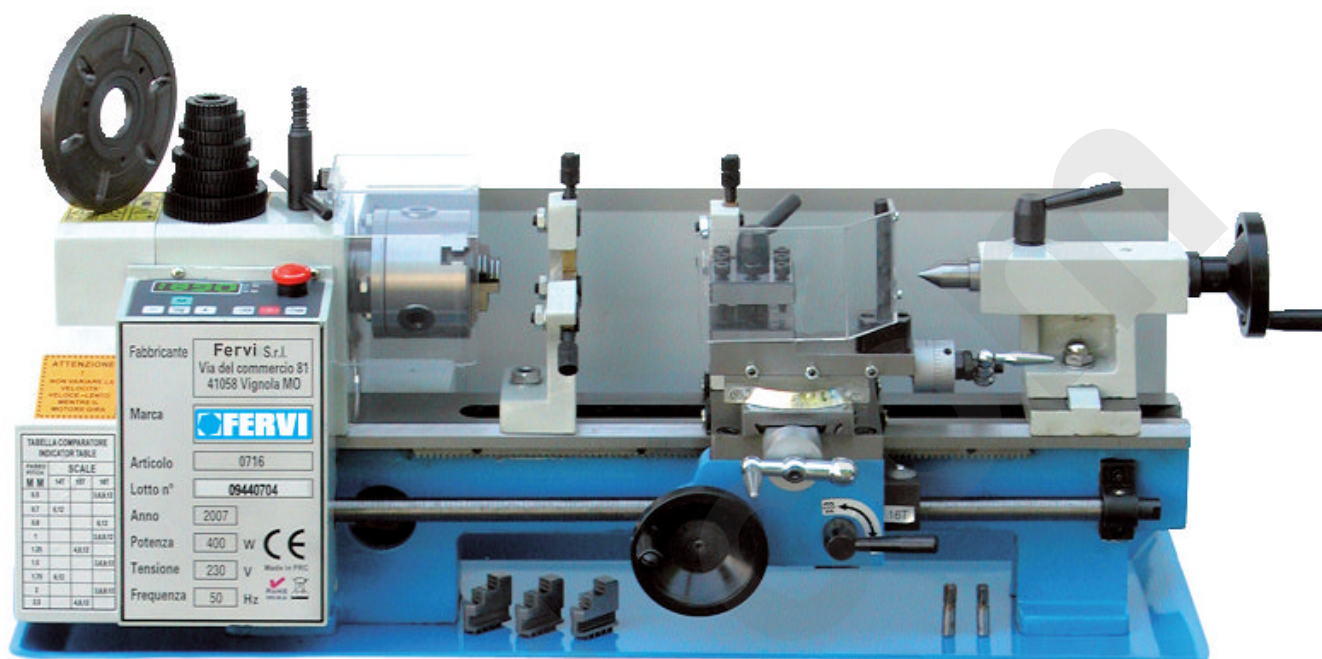


USER AND MAINTENANCE MANUAL



Bench Lathe Art. 0716



ORIGINAL INSTRUCTIONS

FOREWORD



Read this manual before operation

TRANSLATION OF THE ORIGINAL INSTRUCTIONS

Reading this instruction manual is required before operating any of the machinery. The guarantee that the machine will function and perform properly is strictly dependent upon the application of all the instructions contained in this manual.

We guarantee the Machine's conformity to specifications and technical instructions described in the Manual on the date of issuance and listed herein; On the other hand, the machine may also be subject to important technical changes in the future, without the manual being updated.

Therefore, contact FERVI for information about modifications that could be implemented.

REV. 1

July 2013



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1 INTRODUCTION

This manual is considered an integral part of the machine to which it was attached at the time of purchase.

The manufacturer reserves the material and intellectual property rights of this publication and prohibits the disclosure and copying of any part herein without prior written consent.

The purpose of this manual is to provide the knowledge necessary for the use and maintenance of the **Bench Lathe (Art. 0716)** and create a sense of responsibility and knowledge of the capabilities and limitations of the device entrusted to the operator.

Operators must be properly trained and prepared, so make sure that this manual is read and consulted by the staff responsible for commissioning, operating and maintaining the machine. This is to make all operations the safest and most effective possible for those who carry out these tasks. It is, therefore, imperative to strictly comply with the requirements in this manual, a necessary condition for safe and satisfactory operation of the Lathe.

Prior to the installation and use of the machine, authorised personnel shall:

- carefully read this technical document;
- know what protections and safety devices are available on the Lathe, their location and how they work.

The buyer is responsible for ensuring that users are properly trained, that they are aware of all the information and instructions in this document and that they are aware of the potential risks of operating the Lathe.

The manufacturer declines all responsibility for any damage to people and/or things caused by non-observance of the instructions in this manual.

Users will be held fully responsible for any changes made to the machine and the manufacturer will not, therefore, be held responsible for any damage caused to persons and/or property resulting from maintenance performed by unqualified personnel and in a manner that differs from the operating procedures shown below.

The **Variable Speed Bench Lathe** was designed and built with mechanical guards and safety devices designed to protect the operator/user from possible injury.

It is strictly forbidden to modify or remove guards, safety devices and caution labels. If you do so temporarily (for the purposes of cleaning or repair, for example), make sure that no one can use the machine.

Graphic risk alerts and safety and operational warnings

The following boxes are designed to attract the attention of the reader / user for the **proper** and **safe** use of the machine:



Attention

This emphasizes behavioural rules to avoid damaging the machine and/or the occurrence of hazardous situations.



Residual Risks

This highlights the presence of dangers that cause residual risks to which the operator must pay attention in order to avoid injury or damage to property.



2 GENERAL SAFETY WARNING

2.1 General Safety Rules for the Machine's Equipment

Even if the operator is already familiar with the use of manually operated lathes, it is necessary to follow the instructions contained herein, in addition to the general precautions to be observed while working. In particular:

- **Acquire full knowledge of the machine.**

For safe use of the machine, carefully read this manual to acquire the necessary knowledge and to understand: operation, safety devices and all necessary precautions.

- **Wear appropriate clothing for the job.**

The operator must wear appropriate clothing to prevent the occurrence of unpleasant accidents.

- **Take proper care of the machine.**



Risks Associated with Using the Machine

The machine must only be used by personnel who have been specially trained by authorized personnel.



Risks Associated with Using the Machine

DO NOT underestimate the risks associated with using the machine and concentrate on the work in progress.



Risks Associated with Using the Machine

Despite the implementation of all the safety devices for safe use of the machine, it is necessary to take note of all the requirements for the prevention of accidents detailed in the various sections of this manual.



Operator Protection

Before starting any work, the operator must wear the appropriate personal protective equipment (PPE) such as goggles, gloves, etc. (see section 5.3 of this manual).

1. Always check the efficiency and integrity of the machine.
2. Before connecting the machine to the mains, make sure that the rotating parts are not damaged or badly worn. Make sure that the switch is in the neutral position.
3. Do not start the machine in an enclosed or poorly ventilated area, or in the presence of a flammable and/or explosive atmosphere. Do not use the machine in damp and/or wet locations, or those exposed to rain.
4. Avoid starting accidentally.
5. Before starting the machine, get used to ensuring that no remaining maintenance and service keys are inserted.
6. Keep the workplace tidy and free from obstruction; disorder causes accidents.
7. Make sure that the work environment is forbidden to children, non-employees and animals.

8. Do not perform tasks on the machine other than those for which it was designed. Only use the machine in the manner in which it was intended, as described in this instruction manual.
9. Work without disturbances.
10. Work areas must be well lit.
11. Always wear eye protection and protective gloves while working. If dust is produced, use the appropriate masks.
12. Wear appropriate clothing. Loose clothing, dangling jewellery, long hair, etc., can get caught in the moving parts, causing irreparable injury.
13. Firmly secure the work piece before starting the lathe, using the jaws installed on the spindle.
14. Always use the tool in an appropriate manner. Perform only the work for which the tool is made. Do not use the tool for inadequate work.
15. Only use suitable resistance tools in relation to the work that is to be done. This is to avoid risky and unnecessary overloading for the operator, which may be harmful for the life of the tools themselves.
16. Do not pick up moving tools or other moving parts. To stop the moving parts on the machine, always only use the stop command device.
17. Before measuring the work piece mounted on the spindle, turn the engine off, unplug it and wait for the spindle to stop.
18. Do not remove the shavings with hands, even at a standstill. To do this, use tongs or a palette knife.
19. When the work tools need to be replaced or the speed needs to be changed, stop the motor and wait for the spindle to stop.
20. Do not leave the machine until the equipment and other moveable parts are completely stopped.
21. After the work is completed, clean the tool and check its efficiency.
22. Replace worn and/or damaged parts; check that the repairs and protection work correctly before operating. Eventually, if necessary, have it checked by Service staff. Use only original spare parts.
23. **Unplug the power cord of the machine from the power outlet when:**
 - not using the machine;
 - the machine is left unattended;
 - performed maintenance or registration does not work properly;
 - the power cord is damaged;
 - the tool is replaced;
 - moved or transported;
 - cleaning.
24. It is recommended that users of this publication, for maintenance and repair, have a basic knowledge of mechanical principles and procedures inherent in repair technique.
25. **Management responsible for safety is to make sure that the staff responsible for using the machine has read and understood this manual in its entirety.**
26. **Management is responsible for safety and verification of the company's risk status according to Legislative Decree 81/08.**



2.2 Safety Regulations for Electrical Machine Equipment



Changes in the Electrical System

1. Do not modify the electrical system in any way. Any attempt in this regard may jeopardize the operation of electrical devices, thus causing malfunction or accident.
 2. Work carried out in the electrical system of the machine must, therefore, be carried out only by qualified and authorized personnel.
 3. If one hears unusual noises, or feels something strange, immediately stop the machine. Afterwards, inspect the machine and repair if necessary.
-
1. The supply voltage must correspond to that stated on the identification plate and in the technical specifications (220 V / 50 Hz). **Never use any other type of power supply.**
 2. The use of a lifesaving device on the power supply line is recommended. For more detailed information, contact a trusted electrician.
 3. The power connector must be bipolar with a (10 / 16 A, 250 V) grounding pin; any extension cords must have sections equal to or greater than those of the machine's power cord.
 4. Make sure that the power cord does not come into contact with hot objects, wet or oiled surfaces, and/or sharp edges.
 5. The power cord should be checked regularly and before each use to check for signs of damage or wear. If these are not in good condition, do not use the machine and replace the cable.
 6. Do not use the power cord to remove the plug from the socket or move the machine.

