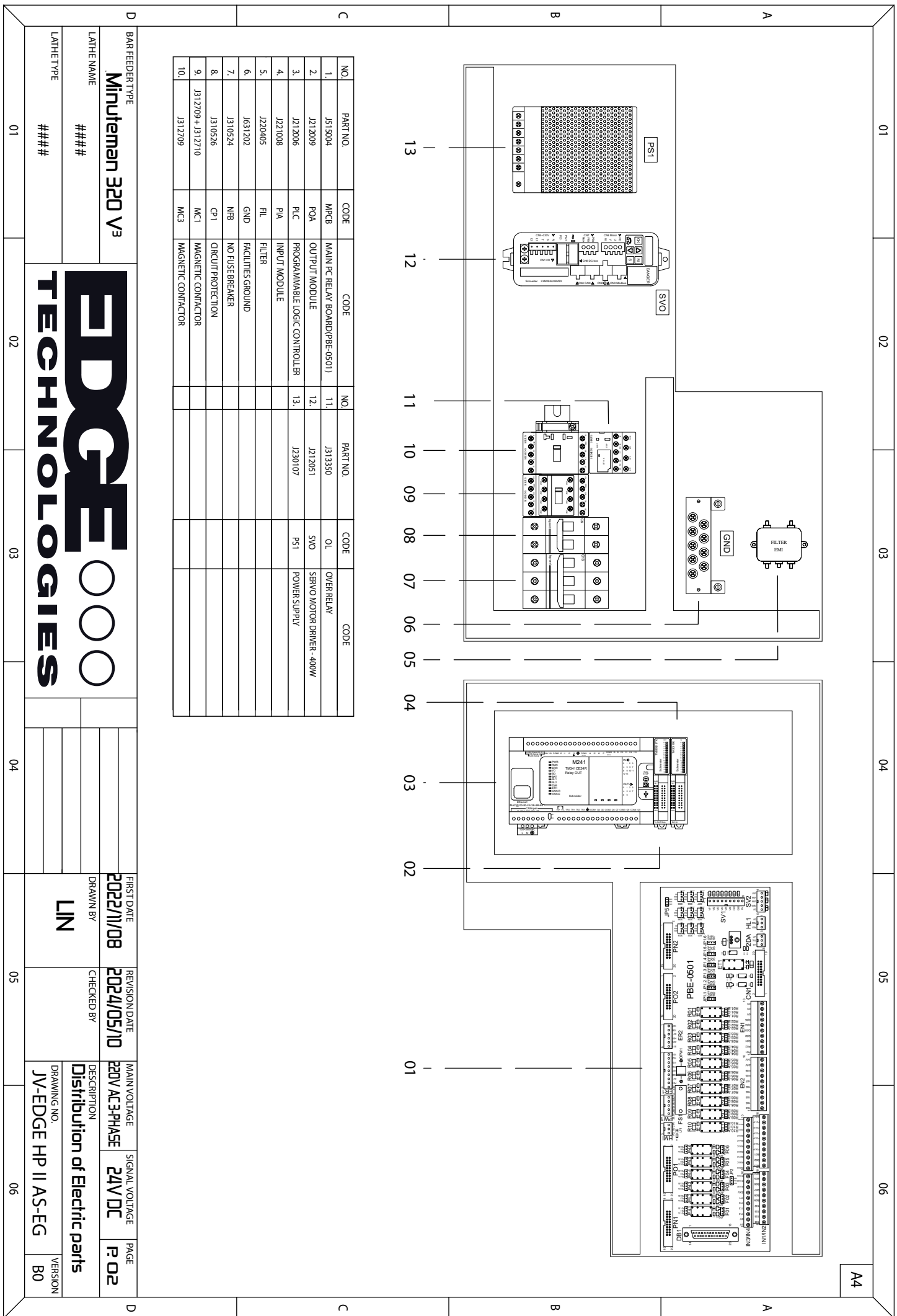
NO.	PART NO.	CODE	CODE
1.	J515004	MPCB	MAIN PC RELAY BOARD(PBE-0501)
2.	J212009	PQA	OUTPUT MODULE
3.	J212006	PLC	PROGRAMMABLE LOGIC CONTROLLER
4.	J221008	PIA	INPUT MODULE
5.	J220405	FIL	FILTER
6.	J631202	GND	FACILITIES GROUND
7.	J310524	NFB	NO FUSE BREAKER
8.	J310526	CP1	CIRCUIT PROTECTION
9.	J312709+J312710	MC1	MAGNETIC CONTACTOR
10.	J312709	MC3	MAGNETIC CONTACTOR

NO.	PART NO.	CODE	CODE
11.	J313350	OL	OVER RELAY
12.	J212051	SVO	SERVO MOTOR DRIVER - 400W
13.	J230107	PS1	POWER SUPPLY

BAR FEEDER TYPE: Minuteman 320 V3
LATHE NAME: ####
LATHE TYPE: ####

EDGE TECHNOLOGIES

FIRST DATE	DRAWN BY	REVISION DATE	CHECKED BY	MAIN VOLTAGE	SIGNAL VOLTAGE	PAGE
2022/11/08	LIN	2024/05/10		220V AC 3-PHASE	24V DC	P. 02

DESCRIPTION: Distribution of Electric parts
DRAWING NO.: JV-EDGE HP II AS-EG
VERSION: B0

RIGHT:

JL01
L01.1 L01 L01.2

LEFT:

JL01
L01.1 L01 L01.2

PGE0502 KEY BOARD

PGE0502 KEY BOARD

1

2

3

4

5

6
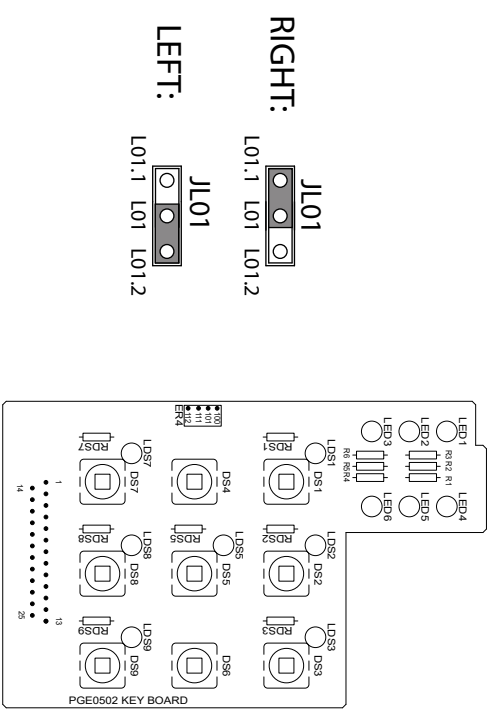
NO.	PART NO.	CODE	NAME
01	J310702	ES2	EMERGENCY STOP
02	AV51BA6600	STICKER	STICKER
03	G9112O5OO	TOP	TOP
04	J515002	HPCB	PCB PGE-0502 (DISTRIBUTION BOX)
05	G9112O6OO	BOTTOM	BOTTOM
06	J420600	CABLE	CABLE

BAR FEEDER TYPE	Minuteman 320 V³
LATHE NAME	####
LATHE TYPE	####

EDGE TECHNOLOGIES ○○○ ○○○

DRAWN BY	LIN
FIRST DATE	2022/11/08
CHECKED BY	
REVISION DATE	2024/05/10
DESCRIPTION	Composition of remote control pendant
MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC
DRAWING NO.	JV-EDGE HP II AS-EG
PAGE	P.03
VERSION	B0

A4

BAR FEEDER TYPE: Minuteman 320 V³

LATHE NAME: ####

LATHE TYPE: ####

EDGE TECHNOLOGIES

(SV1)

VAL6 V06	—01
VAL5 V05	—02
VAL3 V03	—03
VAL1 V01	—05
VAL11 Q02	—07
VAL7 V07	—08
VAL12 Q03	—09
VAL10 Q01	—10

| VAL4 V04 | —04 |
| VAL2 V02 | —06 |

(SV2)

| VAL8 V08 | —11 |

EDGE TECHNOLOGIES

NO.	PART NO.	CODE	NAME
01	J515005	R1~R10 / F01~F06	RELAY
02	J620106	FS1	FUSE
03	J515004	MPCB	MAIN PCB (PBE 0501)

BAR FEEDER TYPE	Minuteman 320 V³
LATHE NAME	####
LATHE TYPE	####

FIRST DATE	2022/11/08
DRAWN BY	LIN
REVISION DATE	2024/05/10
CHECKED BY	
MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC
DESCRIPTION	Main PC board
DRAWING NO.	JV-EDGE HP II AS-EG
PAGE	P. 06
VERSION	B0

PBE-0501

DB1 · PN1 · PO1 · PO2 · PN2 · IN1/IN2 · IN3/IN4
EN1 · EN2 · CN1 · HMI · PW1 · ER1 · ER2
R01–R10 · F01–F06
JP1.1–JP1.6 · JP2.1–JP2.6 · JP3.1–JP3.10 · JP4.1–JP4.6 · JP5
S01–S09 · SV1 · SV2 · 2DA · HL1 · ET1 · FS1

NO.	PART NO.	CODE	NAME
01	A12120100	VAL6	GRIPPERS (V06)
02	A12120100	VAL5	SEPARATORS (V05)
03	A12120100	VAL3	INTRODUCTION (V03)
04	A12120200	VAL4	EXTRACTION (V04)
05	A12120200	VAL1	CHANNEL OPEN (V01)
06		VAL2	CHANNEL CLOSE (V02)
07	A12120100	VAL11	3rd ANTI-VIBRATION (Q02)
08	A12120100	VAL7	1st ANTI-VIBRATION (Q07)
09	A12120100	VAL12	2nd ANTI-VIBRATION (Q03)
10	A12120100	VAL10	4th ANTI-VIBRATION (Q01)
11	A12120100	VAL8	MOVABLE ANTI-VIBRATION (V08)

(SV1)

VAL6	–01
V06	
VAL5	–02
V05	
VAL3	–03
V03	
VAL1	–05
V01	
VAL11	–07
Q02	
VAL7	–08
V07	
VAL12	–09
Q03	
VAL10	–10
Q01	

V04	–04
VAL4	
V02	–06
VAL2	

(SV2)

| VAL8 | –11 |
| V08 | |

EDGE TECHNOLOGIES
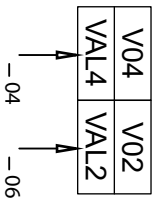
BAR FEEDER TYPE	Minuteman 320 V³			
LATHE NAME	####			
LATHE TYPE	####			
	01	02	03	04	05	06
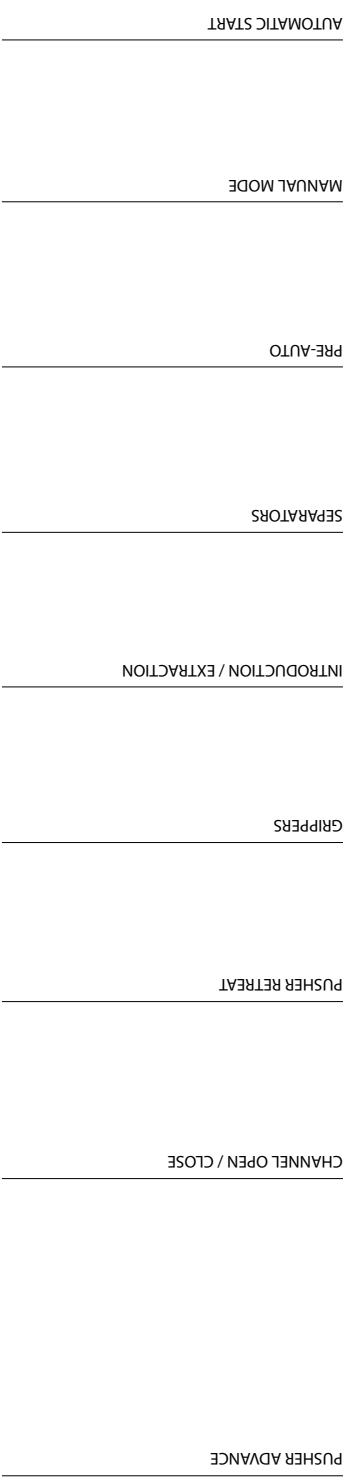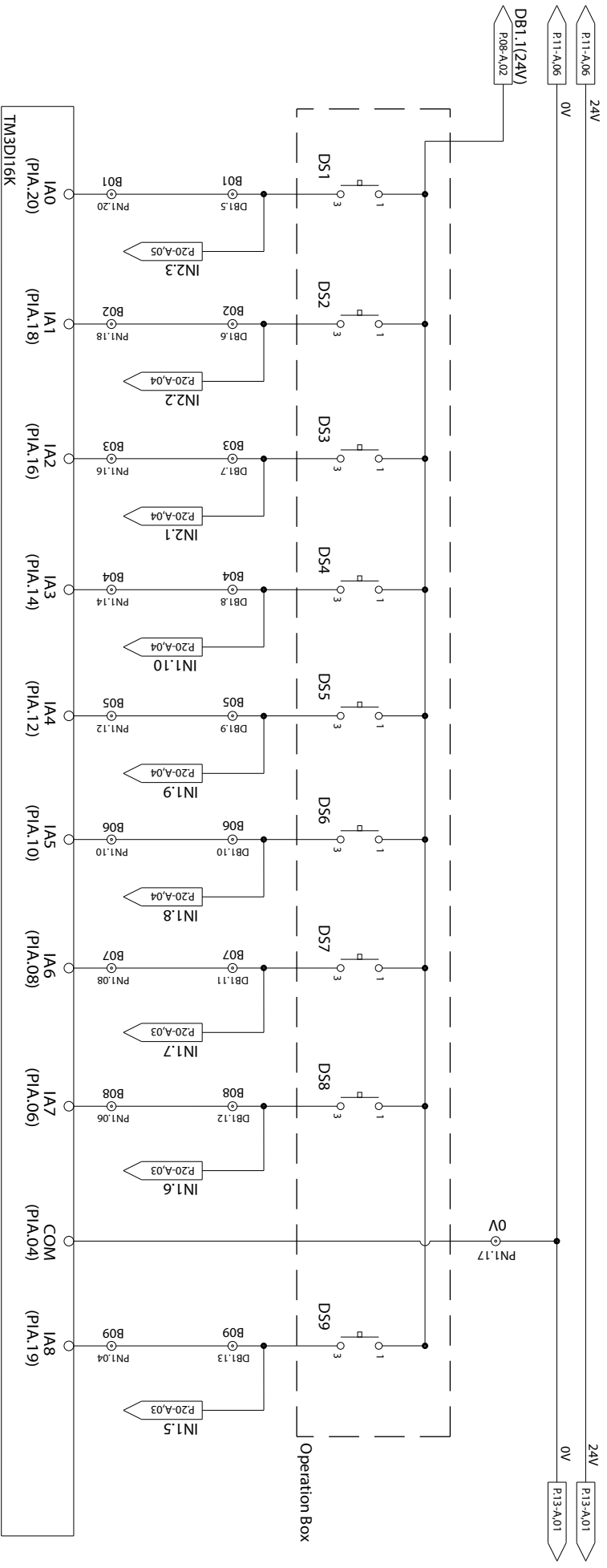
FIRST DATE	2022/11/08	REVISION DATE	2024/05/10	MAIN VOLTAGE	220V AC 3-PHASE	SIGNAL VOLTAGE	24V DC
DRAWN BY	LIN	CHECKED BY		DESCRIPTION	Solenoid valves position		PAGE P.05
				DRAWING NO.	JV-EDGE HP II AS-EG		VERSION B0

EDGE TECHNOLOGIES ○○○

NO.	PART NO.	CODE	NAME
01	J515005	R1~R10 / F01~F06	RELAY
02	J620106	FS1	FUSE
03	J515004	MPCB	MAIN PCB (PBE 0501)

BAR FEEDER TYPE: Minuteman 320 V³

LATHE NAME: ####

LATHE TYPE: ####

FIRST DATE: 2022/11/08

DRAWN BY: LIN

REVISION DATE: 2024/05/10

CHECKED BY:

