



SPECIAL AND STANDARD HEADS
TOOLS TO SHAPE THE WORLD

USE AND MAINTENANCE MANUAL

ANGLE HEADS





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 product; you will receive important information on the use and maintenance of the product as well as on safety requirements.

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Best Regards MPA srl



EEC MACHINE DIRECTIVE

MANUFACTURER'S DECLARATION

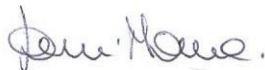
MPA srl
Via Pizzoli, 3 - Bargellino Cà Bianca
40012 Calderara di Reno (Bo) Italy

in the Person of the Legal Representative

declares that the heads

are compliant with the provisions of the
Machinery Directive 2006/42/EC
and forbids the start-up
before the machine in which the head
has to be fitted in is declared compliant with
Machinery Directive it self.

Signature
Marco Ceneri



EUROPEAN
COMMUNITY



GENERAL WARRANTY CONDITIONS

A correct use and regular maintenance ensure the effective operation of the product in time.

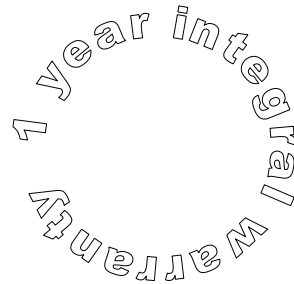
Any change, tampering or improper use frees MPA from any responsibility for any accident, damage or casualty taking place while the product is being used.

MPA 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 Purpose 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 product 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 product, 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.
- ✓ 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

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



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



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 the product with cutting tools mounted on spindle tool-holder, 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 cheap and protected with suitable anticorrosive treatments in particularly aggressive environments such as salty atmosphere, moist and chemical substances.



Note: if idle time exceeds 6 months, the lubricants inside the product should be replaced.

1-8 Disposal

This MPA product has been manufactured with the following materials:

- aluminum
- steel
- rubber
- lubricants



Note: 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 AND GENERAL DESCRIPTION

2-1 Manufacturer's data

MPA srl

Via Pizzoli, 3 Bargellino Cà-Bianca
40012 Calderara di Reno (BO) Italy

vat code 00522081207

tax code 00739970374

phone.: +39 (051) 727073

fax: +39 (051) 727730

e-mail: mpa@m-p-a.it

web: www.m-p-a.it

2-2 Product identification data

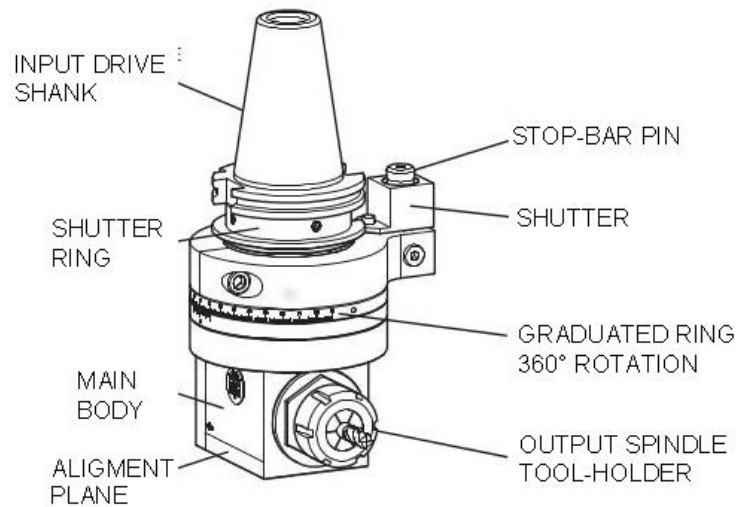
All MPA products bear an aluminum identification plate reporting the main technical features of the product. Since all MPA products differ in terms of dimensions and shape, the position and shape of the identification plate change according to the model. Normally, it is riveted on one of the external surfaces.



Note: removing or tampering with the identification plate is strictly prohibited.

2-3 Definition of terms

The technical drawing below explain product specific terms which will be useful in understanding this use and maintenance manual.



2-4 Use

MPA angle heads are designed and manufactured to carry out: drilling - tapping – sawing – milling – boring – countersinking - counterboring machining operations on steel, aluminum, plastic and wood materials.

Any other use is to be considered improper use and frees MPA from any responsibility whatsoever. The working parameters shall be compatible and appropriate.