2.3 Technical Support

For any problems or concerns, please contact, without hesitation, your dealer's Customer Service, who has competent and specialized staff, specific equipment and spare parts.

2.4 Other Provisions

IT IS FORBIDDEN TO TAMPER WITH SAFETY DEVICES

Check the presence and integrity of protections and the proper functioning of safety devices before starting operation.

If any defect is detected, do not use the Variable Speed Bench Lathe!

It is strictly forbidden to modify or remove guards, safety devices, labels and caution signs on the machine.

3 TECHNICAL SPECIFICATIONS

| Description (unit of measurement) | Value |
|--|-----------------|
| Distance between centres (mm) | 300 |
| Turning diameter over bed (mm) | 180 |
| Turning diameter over carriage (mm) | 110 |
| Spindle diameter (mm) | 80 |
| Spindle bore taper | CM 3 |
| Taper tailstock | CM 2 |
| Spindle bore diameter (mm) | 16 |
| Spindle speed (rev./min) | 0 ÷ 2500 |
| Precision spindle (mm) | 0.01 |
| Range of metric threads (mm) | 0.5 ÷ 2.5 |
| Transverse displacement of the carriage (mm) | 65 |
| Longitudinal movement of the carriage (mm) | 35 |
| Lathe dimensions (mm) | 700 x 230 x 270 |
| Package dimensions (mm) | 760 x 305 x 315 |
| Weight (kg) | 40 |
| Voltage/power supply frequency (V/Hz) | 230/50. |
| Power (W) | 400 |
| Type of motor | DC |
| Sound power level emitted (dB(A)) | 78 |
| Vibration level measured through the hand-arm system (m/s ²) | < 2.5 |



4 DESCRIPTION OF THE MACHINE

The **Variable Speed Bench Lathe (Art. 0716)** is a machine tool, with a horizontal axis, for the machining of metallic materials by means of cold chip removal.

The cutting motion is created by the motion of the work piece, rotating on its own axis, and the feeding motion of the tool.

The machine is completely **manually operated**, as it can only execute movements under the direct control of the operator.

4.1 Intended Use and Scope of Application

The machine is designed and built to perform the following operations on all types of ferrous metals:

- Cylindrical turning;
- Taper turning;
- Facing;
- Profiling;
- Drilling;
- Boring;
- Threading;
- Cutting / Breaking (from bar).



Intended use and materials

The machine has been designed and made for the use specified. Operating the machine other than as intended and non-observance of the technical parameters laid down by the Manufacturer may be dangerous for operators; therefore the former cannot accept any responsibility for resulting damage.

The Lathe must be installed and used on flat supporting surfaces, with adequate ergonomic and resistance features, such as a workbench or a base

The Lathe can operate in closed work environments (production halls, warehouses, etc.), i.e. protected from the weather and where there is no danger of fire or explosion.

The operating temperature is in the range of -20 / +50°C.

The working environment must also be sufficiently lit to ensure maximum operational safety (at least 50 lux are recommended).

There are two main groups within the Lathe (see **Figure 1**):

- The spindle shaft unit;
- The sliding tool holder unit.

The first consists of the spindle, which is integral to the work piece, and the spindle motor's power running gear.

The second consists of the parts that transmit motion to the moving slides that drive the tool in a forward motion and placement on the work piece.

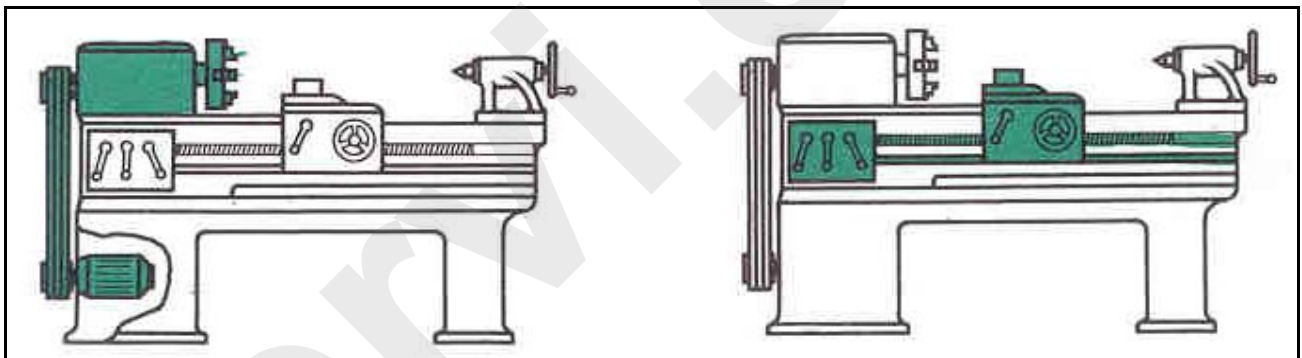


Figure 1 - Typical main groups of the bench lathe.



4.2 Description of the Main Parts

The **Variable Speed Bench Lathe (Art. 0716)** consists of the following main parts (See Figure 2 and Figure 4):

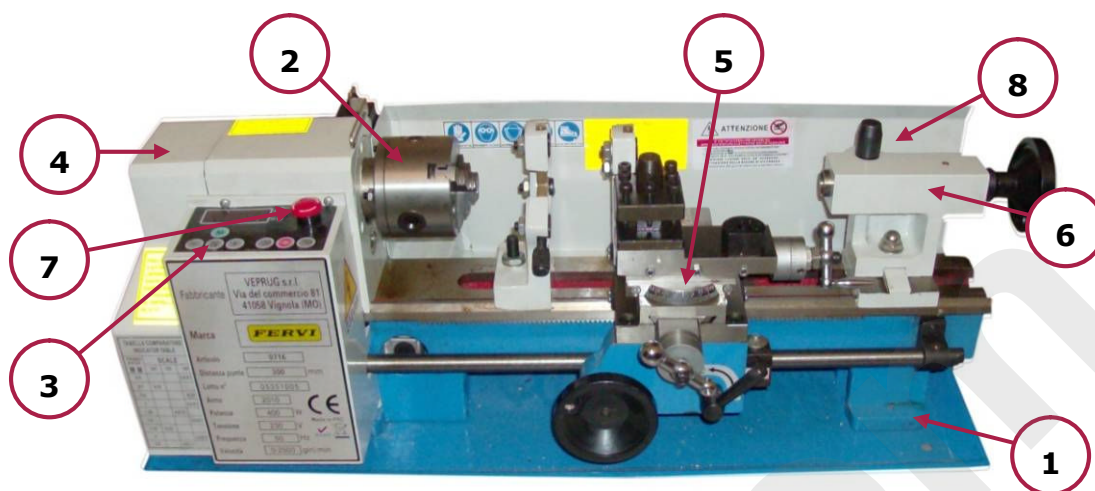


Figure 2 – Main parts of the Variable Speed Bench Lathe (Art. 0716).



Figure 3 – Rear view of the lathe (Art. 0716)

- | | |
|----------|--------------------------------|
| 1 | Supporting table |
| 2 | Head and spindle |
| 3 | Electrical and control panel |
| 4 | Feed speed change gearbox |
| 5 | Carriage and tool holder guide |
| 6 | Tailstock |

- | | |
|-----------|-----------------------|
| 7 | Emergency button |
| 8 | Rear protective cover |
| 9 | Speed selector lever |
| 10 | Feed selector lever |
| 11 | Power cable |

4.2.1 Supporting table

The supporting table (See 1 in **Figure 2**) is made of cast iron; the casting has been stabilised to avoid torsion and/or deformities due to the internal stresses in the material. At the top there are prismatic guides that ensure the movement and alignment of the motor head with the carriage and mobile head (tailstock). The rails have been hardened and grounded. They have been prepared with reinforcing ribbing that increases rigidity.

4.2.2 Head and spindle

The head is made of high strength cast iron; in addition, there are two internal protrusions which have been introduced that increase rigidity, reducing vibration during high speed machining.

The different spindle speeds are obtained by means of two buttons on the control panel (+ and -), which vary the rotation speed of the continuous current electric motor (see also Section 4.2.3 of this manual).

The spindle (See **Figure 4**) is installed on the head shaft, and is supported by two precision bearings. It is **self-centring** with three clamps (jaws), which permit the work piece to be locked safely and stably. For the opening/closing of the jaws, it is necessary to insert the appropriate key into the seats (square cross-section), located on the outer edge of the spindle. For a more detailed explanation on this subject, see Chapter 10 of this manual.



Figure 4 – Spindle



4.2.3 Electrical and control panel

The electric control panel (See ref. 3 in [Figure 2](#)) is positioned at the left part of the machine, between the spindle and the feed speed change gearbox.