MAIN VOLTAGE: 220V AC 3-PHASE

SIGNAL VOLTAGE: 24V DC

DESCRIPTION: Main PC board

DRAWING NO.: JV-EDGE HP II AS-EG

PAGE: P.06

VERSION: B0

A4

PBE-0501

DB1 PN1

IN1/IN2
IN3/IN4

HMI
FS1
PW1
ER1
ER2

PO1
PO2
PN2

JP5

CN1
EN1
EN2

2DA
HL1
SV1
SV2
ET1

F01 F02 F03 F04 F05 F06

R01 R02 R03 R04 R05 R06 R07 R08 R09 R10

S01 S02 S03 S04 S05 S06 S07 S08 S09

BAR FEEDER TYPE
Minuteman 320 V³

LATHE NAME
####

LATHE TYPE
####

01

EDGE○○○
TECHNOLOGIES

FIRST DATE
2022/11/08

DRAWN BY
LIN

REVISION DATE
2024/05/10

CHECKED BY

MAIN VOLTAGE
220V AC 3-PHASE

SIGNAL VOLTAGE
24V DC

DESCRIPTION
Main PC board

DRAWING NO.
JV-EDGE HP II AS-EG

PAGE
P.07

VERSION
B0

A4

SERVO MOTOR

MT1
3~

U1
V1
W1

SV0
LXM28AU04M3X
U V W
FG
L1 L2 L3
L11 L21

NFB

MC1

R1 S1 T1
R2 S2 T2

P.20-A.01 R
P.20-A.01 S
P.20-A.01 T
P.20-A.01 FG

OIL PUMP

MT2
3~

U2
V2
W2

OL

MC3

R2 S2 T2

PLC POWER

P.10-B.01 PL
P.10-B.01 PN

NF1
FN2010-10-06 250V
LINE LOAD
P P'
N N'
FG

CP1
6A

R1 S1
R4 S4

R1
S1
T1
FG

P.08-A.01

DC CONTROL LOOP POWER

PW1
PMT-24V100W2BA
L N FG
PL PN

FS1
3A

24VA
0VA
PW1-03 +
PW1-02 −
PW1-01 FG

DPW1

24V P.08-A.01
0V   P.08-A.01
FG   PW1-01

INTERFACE EMERGENCY FROM LATHE

INTERFACE BAR FEEDER EMERGENCY

HMI EMERGENCY STOP

EMERGENCY STOP

BAR FEEDER EMERGENCY STOP

AXIAL SENSE SWITCH AND SYNCHRONIZATION SWITCH CIRCUIT

AXIAL SENSE SWITCH

SYNCHRONIZATION SWITCH

TO PLC INPUT T02

SERVO DRIVER POWER ON

TO PLC INPUT T01

P20-A.01 IN1.04 102
P20-A.02 IN1.03 103
P20-A.02 IN1.02 103
P20-A.02 IN1.01 104

P07-A.06 FG
P07-D.06 0V
P07-D.05 24V

JP1.2 OFF 104 / 103
JP1.1 OFF 103 / 102

ES1 ER1.2 102 / ER1.1 101
ES2 DB1.2 101 / DB1.1 100
P12-A.01

P20-A.03 IN3.03 114 ER1.4 114 / ER1.3 113
P20-A.02 IN3.04 113
P20-A.02 IN3.05 112 DB1.3 112 / 111
P20-A.02 IN3.06 111

EN2.2 105   EN2.1 104

JP1.5 OFF 107 / 106
JP1.4 OFF 106 / 105
JP1.3 OFF 105 / 104

P11-A.05

JP1.6 OFF 107 / 108
P11-A.05

107 SS1 ER1.5 107
108 ER1.6 108
LSS X1 / X2 ER1.7 0V

ACT1 ER2.1 107
MC1 A1 / A2 ER2.3 0V
ER2.2 108

0V

24V
0V
FG
P09-A.01
P09-A.01
P09-A.01

Grid references: 01 02 03 04 05 06 / A B C D

Top connector arrows (right side):
- P.08-A.06 FG
- P.08-A.06 0V
- P.08-A.06 24V

Bottom connector arrows:
- P.10-A.01 24V
- P.10-A.01 0V
- P.10-A.01 FG

HMI POWER
HMI — DOP-107WV
- 24V — 24V — HMI.1 — 24V
- 0V — 0V — HMI.2 — 0V
- PE — PE — HMI.3 — PE

SYNCHRONIZATION
- SSR
- 0V — SV2.5
- V09 — SV2.3 — SYNCHRONIZE

ALARM & AUTO LAMP
- R01 — HL1.3 — R01 — X1 / X2 — LRD — ALARM LED
- R02 — HL1.2 — R02 — X1 / X2 — LGR — AUTO LED
- 0V — HL1.1

- ACT1 — 24 / 23
- 24V — PW1.4 — 24V
- 24.1V — PW1.5 — 24.1V — P.14-D.01

Title block:

BAR FEEDER TYPE	Minuteman 320 V³
LATHE NAME	####
LATHE TYPE	####

EDGE TECHNOLOGIES

DRAWN BY	LIN
FIRST DATE	2022/11/08
REVISION DATE	2024/05/10
CHECKED BY	
DESCRIPTION	Main circuit 3
MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC
DRAWING NO.	JV-EDGE HP II AS-EG
PAGE	P.09
VERSION	B0

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TM241CEC24R

L	PL	P.07-D.04
N	PN	P.07-D.04
GND		
Ethernet	RJ45	HMI SIGNAL CABLE
COM0 DC IN	0V PN2.17	
i0	SPARE	
I1	SPARE	
I2	AIR PRESSURE SENSOR	S09 PN2.3 — S09 S09.2 — S09 S09.3 — 24V PN2.3
I3	OIL PUMP ALARM	S11 PN1.11 — S11 ER2.6 — OL 96 / 95 — 24V ER2.5

P.09-A.06 — FG
P.09-A.06 — 0V
P.09-A.06 — 24V

FG — P.11-A.01
0V — P.11-A.01
24V — P.11-A.01

EDGE TECHNOLOGIES

BAR FEEDER TYPE	Minuteman 320 V³
LATHE NAME	####
LATHE TYPE	####

FIRST DATE	2022/11/08
DRAWN BY	LIN
REVISION DATE	2024/05/10
CHECKED BY	
MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC
DESCRIPTION	PLC INPUT
DRAWING NO.	JV-EDGE HP II AS-EG
PAGE	P.10
VERSION	B0

01 02 03 04 05 06

A B C D

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BAR FEEDER TYPE	Minuteman 320 V³
LATHE NAME	####
LATHE TYPE	####

DRAWN BY	LIN
FIRST DATE	2022/11/08
REVISION DATE	2024/05/10
CHECKED BY	
DESCRIPTION	PLC INPUT
MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC
DRAWING NO.	JV-EDGE HP II AS-EG
PAGE	P.11
VERSION	B0

TM241CEC24R

P.10-A.06 24V
P.10-A.06 0V

COM1 DC IN — 0V PN2.19

I4 ALARM FROM LATHE — F01 PN1.02 — JP4.1 F01.B / F01.A F01
I5 TORQUE STOP / M-CODE — F02 PN1.01 — JP4.2 F02.B / F02.A F02 — DB1.14 F02 P.18-A.04
I6 BAR CHANGE — F03 PN1.03 — JP4.3 F03.B / F03.A F03 — DB1.15 F03 P.18-A.03
I7 CHUCK OPEN — F04 PN1.05 — JP4.4 F04.B / F04.A F04 — DB1.16 F04 P.18-A.03

COM2 DC IN — 0V PN2.19

I8 FEEDING ALLOW — F05 PN1.07 — F05 EN2.7 — JP4.5 F05.B / F05.A F05
I9 MANUAL / AUTO FROM LATHE — F06 PN1.09 — F06 EN2.8 — JP4.6 F06.B / F06.A F06
I10 HOOD SAFETY SENSOR — S08 PN2.01 — S08 S08.2 — S08 22 BLACK / 21 WHITE — 24V S08.3
I11 SERVO DRIVER POWER ON — T01 PN2.09 — P.08-D.05
I12 EMERGENCY STOP — T02 PN2.11 — P.08-D.04
I13 POWER UP BUTTON SIGNAL — P01 PN2.05 — P01 ER1.8 — SS1 4/3 — 24V ER1.9 — P01 EN1.1

24V P.12-A.01
0V   P.12-A.01

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DB1.1(24V)
P.08-A.02

P.11-A.06
24V

P.11-A.06
0V

TM3DI16K

AUTOMATIC START — IA0 (PIA.20)
MANUAL MODE — IA1 (PIA.18)
PRE-AUTO — IA2 (PIA.16)
SEPARATORS — IA3 (PIA.14)
INTRODUCTION / EXTRACTION — IA4 (PIA.12)
GRIPPERS — IA5 (PIA.10)
PUSHER RETREAT — IA6 (PIA.08)
CHANNEL OPEN / CLOSE — IA7 (PIA.06)
COM (PIA.04)
PUSHER ADVANCE — IA8 (PIA.19)

B01 / PN1.20 — B01 / DB1.5 — DS1 — IN2.3 P.20-A.05
B02 / PN1.18 — B02 / DB1.6 — DS2 — IN2.2 P.20-A.04
B03 / PN1.16 — B03 / DB1.7 — DS3 — IN2.1 P.20-A.04
B04 / PN1.14 — B04 / DB1.8 — DS4 — IN1.10 P.20-A.04
B05 / PN1.12 — B05 / DB1.9 — DS5 — IN1.9 P.20-A.04
B06 / PN1.10 — B06 / DB1.10 — DS6 — IN1.8 P.20-A.04
B07 / PN1.08 — B07 / DB1.11 — DS7 — IN1.7 P.20-A.03
B08 / PN1.06 — B08 / DB1.12 — DS8 — IN1.6 P.20-A.03
B09 / PN1.04 — B09 / DB1.13 — DS9 — IN1.5 P.20-A.03

0V
PN1.17

Operation Box

24V
P.13-A.01

0V
P.13-A.01

BAR FEEDER TYPE	Minuteman 320 V³	
LATHE NAME	####	
LATHE TYPE	####	

EDGE TECHNOLOGIES

FIRST DATE	2022/11/08	DRAWN BY	LIN
REVISION DATE	2024/05/10	CHECKED BY	

DESCRIPTION	PLC INPUT
MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC
DRAWING NO.	JV-EDGE HP II AS-EG
PAGE	P.12
VERSION	B0

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EDGE TECHNOLOGIES ○○○

TM3DI16K

Signal	PLC Input	Terminal	Switch
HOME SENSOR	IA9 (PIA.17)	S01 PN2.14 / S01.2	S01 NO / S01.3 COM / 24V
MEASUREMENT FLAG SENSOR	IA10 (PIA.15)	S02 PN2.12 / S02.2	Sensor (BLUE 0V S02.1 / BLACK 24V S02.3 / BROWN)
CHANNEL OPEN SENSOR	IA11 (PIA.13)	S03 PN2.10 / S03.2	S03 NO / S03.3 COM / 24V
CHANNEL CLOSE SENSOR	IA12 (PIA.11)	S04 PN2.08 / S04.2	S04 NO / S04.3 COM / 24V
INTRODUCTION SENSOR	IA13 (PIA.09)	S05 PN2.06 / S05.2	Sensor (BLUE 0V S05.1 / BLACK 24V S05.3 / BROWN)
EXTRACTION SENSOR	IA14 (PIA.07)	S06 PN2.04 / S06.2	S06 NO / S06.3 COM / 24V
GRIPPER SWITCH	IA15 (PIA.05)	S07 PN2.02 / S07.2	S07 NO / S07.3 COM / 24V
	COM (PIA.03)	0V PN1.19	

P.12-A.06 24V
P.12-A.06 0V
0V
24V

P.14-D.01 24V
P.14-D.01 0V

BAR FEEDER TYPE	Minuteman 320 V³
LATHE NAME	####
LATHE TYPE	####
	01

FIRST DATE	2022/11/08
DRAWN BY	LIN
REVISION DATE	2024/05/10
CHECKED BY	
DESCRIPTION	PLC INPUT
MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC
DRAWING NO.	JV-EDGE HP II AS-EG
PAGE	P.13
VERSION	B0

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TM241CEC24R

Terminal	Signal		Label
V0+	24V	PO1.17	
V0-	0V	PO1.15	
TR0	R01	PO1.02	DR01 R01 A1 A2 — BAR FEEDER ALARM LIGHT
TR1	R02	PO1.04	DR02 R02 A1 A2 — BAR FEEDER AUTO LIGHT
TR2	R03	PO1.06	DR03 R03 A1 A2 — AUTO READY
TR3	R04	PO1.08	DR04 R04 A1 A2 — CHUCK OPEN START
COM1	24V	PO1.17	
Q4	L01	PO1.01	DB1.17 L01 P.18-A.06 — HOME SENSOR LIGHT
Q5	L02	PO1.03	DB1.18 L02 P.18-A.05 — INTRODUCTION LIGHT
COM2	24V	PO1.17	
Q6	L03	PO1.05	DB1.19 L03 P.18-A.05 — CHANNEL CLOSE LIGHT
Q7	H01	PO1.07	ER2.4 H01 — MC3 A1 A2 — ER2.3 0V — OIL PUMP
COM3	24.1V	PO1.19	
Q8	R09	PO1.18	DR09 R09 A1 A2 — CYCLE STOP
COM4	24.1V	PO1.19	
Q9	R10	PO1.20	DR10 R10 A1 A2 — 1stCYCLE

P.09-B.06 24.1V
P.13-A.06 24V
P.13-A.06 0V

P.15-D.01 24.1V
P.18-A.01 24V
P.15-D.01 0V

EDGE TECHNOLOGIES

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TM3DQ16TK

QA00 (PQA.20)	R05 PQI.10	R05 A1 / DR05 A2	END OF BAR
QA01 (PQA.18)	R06 PQI.12	R06 A1 / DR06 A2	IMPULSES
QA02 (PQA.16)	R07 PQI.14	R07 A1 / DR07 A2	CYCLE START
QA03 (PQA.14)	R08 PQI.16	R08 A1 / DR08 A2	CYCLE OFF PERMANENT
QA04 (PQA.12)	Q01 PQO.20	VAL-10 DQO1 SV1.7 / SV1.9 0V	4th ANTI-VIBRATION
QA05 (PQA.10)	Q02 PQO.01	VAL-11 DQO2 SV1.8	3rd ANTI-VIBRATION
QA06 (PQA.08)	Q03 PQO.03	VAL-12 DQO3 SV2.4 / SV2.5 0V	2nd ANTI-VIBRATION
V- (PQA.01,PQA.02)	0V PQO.15		
V+ (PQA.03,PQA.04)	24.1V PQO.19		

P.14-D.06 24.1V
P.14-D.06 0V

P.16-D.01 24.1V
P.16-D.01 0V

BAR FEEDER TYPE
Minuteman 320 V³

LATHE NAME
#####

LATHE TYPE
####

EDGE TECHNOLOGIES

DRAWN BY
LIN

FIRST DATE
2022/11/08

REVISION DATE
2024/05/10

CHECKED BY

DESCRIPTION
PLC OUTPUT

MAIN VOLTAGE
220V AC 3-PHASE

SIGNAL VOLTAGE
24V DC

DRAWING NO.
JV-EDGE HP II AS-EG

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VERSION
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01 02 03 04 05 06
A B C D

EDGE TECHNOLOGIES

Field	Value
BAR FEEDER TYPE	Minuteman 320 V³
LATHE NAME	####
LATHE TYPE	####
	01

FIRST DATE	2022/11/08
DRAWN BY	LIN
REVISION DATE	2024/05/10
CHECKED BY	
MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC
DESCRIPTION	PLC OUTPUT
PAGE	P.16
DRAWING NO.	JV-EDGE HP II AS-EG
VERSION	B0

TM3DQ16TK

Signal list:

Terminal	Module	Valve	Channel
QA07 (PQA.06)	PQ2.02 VO1	SV1.1 VO1 — DV01/VAL1 — SV1.9 0V	CHANNEL OPEN
QA08 (PQA.19)	PQ2.04 VO2	SV1.2 VO2 — DV02/VAL2	CHANNEL CLOSE
QA09 (PQA.17)	PQ2.06 VO3	SV1.3 VO3 — DV03/VAL3	INTRODUCTION
QA10 (PQA.15)	PQ2.08 VO4	SV1.4 VO4 — DV04/VAL4	EXTRACTION
QA11 (PQA.13)	PQ2.10 VO5	SV1.5 VO5 — DV05/VAL5	SEPARATORS
QA12 (PQA.11)	PQ2.12 VO6	SV1.6 VO6 — DV06/VAL6	GRIPPERS
QA13 (PQA.09)	PQ2.14 VO7	SV2.1 VO7 — DV07/VAL7 — SV2.5 0V	1st ANTI-VIBRATION
QA14 (PQA.07)	PQ2.16 VO8	SV2.2 VO8 — DV08/VAL8	MOVABLE ANTI-VIBRATION
QA015 (PQA.05)	PQ2.18 VO9 — SSR		SYNCHRONIZATION

