

TOOLS TO SHAPE THE WORLD

USE AND MAINTENANCE MANUAL

SPEED INCREASERS





Dear Customer,

Thank You for choosing MPA. We hope that this product will meet Your needs fully and lead to top-quality production.

Please read the information provided in this manual before starting the speed increaser: You will receive important information on the use and maintenance of the product as well as on safety requirements.

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Yours Sincerely

MPA srl



**EEC MACHINE DIRECTIVE
MANUFACTURER'S DECLARATION**

MPA srl
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40012 Calderara di Reno (Bo) Italy

in the Person of the Legal Representative
declares that this product
is compliant with the provisions of the
Machinery Directive 2006/42/EC

and forbids the start-up
before the machine in which the product has to be fitted in
is declared compliant with Machinery Directive it self.

Signature of issuer
Marco Ceneri



EUROPEAN
COMMUNITY



General warranty conditions

A correct use and regular maintenance ensure the effective operation of the product in time. Any change, tampering or improper use frees MPA from any responsibility for any accident, damage or casualty taking place while the product is being used.

MPS provides a warranty covering the product against any faulty material or manufacturing defect over a period of **12 months** starting from the date of purchase with reference to ordinary usage in time. The warranty is void if the user opens or tampers with the product. MPA solely provides for its technical service to ensure the reparation or replacement of the parts found to be defective. Please feel free to contact MPA if you need clarifications and technical assistance to obtain the best results from the product.

MPA reserves the right to modify all the parts without notice deemed necessary to improve the quality of the product.

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1 GENERAL INFORMATION

1-1 Scope of the document

The information contained herein illustrates the necessary operations for a correct use of this MPA product by the end user. The manual contains information on the installation, adjustment and maintenance of the speed increaser You have purchased.

Special care was taken to illustrate the topics on safety and the protection of the operators' health, as well as on the protection of the working environment.

Before using the speed increaser, read this manual carefully and, if in doubt, contact the MPA Technical assistance service.

1-2 General information

To maximise the performance of the product in time, please comply with the following instructions:

- Make sure that the product has been correctly installed on the machine tool.
When selecting the coupling system with the machine tool, make sure that it is compatible with the performance declared.

This product has been designed to be installed on a machine tool equipped with safety protections compliant with the laws in force and the Machinery Directive 2006/42/EC.

- Never use the equipment incorrectly and operate carefully and attentively.
- Regularly carry out all envisaged maintenance operations (see chapter 10).

1-3 Statutory references

The MPA product You have purchased complies with the Machinery Directive 2006/42/EC (formerly 98/37/EC).

1-4 Noise

This MPA product complies with the regulations in force on noise levels on the workplace.
The manufacturer of the machinery incorporating this product is responsible for providing the data on noise levels in the relevant manual.



1-5 Packaging

The product You have purchased is supplied with a suitable packaging and is protected with shock-resistant material.



NOTICE Upon receiving the product, make sure that the delivery matches the specifications of Your order and that the material was not damaged during transport. If apparent anomalies emerge, do not use the product and contact MPA immediately.

The packaging shall be disposed of in compliance with the local waste disposal regulations.

1-6 Handling

When handling the product, remember You are handling a high-precision equipment and great care is needed. Please handle in compliance with the relevant laws on safety on the workplace.



DANGER Do not remove, transport and assemble back the product with tools mounted on spindles since sharp cutters may cause damage.

In case of models exceeding 10 kg in weight, please use suitable hoisting equipment. The technical drawing attached shows the position of anchoring points for hoisting operations, if envisaged.

1-7 Storage

If the product is to be stored in a warehouse for a long time, we suggest it should be cleaned from residues and protected with suitable anticorrosive treatments in particularly aggressive environments such as salty atmosphere, moist and chemical substances.



NOTICE If idle time exceeds 6 months, the lubricants inside the product should be replaced upon start-up (see chapter 10).

1-8 Disposal

This MPA product has been manufactured with the following materials:

- aluminium;
- steel;
- lubricants.

**NOTICE**

This product shall be disposed of by separating the various materials in compliance with the laws in force on waste recycling and disposal in the country where the product was used.

In particular, drain lubricants shall not be disposed of in the environment and shall be delivered to dedicated authorised collection centres.

2 IDENTIFICATION

2-1 Manufacturer's data

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2-2 Product identification data

All MPA products bear an aluminium identification plate reporting the general characteristics of the product.

Since all MPA products differ in terms of dimensions and shape, the position and shape of the identification plate change according to the model. Normally, it is riveted on one of the external surfaces.

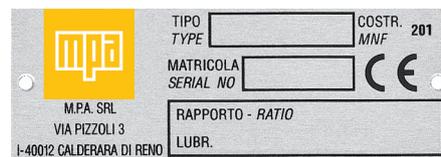


Fig. 1



NOTICE Removing or tampering with the identification plate is strictly prohibited.