The panel contains the following commands (See [Figure 5](#)):

- buttons for starting rotation of the spindle and selecting the direction of rotation;
- buttons for adjusting the speed of rotation and stopping the spindle
- mushroom-shaped emergency stop button;
- Buttons for setting the number of revolutions;
- Display showing the number of revolutions of the spindle, indicating the operating status.



Figure 5 – Tool holder carriage

4.2.4 Feeding speed change gearbox

The feeding speed change gearbox (with replaceable gears, See 4 in [Figure 2](#)), is positioned at the left end of the machine. The lathe is provided with gears able to guarantee a considerable availability of feeds and threads (metric and inch). Spacing selection is performed through the application of the corresponding gears. During the rotation of the gears, they are automatically lubricated.

4.2.5 Carriage and tool holder guide

The carriage, which slides along the rails of the table, is used to fix the tool, and to drive the movement and feeding actions. The various parts (See Figure 6) are made of cast iron, with hardened and ground guides for greater stability.

The hand wheels for feeding the carriage and the lever for engaging the lead screw are easily accessible and easy to use.

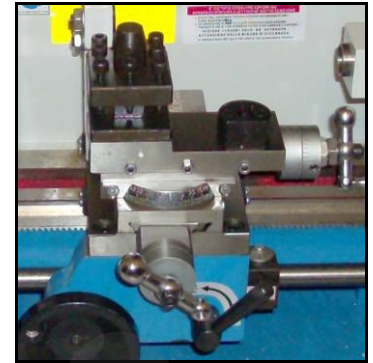


Figure 6 – Tool holder carriage

4.2.6 Tailstock

The tailstock (See Figure 6) consists of a cast iron body that ensures rigidity and stability in all conditions of use. The body of the tailstock is equipped with a nut locking system on the guides, or rails, of the lathe. Inside a steel sleeve has been fitted. It moves via a crank.

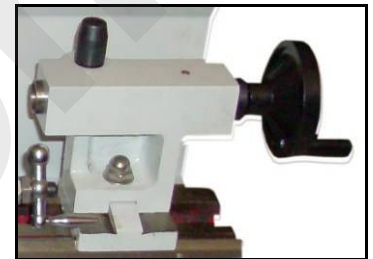


Figure 7 – Tailstock.

4.3 Identification Plate

The following identification plate is present on the machine, particularly on the casing of the electrical and control panel (See Figure 8):

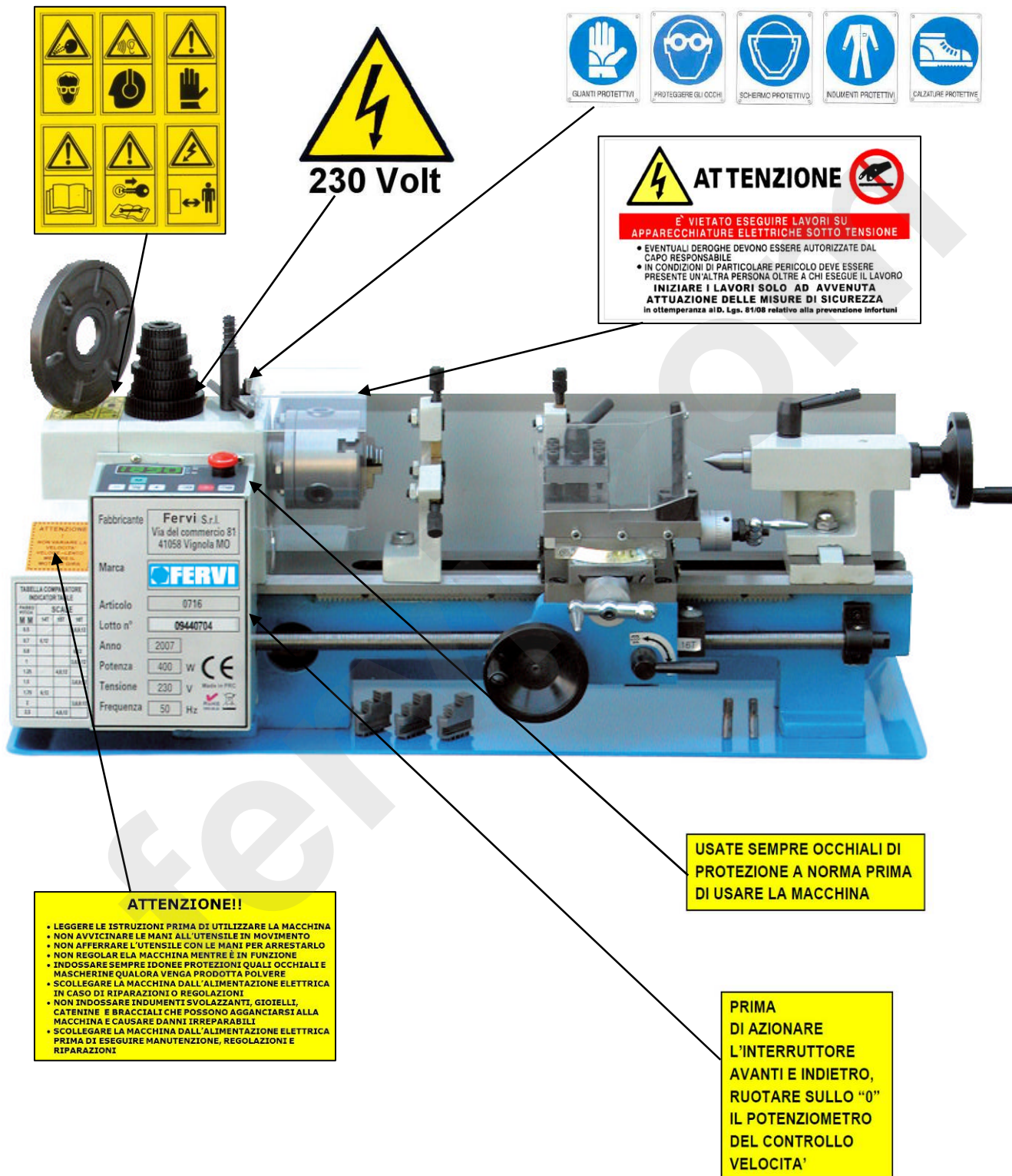
| | | | | | |
|----------------|---|--|-----------|-------------------|---|
| Fabbricante | Fervi s.r.l. Via del Commercio 81, 41058 Vignola (MO) | | Lotto n° | |  Made in PRC  |
| Marca |  | | Anno | 2012 | |
| Articolo | 0716 | | Potenza | 400 W | |
| Distanza ponte | 300 mm | | Tensione | 230 V | |
| | | | Frequenza | 50 Hz | |
| | | | Velocità | 0 - 2500 giri/min | |

Figure 8 – Identification plate.

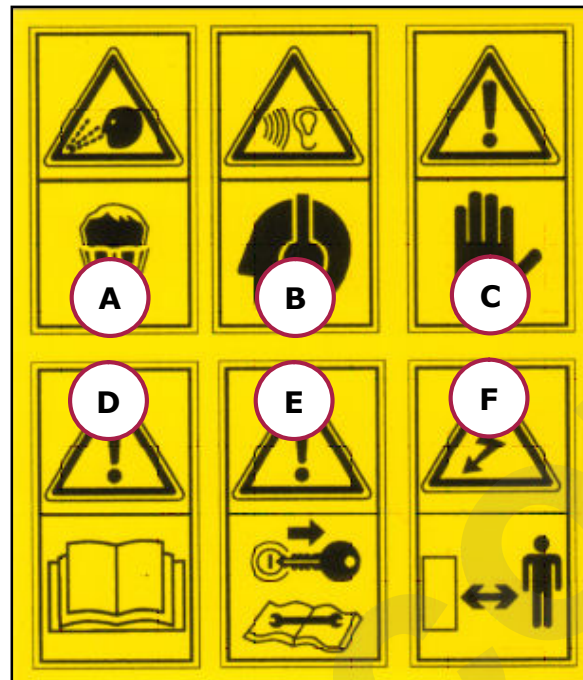


4.4 Pictograms and Labels

The machine has the following pictograms:



CAUTION AND WARNING PICTOGRAMS



A: PPE use plate.

Indicating that the use of suitable personal protective equipment (PPE) is obligatory when working with the machine, particularly glasses and/or safety shields for the eyes.

B: PPE use plate.

Indicating that the use of suitable personal protective equipment (PPE) is obligatory when working with the machine, particularly headphones and/or protective covers for the ears.

C: PPE use plate.

Indicating that the use of suitable personal protective equipment (PPE) is obligatory when working with the machine, particularly protective gloves for abrasions and cuts.

D: Operation and maintenance manual consultation plate.

Indication of the obligation to consult the manual before starting the machine.

E: Moving components safety plate.

Indication of the obligation to stop the motor before opening doors and/or protective guards to carry out inspections, cleaning and maintenance.

F: Operating range safety plate.

Indication of the obligation to ensure that any people in the surrounding area of the workplace, are out of range of the machine.

G: PPE use plate.



Indicating that the use of suitable personal protective equipment (PPE) is obligatory when working with the machine, particularly glasses and/or safety shields for the eyes.

CONTROL MARKINGS

**AS A FIRST RULE FOR
USING THE MACHINE, ALWAYS
USE PROTECTIVE
EYEWEAR**

G

VELOCE LENTO

I

I: Gear selector lever plate.

Labelling on the back of the gear selector lever.

L: Feed selector lever plate.

Labelling on the back of the lever for selecting the auto feed direction for the tool holder carriage (toward the left or the right).