2-5 Improper use

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



3 SAFETY REGULATIONS

- Only trained personnel may work with angle heads. Individual responsibilities for operation, maintenance and servicing shall be clearly defined.
- Before starting the machine tool, make sure that the head is correctly clamped to the machine tool and that it cannot disconnect and fall down.
- When handling the head, wear protective gloves and disassemble the tools since the cutters may cause injuries and skin disruptions.
- All adjustments and interventions on the head shall be carried out when the machine tool has stopped and the operator is in fully safe conditions.
- The machine tool upon which the MPA head 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 head is assembled; checking safety parameters is a responsibility solely of the works where the head is used.
- When using the MPA head, 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.
- Before starting the machine tool, make sure to input the correct direction of rotation to the head; always keep under control the gear ratio and direction of rotation. Technical 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 head 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 cutting 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 head. In case of doubt, always contact the MPA technical assistance.



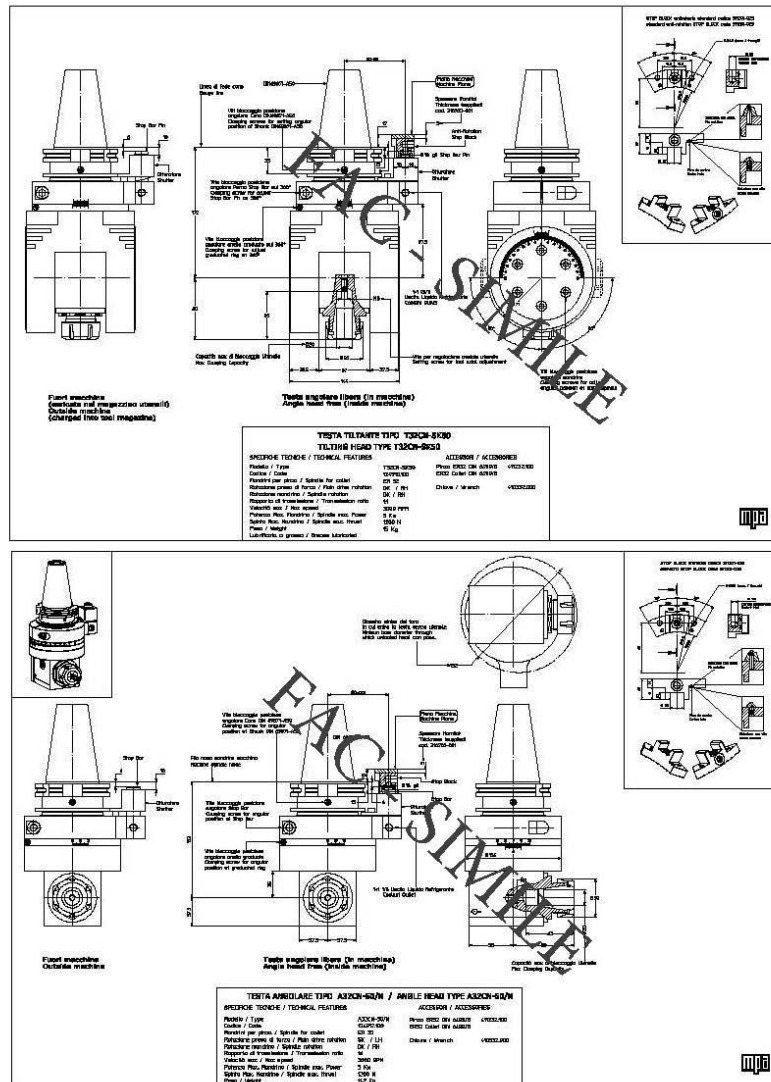
Caution:

The normal operating temperature of the head should not exceed **70°C**.

If the temperature exceeds the max. limit (70°C), stop the rotation and wait for the temperature to decrease naturally within the limits allowed.

4 TECHNICAL FEATURES

Overall dimensions and adjustments are clearly indicated in the enclosed drawing. For purely illustrative purposes, these drawings shows an example.





5 INSTALLATION

- ✓ before starting the installation procedure, make sure that the weight and overall dimensions of the head including its accessories are compatible with the technical specifications of the machine tool 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.
- ✓ when mounting the head on the machine tool and in general every time an intervention is to be carried out on the MPA head, make sure that the machine has stopped and the operator in safe conditions.
- ✓ before starting-up the machine tool, make sure that both the head and the relevant cutting tool are correctly clamped so as to ensure full safety conditions.