3 OVERALL DESCRIPTION

The speed increaser You have purchased is composed as follows:

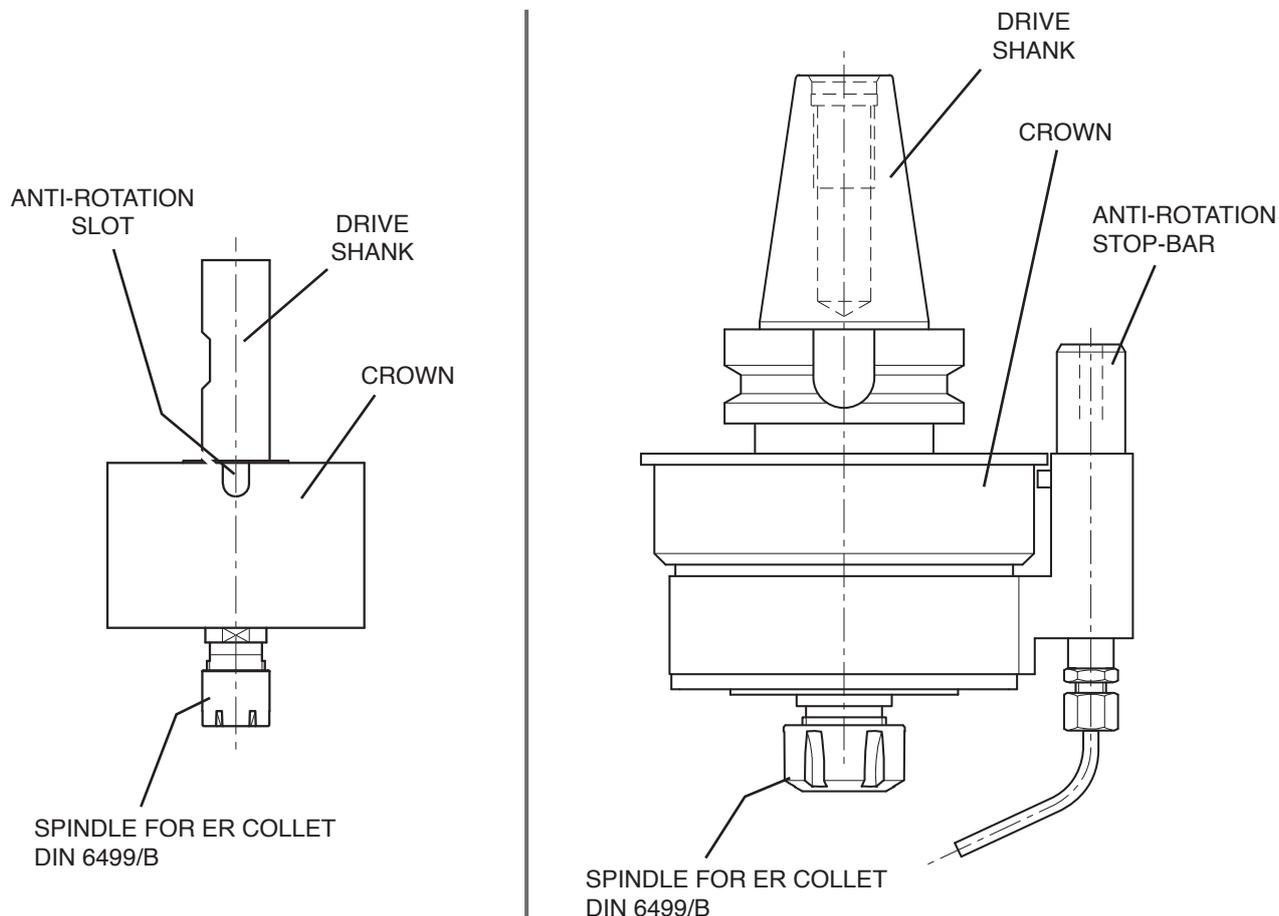


Fig. 2

3-1 Use

MPA speed increasers are designed and manufactured to carry out drilling and light milling operations on metal, plastic and wood materials. They are particularly suitable for finishing operations. Any other use is to be considered improper use and frees MPA from any responsibility whatsoever. The relevant working parameters shall be compatible and appropriate.

3-2 Improper use

Any use other than those illustrated under **paragraph 3-1** of the present manual is to be considered improper and not authorised and frees MPA from any responsibility for damage or casualties.



4 SAFETY REGULATIONS

- Before starting the machine tool, make sure that the product is correctly clamped to the machine tool and that it cannot disconnect and fall down.
- When handling the product, wear protective gloves and disassemble the tools since the cutters of the machine tool may cause injuries and skin disruptions.
- Never handle the product when it is operating. All adjustments and interventions shall be carried out when the machinery has stopped and the operator is in fully safe conditions.
- The tool machine upon which the MPA product is assembled shall be manufactured in compliance with the laws in force on safety. All protections for the operator shall be correctly in place and working in compliance with the Machinery Directive 2006/42/EC (formerly 98/37/EC).