PLATE IN ITALIAN


ATTENZIONE 

È VIETATO ESEGUIRE LAVORI SU APPARECCHIATURE ELETTRICHE SOTTO TENSIONE

- EVENTUALI DEROGHE DEVONO ESSERE AUTORIZZATE DAL CAPO RESPONSABILE
- IN CONDIZIONI DI PARTICOLARE PERICOLO DEVE ESSERE PRESENTE UN'ALTRA PERSONA OLTRE A CHI ESEGUE IL LAVORO

INIZIARE I LAVORI SOLO AD AVVENUTA ATTUAZIONE DELLE MISURE DI SICUREZZA
In ottemperanza al Dgs.81/08 relativo alla prevenzioni infortuni

PLATE IN ENGLISH


ATTENTION 

IT IS PROHIBITED TO WORK ON LIVE ELECTRICAL EQUIPMENT

- ANY EXCEPTIONS MUST BE APPROVED BY THE HEAD MANAGER
- UNDER PARTICULARLY DANGEROUS CONDITIONS, ANOTHER PERSON MUST BE PRESENT WHO IS NOT PERFORMING THE WORK

ONLY BEGIN WORKING WHEN SAFETY MEASURES HAVE BEEN IMPLEMENTED
In accordance with Legislative Decree 81/08 on accident prevention

USATE SEMPRE OCCHIALI DI PROTEZIONE A NORMA PRIMA DI USARE LA MACCHINA

AS A FIRST RULE FOR USING THE MACHINE, ALWAYS USE PROTECTIVE EYEWEAR

PRIMA DI AZIONARE L'INTERRUTTORE AVANTI E INDIETRO RUOTARE SULLO "0" IL POTENZIOMETRO DEL CONTROLLO VELOCITÀ

BEFORE OPERATING THE SWITCH BACK AND FORTH, TURN THE POTENTIOMETER SPEED CONTROL TO THE "0" POSITION

ATTENZIONE!!

- LEGGERE LE ISTRUZIONI PRIMA DI UTILIZZARE LA MACCHINA
- NON AVVICINARE LE MANI ALL'UTENSILE IN MOVIMENTO
- NON AFFERRARE L'UTENSILE PER ARRESTARLO
- NON REGOLARE LA MACCHINA MENTRE È IN FUNZIONE
- PRIMA DI AVVIARE LA MACCHINA VERIFICARE CHE LA CHIAVE DI SERRAGGIO DEL MANDRINO SIA STATA DISINSERITA
- INDOSSARE SEMPRE ADEGUATE PROTEZIONI QUALI OCCHIALI E MASCHERINE QUALORA VENGA PRODOTTA DELLA POLVERE
- SCOLLEGARE LA MACCHINA DALL'ALIMENTAZIONE ELETTRICA IN CASO DI RIPARAZIONE O REGOLAZIONI
- NON INDOSSARE INDUMENTI SVOLAZZANTI, GIOIELLI CATENINE E BRACCIALI CHE POSSONO AGGANCIARSI ALLA MACCHINA E CAUSARE DANNI IRREPARABILI
- SCOLLEGARE LA MACCHINA DALL'ALIMENTAZIONE ELETTRICA PRIMA DI ESEGUIRE MANUTENZIONE, REGOLAZIONI E RIPARAZIONI

ATTENTION!!

- READ THE INSTRUCTIONS BEFORE USING THE MACHINE
- KEEP HANDS AWAY FROM MOVING PARTS
- DO NOT GRASP THE PIECE WITH YOUR HANDS TO STOP IT
- DO NOT ADJUST THE MACHINE WHILE IN OPERATION
- ALWAYS WEAR SUITABLE PROTECTIVE GLASSES AND MASKS IN CASE OF ANY DUST
- DISCONNECT THE MACHINE FROM THE POWER SUPPLY WHEN DOING REPAIRS OR ADJUSTMENTS
- DO NOT WEAR LOOSE CLOTHING, JEWELRY,
- CHAINS OR BRACELETS THAT CAN GET CAUGHT IN THE MACHINE AND CAUSE IRREVERSIBLE DAMAGE
- DISCONNECT THE MACHINE FROM THE POWER SUPPLY BEFORE CARRYING OUT MAINTENANCE, ADJUSTMENTS AND REPAIRS



5 MACHINE SAFETY

5.1 Electrical Safety Devices

The lathe can be launched exclusively through voluntary actions, in particular by pressing one of the buttons to start the spindle, located on the machine's **control panel** (see Chapter 9 of this manual).

The machine is also equipped with an **emergency stop button** (mushroom-type, self-locking). When pressure is applied to the cap in an emergency, the dangerous functions stop. To restart the machine, you must reset the button by turning it clockwise.

In the event of malfunction or breakdown, the Lathe is equipped with a power cord and plug with a **grounding conductor** that provides a path of least resistance for electric current, reducing the danger of electrocution.

The plug must be plugged into an appropriate outlet, grounded in accordance with current regulation. Extension cable diameters must be equal to or greater than the machine's power cable diameter.



Electric Shock

Improper connection of the Lathe and/or the grounding conductor can result in the risk of electric shock.

The use of a **lifesaving device** on the power supply line is recommended. For more detailed information, contact a trusted electrician.

Check with a qualified electrician if you don't understand the instructions for grounding or if you have any doubts about the grounding of the machine.

5.2 Mechanical Safety Devices

Protective screens

The screens and guards have the role of protecting the operator by preventing coolant, chips, splinters, tool fragments or even the work piece, which may detach, from being projected towards the face or torso. The screens are either mobile (simple or interlocked) or fixed type screens.



Checking the Safety Devices

- Each time the Lathe is used, check that the safety devices function and are positioned properly.
- In case of damage and/or breakage, do not use the machine.

5.3 Personal Protective Equipment (PPE)



Use of PPE

ALWAYS use appropriate personal protective equipment (PPE), such as: (see [Figure 9](#))

- Gloves,
- Goggles or face shields;
- Overalls or aprons;
- Safety shoes.



PROTECTIVE
GLOVES



PROTECT THE
EYES



PROTECTIVE
CLOTHING



PROTECTIVE
FOOTWEAR

Figure 9 – Personal Protective Equipment.



6 FORBIDDEN USES AND HAZARDS

The modes of use specified in the manual as incorrect ***should never be permitted*** under any circumstances.

Using the machine for lathing non-ferrous materials, unauthorized manoeuvres, or misuse or failure to maintain the machine can result in serious danger to the safety of the staff, especially the operator, and will affect the functionality and intrinsic safety of the machine itself.

The following actions, which obviously cannot cover the entire range of potential possibilities for "misuse" of the machine, however, those that are "reasonably" more predictable, are to be considered strictly prohibited.



IT IS STRICTLY FORBIDDEN:

- Supplying the machine with voltage from the mains that is different from that shown on the identification plate (230V, 50 Hz).
- Use the machine for services other than those for which it was intended;
- Using the machine without having read the operating instructions and without due care.
- Using the machine, particularly manual loading, without using suitable personal protective equipment (PPE) according to the information provided in this manual.
- Using the machine and, particularly, the tool improperly.
- Picking up moving tools or other moving parts.
- Taking measurements of the work piece mounted on the spindle, without turning the motor off, unplugging it and waiting for the spindle to stop.
- Removing chips with your hands.
- Replacing the work tools or carrying out the speed change, without stopping the motor, disconnecting the plug and waiting for the machine to stop.
- Modifying and/or tampering with the safety devices on the lathe.
- Using the machine as a support and/or work surface, or climbing on the machine.
- Touching the machine with damp and/or wet hands.
- Using the machine when barefoot.
- Exposing the machine to the elements (sun, rain, hail, etc..).
- Using water jets or sprayers.
- Using the machine without securing it properly.
- Cleaning and/or maintaining the machine without securing it properly.
- Installing and using the machine on surfaces that are not sufficiently flat and smooth.
- Installing and using the machine on surfaces that are not hard and strong enough to support its weight.
- Installing and using the machine outdoors.
- Using the machine in a dark place.
- The machine is used by untrained personnel or those who are not physically or mentally

fit to operate the machine.

- Allowing untrained and unqualified personnel to perform maintenance on the machine and without complying with the procedures specified in this manual.
- Performing maintenance with insufficient visibility and/or lighting.
- Performing cleaning and/or maintenance without disconnecting the power plug.
- Changing the machine's electrical system.

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7 LIFTING, TRANSPORTATION AND STORAGE IN WAREHOUSE

7.1 Lifting

To lift the Lathe, follow these steps:

1. To achieve a perfect balance, move the tailstock all the way on the right side of the pallet and be sure to tighten the lock nut;
2. At the same time, slide the tool holder carriage until the perfect machine balance is obtained.



Cleaning of the guide rails

Do not move the tool holder carriage and/or the tailstock until the relative guide rails have been cleaned.

3. Given the low weight (40 kg) of the machine, it can be manual lifted by at least two operators, who must grasp the lathe at the ends with both hands and be equipped with anti-crushing gloves.



Cleaning of the guide rails

For transport, DO NOT grab the lathe by the slide rails and/or lead screw, which may be damaged beyond repair.

The manufacturer declines all responsibility for any damage to persons and/or property resulting from improper lifting of the machine performed by unsuitable personnel.

7.2 Transportation

The transport of the machine can be carried out through the aid of vehicles and/or industrial transportation vehicles, such as trucks, with containers of sufficient size to hold the machine itself. The machine must be suitably anchored to the means of transport (for example, through the aid of ropes).

During transport, the machine must be protected from rain, snow, hail, wind, and any other adverse weather conditions. In this regard, it is advisable to use means of transport with closed compartments (vans, trucks etc.) or possibly covered with tarpaulin.