P.15-D.06 24.1V
P.15-D.06 0V
P.18-D.01 24.1V / 0V
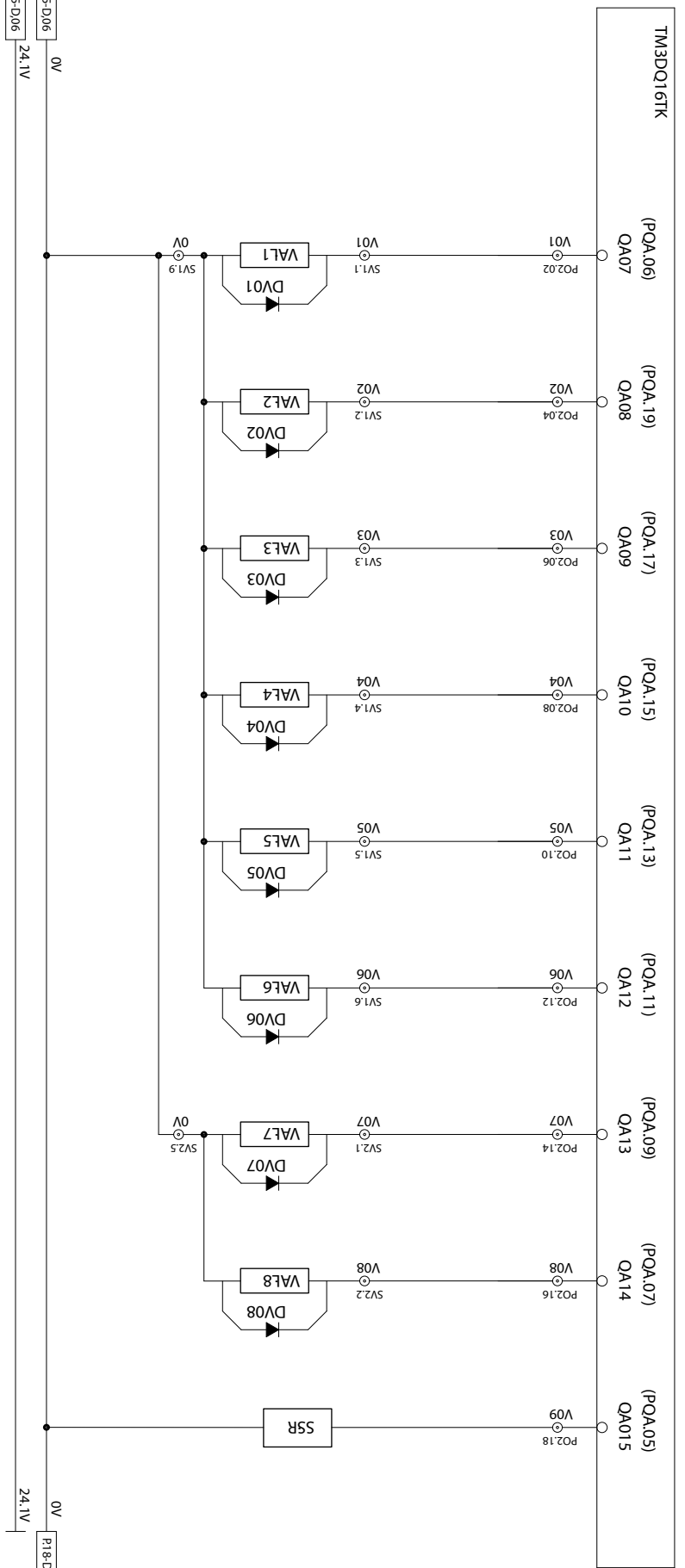
PLC

TM241CEC24R

CANopen

CAN_H

CAN_L

GND

Sheild

120Ω

ORANGE WHITE

ORANGE

GREEN WHITE

BLACK

120Ω

CANH

CANL

GND

Sheild

CAN
CN4
RJ45

SERVO DRIVER

LXM28AU10M3X
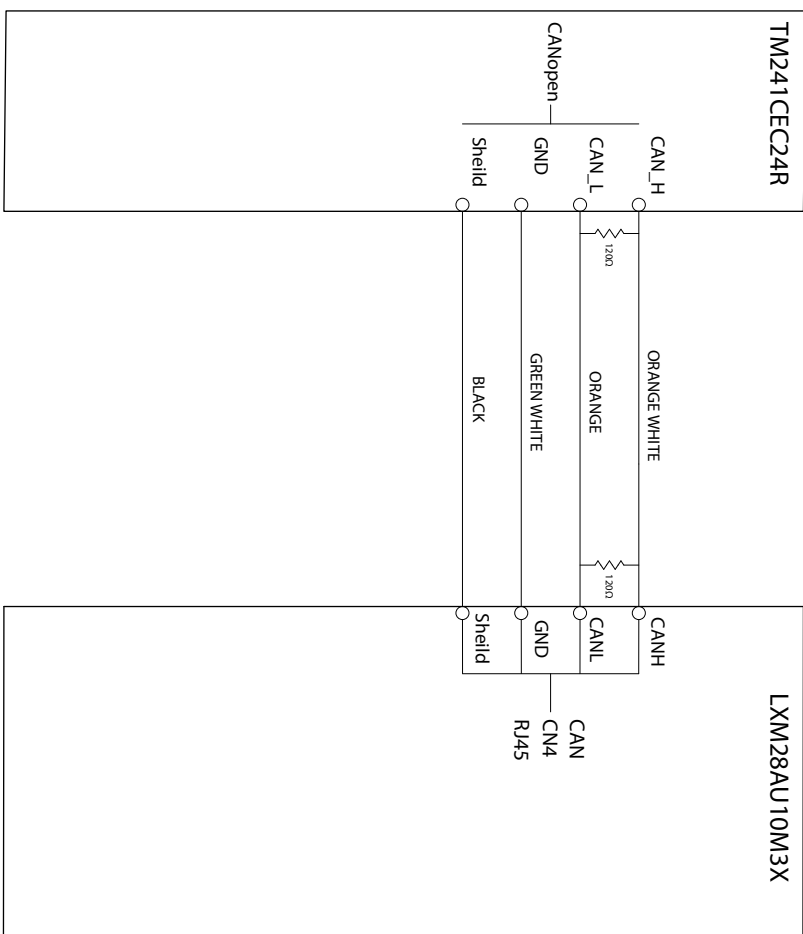
BAR FEEDER TYPE			FIRST DATE	REVISION DATE	MAIN VOLTAGE	SIGNAL VOLTAGE	
Minuteman 320 V3			2022/11/08	2024/05/10	220V AC 3-PHASE	24V DC	
LATHE NAME			DRAWN BY	CHECKED BY	DESCRIPTION	PAGE	
####			LIN		CANopen circuit of Servo motor	P.17	
LATHE TYPE					DRAWING NO.		VERSION
####					JV-EDGE HP II AS-EG		B0
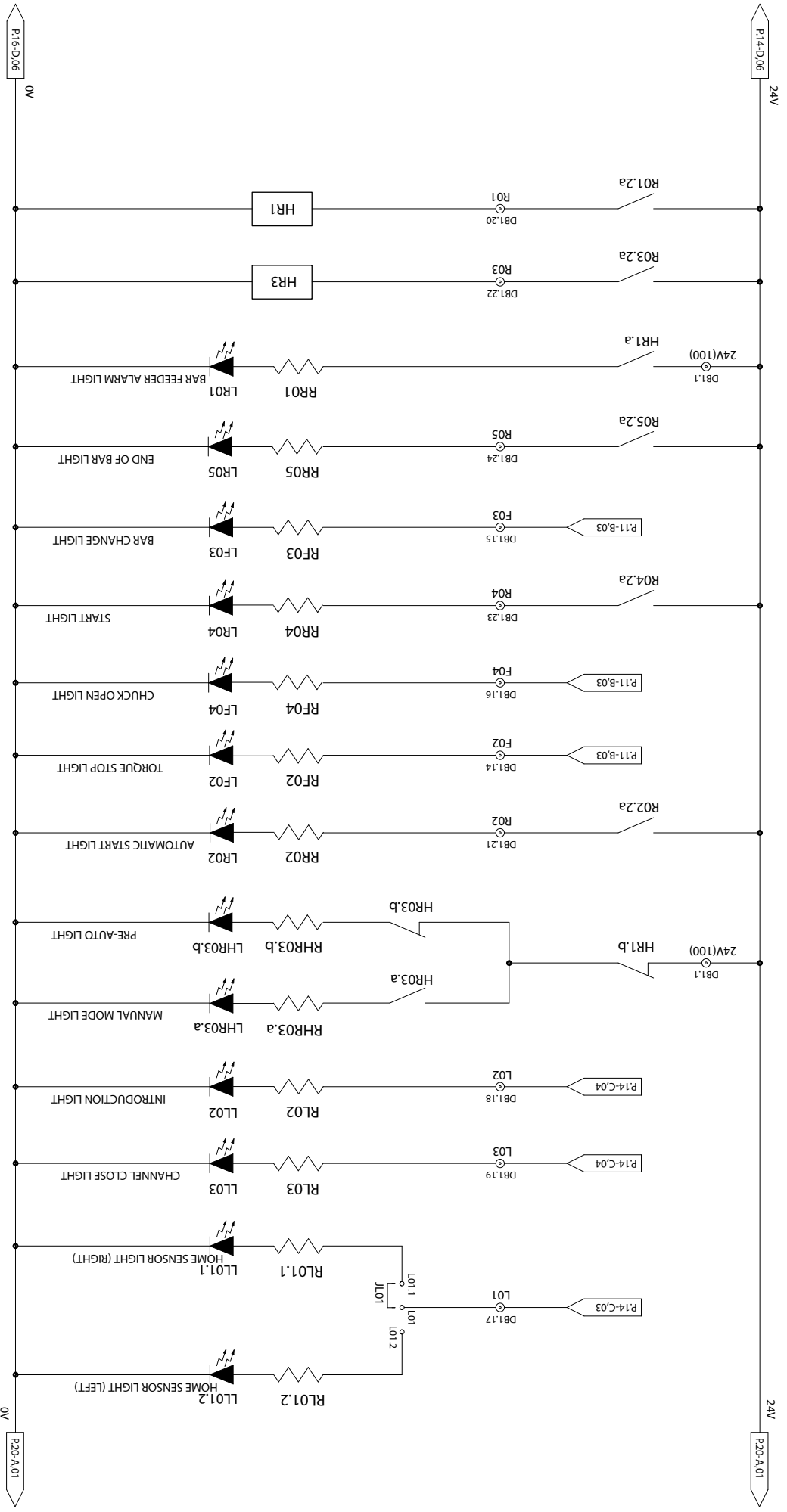
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Title block:

BAR FEEDER TYPE	Minuteman 320 V3
LATHE NAME	####
LATHE TYPE	####

EDGE TECHNOLOGIES ○○○
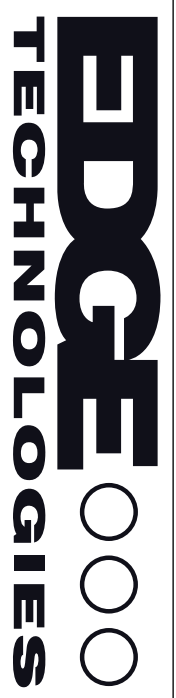
DRAWN BY	LIN
FIRST DATE	2022/11/08
REVISION DATE	2024/05/10
CHECKED BY	
MAIN VOLTAGE	220V AC3-PHASE
SIGNAL VOLTAGE	24V DC
PAGE	P.18
DESCRIPTION	LED circuit of Remote control pendant
DRAWING NO.	JV-EDGE HP II AS-EG
VERSION	B0

Circuit labels:

P.14-D.06 24V
P.16-D.06 0V
P.20-A.01 24V
P.20-A.01 0V

RO1.2a — DB1.20 RO1 — HR1
RO3.2a — DB1.22 RO3 — HR3
24V(100) DB1.1 — HR1.a — RR01 — LR01 BAR FEEDER ALARM LIGHT
RO5.2a — DB1.24 RO5 — RR05 — LR05 END OF BAR LIGHT
P.11-B.03 — DB1.15 F03 — RF03 — LF03 BAR CHANGE LIGHT
RO4.2a — DB1.23 RO4 — RR04 — LR04 START LIGHT
P.11-B.03 — DB1.16 F04 — RF04 — LF04 CHUCK OPEN LIGHT
P.11-B.03 — DB1.14 F02 — RF02 — LF02 TORQUE STOP LIGHT
RO2.2a — DB1.21 RO2 — RR02 — LR02 AUTOMATIC START LIGHT
HR03.b — RHR03.b — LHR03.b PRE-AUTO LIGHT
24V(100) DB1.1 — HR1.b — HR03.a — RHR03.a — LHR03.a MANUAL MODE LIGHT
P.14-C.04 — DB1.18 L02 — RL02 — LL02 INTRODUCTION LIGHT
P.14-C.04 — DB1.19 L03 — RL03 — LL03 CHANNEL CLOSE LIGHT
P.14-C.03 — DB1.17 L01 — JL01 — L01.1 — RL01.1 — LL01.1 HOME SENSOR LIGHT (RIGHT)
L01.2 — RL01.2 — LL01.2 HOME SENSOR LIGHT (LEFT)

EDGE TECHNOLOGIES ○○○

BAR FEEDER TYPE	Minuteman 320 V³
LATHE NAME	####
LATHE TYPE	####

FIRST DATE	2022/11/08
DRAWN BY	LIN
REVISION DATE	2024/05/10
CHECKED BY	
MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC
DESCRIPTION	INTERFACE 1
DRAWING NO.	JV-EDGE HP II AS-EG
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VOLTAGE SUPPLY AC 3P 220V

NFB-1

R Red
S White
T Black
PE Green

FG

P07-A.01
P07-A.01
P07-A.01
P07-A.01

P.18-D.06
24V
0V

24 Pin
01 Red
02 White
03 Black
PE Green

EMG FROM LATHE 1
EMG FROM LATHE 2

EMG FROM BAR LOADER 1
EMG FROM BAR LOADER 2

21 21 102 P.08-D.01
22 22 103 P.08-D.01
      103 P.08-D.01
      104 P.08-D.01 IN1

23 23 111 P.08-C.02
      112 P.08-C.02
      113 P.08-C.02
24 24 114 P.08-C.02
      0V
      EXV IN3

B09 P.12-B.06
B08 P.12-B.05
B07 P.12-B.04
B06 P.12-B.04
B05 P.12-B.03
B04 P.12-B.03 IN1
B03 P.12-B.02
B02 P.12-B.02
B01 P.12-B.02

MANUAL / AUTO FROM LATHE   109 10 10 F06.P F06 JP2.6
LATHE SAFETY GATE SWITCH   108 09 09 F05.P F05 JP2.5
CHUCK OPEN   107 08 08 F04.P F04 JP2.4
                                              JP2 F03 F04 OFF
BAR CHANGE   106 07 07 F03.P F03 JP2.3
TORQUE STOP   105 06 06 F02.P F02 JP2.2
LATHE ALARM   104 05 05 F01.P F01 JP2.1
                                        04 04 24V IN2
                                              0V
                                              24V

24 Pin CONNECTOR PLUG PIN
WIRE SILKSCREEN

24 Pin

IN4

RCOM 10

BAR FEEDER ALARM — TR0
R01.B / R01.A / R01.C — R01 — JP3.1 — pins 11, 12 / 9

SOFTWARE CONFIGURABLE — TR1
R02.B / R02.A / R02.C — R02 — JP3.2 — pins 13 / 8

AUTO READY — TR2
R03.B / R03.A / R03.C — R03 — JP3.3 — pins 14 / 7

FEED CONFIRM — TR3
R04.B / R04.A / R04.C — R04 — JP3.4 — pins 15 / 6

END OF BAR — QA00
R05.B / R05.A / R05.C — R05 — JP3.5 — pins 16 / 5

INCHING — QA01
R06.B / R06.A / R06.C — R06 — JP3.6 — pins 17 / 4

CYCLE START — QA02
R07.B / R07.A / R07.C — R07 — JP3.7 — pins 18 / 3

AUTO MODE TO LATHE — QA03
R08.B / R08.A / R08.C — R08 — JP3.8 — pins 19 / 2

SOFTWARE CONFIGURABLE — Q08
R09.B / R09.A / R09.C — R09 — JP3.9 — pins 20 / 1

SOFTWARE CONFIGURABLE — Q09
R10.B / R10.A / R10.C — R10 — JP3.10 — pin 10

IN3

CONNECTOR PLUG PIN
WIRE SILKSCREEN

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PGE 0502 KEY BOARD

BAR FEEDER ALARM
BAR END
BACK START

RHR1.a LHR1.a HR1.a
RR05 LR05 R05
RF03 LF03 F03
0V

RR04 LR04 R04 CYCLE START
RF04 LF04 F04 COLLET OPEN
RF02 LF02 F02 TORQUE STOP

JL01
L01.2 L01 L01.1

ER4 XH 2.54
04 112
03 111
02 I01
01 I00

DB2

F02	14 01	I00 (24V)
F03	15 02	I01
F04	16 03	I11
L01	17 04	I12
L02	18 05	B01
L03	19 06	B02
R01	20 07	B03
R02	21 08	B04
R03	22 09	B05
R04	23 10	B06
R05	24 11	B07
0V	25 12	B08
	13	B09

LDS7 RL01.1 L01.1 0V
DS7
24V 1 2 24V
24V 24V
B07 3 4 B07

LDS4 0V
DS4
24V 1 2 24V
24V 24V
B04 3 4 B04

LDS1 RR02 R02 0V
DS1
24V 1 2 24V
24V 24V
B01 3 4 B01

LDS8 RL03 L03 0V
DS8
24V 1 2 24V
24V 24V
B08 3 4 B08

LDS5 RL02 L02 0V
DS5
24V 1 2 24V
24V 24V
B05 3 4 B05

LDS2 RHR03.a HR03.a 0V
DS2
24V 1 2 24V
24V 24V
B02 3 4 B02

LDS9 RL01.2 L01.2 0V
DS9
24V 1 2 24V
24V 24V
B09 3 4 B09

LDS6 0V
DS6
24V 1 2 24V
24V 24V
B06 3 4 B06

LDS3 RHR03.b HR03.b 0V
DS3
24V 1 2 24V
24V 24V
B03 3 4 B03

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EDGE TECHNOLOGIES

PBE 0501

BAR FEEDER TYPE	Minuteman 320 V³
LATHE NAME	####
LATHE TYPE	####

FIRST DATE	2022/11/08	DRAWN BY
REVISION DATE	2024/05/10	CHECKED BY
		LIN

MAIN VOLTAGE	220V AC 3-PHASE
SIGNAL VOLTAGE	24V DC

DESCRIPTION	Main PC Circuit Board
DRAWING NO.	JV-EDGE HP II AS-EG
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VERSION	B0