The design of such protections is a responsibility solely of the Manufacturer of the machinery on which the product is assembled; checking safety parameters is a responsibility solely of the works where the product is used.

- When using the MPA product, suitable clothes for workshop operations shall be worn. Consequently, no ties, necklaces or hanging clothes and accessories are allowed since they may cause danger.

Please comply with the laws in force dealing with safety on the workplace.

- During cleaning operations, in particular when using compressed air, act carefully and protect Your eyes with goggles or suitable visors.
- Always keep under control the gear ratio and direction of rotation; values are reported both on the identification plate and in the attached technical drawing.
- The operating manual shall be stored near the place where the product is used. In addition to the instructions contained in the operating manual, the overall and local regulations in force shall be complied with for the prevention of accidents and the protection of the environment.
- Check the conditions and wear of the tool. Keep the cutter perfectly sharp.
- Any working anomaly may cause serious damage and lead to a drastic reduction of the life and deterioration of the precision of the product. In case of doubt, always contact the MPA technical assistance.
- The normal operating **temperature** of the product should **not exceed 85°C**.
If the temperature exceeds the max. limit (85°C), stop the rotation and wait for the temperature to decrease naturally within the limits allowed.

5 TECHNICAL SPECIFICATIONS

Dimensions and specifications are reported in the attached technical drawing. For purely illustrative purposes, **fig. 3** shows an example of technical drawing.

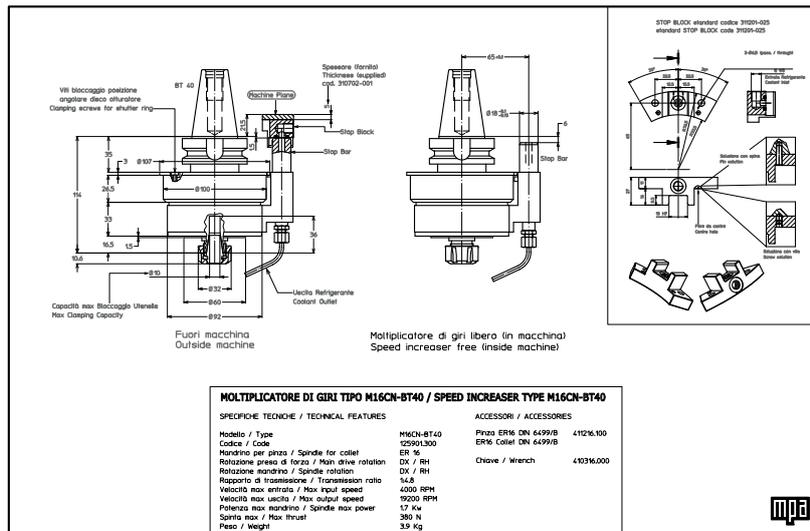


Fig. 3

6 CONNECTION

6-1 Speed increasers suitable for installation on units

MPA speed increasers suitable for installation on units shall be connected by means of a quill clamp and an anti-rotation bar as reported in the example under **fig. 4**.