7.3 Warehouse Storage

In the event that the machine is to be stored and unused for some time before being put into service again, proceed as follows:

1. Disconnect the power supply cable;
2. Protect machined parts (such as rails, the carriage and tool carrier slide, spindle, tailstock quill, etc.) with protective fluid and/or grease;
3. Store in a dry place, free from dust and contaminating agents. Climatic conditions recommended for storage:

Temperature: - 15° / + 55° C;

Maximum humidity: 95% (in the absence of condensation).



Shock Protection

Make sure the Lathe is protected from knocks and vibrations.



8 ASSEMBLY AND COMMISSIONING

8.1 Identification of the Installation Site

To install the machine, locate an area that is well lit, away from humidity and has no sources of vibration in the vicinity.

The lathe must be positioned in such a way that adequate spaces are available for the operator, in order for it to be used to its full potential, and to allow the adjustment, maintenance and cleaning operations to be performed safely. In this regard, an area of at least two square metres in front of the machine must be kept free



Installing the Machine

Do not install the Machine outdoors to avoid deformation, loss of function and damage to the electrical control circuit.

8.2 Support Base

It is essential that the machine is positioned on a level, flat support surface that is of adequate strength to support it in every condition that can occur during normal use. In this regard, use a base, a bench or a similar support.



Loss of Stability

Mount the Lathe on a support base that is solid and strong to avoid it falling over and so it does not cause vibrations;

8.3 Securing the Machine



Clean the Workbench

Before supporting the lathe, clean the workbench of any dirt that may be present.

In the case of using a steel bench, it is advisable to place between the Lathe and the supporting surface a layer of suitable material which will reduce the vibrations (anti-vibration pads).

8.4 Levelling the Machine

For this operation, it is recommended to use a precision spirit level (0.001 mm).

8.4.1 Preliminary phase

The preliminary phase serves to eliminate the presence of torsions in the lathe table. Proceed with resetting the head by adjusting the appropriate screws, then locking the tailstock with the appropriate adjusting screw.

8.4.2 Transverse bench levelling

Place the level in the transverse direction on the rails under the spindle of the lathe and check the bubble.

Place the level in the transverse direction on the rails of the pallet under the tailstock and check the bubble.

Frequently repeat these operations and, if necessary, make small corrections, increasing or decreasing the number of anti-vibration pads under the table.

8.4.3 Levelling the lathe guide rails

Place the level on the sides of the trolley and move it slowly along its entire length while checking that the bubble does not change.

If the bubble moves, adjust the levelling of the table, adding / removing shims, to reach a uniform level throughout the entire travel of the carriage.

Periodically check these measurements (at least every six months).

Levelling the machine perfectly is one of the first and most essential steps to carry out before using the machine.

8.5 Operations Before Starting the Machine.

8.5.1 Lubrication and greasing

Before you start the machine, it should be lubricated and greased as described in section 11.1, on "Lubrication".

8.5.2 Connecting the power supply plug

Insert the power plug into a grounded bipolar wall socket.



Connection

Ensure the perfect connection of the power plug.



8.5.3 Open circuit test

Manually rotate the hand wheels on the trolley's tool carrier slides and tailstock quills to verify that these move freely and without friction.

Start the machine by pressing one of the buttons to select the direction of rotation of the spindle, and adjust the speed of rotation with the buttons; once this is done, make sure that the electric motor and the spindle are working properly.

Test the operation of the button for reversing the rotation direction of the electric motor.

Test the emergency stop button, the whole machine should stop.

Operate the machine for a few minutes: starting from low engine speeds, gradually increasing the speed of the spindle. Perform this test by selecting both positions of the rear speed lever.



Protection against thrown objects

During the test run, no operator and no other person should be within range of the machine.

Before starting work, see the chapter on "Machine settings".

9 DESCRIPTION OF CONTROLS

9.1 Control Switches



Figure 10 – Control Switches.

1. Start the spindle counter-clockwise.
2. Start the spindle clockwise.
3. Stop the spindle.
4. Increase the rotation speed of the spindle.
5. Decrease the rotation speed of the spindle.
6. Quickly vary the rotation speed of the spindle, if the + button and the - button are pushed together.
7. Vary the operating process of the machine.
8. Visual display of the number of spindle revolutions.
9. Status lights on the machine: the green light indicates a normal operating state, the red light indicates protection of the machine caused by an over-current.
10. The mushroom-shaped, self-locking emergency button stops the operation of the machine.



9.1.1 Operating mode button.

The button for selecting the operating mode (see 7 in [Figure 11](#)), allows you to set the various parameters of the machine, particularly:

MODE 0 This is the state when the machine is turned on, the display shows the actual speed of the spindle.

MODE 1 To switch to this mode, press the "M" button once (7). In this mode, you can set the number of spindle revolutions that are wanted after start-up.

To change from one number to another in the display, use the 6 key; using the + and - buttons will increase or decrease the number.

After 10 seconds, if no buttons are pressed, the machine returns to the initial mode.

MODE 2 To switch to this mode, you must press the "M" button twice (7). In this mode, you can set the maximum and minimum spindle rotation speed.

To change from one number to another in the display, use the 6 key; using the + and - buttons will increase or decrease the number.

After 10 seconds, if no buttons are pressed, the machine returns to the initial mode.

MODE 3 To enter this mode, press the "M" button twice (7). In this mode, the machine displays the operating status. The following method does not allow for the change of any of the machine's parameters.

After 10 seconds, if no buttons are pressed, the machine returns to the initial mode.

9.1.2 Emergency Button

To stop the machine in case of emergency, press the red, mushroom-shaped button (see Figure 12). When pressure is applied to the button, the machine stops. To restart the machine after activating the emergency button, it is necessary to re-arm the button by turning it clockwise.



Figure 11 - Emergency button.

Press this button only in case of emergency.



Checking the Emergency Button

Before starting any work on the machine, ensure that the emergency stop button functions.



In Case of an Emergency

In an emergency, press the red emergency button to stop the machine.



Risk of Abrasions and/or Cuts

- After pressing the stop or emergency switch, the spindle will continue to rotate by inertia.
- Do not hold body parts near the moving spindle!



9.2 Levers and Control Wheels

9.2.1 Commands for adjusting the speed of the spindle

The commands for adjusting the speed of the spindle include:

- the + and - buttons on the control panel (see Figure 12/A);
- the lever at the rear of the machine (see Figure 12/B).

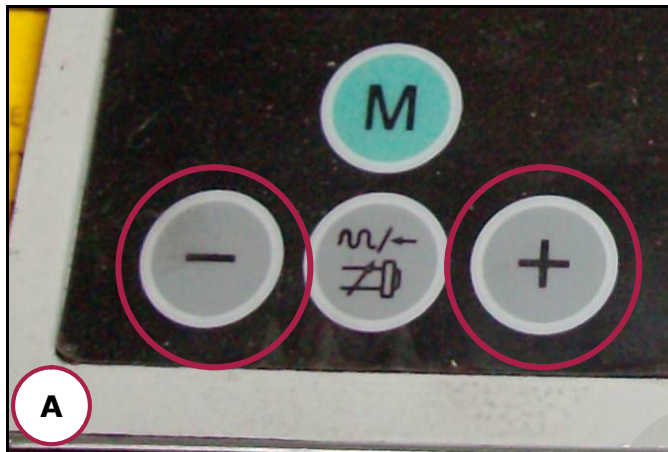


Figure 12 – Speed adjustment knobs.

To select the desired rotation speed, move the lever back in place and press the + or - button to change the rotation speed (see Figure 12).

With rear lever in the "SLOW" position, the rotation speed can be varied from 100 to 1,100 revolutions/min. (L scale), while in the "FAST" position, the rotation speed can be varied from 200 to 2,500 r/min. (H scale).



Adjusting the rear lever

Before moving the rear lever, always stop the machine's motor.

9.2.2 Levers and hand wheels of the carriage and tool holder slides

On the tool holder carriage there are five manual controls (levers and hand wheels) for carrying out fine adjustments and feeding (see Figure 13).

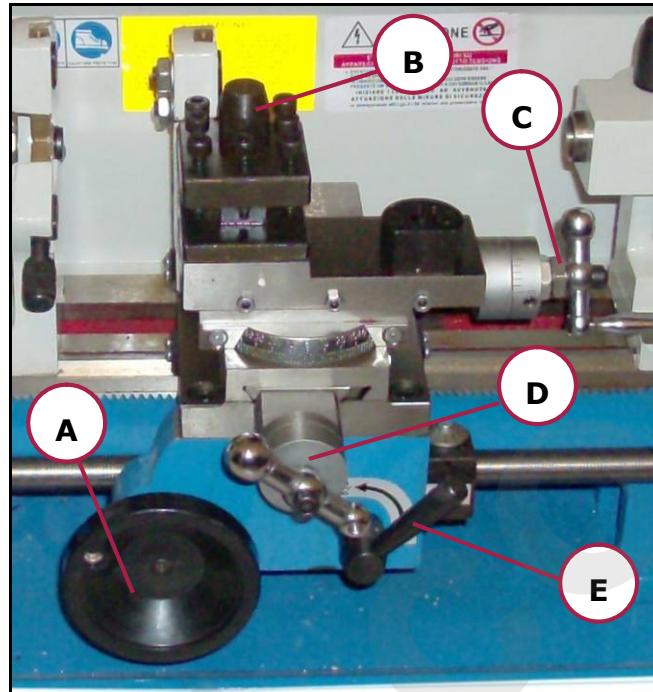


Figure 13 – Lever and hand wheel of the tailstock.

(a) Hand wheel for longitudinal movement of the carriage: The hand wheel allows the quick longitudinal displacement, to the right and left, of the tool holder carriage. To move the carriage to the right (towards the tailstock), turn the wheel clockwise and anticlockwise to move the carriage to the left (towards the spindle).

(b) Tool locking lever: The lever allows locking of the cutting tool, to the tool holder base (turret).