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PN1

B01		20	19		0V
B02		18	17		0V
B03		16	15		24V
B04		14	13		24V
B05		12	11		S11
B06		10	09		F06
B07		08	07		F05
B08		06	05		F04
B09		04	03		F03
F01		02	01		F02

PO1

R10		20	19		24.1V
R09		18	17		24V
R08		16	15		0V
R07		14	13		SPARE
R06		12	11		Q05
R05		10	09		Q04
R04		08	07		H01
R03		06	05		L01
R02		04	03		L02
R01		02	01		L01

HMI
- 03 FG
- 02 0V
- 01 24V
VH3.96

PW1
- 05 24.1V
- 04 24V
- 03 24VA
- 02 0VA
- 01 FG
VH3.96

ER1
- 09 24V
- 08 P01
- 07 0V
- 06 108
- 05 107
- 04 114
- 03 113
- 02 102
- 01 101
VH3.96

ER2
- 06 S11
- 05 24V
- 04 H01
- 03 0V
- 02 108
- 01 107
VH3.96

PO2

Q010		20	19		24.1V
V09		18	17		24V
V08		16	15		0V
V07		14	13		SPARE
V06		12	11		SP1
V05		10	09		ST2
V04		08	07		ST1
V03		06	05		SON
V02		04	03		Q03
V01		02	01		Q02

PN2

E01		20	19		0V
E02		18	17		0V
S10		16	15		24V
S01		14	13		24V
S02		12	11		T02
S03		10	09		T01
S04		08	07		P02
S05		06	05		P01
S06		04	03		S09
S07		02	01		S08

JP5
- 03 24V
- 02 S09
- 01 OFF

IN3 / IN1
- 104 01
- 103 02 0V
- 103 03 0V
- 102 04 114
- B09 05 113
- B08 06 112
- B07 07 111
- B06 08 EXV
- B05 09 R10.E
- B04 10 R10.D
- R10.C

IN4 / IN2
- B03 01
- B02 02 R09.C
- B01 03 R08.C
- F06.P 04 R07.C
- F05.P 05 R06.C
- F04.P 06 R05.C
- F03.P 07 R04.C
- F02.P 08 R03.C
- F01.P 09 R02.C
- 24V 10 R01.C
- RCOM

EN2
- 104 01
- 105 02
- 105 03
- 106 04
- 106 05
- 107 06
- F05 07
- F06 08
- 24V 09
- 24V 10

EN1
- P01 01
- P02 02
- Q01 03
- Q02 04
- Q03 05
- Q04 06
- Q05 07
- 0V 08
- 0V 09
- 0V 10

CN1
SON	01	02	LA
ST1	03	04	LAR
ST2	05	06	LB
SP1	07	08	LBR
LOF	09	10	VC
Q06	11	12	TLA
SPARE	13	14	LQ
SPARE	15	16	DICOM(24V)
SPARE	17	18	ALM
SPARE	19	20	SG/DOCOM(0V)

2DA
- 03 LG
- 02 TLA
- 01 VC
VH3.96

HL1
- 03 R01
- 02 R02
- 01 0V
VH3.96

SV2
- 05 0V
- 04 Q03
- 03 V09
- 02 V08
- 01 V07
VH3.96

DB1

JP2.1 EXV F01 0V
JP2.2 EXV F02 0V
JP2.3 EXV F03 0V
JP2.4 EXV F04 0V
JP2.5 EXV F05 0V
JP2.6 EXV F06 0V

JP4.1 F01.A F01 F01.B
JP4.2 F02.A F02 F02.B
JP4.3 F03.A F03 F03.B
JP4.4 F04.A F04 F04.B
JP4.5 F05.A F05 F05.B
JP4.6 F06.A F06 F06.B

JP2
- F03
- F04
- OFF

R10 JP3.10 R10.A R10.C R10.B
R09 JP3.9 R09.A R09.C R09.B
R08 JP3.8 R08.A R08.C R08.B
R07 JP3.7 R07.A R07.C R07.B
R06 JP3.6 R06.A R06.C R06.B
R05 JP3.5 R05.A R05.C R05.B
R04 JP3.4 R04.A R04.C R04.B
R03 JP3.3 R03.A R03.C R03.B
R02 JP3.2 R02.A R02.C R02.B
R01 JP3.1 R01.A R01.C R01.B

FS1
- 24V 01 02
- 24VA
- 24V
- 0V LH1
0VA DPW1 0V

JP1.1 102 103
JP1.2 104 OFF
JP1.3 104 OFF
JP1.4 105 OFF
JP1.5 106 107
JP1.6 107 108

ET1 SERVO ALARM

SV1
| 09 0V | 08 Q02 | 07 Q01 | 06 V06 | 05 V05 | 04 V04 | 03 V03 | 02 V02 | 01 V01 |
VH3.96

S01 S02 S03 S04 S05 S06 S07 S08 S09
- 03 24V
- 02 S0x
- 01 0V
XH2.5

010	FRAME DEVICE
020	CLAMP DEVICE
030	LOADING-UNLOADING CONTROL
040	BASES AND BEAM
050	FEED MOTOR DRIVE
060	CUTTING DEVICE
070	GUIDE CHANNEL
080	BAR PUSHER DEVICE
090	SUPPORT
100	FIRST ANTI-VIBRATION DEVICE
110	SYCHRONIZATION DEVICE
120	TELESCOPIC FRONT NOSE / FIXED FRONT NOSE
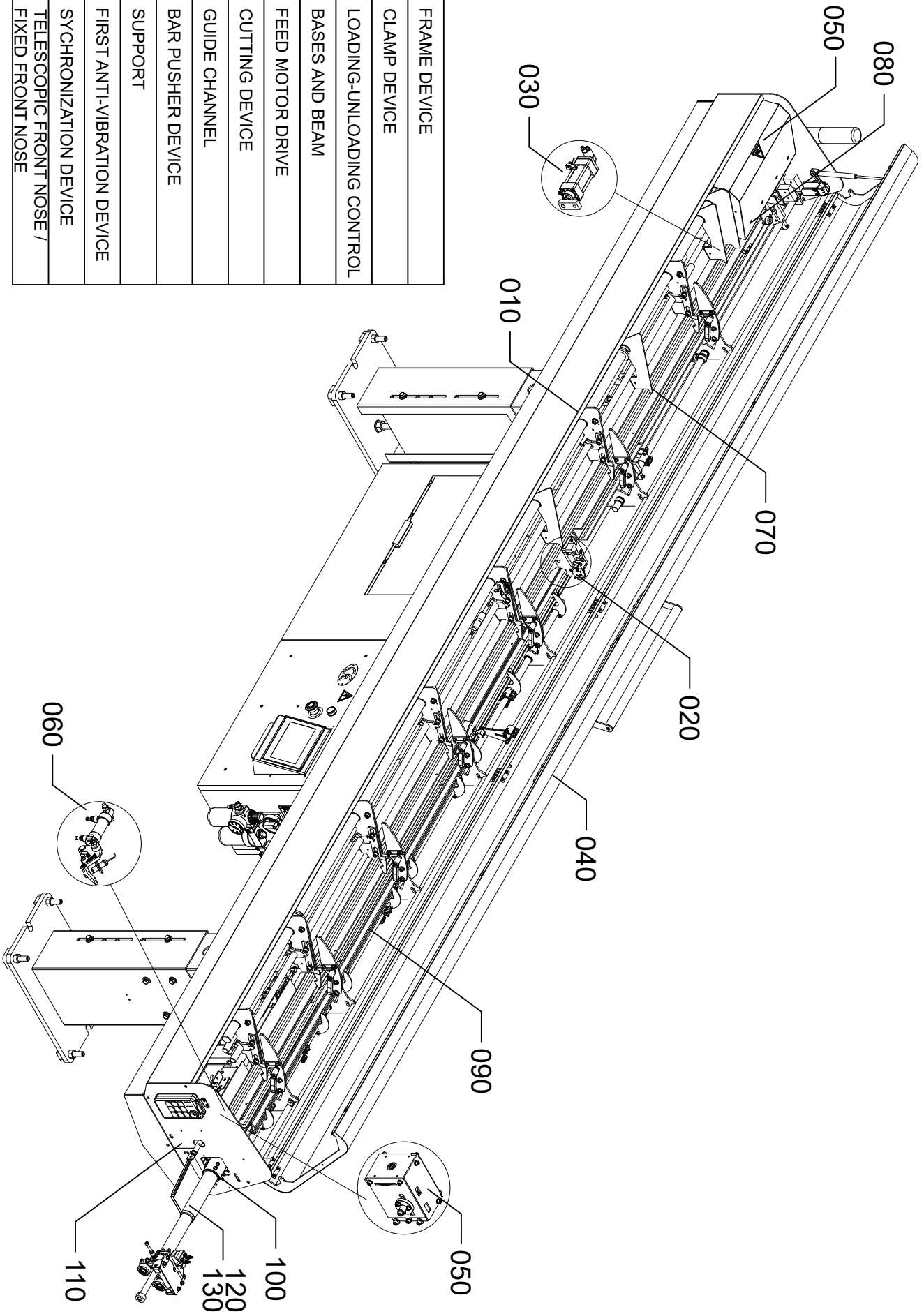
Minuteman 320 V³

PICTURE INDEX

Tab. 000 1

FRAME DEVICE

N.	Code	QTY	Denomination
1	P11200312	1	Support
2	P7620080	2	Support
3	P11201210	7	Plate
4	P12200800	1	Cylinder anchor
5	P11200410	3	Support
6	P12200737	2	Arbor-3.7M L=3500mm
7	P11200837	1	Arbor-3.7M L=3690mm
8	P13200600	2	Bushing
9	P53200500	2	Plate
10	P12200600	1	Plate
11	A11110410	1	Piston cylinder
12	P11200402	3	Plate
13	P11201120	2	Frame
14	P11201300	7	Plate
15	P12200200	35	Bushing
16	P12200402	8	Collet
17	P12200401	7	Plate
18	P12200300	7	Plate
19	P11201130	4	Support
20	P11201840	1	Plate
21	P11201410	7	Plate
22	P11201160	1	Support
23	P11202200	2	Hander
24	P11202300	1	Plate
25	RB20MA2300	1	Ruler

N.	Code	QTY	Denomination
26	P11201220	1	Frame
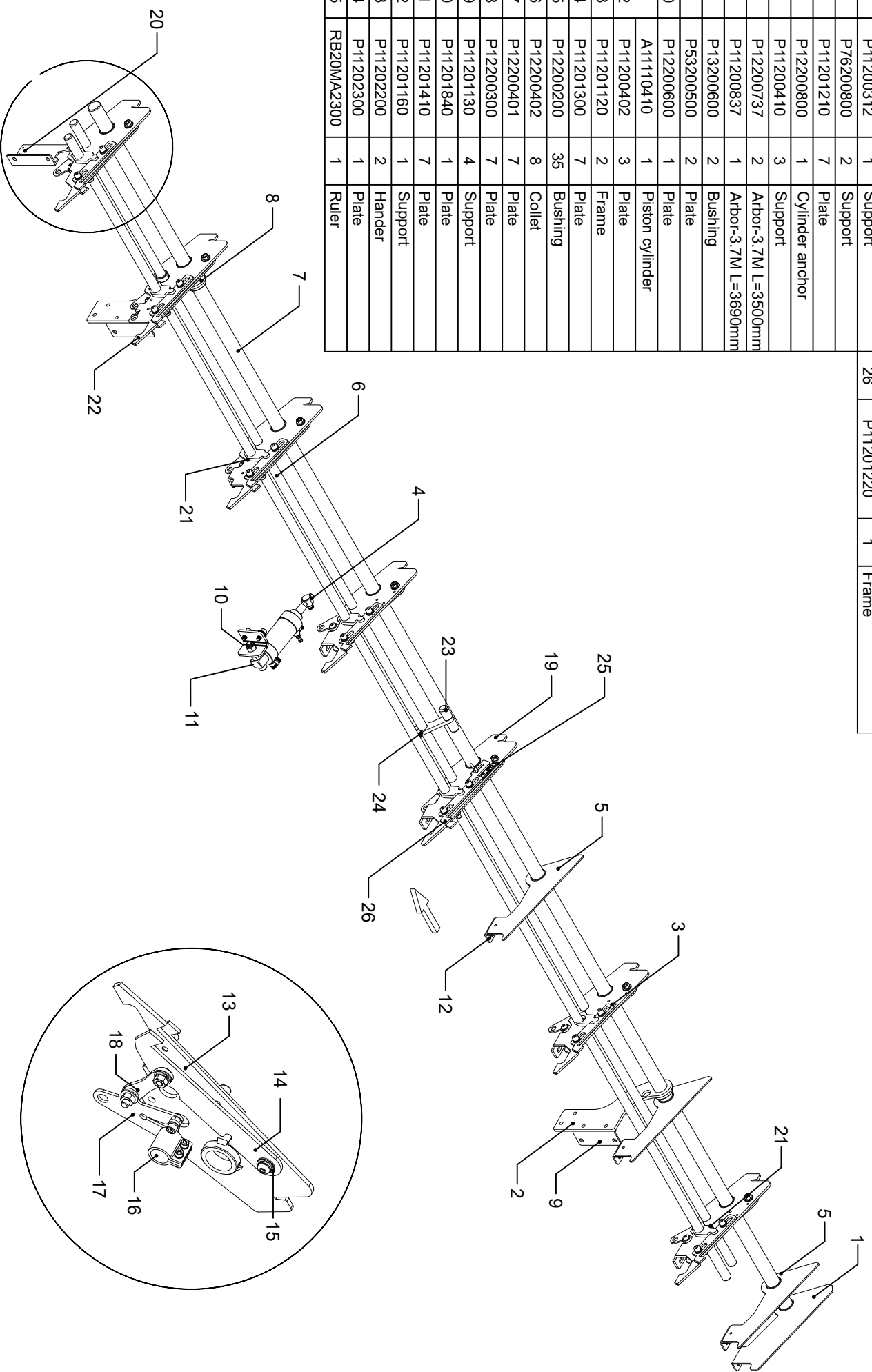
Tab. 010 1

CLAMP
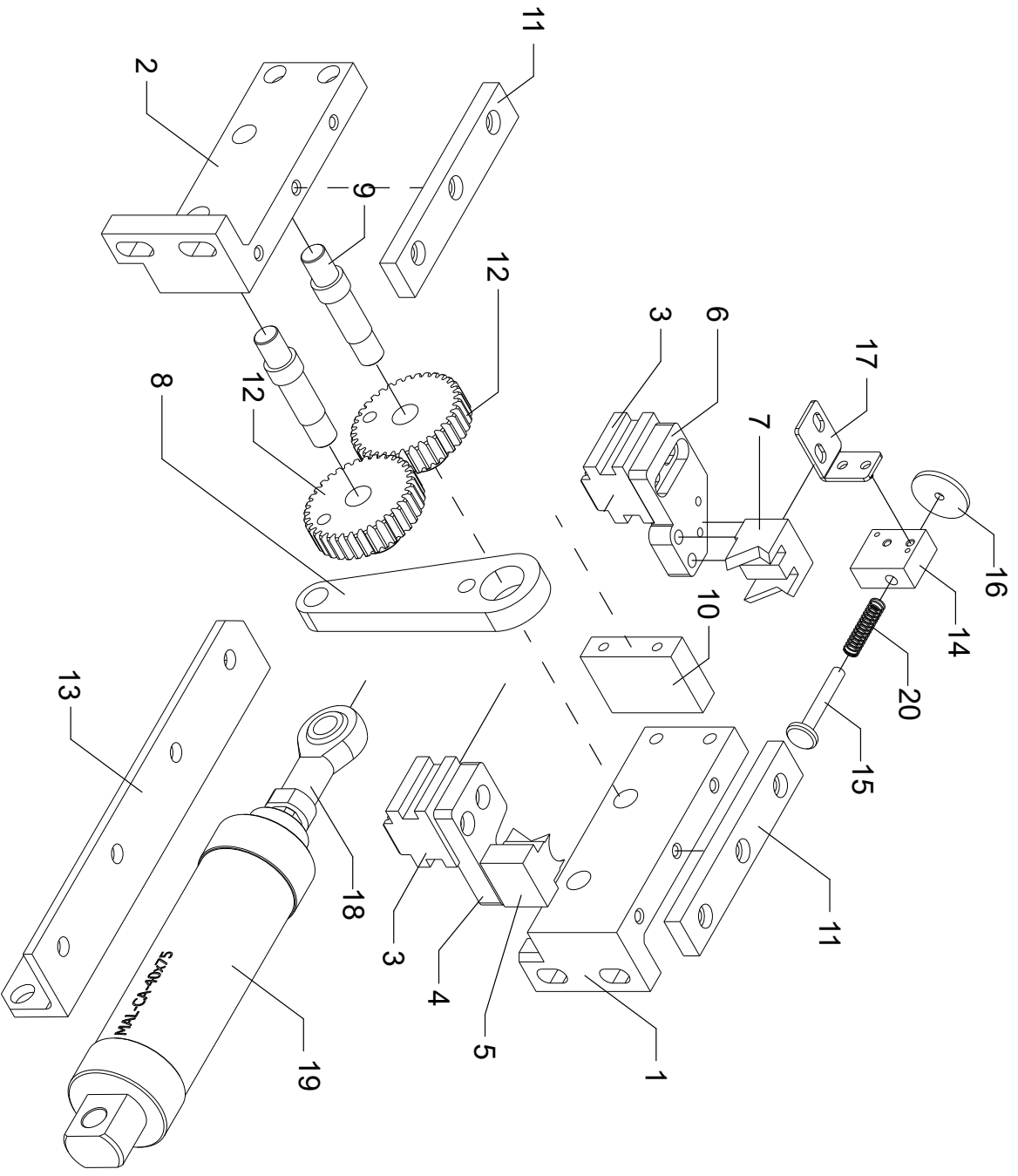
N.	Code	QTY	Denomination
1	P21200100	1	Support
2	P21200101	1	Support
3	P21200200	2	Anchor
4	P21200310	1	Plate
5	P21200401	1	Seal (A)
6	P21200501	1	Seal (B)
7	P21200601	1	Plate
8	P21200700	1	Support
9	P21200800	2	Arbor
10	P21200900	1	Anchor
11	P21201000	2	Anchor
12	P21201100	2	Spur gear
13	P21201200	1	Plate
14	P21201501	1	Anchor
15	P21201600	1	Arbor
16	P21201700	1	Plate
17	P21201801	1	Plate
18	BPHS12	1	Joint
19	A111110601	1	Cylinder MAL-CA40x75
20	607310600	1	Spring