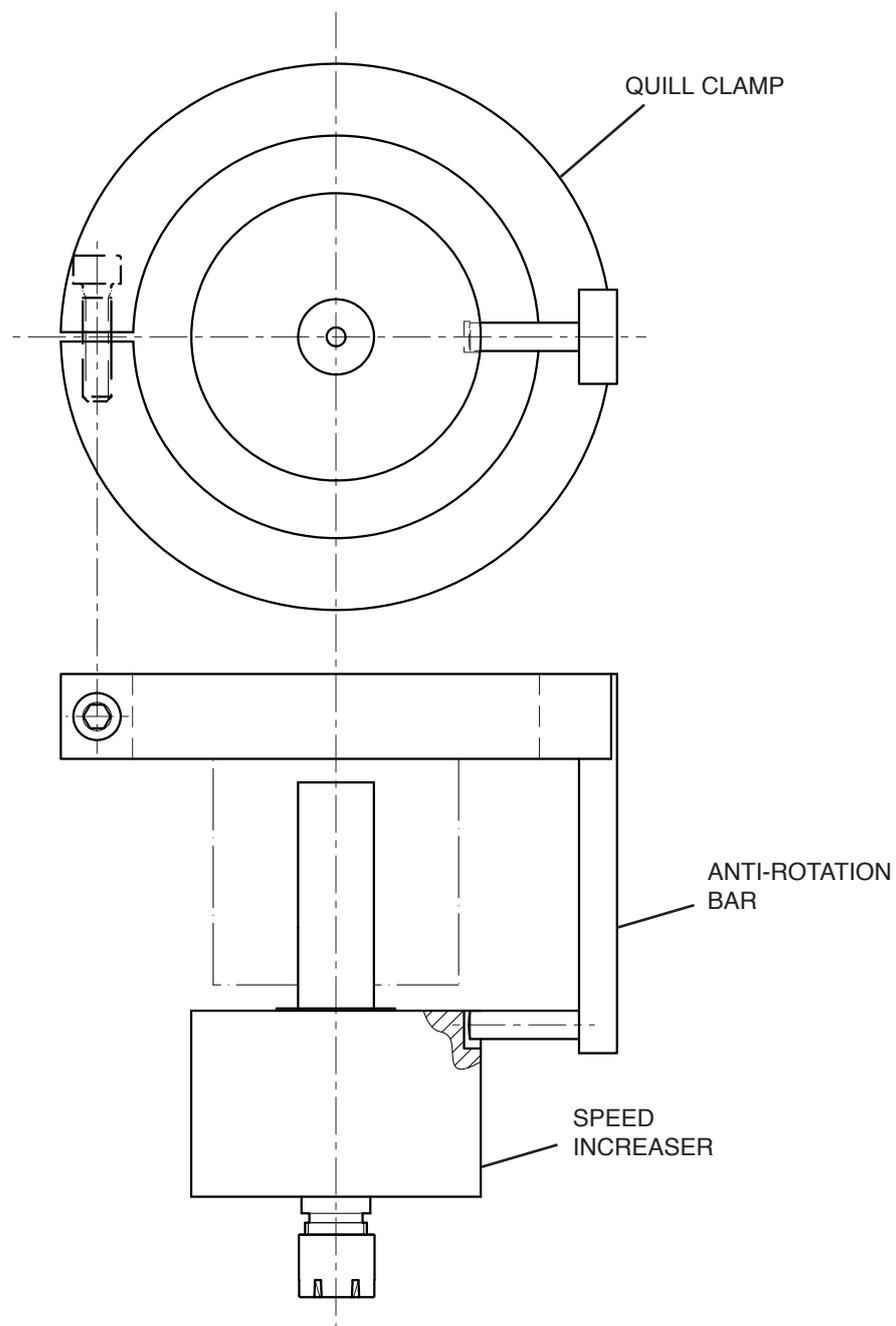


Fig. 4

6-2 Speed increasers suitable for installation on CNC machinery

MPA speed increasers suitable for installation on CNC machinery may be used with machinery equipped with both automatic and manual tool replacement systems. The Stop-Bar unit is interchangeable and may be customised upon request according to the Customer's specific needs.

6-2-1 Stop-bar pin

If no customised stop-bar pin is requested for the machine tool on which the speed increaser is mounted, the speed increaser shall come with standard Stop-Bar pin.

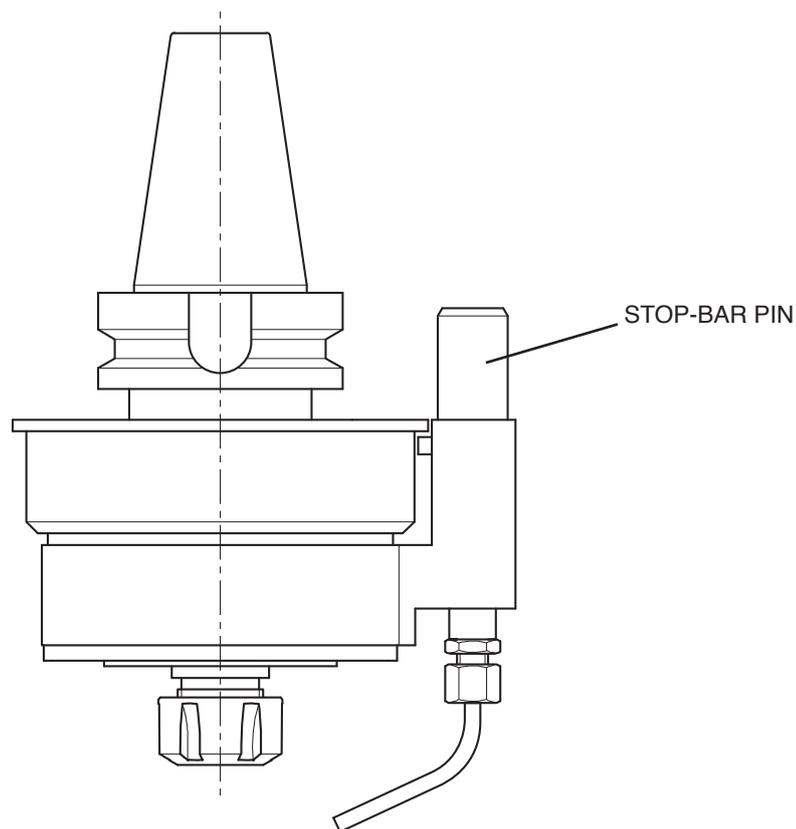


Fig. 5



NOTICE The weight of the speed increaser changes according to the model You have chosen. If the model is too heavy for manual hoisting, we suggest You lay it on a dedicated support to bring it to the position where it shall be installed on the machine tool.