(c) Hand wheel for longitudinal displacement of the tool holder slide: The manual hand wheel allows for fine, longitudinal movements, right to left, of the tool holder slide. To move the slide to the left (toward the spindle), turn the wheel clockwise and anticlockwise to move the slide to the right (toward the tailstock).

(d) Hand wheel for transversal displacement of the tool holder slide: The hand wheel allows for fine, transverse movements of the tool holder slide.

To move the slide forward (toward the work piece), turn the wheel clockwise and anticlockwise to move the slide back (towards the operator).

(e) Lead screw casing lever: The lever allows the closing / opening of the lead screw casing to select the automatic feeding of the carriage in a longitudinal direction. To close the lead screw casing, for the automatic feeding of the carriage lower the lever, conversely to open the casing, lift the same lever.



9.2.1 Tailstock lever and hand wheel

There are three manual controls on the tailstock (levers, hand wheels and screws) which allow for fine adjustments and feeding (see [Figure 14](#)).

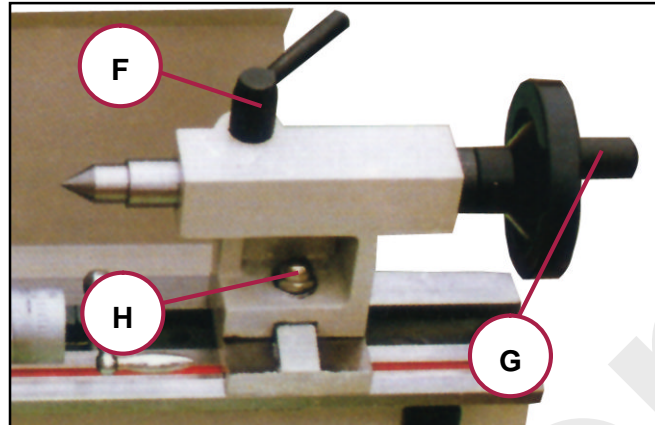


Figure 14 – Lever and hand wheel of the tailstock.

(f) Quill locking lever: The lever allows the locking of the tailstock quill.

(g) Hand wheel for longitudinal movement of the quill: The manual hand wheel allows for lengthwise movements, right to left, of the tailstock quill. To move the quill to the left (toward the spindle), turn the wheel clockwise and anticlockwise to move the barrel to the right.

(h) Locking screw for the transverse adjustment of the tailstock: The screw locks the tailstock, once it has been transversally centred.

10 OPERATION



Intended use and materials

The Variable Speed Bench Lathe (Art. 0716) was designed and created for the machining of metallic materials by means of a cold chip removal process. Operating the machine other than as intended and non-observance of the technical parameters laid down by the Manufacturer may be dangerous for operators; therefore the former cannot accept any responsibility for resulting damage.



Risk of Abrasion and Accident

- Before using the machine, make sure that it is rigidly fixed to the workbench to prevent unwanted movement or loss of stability.
- Wear appropriate personal protective equipment (PPE) such as gloves, goggles, overalls or apron and safety shoes.



Environment for Use

- The lathe can operate in enclosed working environments (production departments, warehouses, etc.), such as those that are protected from the weather and where there is no danger of fire or explosion.
- The operating temperature is in the range of -10 / +50°C.
- The working environment must be sufficiently lit to ensure maximum operational safety (at least 50 lux).



Working Near the Spindle

Before starting work in the vicinity of the spindle, ALWAYS check that the machine is stopped.

It is recommended to not extend the continued use of the machine for more than 10 minutes to avoid overheating of the machine (which could damage the engine) and the equipment.

1. insert the work piece into the spindle and secure it by tightening the jaws with the appropriate key. insert the key in one of the hollow, square sections on the spindle and turn it clockwise to tighten in the jaws (see **Figure 15**).

Mount the series of jaws, outdoors or indoors, that are suitable for the type of processing. Enter the appropriate jaws, bearing in mind that the jaw and the seat on the corresponding spindle are marked by the same number.

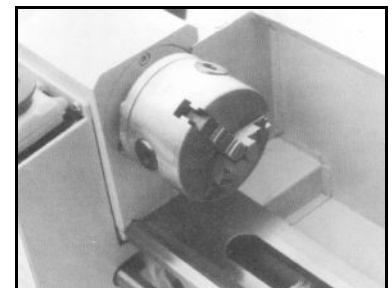


Figure 15 – Spindle key.



Locking the Work Piece

Lock the work piece onto the self-centring spindle in a stable and secure manner, by tightening the jaws with the necessary force.

2. If necessary, secure the opposite end of the work piece through the tailstock.

In this regard, mount a centre point on the tailstock, start turning slowly, bring the tip from the centre of the work piece and make a small hole in the centre. Remove the tip from the centre, refit the chuck and tighten the piece between the spindle and the tailstock (see [Figure 16](#)).

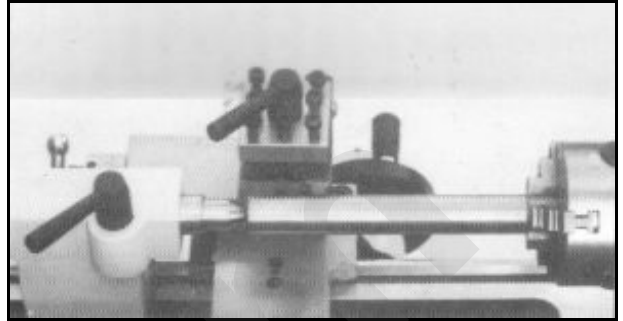


Figure 16 - Detail of the tailstock.

3. If necessary, check the eccentricity of the work piece using a comparator and rotating the piece slowly (by hand) after it has been placed between the points (see [Figure 17](#)).

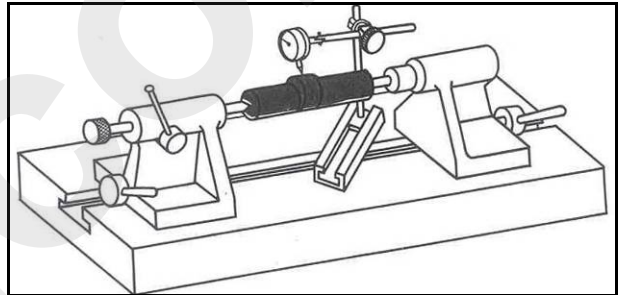


Figure 17 – Check the eccentricity of the work piece.

4. Insert the tool on the turret of the tool holder carriage, and secure it with the relative locking lever (see ref. b in [Figure 13](#)).
5. Adjust the position of the tool carriage and slide using the appropriate levers and hand wheels (see [Figure 13](#)).

By loosening the two screws (see ref. A in [Figure 18](#)), you can rotate the tool carriage.

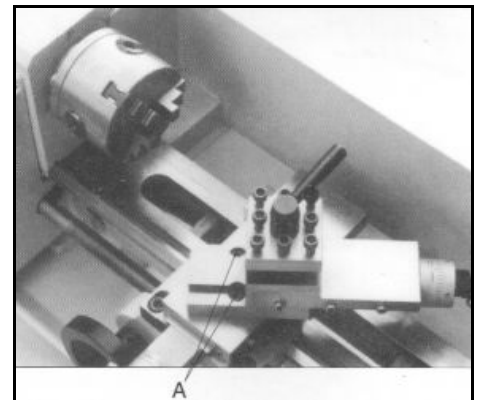


Figure 18 - Turret screws.

6. Set the correct spindle rotation speed using the rear lever (see [Figure 12/B](#)) and the + and - buttons (see [Figure 12/A](#)) to start the rotation of the spindle.
7. If necessary, set the direction of rotation of the electric motor as desired, using the buttons to reverse the direction of rotation (see ref. 1 and 2 in [Figure 10](#)).
8. Perform the machining of the work piece, by moving the tool towards the work piece, in rotation, only using the hand wheels that regulate the fine movement of the tool holder slides (see ref. c/d in [Figure 13](#)).

Use the controls for the automatic feeding of the carriage, for threading operations, where appropriate (see the following paragraph).

9. When finished, move the tool away from the work piece, then turn off the machine by pressing the stop button (see in **Figure 10**).



Risk of Abrasions and/or Cuts

- After putting the start lever into the neutral position or pressing the emergency stop switches, the spindle will continue to rotate by inertia.
- Do not hold body parts near the moving spindle!

10. After waiting for the spindle to stop, remove the piece from the spindle itself, opening the jaws with the appropriate key. To do this, insert the key into one of the hollow, square sections on the spindle (see **Figure 15**) and turn it anticlockwise.

10.1 Automatic Feeds

The automatic longitudinal feed originates in the spindle, which transmits motion to the lead screw connected to the spindle itself by means of gears that allow for the variation in the rotational speed (see **Errore. L'origine riferimento non è stata trovata.** **Figure 20**).

To the rear of the lathe is the lever for inserting the automatic feed. This lever selects the carriage's direction of travel, as indicated by the label provided. In the middle position, the carriage's automatic feeding is disabled.

The lead screw's motion of rotation exerts pressure on the trolley's split nut, which determines the automatic longitudinal feed.