Tab. 020 1

LOADING-UNLOADING CONTROL

N.	Code	QTY	Denomination
1	P22200100	2	Anchor
2	P22200201	1	Anchor
3	P22201700	1	Bushing
4	P22200400	1	Arbor-3.2M 3.7M 4.4M
5	P22200410	1	Arbor-2.2M
5	P22201500	1	Plate
6	G52121100	1	Plate
7	B696ZZ	2	Bearing 696ZZ
8	P22201600	1	Spring
9	P22200800	1	Anchor
10	P22201400	1	Support
11	A11150200	1	Piston cylinder-3.2M 3.7M 4.4M SC-50x50-S-CA
11	A11150210	1	Piston cylinder-2.2M SC-50x50-S-CA
12	A12140110	1	Sensor CS1-U

Tab. 030 1

BASES AND BEAM
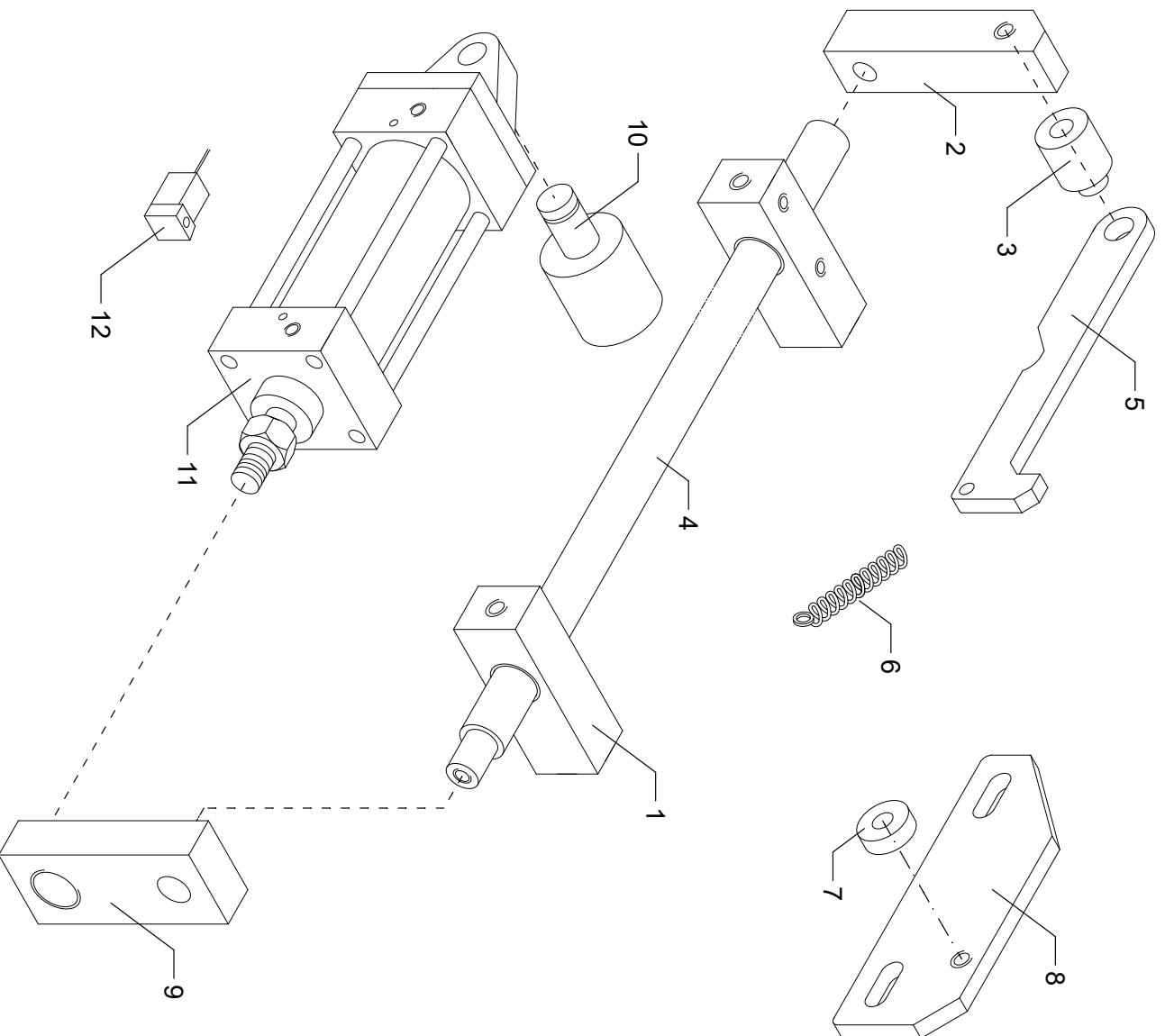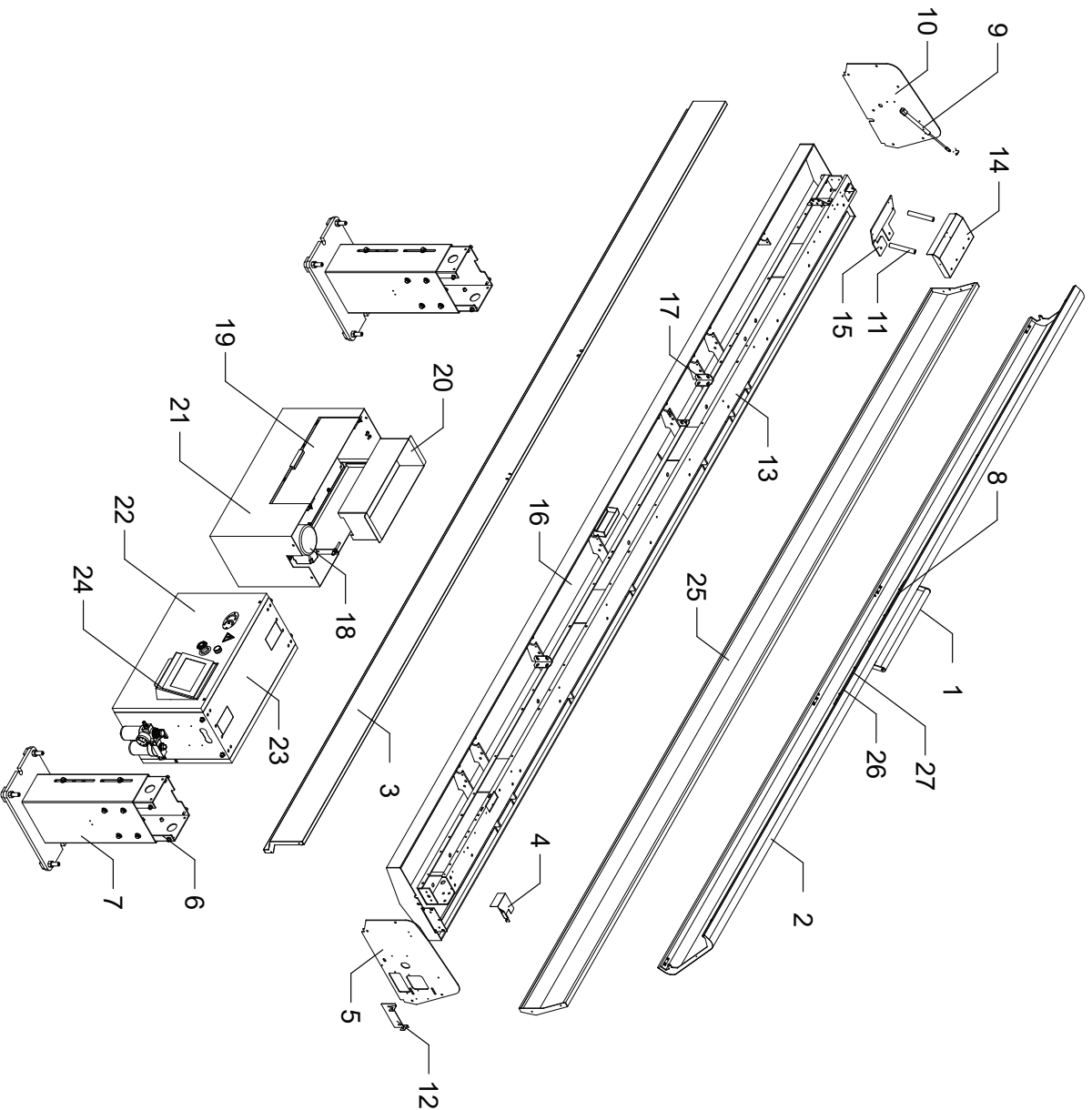
N.	Code	27	32	37	Denomination
1	HP7128000A	1			Handle
	P76201429	1			Cover L=3315mm
2	P76201436	1			Cover L=3842mm
	P762014372			1	Cover L=4344mm
	P76201329	1			Cover L=3320mm
3	P76201336		1		Cover L=3850mm
	P762013392			1	Cover L=4350mm
4	P76202110	1			Cover
5	P76201008	1			Plate
6	P76200100	2			Stand
7	P76200200	2			Stand
8	P76204700	2			Plate
9	P76201803			2	Shaft KS-105-269-13kg-20-AF 3.7M
10	P76201108	1			Plate
11	P76202400	2			Screw
12	P76205000	1			Plate
13	P79200239			1	Beam-3.7M L=4306mm
14	P76202302	1			Cover
15	P76202210	1			Plate
16	P76200337			1	Dilslot-L=4372mm
	P7620527		1		Dilslot-L=3342mm
	P7620532	1			Dilslot-L=3872mm
17	P76200900	2			Plate
18	P76202000	1			Pump
19	P76200401	2			Cover
20	P76200500	1			Remnant tank
21	P76200400	1			Oil tank
22	P76200604	2			Cover
23	P76200602	1			Control box
24	P76200615	1			Housing
25	P76201228	1			Cover-3.7M L=3320mm
	P76201234	1			Cover-3.7M L=3850mm
	P76201239			1	Cover-3.7M L=4350mm
26	AV51BA2103	1			Plexiglass window
27	P76204800	2			Plate

Tab. 040 1
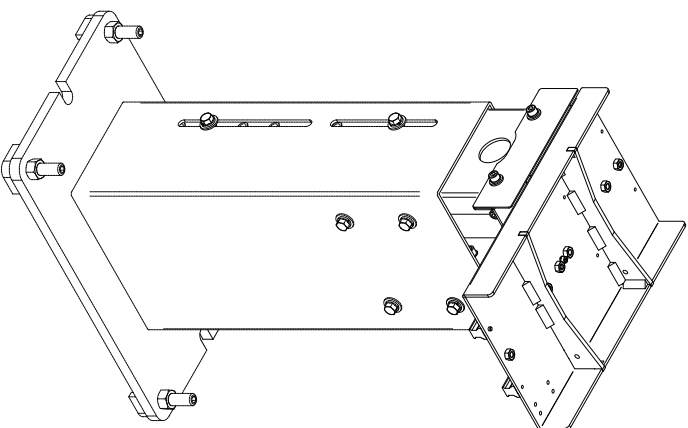
N.	Code	QTY	Denomination
1	P36200100	1	Support
2	P36200300	2	Plate
3	P36200500	2	Linear Guide
4	P36200200	1	Plate
5	P35201110	1	Plate
6	J461024	1	Micro switch TZ-7311
7	P35200600	1	STOPPER
8	HP3128000A	1	FRONT TRACKING SYSTEM
9	HP3128010A	1	BACK TRACKING SYSTEM (Not including micro switch)

TRACKING SYSTEM

8

9

2

3

1

6

5

4

7

Tab. 041 2

FEED MOTOR DRIVE

Tab. 050 1
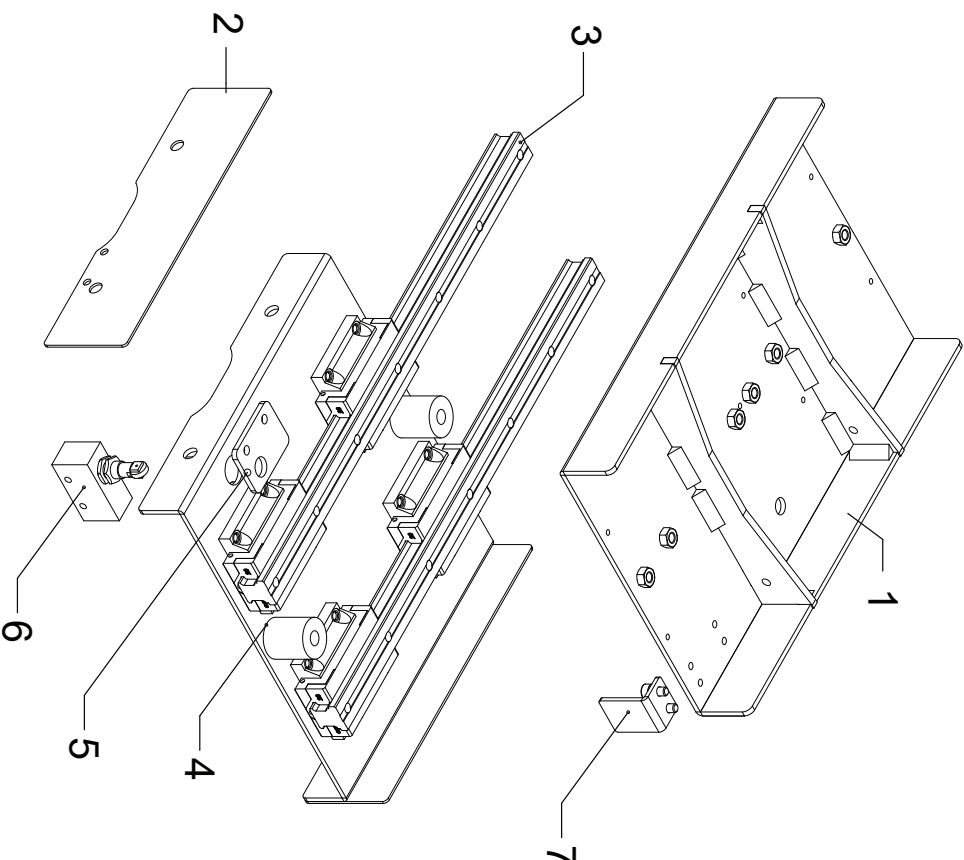
N.	Code	QTY	Denomination
1	J2210021	1	Motor
2	P48200120	1	Seat
3	RA26DR1600	1	Gcar wheel T=22
4	P48200200	1	Gcar wheel T=42
5	P48200300	1	Pulley 15T
6	B6000ZZ	2	Bearing
7	BTLA1212	2	Bearing TLA1212
8	BIRT812	2	Bearing IRT812
9	P63200500	1	Belt
10	P63200300	1	Seat
11	P63200400	2	Cover
12	P63200200	1	Spacer
13	P49202600	1	Bushing
14	HP4127002G	1	SY Set