7 INSTALLATION



DANGER When mounting the speed increaser on the machinery and in general every time an intervention is to be carried out on the MPA speed increaser, make sure that the machine has stopped and the operator in safe conditions.

- Before starting the installation procedure, make sure that the weight and dimensions of the speed increaser including its accessories are compatible with the specifications of the machinery on which it is being installed.

The operation shall be carried out in compliance with the regulations in force dealing with safety on the workplace.

Make sure that the machinery on which the speed increaser is being installed is equipped with safety protections compliant with the Machinery Directive 2006/42/EC (formerly 98/37/EC).



DANGER Before starting-up the machine tool, make sure that both the speed increaser and the relevant tool are correctly clamped so as to ensure full safety conditions.



NOTICE Check the rotation direction of the speed increaser so as to make sure that the machine tool mounted on the spindle is rotating in the correct direction.



NOTICE Upon start-up, if excessive noise levels and vibrations are produced by the speed increaser, stop working and contact the MPA Technical assistance.

7-1 Stop-block unit

The machine spindle on which the speed increaser is to be mounted shall be equipped with a Stop-Block unit to prevent the speed increaser from rotating. Our standard Stop-Block is supplied as standard equipment.

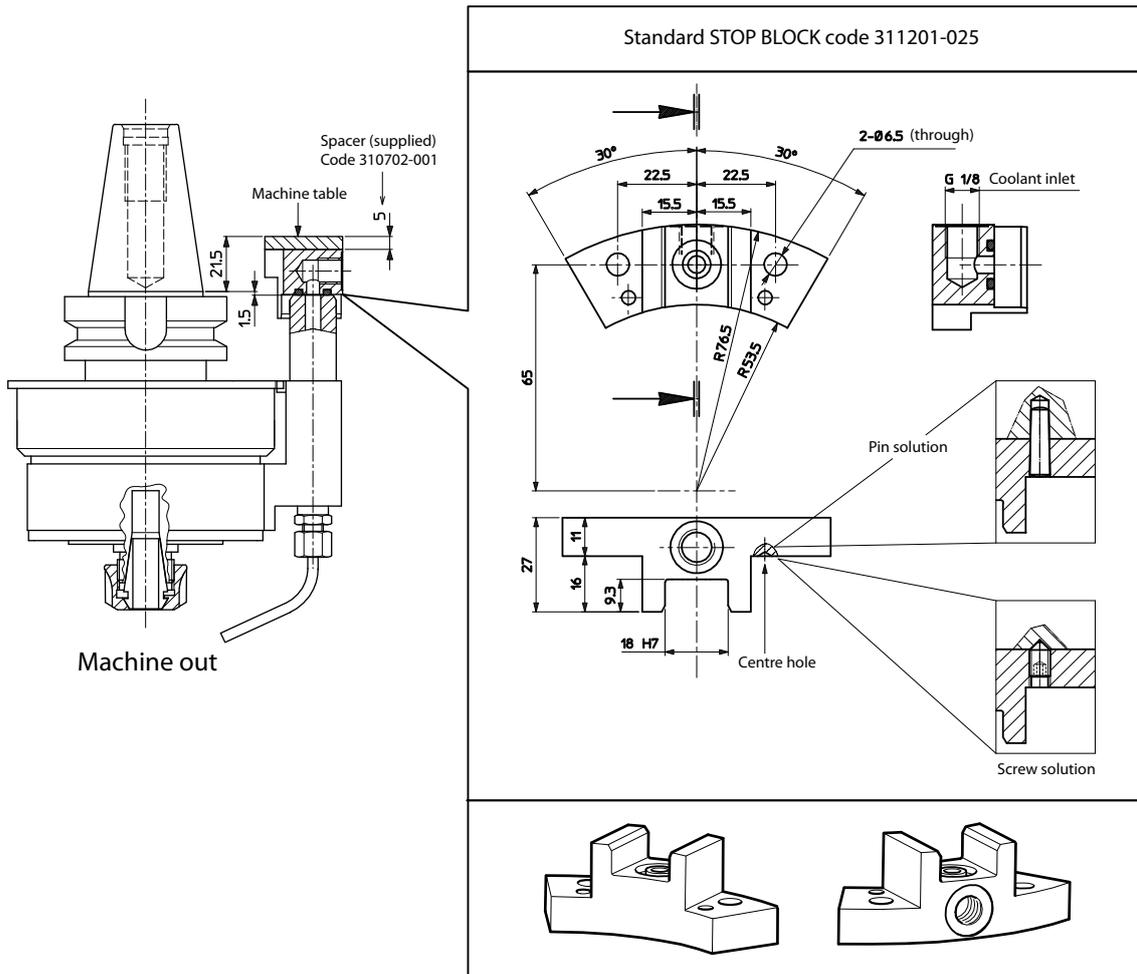


Fig. 6

7-1-1 Standard stop-bar pin

If Your speed increaser comes with a standard stop-bar pin, comply with the following instructions:

- Insert the Stop-Bar pin into the dedicated stop-block slot by following the instructions reported in **Fig. 6 paragraph 7.1** of this manual.