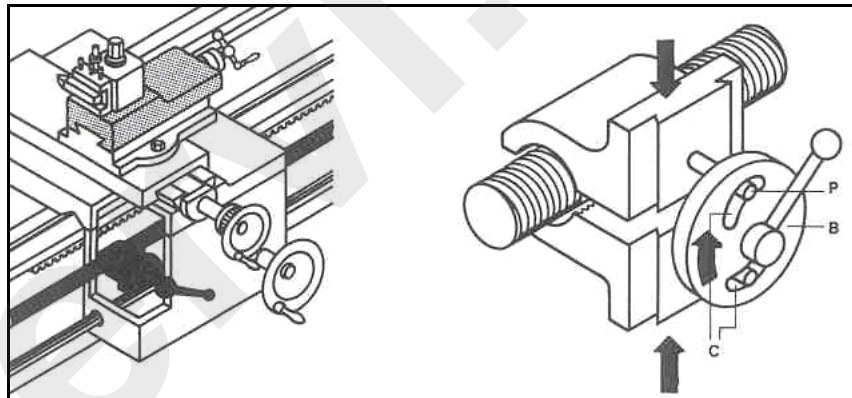


Figure 19 – Longitudinal feed with the lead screw.



A three-position lever is located at the rear of the machine to select the direction of the tool holder carriage's automatic feed (see **Errore. L'origine riferimento non è stata trovata.**Figure 20).

Move the lever down to select an automatic feed to the right, and vice versa, move up to select an automatic feed to the left.

The central positions puts the automatic feed into neutral.



Adjusting the rear lever

Before moving the rear lever, always stop the machine's motor.

The Variable Speed Bench Lathe (Art. 0716) has a replaceable gear type feeding speed changer. Therefore, the gears that execute the desired feed rate must be replaced from time to time.

To do this, proceed as follows:



Risk of Crushing

Before replacing the gears, turn off the machine, put the main switch in the "0" position .

1. Open the guard for the feed speed change gearbox, placed on the left part of the machine (see ref. 4 in Figure 2);
2. Unscrew the fastening nuts and disassemble the gears;
3. Position the relative gears for the feed desired, check they fit perfectly and tighten the fastening nuts;
4. Close the guard of the gearbox.

11 MAINTENANCE



Electric Shock

Before maintenance or checks, turn off the machine and ALWAYS unplug the plug from the power outlet. This is so that there is no risk of electric shock.

Regularly clean and take care of the machine to guarantee proper efficiency and a long working life.

Use a compressor to blow off shavings, filings and sawdust accumulating on the floor of the machine and on the worktable at the end of each machining operation.



Working with the Air Compressor

ALWAYS wear protective goggles when using the air compressor.

Check the status of the Lathe and the EC and warning plate; if these are no longer legible request replacements.

Do not use the Lathe if there are any defects!

| Daily checks | |
|--------------|--|
| 1 | Check that all moving parts are well lubricated . |
| 2 | Clean the surface of the spindle, turret and the body of the machine. |
| 3 | Check that there are no objects/tools near the moving parts.. |
| 4 | Check the operation of the manually operated hand wheels . |
| 5 | Check the wear on the sliding guide rails . |



11.1 Lubrication

It is good practice to clean the machine, especially the guides, removing all chips produced by the work.

Apply a thin layer of oil with a rag or a brush on the rails and on the spindle to prevent corrosion.

The next day, remember to remove the oil before starting the machine.

Perfect efficiency of the lathe is guaranteed when its moving parts are perfectly lubricated.



Lubrication

Do not use the machine if there are oil leaks or if the levels are not perfect.



Lubrication

- Only use the lubricants listed in the table below.
- DO NOT use any types other than those indicated, DO NOT use too much and DO NOT fall below the level indicated by the indicators.

For proper lubrication, proceed as follows (see [Figure 20](#)):

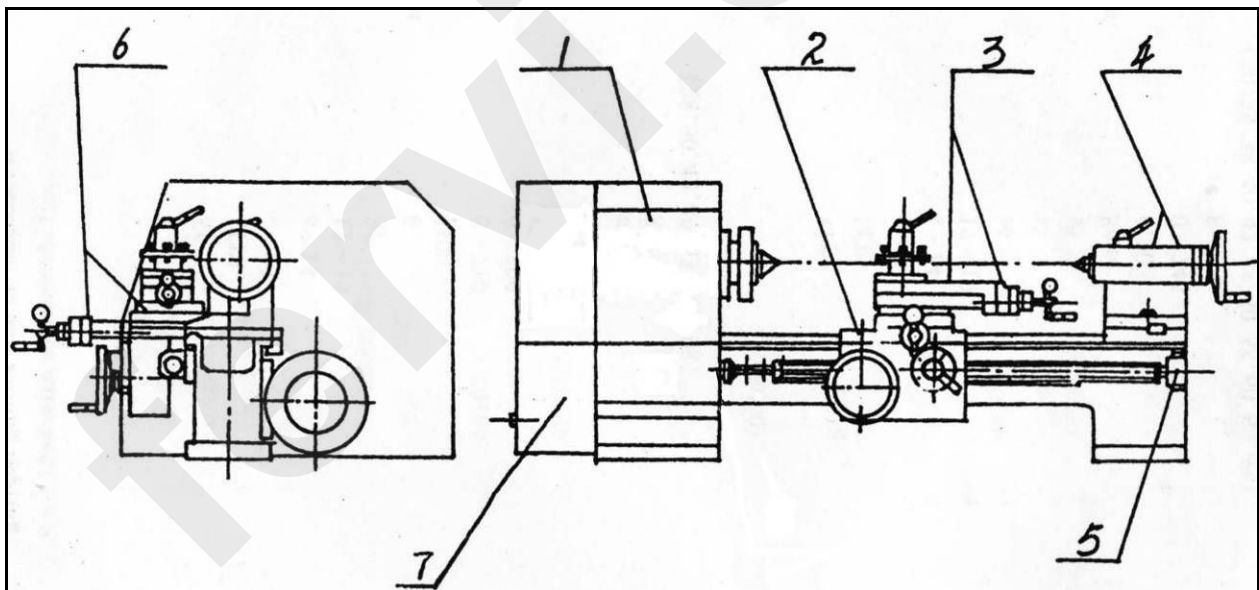


Figure 20 – Points on the machine to be lubricated.

| | Part of the machine | Point to be lubricated | Method of lubrication | Frequency |
|---|----------------------|-------------------------------|-----------------------|---|
| 1 | Spindle head box | Spindle head bearings | Spray | After 10 days of commissioning, and thereafter every 60 days. |
| 2 | Tool holder carriage | Longitudinal rail guides | Oiler | Daily |
| 3 | Longitudinal slide | Screw and longitudinal guides | Oiler | Daily |
| 4 | Tailstock | Screw and quill guides | Oiler | Daily |
| 5 | Lead screw supports | Lead screw | Oiler | Daily |
| 6 | Transverse slide | Screw and transverse guides | Oiler | Daily |
| 7 | Threading gears | Gears | Oiler | Daily |

Recommended types of oil

| |
|--------------------------|
| Mobil Vectra No. 2 |
| Shell – Tonna – T68/TX68 |
| Chevron – Vistac – 68X |
| Esso – Febis – K68 |



Lubrication

DO NOT discard used oil into the environment. Please contact authorized centres for the collection and disposal of waste oil.



11.2 Periodic Checks

Every 6 months during the life of the machine, perform a thorough check of operation, wear and accurate levelling on the work bench.

The variable speed drive requires no maintenance.

11.3 Adjusting the Machine

11.3.1 Motor belt tension adjustment

Make sure the motor belt tension is at an appropriate level. In this regard, make a simple check by pressing down firmly on the individual belts (approximately in the middle), which should move by a maximum of 5 mm. If the belts are loose or too tight, loosen the belt adjustment system bolts until the correct tension is achieved.

Proper belt tension reduces wear and increases the production of the machine.

11.3.2 Tailstock alignment

When the tailstock is off-axis it is necessary to correct its position, following these instructions:

1. Loosen the locking screw (see ref. I in **Figure 21**) and adjust the tailstock;
2. Tighten the locking screw, fixing the body of the tailstock onto the guide rails and test the alignment.