Minuteman 320 V³

SYNCHRONIZATION SYSTEM

051 1
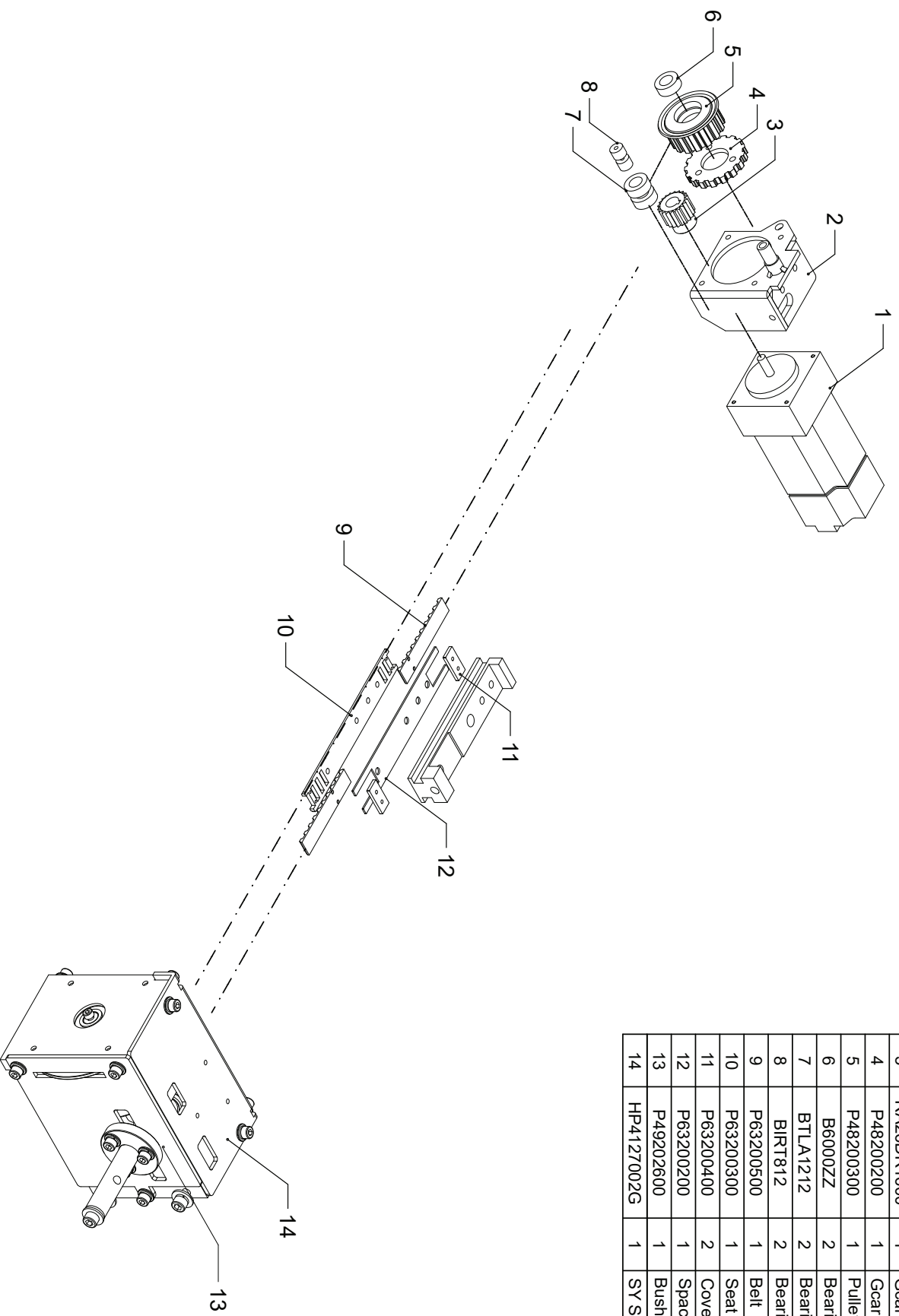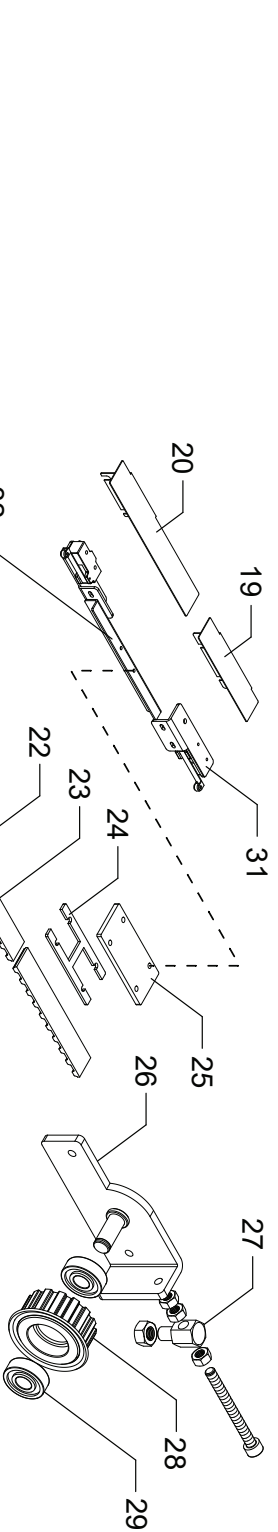
N.	Code	QTY	Denomination
31	P49204100	2	Plate
32	P49204200	1	Support
33	P49204000	1	Bushing

N.	Code	QTY	Denomination
1	P49200710	1	Base plate
2	B6001ZZ	2	Bearing 6001ZZ
3	P49201700	1	Pulley L 17T
4	P49203300	1	Shaft
5	P49203900	1	Spacer
6	P49203100	1	Pulley L 17T
7	B6002ZZ	2	Bearing 6002ZZ
8	P49203200	1	Spacer
9	RA26DR2000	1	Clutch
10	P49203800	1	Spacer
11	P49203410	1	Plate
12	P49202403	1	Bar
13	P49202600	1	Bush
14	P49203500	1	Front cover
15	ZS06050520	2	Key 5x20
16	P49203610	1	Rear cover
17	P49203710	1	Support
18	607460402	1	Plate
19	P49202110	1	Cover
20	P49202210	1	Cover
21	P49201000	1	Slider
22	P49202310	1	Belt
23	P49201300	1	Seat
24	P49201400	1	Spacer
25	P49201500	1	Cover
26	P49200410	1	Tighten seat
27	P49200500	1	Support
28	P48200300	1	Pulley L 15T
29	B6000ZZ	2	Bearing 6000ZZ

CUTTING DEVICE

20X10

N.	Code	QTY	Denomination
1	P75201600	1	Bracket
1	P75201700	1	Plate
2	P75201712	1	Plate（For 2mm Mat'l）
3	P45200300	1	Bush
4	P75201800	1	Plate
5	P53200401	1	Connector
6	P45200500	1	Spring
7	A11110700	1	Cylinder MAL-CA20x10
8	G92120700	1	Central shaft
9	P75201900	1	Plate
10	A12130100	2	JSC 6-01 1/8",φ6
11	J312501	1	BCC0322/5M
12	HP71270001C	1	CUTTING DEVICE

Tab. 060 1

QUICK-GUIDE CHANNEL 37
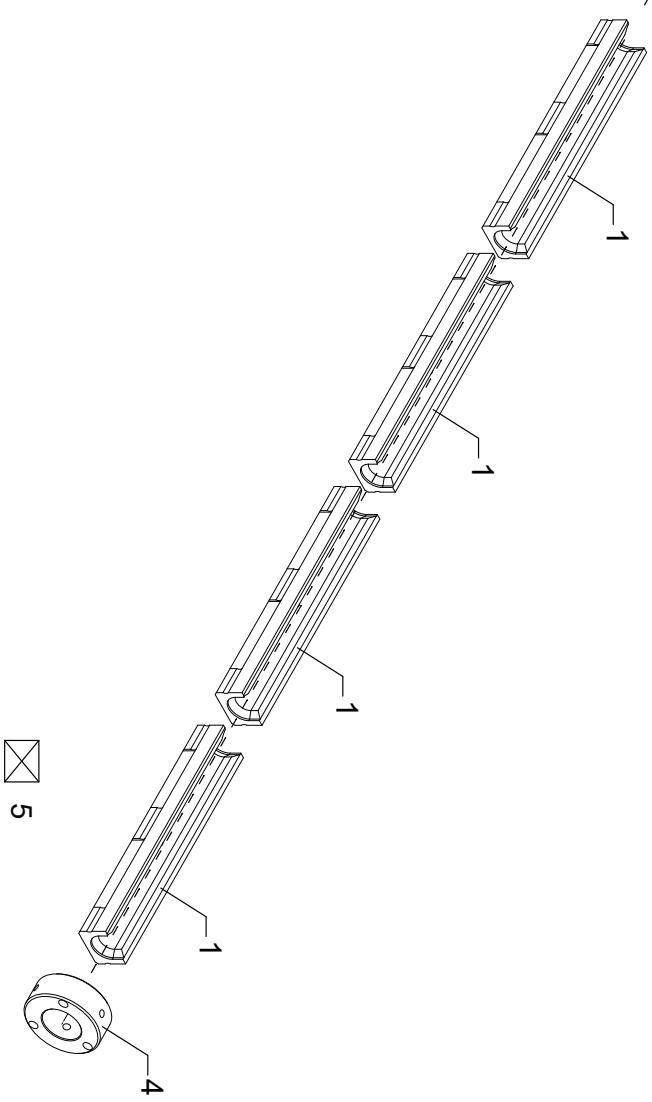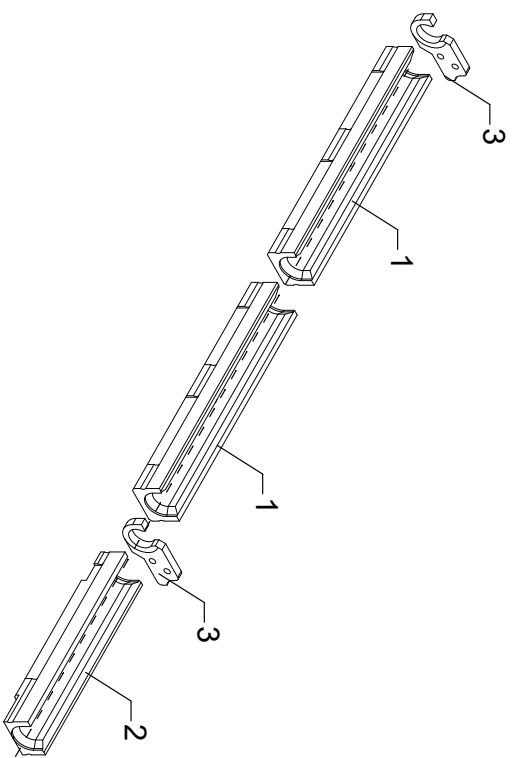
N.	Code	QTY	Denomination
1	P59__0154	6	Guide channel L=540
2	P59__0136	1	Guide channel L=365
	NOMINAL DIAMETER D.		φA 8 11 14 16 18 20 22 24 28
3	P53__0201	2	Anchor
	NOMINAL DIAMETER D.		φA 8 10 12 16 18 20 23 25
4	P82__0803	1	Fixed block
	NOMINAL DIAMETER D.		φA 9 12 15 19 21 23 25 29
5	HL59__371-BC	1	Lower guide channel
	NOMINAL DIAMETER D.		φA 8 10 12 15 16 18 20 23 25
			11 14 16 18 20 22 24 28

Tab. 070 2

QUICK-GUIDE CHANNEL 22

Tab. 072 2

N.	Code	QTY	Denomination
1	P59__0154	4	Guide channel L=540
2	P59__0136	1	Guide channel L=365
	NOMINAL DIAMETER D.		φA 08 10 12 15 16 18 20 23 25
			8 11 14 16 18 20 22 24 28
3	P53__0201	2	Anchor
	NOMINAL DIAMETER D.		φA 08 10 12 16 18 20 23 25
4	P82__0803	1	Fixed block
	NOMINAL DIAMETER D.		φA 09 12 15 19 21 23 25 29
			08 10 12 16 18 20 23 25
5	HL59__221-BC	1	Lower guide channel
	NOMINAL DIAMETER D.		φA 08 10 12 15 16 18 20 23 25
			8 11 14 16 18 20 22 24 28

BAR PUSHER DEVICE FOR MINUTEMAN 320

Tab. 080 1
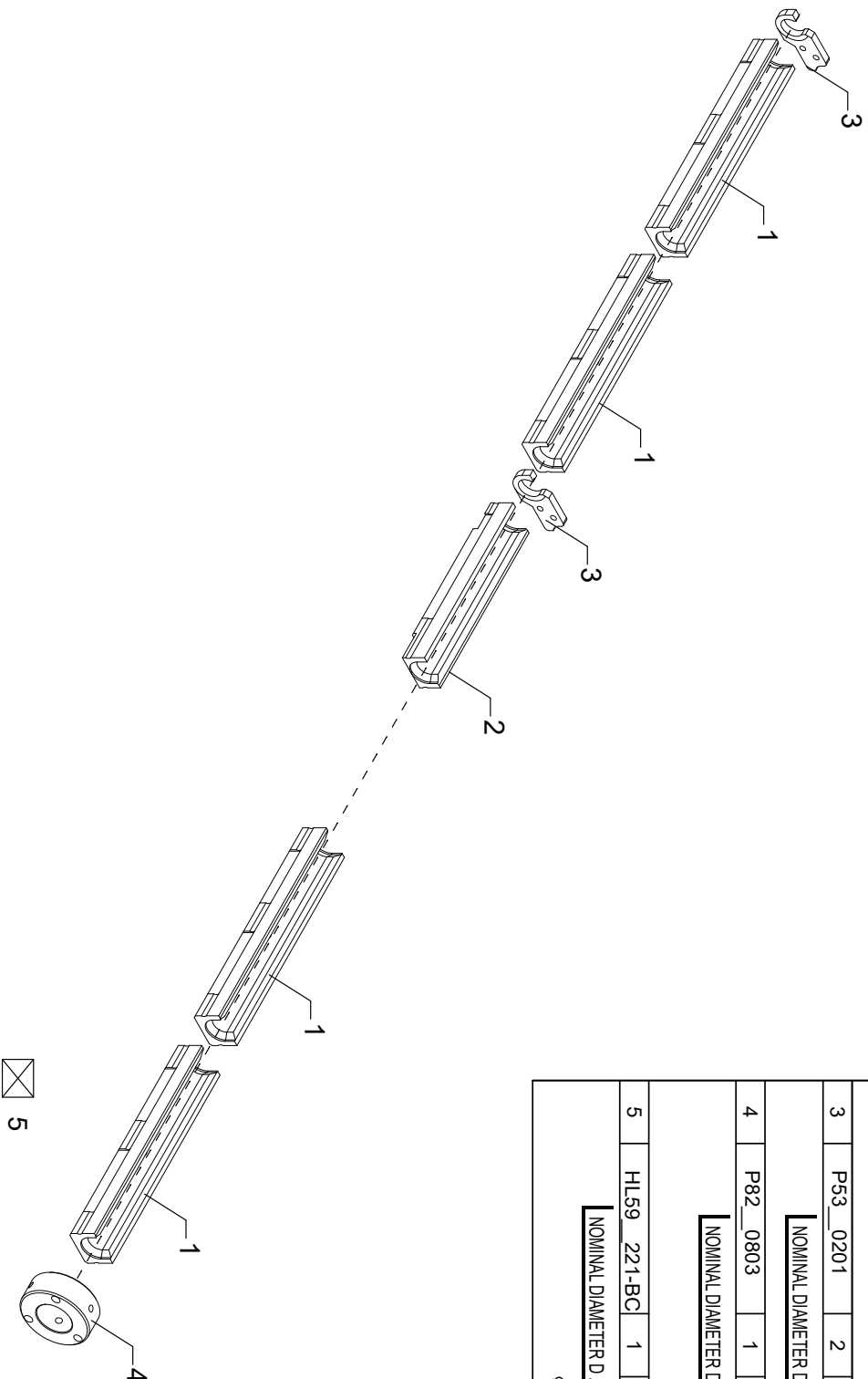
Push head

Push head	φ
P52120100	13
P52150100	15
P52160100	17
P52200100	21
P52230100	23
P52250100	27

Bushing

Bushing	#	T
P52160200	12	6
	15	
	16	
P52200200	20	
	23	
	25	3.5

Rear bar

Rear bar	φ
P52120600	13
P52150600	15
P52160600	17
P52200600	21
P52230600	23
P52250600	27
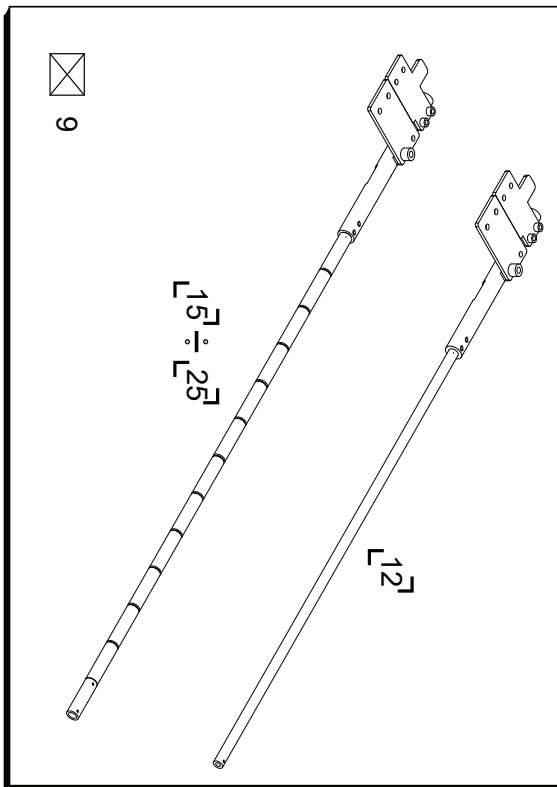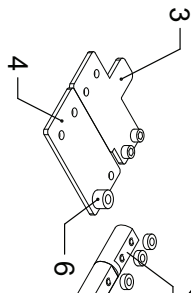
Push bar sleeve(PE)

Push bar sleeve(PE)	φA	φB
15# P54150400	φ14.5	φ10.1
16# P54160400	φ15.5	φ10.1
20# P54200400	φ19.5	φ12.1
23# P54230400	φ21.5	φ12.1
25# P54250416	φ24.5	φ16.1