5-1 MACHINING CENTRES WITH ATC AUTOMATIC TOOL CHANGER

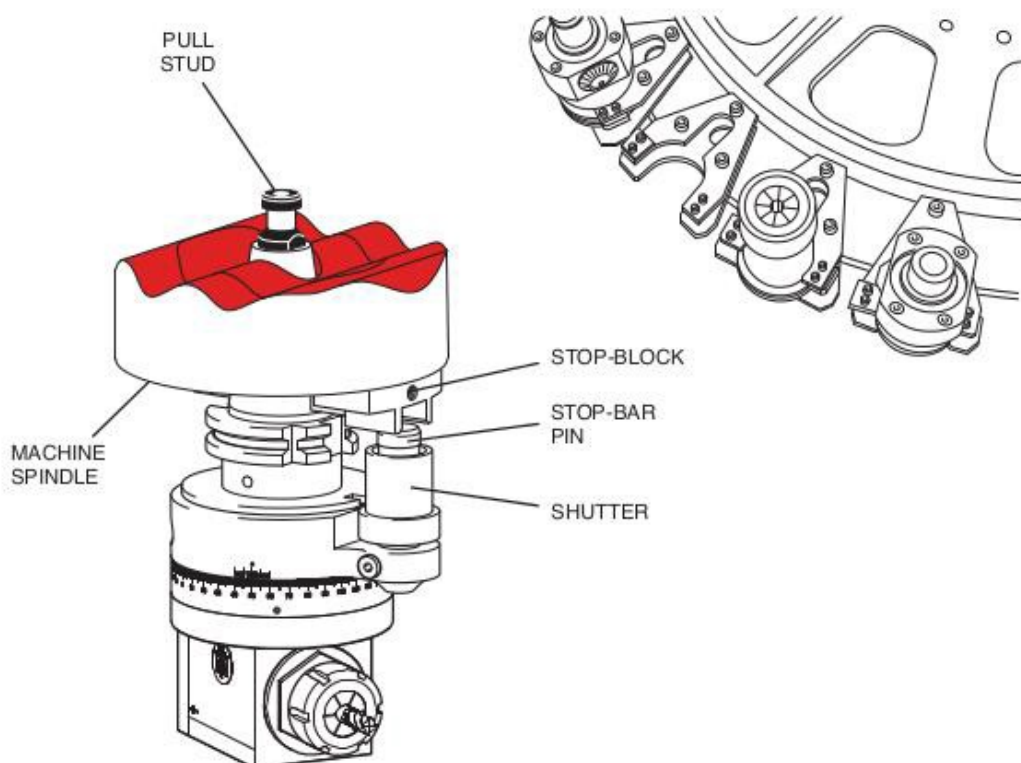
If machine tool on which the head is to be mounted is equipped with an ATC automatic tool changer, before starting the installation procedure, please check and make absolutely sure that:

- weight and overall dimensions of the head, including the related accessories, are compatible with the maximum load capacity and overall dimension of the ATC automatic tool changer;
- before housing the head in the tool magazine, fit the pull stud (not supplied) compatible with the coupling system of the machine spindle taper;
- check automatic tool changer (ATC) timings/loading and unloading cycle thoroughly before running the CNC machine in auto cycle.



Danger:

during the first automatic tool change make sure that the head does not interfere with other component of the CNC machine.