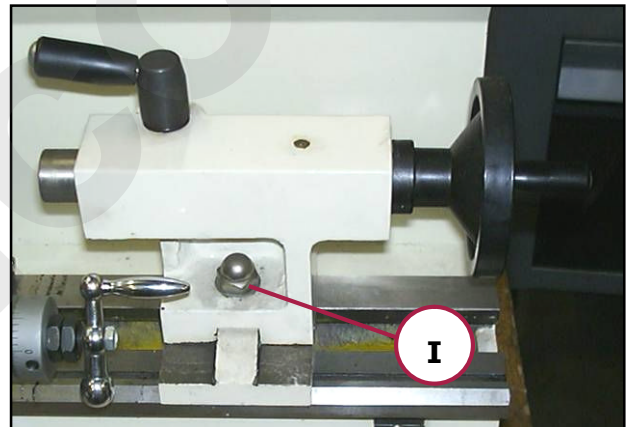
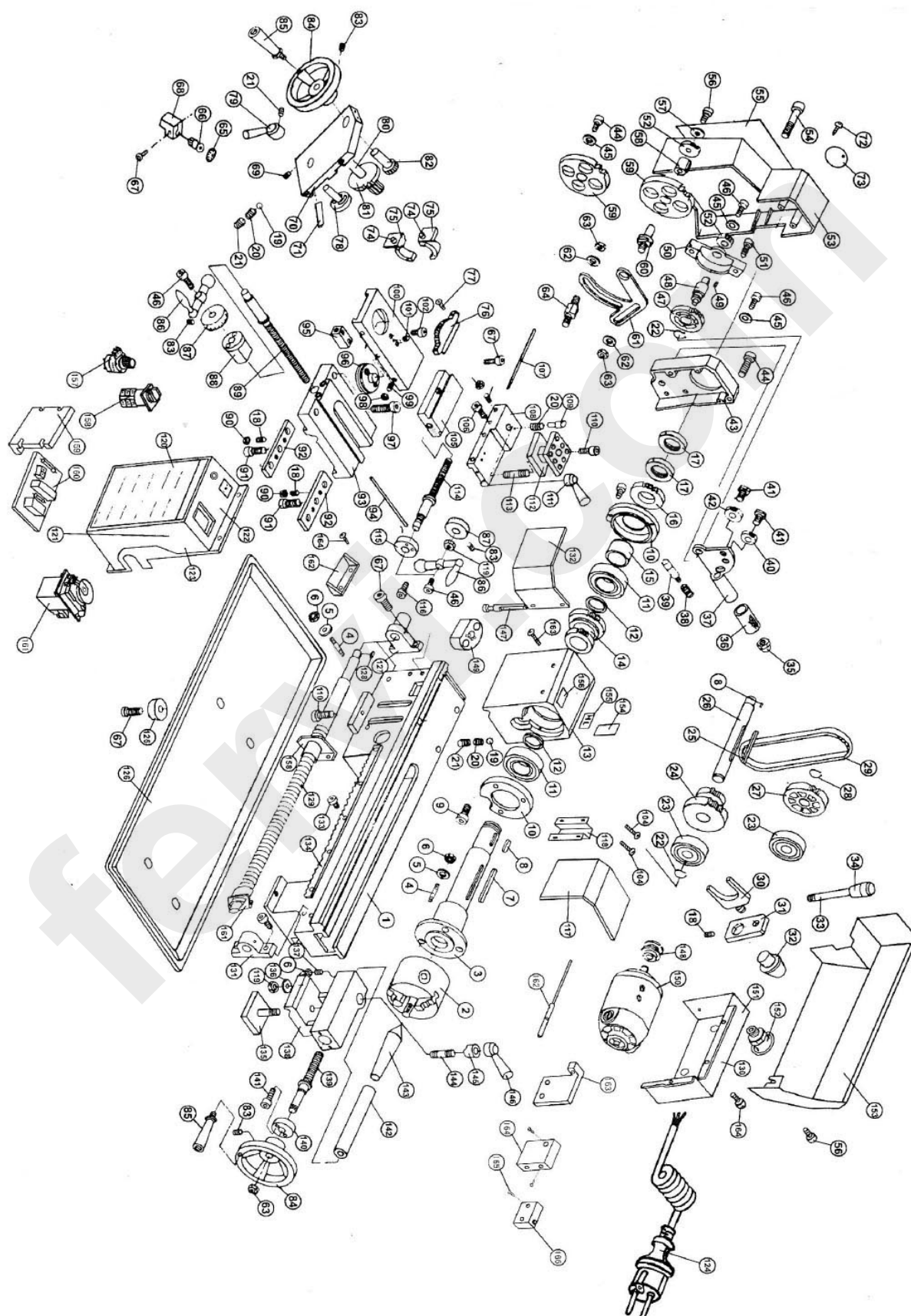


Figure 21 – Tailstock alignment.

12 REPLACEMENT PARTS

TABLE A





| Part No. | Description | Part No. | Description |
|----------|------------------------|----------|--------------------|
| 0716/1 | Table | 0716/37 | Spring |
| 0716/2 | Spindle | 0716/38 | Switch |
| 0716/3 | Spindle shaft | 0716/39 | Pinion 25D |
| 0716/4 | Grub screw M6x16 | 0716/40 | Bolt |
| 0716/5 | Washer M6 | 0716/41 | Pinion 20D |
| 0716/6 | Nut M6 | 0716/42 | Cover |
| 0716/7 | Key | 0716/43 | Screw M6x20 |
| 0716/8 | Key | 0716/44 | Screw M5x10 |
| 0716/9 | Allen screw M5x10 | 0716/45 | Gear 45D |
| 0716/10 | Cover | 0716/46 | Shaft |
| 0716/11 | Bearing 6206ZZ | 0716/47 | Key 4x8 |
| 0716/12 | Spacer | 0716/48 | Support |
| 0716/13 | Headstock | 0716/49 | Screw M5x15 |
| 0716/14 | Gear 21D-29D | 0716/50 | Pinion 20D |
| 0716/15 | Spacer | 0716/51 | Washer 16 |
| 0716/16 | Gear 45D | 0716/52 | Screw M5x10 |
| 0716/17 | Nut | 0716/53 | Cover |
| 0716/18 | Screw set M5x8 | 0716/54 | Screw M5x40 |
| 0716/19 | Steel ball diam. 5 | 0716/56 | Screw M6x6 |
| 0716/20 | Spring diam. 4x9 | 0716/57 | Washer |
| 0716/21 | Screws M6x6 | 0716/58 | Compass with key |
| 0716/22 | Elastic ring 12 | 0716/59 | Gear 80D |
| 0716/23 | Bearing 6201ZZ | 0716/60 | Shaft |
| 0716/24 | Gear 12D-20D | 0716/61 | Support adjustment |
| 0716/25 | Key 4x45 | 0716/62 | Washer 8 |
| 0716/26 | Shaft | 0716/63 | Nut M8 |
| 0716/27 | Pulley | 0716/64 | Shaft |
| 0716/28 | Elastic ring 10 | 0716/67 | Screw M6x16 |
| 0716/29 | Belt | 0716/69 | Screw set M4x10 |
| 0716/30 | Selector | 0716/70 | Front |
| 0716/31 | Arm | 0716/71 | Linchpin |
| 0716/32 | Headstock selector | 0716/74 | Shaft |
| 0716/33 | Lever | 0716/75 | Half nut |
| 0716/34 | Knob | 0716/78 | Spindle cam |
| 0716/35 | Knob | 0716/79 | Selector |
| 0716/36 | Lever | 0716/80 | Shaft |
| 0716/81 | Feeding gear A 11T-54T | 0716/119 | Nut M10 |
| 0716/82 | Feeding gear B 24T | 0716/120 | Model sticker |
| 0716/83 | Screw M6x12 | 0716/121 | Warning sticker |
| 0716/84 | Hand wheel | 0716/122 | Switch sticker |

| Part No. | Description | Part No. | Description |
|-----------------|-------------------------|-----------------|-----------------------|
| 0716/85 | Knob | 0716/123 | Gearbox controls |
| 0716/86 | Hand wheel | 0716/124 | Cable with plug |
| 0716/87 | Micrometer | 0716/125 | Thick rubber |
| 0716/88 | Support | 0716/126 | Bath |
| 0716/89 | Shaft | 0716/127 | Support |
| 0716/90 | Nut M5 | 0716/128 | Key B4x8 |
| 0716/91 | Screw M6x12 | 0716/129 | Main screw |
| 0716/92 | Sliding plate | 0716/131 | Support |
| 0716/93 | Saddle | 0716/133 | Screw M3x10 |
| 0716/94 | Gib | 0716/134 | Rack |
| 0716/95 | Feeding nut | 0716/135 | Clamp |
| 0716/96 | Turn table | 0716/136 | Washer 10 |
| 0716/97 | Screw M8x20 | 0716/137 | Screw M5x15 |
| 0716/98 | Nut M4 | 0716/138 | Tailstock support |
| 0716/99 | Screw M4x16 | 0716/139 | Supp. screw Tailstock |
| 0716/100 | Transverse slide | 0716/140 | Support |
| 0716/101 | Screw M5x10 | 0716/141 | Screw M4x10 |
| 0716/102 | Screw M4x10 | 0716/142 | Sleeve |
| 0716/105 | Support slide trolley B | 0716/143 | Tailstock |
| 0716/106 | Screw M4x14 | 0716/144 | Stud M8x25 |
| 0716/107 | Gib | 0716/145 | Clamp |
| 0716/108 | Slide A | 0716/146 | Locking lever |
| 0716/109 | Positioning plug | 0716/148 | Pulley |
| 0716/110 | Screw M8x25 | 0716/150 | Motor |
| 0716/111 | Locking lever | 0716/151 | Protective device |
| 0716/112 | Turret | 0716/152 | Cable retainer |
| 0716/113 | Stud M10x50 | 0716/153 | Protective device |
| 0716/114 | Shaft | 0716/154 | Warning sticker |
| 0716/115 | Support | 0716/155 | V/L sticker |
| 0716/116 | Screw M4x14 | 0716/156 | Warning sticker |



13 ACCESSORIES SUPPLIED

The Variable Speed Bench Lathe is available with the following accessories:

- No. 1 spindle with external 3 jaws + internal 3 jaws;
- No. 1 turret key;
- No. 1 fixed tailstock (taper 2)
- No. 3 spindle securing screws

14 DISPOSAL OF PARTS AND MATERIALS

If the machine is to be scrapped, its parts must be disposed of in a different way.

The Lathe is composed of the following materials:

- the headstock, pallet bench, tailstock, slides and carriages are made of cast iron;
- gears, shafts, bearings, slideways and spindle are made of steel.



Respect the Environment!

Contact a specialist centre for the collection of metallic materials.

15 TROUBLESHOOTING

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|--|--|---|
| Noisy operation. | A) Damaged bearings. B) Bearings not lubricated. C) Blunt tool. D) Loose tool. | A) Contact Customer Service. B) Lubricate. C) Remove/sharpen the tool. D) Tighten the fastening lever. |
| The motor will not start. | A) Electrical power supply. B) Electric connections. C) Burnt motor windings. D) Blown fuses. E) Broken switch. | A) Check the mains power supply. B) Check the wiring connections. C) Contact Customer Service. D) Replace the fuses. E) Contact the service department. |
| The attachment or accessory rubs or becomes too hot. | A) Excessive pressure on the work piece. B) Shavings will not discharge. C) Tool is worn or does not cut the material well. D) Needs lubrication. | A) Apply less pressure. B) Clean the Machine. C) Check the tool sharpness and wear. D) Lubricate as you work. |



16 ELECTRICAL CIRCUIT