Parts list

N.	Code	QTY	Denomination
1	P52_0100	1	Push head
2	P52_0200	4	Bushing
3	P52200300	1	Plate
4	P52200500	1	Push plate
5	P52_0600	1	Rear bar
6	P5200700	1	Stop bush
7	P54_0102	1	Bar pusher
	P54_0104	1	Bar pusher (LL)
	P54_0500	1	Grease nipple
8	PD52_028	1	Bar pusher device
9	PD52_028-LL	1	Bar pusher device (LL)
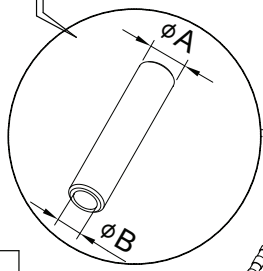
Bar pusher

Code	Bar pusher	φA	L
P54160102	15# 16#	φ10	1091
P54200102	20#	φ12	1076
P54250102	23#	φ16	1382
P54160104	20#	φ12	
P54200104	23#	φ16	1367
P54250104	25#	φ16	

Grease nipple

Grease nipple	φA
P54150500	φ15
P54160500	φ16
P54200500	φ20
P54230500	φ22
P54250500	φ25

Bar pusher (item 8)

Code	Bar pusher	φA	L
P54120102	12#	φ12	
P54120104	12#	φ12	1435

Tip

Tip	Figure	Code
12#	M7*P0.75	IER0712000

Finger

Tip	Figure	Code
15#	M8*P1.0	IER0815000
16#	M8*P1.0	IER0816000
20#	M10*P1.0	IER1020000
23#	M10*P1.0	IER1023000
25#	M10*P1.0	IER1025000

Finger:IER0712XXX
→ Figure:M7,M12,M18
→ Outer DIA. EX:φ12→120 φ22.5→225
→ Bar Size
→ R is Right thread

R is Right thread

NOMINAL DIAMETER D → 12 15 16 20 23 25

Minuteman 320 V³ | PUSH ROD EXTENSION SET(BELT) LENGTHENED BY 291mm

N.	Code	QTY 22	QTY 27	QTY 37	Denomination
1	P63205221	1			Belt OPEN 6072L-16MM
1	P63205271		1		Belt OPEN 7132L-16MM
1	P63205371			1	Belt OPEN 9714L-16MM
2	P64200110-C1	1			HL Extended rack L=289
3	P64200210	1			Material tube holder
4	P64200310	1			Weldment
5	P64200400	1			Gasket
6	P64200520-P6	1			Back panel
7	P64200600	2			Plate
8	P64200720-P6	1			Cover
9	P64200810-P6	1			Lower oil tank
10	P64200900	1			Aluminum base
11	P64201100	1			Arbor
12	P64201200	1			Connection rod
13	P64201300	1			Spindle 3.7M LL extended
14	P64201400	1			Track L=291
15	ZN04AV0100	1			Anti-pinch nameplate
16	P6200503	1			Block
17	G8112000A	2			Back button group
18	HP6127010C	1			Push rod extension set

Tab. 081 2

N.	Code	QTY			Denomination
		22	27	37	
1	P63205221	1			Belt OPEN 6072L-16MM
1	P63205271		1		Belt OPEN 7132L-16MM
1	P63205371			1	Belt OPEN 9714L-16MM
2	P64200100-P6	1			HL Extended rack L=289
3	P64200200	1			Material tube holder
4	P64200300	1			Weldment
5	P64200400	1			Gasket
6	P64200520-P6	1			Back panel
7	P64200600	2			Plate
8	P64200730-P6	1			Cover
9	P64200820-P6	1			Lower oil tank
10	P64200900	1			Aluminum base
11	P64201100	1			Arbor
12	P64201200	1			Connection rod
13	P64201300	1			Spindle 3.7M LL extended
14	P64201400	1			Track L=291
15	ZN04AV0100	1			Anti-pinch nameplate
16	P6220503	1			Block
17	G812000A	2			Back button group
18	HP6127011C	1			Push rod extension set

Tab. 082 2

N.	Code	QTY	Denomination
1	P61200400	1	Stop block
2	P61200600	1	Spring
3	P61200300	1	Central shaft
4	P62200300	1	Stop plate
5	P62200401	1	Anchor
6	P52200400	1	Press plate
7	P63200100	1	Push block
8	P61200138	1	Rail L=4166
9	P62201800	1	Block
10	P62201700	1	Fixed block
11	P43201400	1	Extension plate
12	P62200710	1	Anchor
13	P58200110	1	Back aluminum batten L=1047
14	P58200210	1	Center aluminum batten L=310
15	P58200138	1	Aluminum batten L=2175
16	P16200300	1	Seat L=1342.5
17	P16200137	1	Seat L=2190
18	P13200300	7	Press plate
19	P13200400	7	Plate
20	P13200200	7	Connection plate
21	A11110300	1	Cylinder MAL-25x75-CA
22	P12200403	2	Support
23	P62201900	1	Plate
24	P13200500	1	Anchor
25	P62200501	1	Support

N.	Code	QTY	Denomination
26	P13200700	2	Bushing
27	P53200200	1	Anchor
28	P13208814	1	Arbor L=1400
29	P58200331	1	Upper guide channel L=310
30	P58200350	3	Upper guide channel L=500
31	P58200362	1	Upper guide channel L=620
32	P58200400	10	Anchor
33	P13200878	1	Arbor L=780
34	P13200810	1	Arbor L=1000
35	A11111330	3	Cylinder MAL-25x50-CA
36	P53200500	4	Plate
37	P13200860	1	Arbor L=600
38	P14200700	8	Ring
39	P13200600	4	Bushing
40	P58200500	10	Support
41	P12200401	6	Support
42	P12200402	10	Collet
43	P53200400	4	Connector
44	P53200501	1	Plate
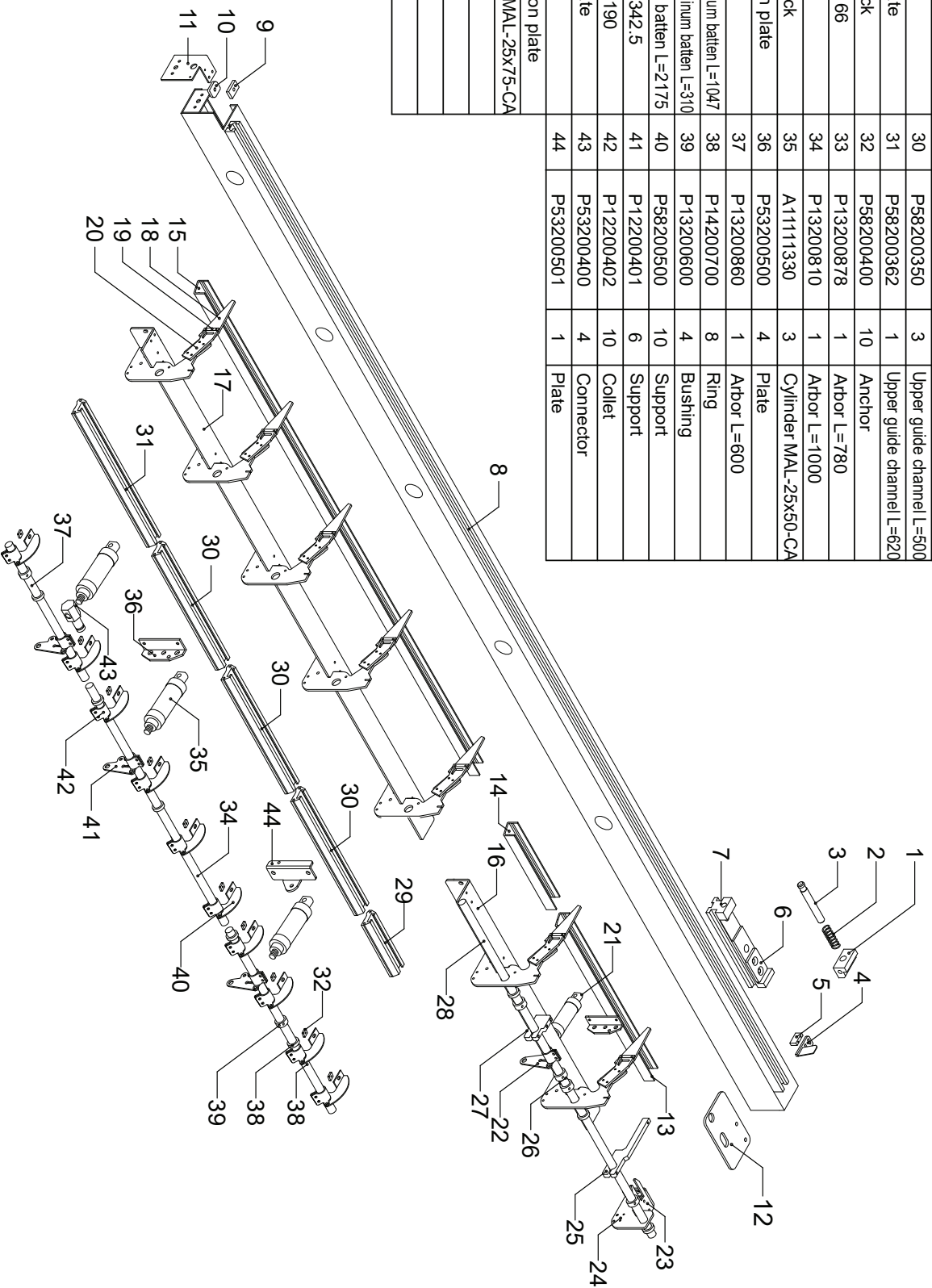
SUPPORT 22

N.	Code	QTY	Denomination
1	P61200400	1	Stop block
2	P61200600	1	Spring
3	P61200300	1	Central shaft
4	P62200300	1	Stop plate
5	P62200401	1	Anchor
6	P52200400	1	Press plate
7	P63200100	1	Push block
8	P61200133	1	Rail L=3666
9	P62201800	1	Block
10	P62201700	1	Fixed block
11	P43201400	1	Extension plate
12	P62200710	1	Anchor
13	P58200110	1	Back aluminum batten L=1047
14	P58200210	1	Center aluminum batten L=310
15	P58200123	1	Aluminum batten L=634
16	P16200100	1	Seat L=1342.5
17	P16200332	1	Seat L=1690
18	P13200300	4	Press plate
19	P13200400	4	Plate
20	P13200200	4	Connection plate
21	A11110300	1	Cylinder MAL-25x75-CA
22	P12200403	2	Support
23	P62201900	1	Plate
24	P13200500	1	Anchor
25	P62200501	1	Support
26	P13200700	2	Bushing
27	P53200200	1	Anchor
28	P13200814	1	Arbor L=1400
29	P58200331	1	Upper guide channel L=310
30	P58200362	1	Upper guide channel L=620
31	P13200800	1	Arbor L=3000
32	A11111330	1	Cylinder MAL-25x50-CA
33	P53200500	2	Plate
34	P58200500	4	Support
35	P58200400	4	Arbor
36	P12200402	4	Collet
37	P12200401	2	Support
38	P13200600	4	Bushing
39	P14200700	5	Ring
40	P53200400	2	Connector M10xP1.25

Tab. 092 1

ANTI-VIBRATION DEVICE

N.	Code	QTY	Denomination
1	P85200700	2	Plate
2	P85200100	2	Arbor
3	P85200200	2	Anchor
4	P85200300	1	Plate
5	P85200500	1	Plate
6	P85200600	1	Plate
7	HP8127000F	4	Plate
8	P85201350	1	Spacer set
9	A11130100	1	Scale shaft
10	P85202300	2	Cylinder SDA 25x20
11	P85200900	2	Roller
12	P85201300	1	Anchor
13	G55120900	2	Arbor
14	A12130300	2	Ball BP-06L
15	P85201360	1	Flow regulator M5,φ6
16	P85200400	1	Indicator plate
17	P82200900	1	Plate
18	P82201200	2	Anchor
19	P76202120	1	Fix rod
20	P852010__A	1	Cover
21	P852010__	2	Anti-vibration bushing set
22	P85200800	2	Bushing block
			Arbor

NOMINAL DIAMETER D.
φ 02 06 08 10 12 14 16 18 20 22 24 26 28
03 07 09 11 13 15 17 19 21 23 25 27 29

Tab. 100 1

ANTI-VIBRATION DEVICE

Minuteman 320 V³

Tab. 100 1

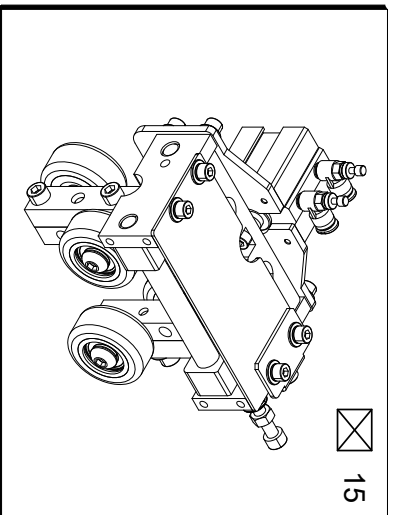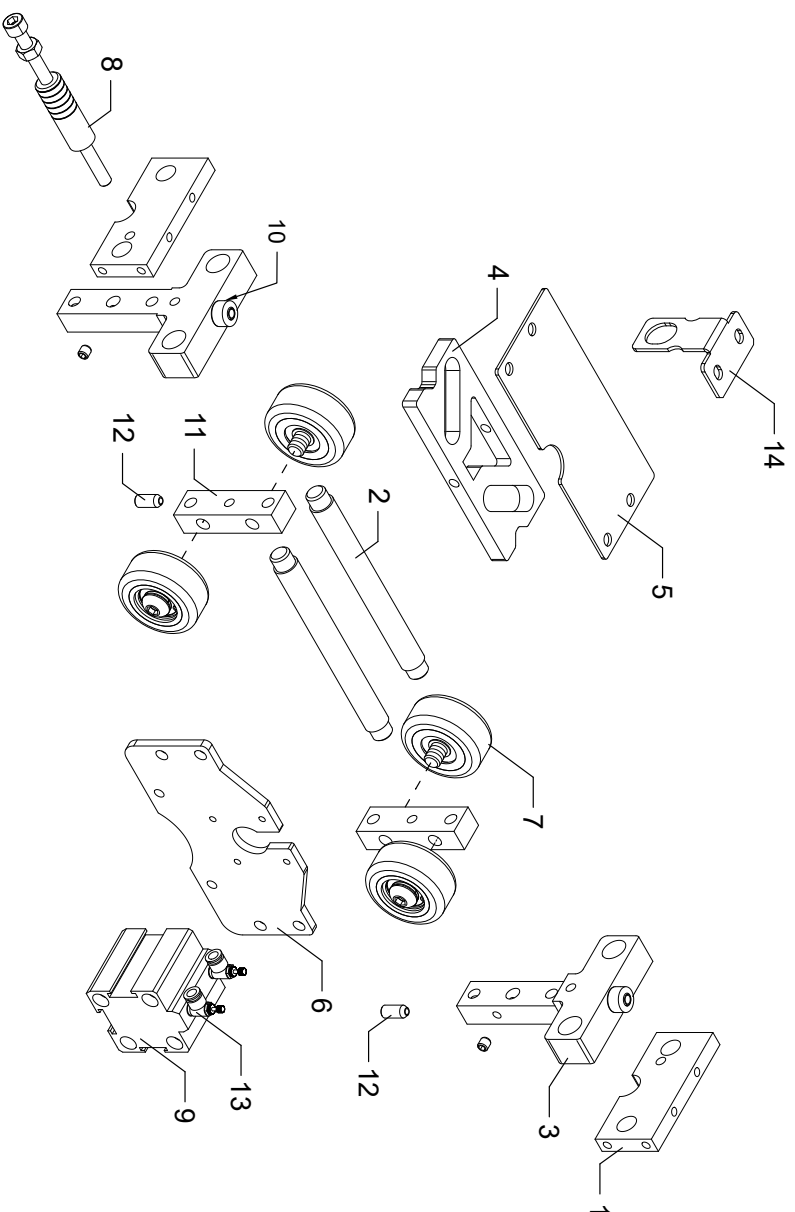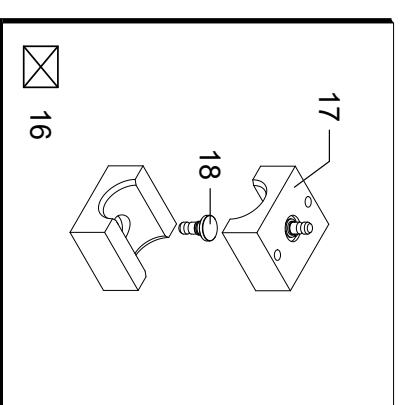| N.	Code	QTY	Denomination
1	P85200700	2	Plate
2	P85200100	2	Arbor
3	P85200200	2	Anchor
4	P85200300	1	Plate
5	P85200500	1	Plate
6	P85200600	1	Plate
7	HP8127000F	4	Spacer set
8	P85201350	1	Scale shaft
9	A11130100	1	Cylinder SDA 25x20
10	P85202300	2	Roller
11	P85200900	2	Anchor
12	P85201300	1	Arbor
13	G55120900	2	Ball BP-06L
14	A12130300	2	Flow regulator M5,φ6
15	P85201360	1	Indicator plate
16	P85200400	1	Plate
17	P82200900	1	Anchor
18	P82201200	2	Fix rod
19	P7620212O	1	Cover
20	P852010__A	1	Anti-vibration bushing set
21	P852010__	2	Bushing block
22	P85200800	2	Arbor

NOMINAL DIAMETER D.