7-1-2 Customised stop-bar pin

If Your speed increaser comes with a customised stop-bar pin according to the machine tool on which it shall be installed, comply with the following instructions:

- Insert the customised stop-bar pin into the dedicated stop-block slot already mounted on the machinery.



7-2 INTERNAL COOLANT FEED THROUGH THE TOOL

The product You have purchased may be suitable for internal coolant through the spindle; please refer to the technical drawing of the product attached to this manual.



NOTICE Never run the speed increaser without coolant; the coolant should flow through the tool, before the speed increaser is switched on. Running in dry conditions damages the internal seals. The maximum permissible coolant pressure can be taken from the technical data of the speed increaser.

To avoid premature wear and damage to the seals system, we recommend to filter the coolant as per filter grades that can be taken from the technical data of the speed increaser; the technical drawing of the product attached to this manual will assist you.

8 RUN-IN



NOTICE All MPA speed increasers are subject to run-in at our works and are sold on a turnkey basis. However, upon initial start-up we recommend additional 4 run-in hours at 50% maximum speed to ensure long tool life.

A run-in period is necessary if **lubricants are topped or replaced or mechanical components are replaced.**

To carry out the run-in procedure, follow the instructions illustrated under **paragraph 8.1** of this manual.

Owing to the high viscosity of the grease, the rotation of the moving mechanism initially requires a remarkable effort which gradually decreases until is stabilised after a certain operating time.

The reason is that during rotation ball-bearings and seal-rings expel grease and a minimum grease content is maintained in the parts touching each other.

Consequently, in particular in case of high-speed rotation, lubricant temperature will initially increase owing to the viscous friction of the grease, but it will decrease until it has stabilised when the minimum lubricant content is present inside the mechanism.

Effective run-in enables the mechanism to operate with the minimum grease quantity necessary for lubrication purposes, with the ensuing lower operating temperature.

Temperature checks during operation are the best indicators of the correct operation of the speed increaser. Please check the temperature of Your speed increaser constantly. **If the max. temperature is exceeded (75°C), stop the rotation and wait for the temperature to decrease.**

8-1 Run-in procedure



NOTICE A run-in period is necessary if **lubricants are topped or replaced or mechanical components are replaced.**

Run-in time varies since it depends on the type of grease being used, operating temperature, amount of grease inside the speed increaser, type of ball-bearings and seal-rings installed.

Normal run-in procedure consists in:

- starting the speed increaser rotation at 20÷25% max. speed.
- if the temperature exceeds the max. limit (75°C), stop the rotation and wait for the temperature to decrease naturally within the limits allowed.



- After the temperature has decreased, resume the rotation and repeat this operation for a few times.
- Increase rotation speed gradually until it has slightly exceeded the maximum temperature allowed. **The run-in of the speed increaser is considered complete when its temperature stays under the maximum limit allowed (75°C).**

9 ASSEMBLING AND ADJUSTING TOOLS

9-1 Spindle for ER collet DIN 6499 shape B

The speed increaser You have purchased comes with a Spindle for ER collet DIN 6499 shape B. The collet shall be inserted into the ring nut; make sure that the ejector **1** is connected correctly (**fig. 7**).