φ 02 06 08 10 12 14 16 18 20 22 24 26 28
03 07 09 11 13 15 17 19 21 23 25 27 29

MOVABLE ANTI-VIBRATION DEVICE (MAVD)

N.	Code	QTY	Denomination
1	P85200700	2	Plate
2	P85200100	2	Arbor
3	P85200200	2	Anchor
4	P85200300	1	Plate
5	P85200500	1	Plate
6	P85200600	1	Plate
7	HP8127000F	4	Spacer set
8	P85201350	1	Scale shaft
9	A11130100	1	Cylinder SDA 25x20
10	P85202300	2	Roller
11	P85200900	2	Anchor
12	G55120900	2	Ball BP-06L
13	A12130300	2	Flow regulator M5,∅6
14	P85201360	1	Indicator plate
15	HP8127002A	1	Anti-vibration device
16	P852010__A	1	Bushing set
17	P852010___	2	Bushing block
18	P85200800	2	Arbor

NOMINAL DIAMETER D.
∅ 02 06 08 10 12 14 16 18 20 22 24 26 28
03 07 09 11 13 15 17 19 21 23 25 27 29

Tab. 101 1

346MM TELESCOPIC FRONT NOSE

Tab. 120 / 1

ø30

øA

øA

øB

346

685

346

7

Bushing P78__1500

φA	—	12	16	20
		18	27.4	28

Small pipe L=275 P78__0400 0401+0402

φA	—	14	18	22	24
φB	—	12	16	20	23
		18	27.4	28	30

Collet P78__0202

φA	—	12	16	20	23
		18	27.5	28	30

Bushing P78__0300

φA	—	12	16	20	23
		14	18	22	24

Support P77__1101

φA	—	12	16	20	23
		14	18	22	24

N.	Code	QTY	Denomination
1	P78200101	1	Telescopic pipe L=235
2	P78200102	1	Collet
3	P78200201	1	First block L=220
4	P78200700	1	Oil gathering L=243
5	P78200500	1	Ring
6	P78200600	1	Oil gathering L=235
7	HP77__001	1	Telescopic front nose

NOMINAL DIAMETER D.
φA 12 16 20 23
    14 18 22 24

øA

346MM TELESCOPIC FRONT NOSE-8#

ø30

ø27.4

øA

4

Small pipe | P7080436 | øA | 8

Small pipe L=275 | P7080400

Collet | P7816202 | øA | 27.5

ø8

346

685

8

3

Bushing | P7080300 | øA | 08

2

5

6

7

1

Support | P77081101 | øA | 08

øA

N.	Code	QTY	Denomination
1	P78200101	1	Telescopic pipe L=235
2	P78200102	1	Collet
3	P78200201	1	First block L=220
4	P78161500	1	Bushing
5	P78200700	1	Oil gathering L=243
6	P78200500	1	Ring
7	P78200600	1	Oil gathering L=235
8	HP77708001	1	Telescopic front nose

Tab. 121 1

346MM TELESCOPIC FRONT NOSE-18#

346

685

⌀20
⌀30

5

| Collet | ⌀A |
| P78230202 | 30 |

4

3

| Bushing | ⌀A |
| P78180300 | 20 |

2

9

6

7

8

1

| Support | ⌀A |
| P77181101 | 20 |

⌀A

N.	Code	QTY	Denomination
1	P78200101	1	Telescopic pipe L=235
2	P78200102	1	Collet
3	P78200201	1	First block L=220
4	P78160402	1	Ring
5	P78180401	1	Sleeve18 L=259
6	P78200700	1	Oil gathering L=243
7	P78200500	1	Ring
8	P78200600	1	Oil gathering L=235
9	HP77718001	1	Telescopic front nose

Tab. 122 1
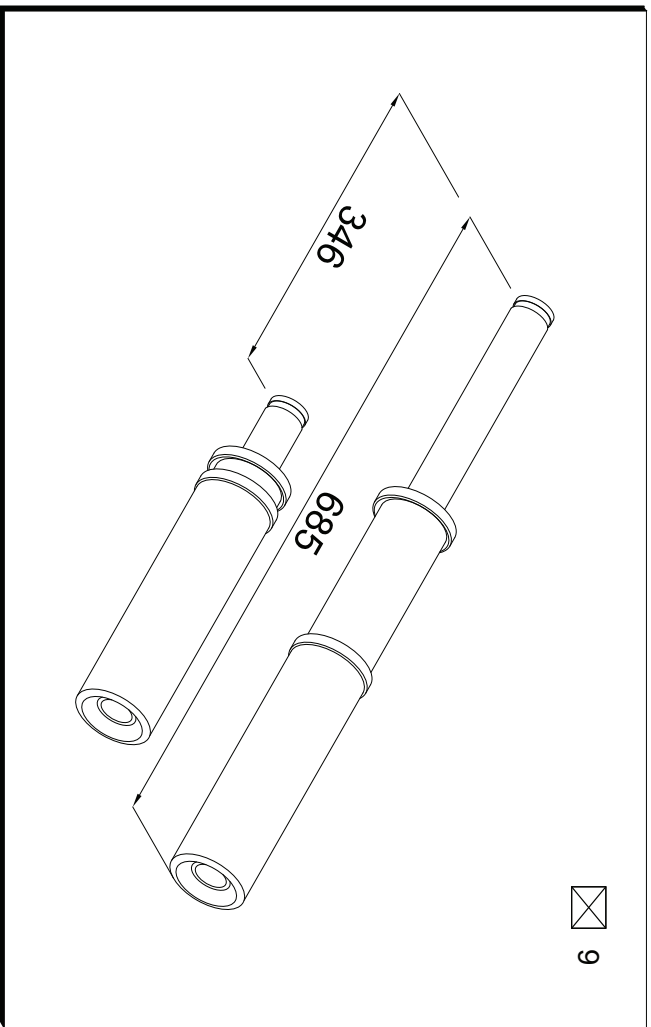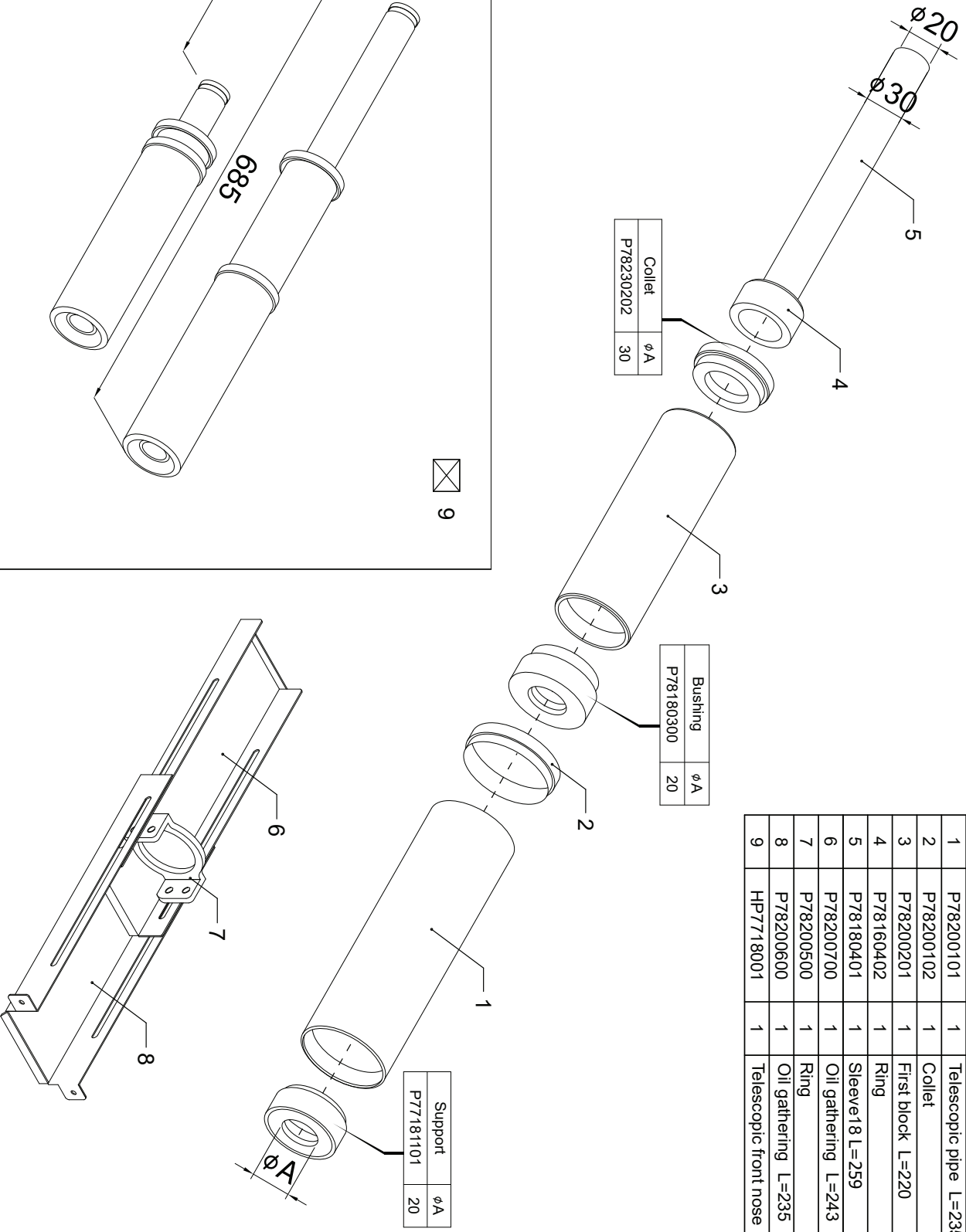
Minuteman 320 V³

346MM TELESCOPIC FRONT NOSE-10#

Tab. 123 1

346

685

8

4

Ø30
Ø15

| Small pipe L=275 |
| P78100420 |
| 0421+0402 |

| Collet | ØA |
| P78100202 | 15 |

3

| Bushing | ØA |
| P78100300 | 11 |

2

5

6

7

1

ØA

| Support | ØA |
| P77101101 | 11 |

N.	Code	QTY	Denomination
1	P78200101	1	Telescopic pipe L=235
2	P78200102	1	Collet
3	P78200201	1	First block L=220
4	P78101500	1	Bushing
5	P78200700	1	Oil gathering L=243
6	P78200500	1	Ring
7	P78200600	1	Oil gathering L=235
8	HP77710001	1	Telescopic front nose

320MM TELESCOPIC FRONT NOSE-25#

ø28

320

660

7

5

4

3

11 ⊠

2

8

9

10

1

ø56.5

ø44.5

6

N.	Code	QTY	Denomination
1	P78250101	1	Telescopic pipe L=220
2	P78250102	1	Collet
3	P78250200	1	2ND Telescopic pipe L=245
4	P78250202	1	Collet
5	P78250400	1	Small pipe L=245
6	P77251101	1	Bushing
7	P82250802	1	Plate
8	P78200700	1	Oil gathering L=243
9	P78200500	1	Ring
10	P78200600	1	Oil gathering L=235
11	HP7725001	1	Telescopic front nose
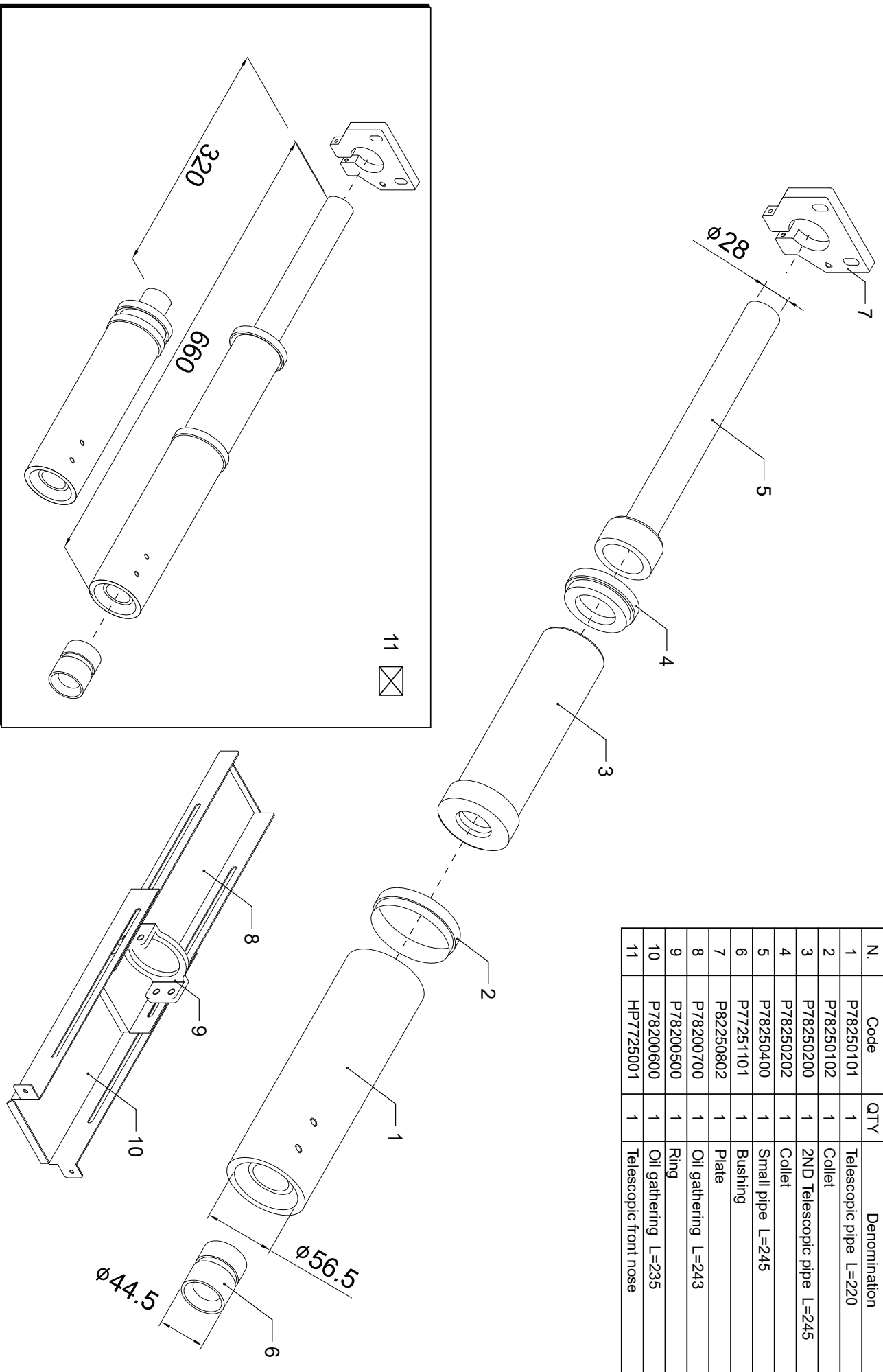
Tab. 124 1

N.	Code	QTY	Denomination
1	P77200800	1	Oil ring
2	A13120600	1	Joint

FIXED FRONT NOSE

First block				
P55__0_____				
ØA	__	12	200	__
14	__	16	300	100
18	20	302	250	
22	23		300	
24	25			
28				
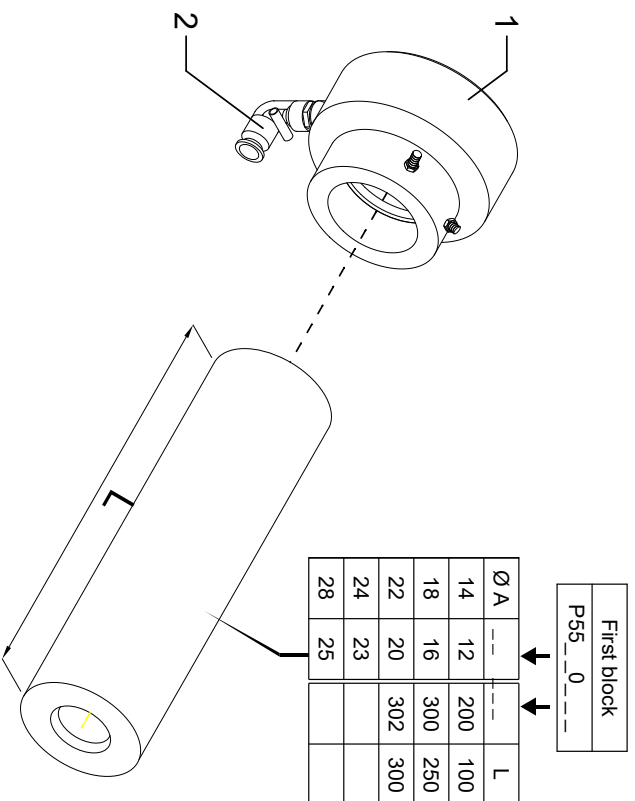
Tab. 130 1

OPERATIONS MANUAL
Minuteman 320^{V3}

514 MM
(20.2")

363 MM
(14.3")

140 MM
(5.5")

(12FT Machine   /12FT Bar length - 3800MM - 12'5"

(6FT Machine   6FT Bar length - 2200MM - 7'2")

Center Height
850 - 1250MM
(33.5" - 49")

Minuteman 320 V3

Technical data subject to change without notice