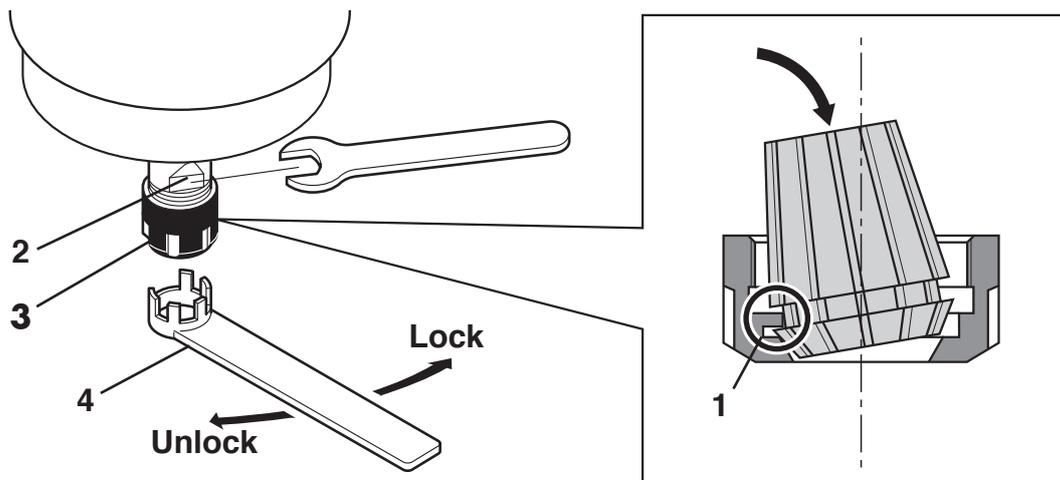


Fig. 7

The tool is locked by holding the spindle with a wrench inserted into slot **2** (**fig. 7**) on the spindle and clamping the nut **3** by means of the wrench **4** (**fig. 7**)

The type of nut varies according to the gear unit on which the spindle is mounted.

Table 2 reports the values suggested for the tightening torque of the various types of wrench.

Table 2

Nut type	Code	Torque (Nm)
ER 11-M	414513-011	16
ER 16-M	414519.013	24
ER 16-UM	414822.016	24
ER 20-UM	414825.020	80
ER 25-UM	414832.025	104
ER 32-UM	414840.032	136
ER 40-UM	414850.040	176



10 MAINTENANCE

10-1 Maintenance staff

OPERATOR: person trained to use the machine tool in normal conditions and authorised to carry out routine adjustments and maintenance.

ENGINEER: Qualified person authorised to carry out complex maintenance or repairs.

10-2 Maintenance schedule



DANGER All maintenance operation shall be carried out when the machine has stopped and the operator is in safe conditions. Those operations shall be carried out by staff having the necessary technical and mechanical skills.

Dedicated staff: **Operator**

- **Periodically:**
Check visually that no lubricant leaks from the gear unit. In case of leaks, contact the MPA technical assistance.



NOTICE If excessive noise levels and vibrations are produced by the speed increaser, stop working and contact the MPA Technical assistance.

Dedicated staff: **Engineer**

- **every % 00 working hours:**
Every 1800 working hours replace the lubricant inside the speed increaser fully. This operation is to be considered rather complex and sufficient technical training is necessary since the speed increaser needs to be opened. To carry out this operation, we suggest You contact our technical assistance.



Fig. 8

Dedicated staff: **Engineer**

- **approximately every 12 months:**

We suggest you disassemble the speed increaser, visually check its mechanisms, check the wear of ball-bearings and seal gaskets, replace all worn components, replace old lubricant with new lubricant of the same type as reported on the identification plate.

This operation is to be considered rather complex and sufficient technical training is necessary since the speed increaser needs to be opened.

To carry out this operation, we suggest You contact our technical assistance.



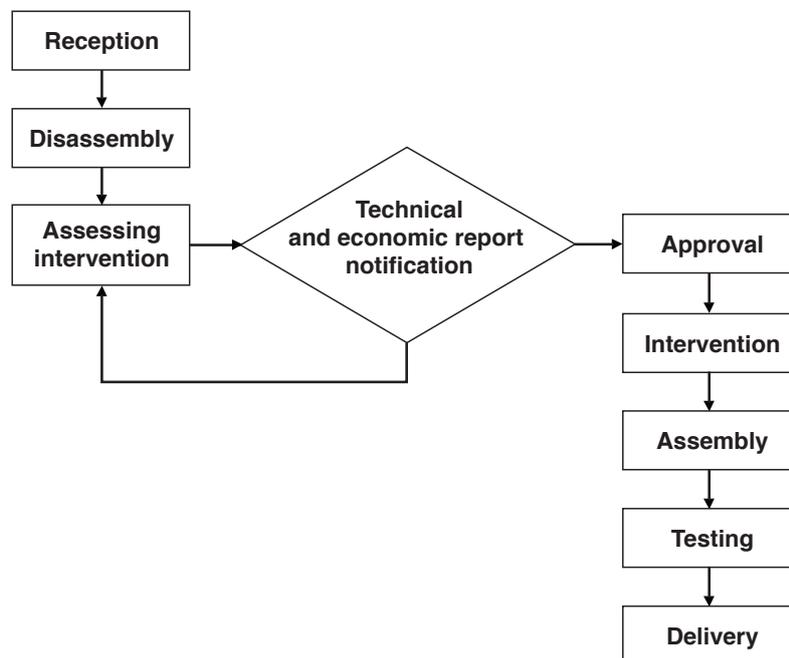
NOTICE Lubricants are very pollutant. Drain lubricants shall not be disposed of in the environment but delivered to an authorised collection centre.

11 SERVICING AND SPARE PARTS

11-1 Technical assistance

MPA supplies direct technical assistance for its products:

Assistance procedure:



11-2 Spare parts

MPA shall consider void and null the warranty covering the speed increaser if non-original spare parts are used.

Please find attached to this manual the component list relating to Your speed increaser and the detailed list of spare parts.

If You request spare parts, please report the following information on Your order:

- type and code of Your speed increaser;
- code, description and quantity of the spare parts being ordered;
- serial number.

MPA ensures that spare parts shall be available for an unrestricted period of time.

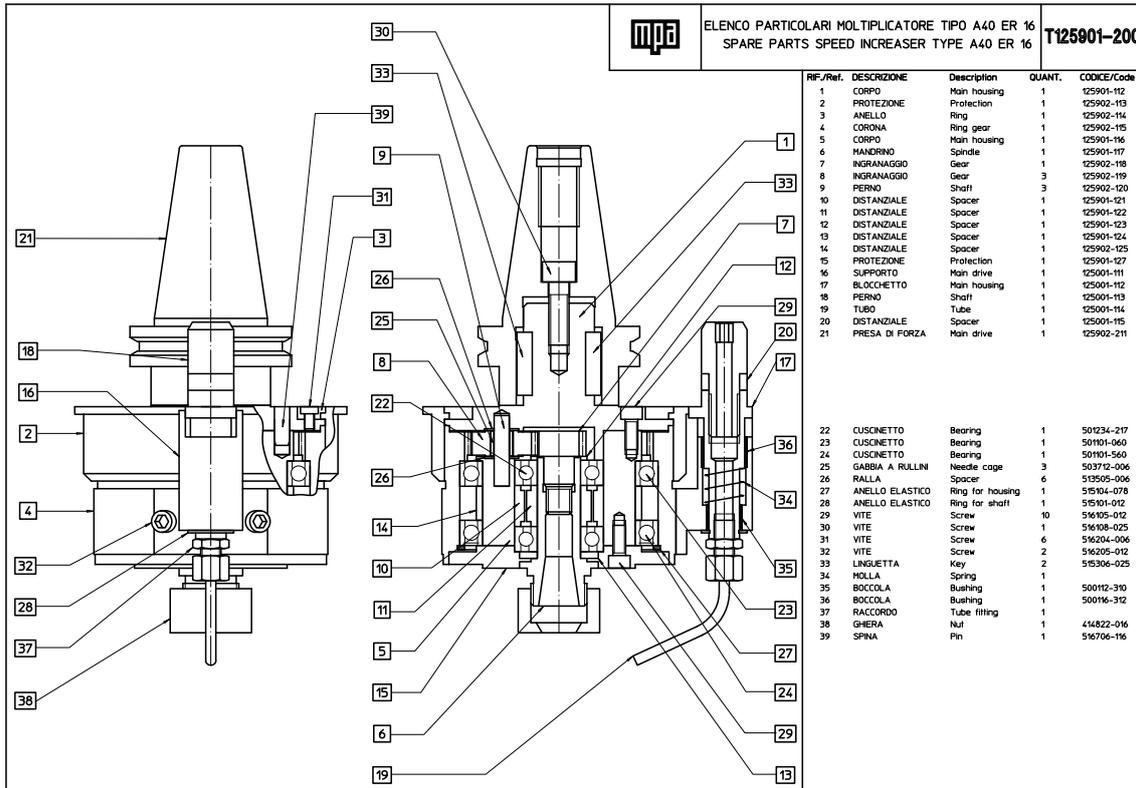
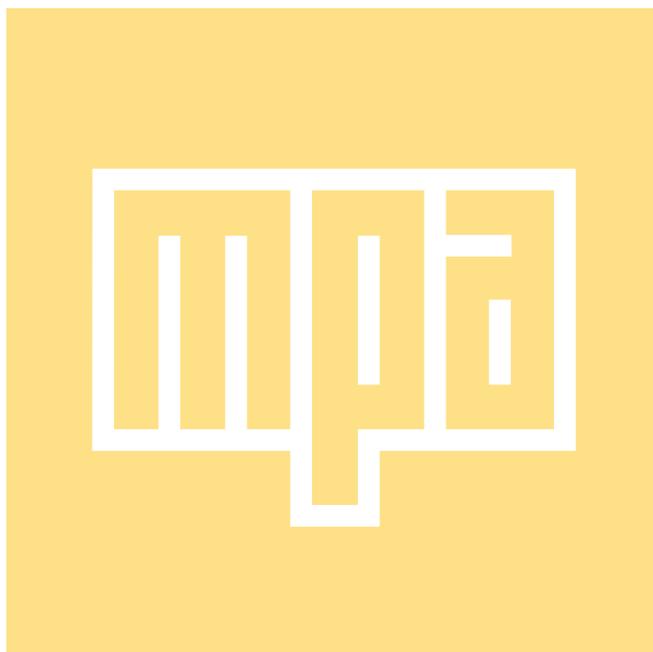


Fig. 9



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