5-1-1 ANTI-ROTATION STOP-BLOCK ALREADY EXISTING ON MACHINE TOOL SPINDLE

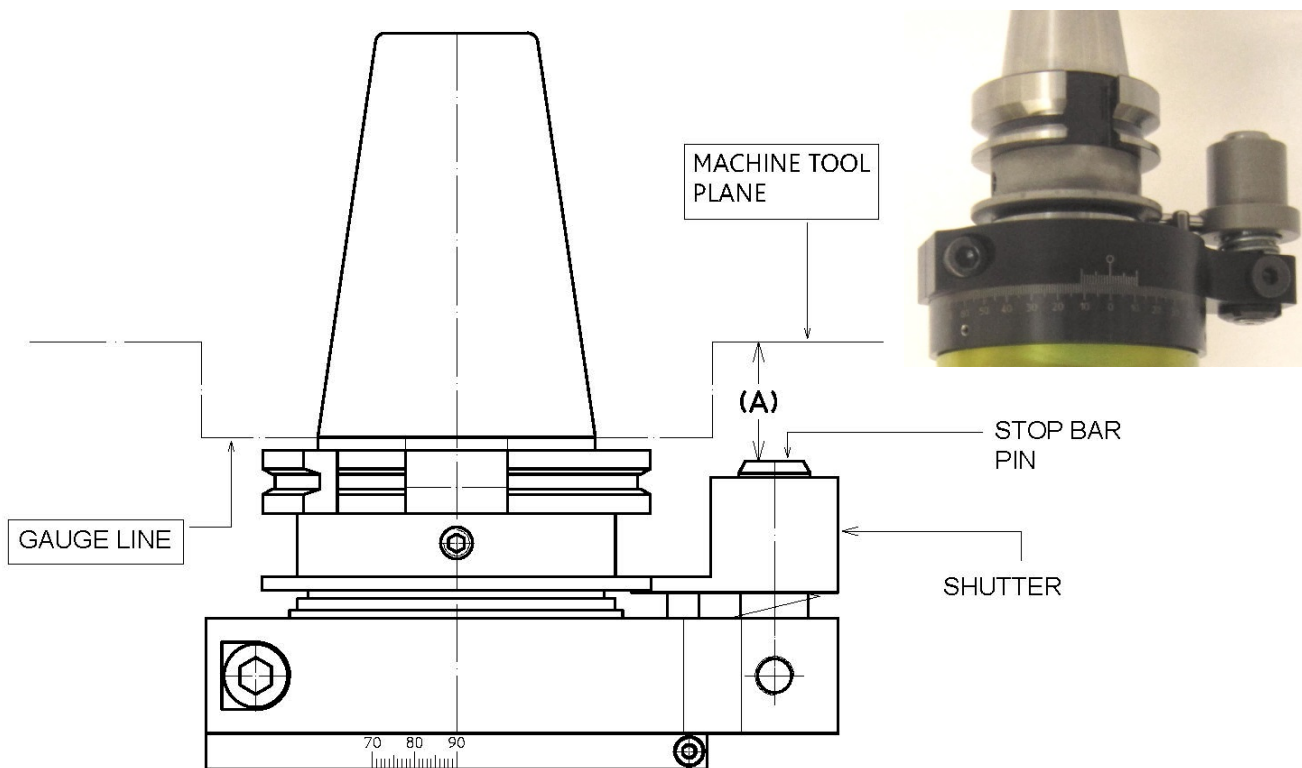
Verify compatibility of the stop-bar pin with existing anti-rotation stop-block

- if stop-bar pin coupling anti-rotation stop, no further action must should be taken
- if stop-bar pin do not coupling anti-rotation stop-block, please contact our engineering dept.

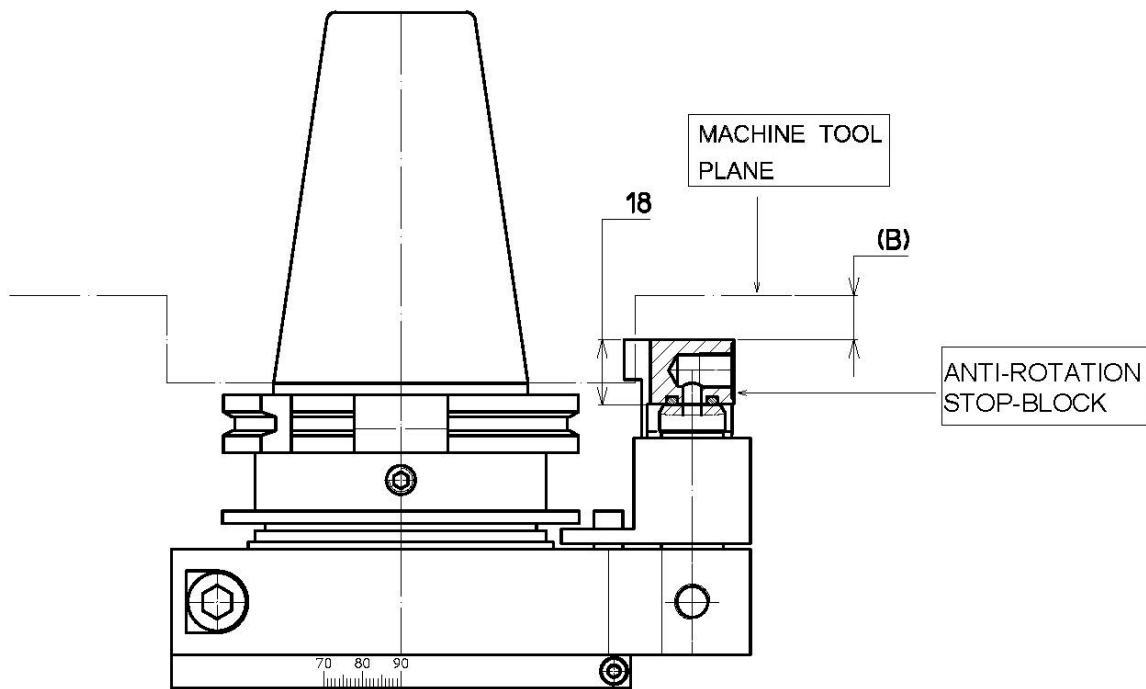
5-1-2 ANTI-ROTATION STOP-BLOCK NOT EXISTING ON MACHINE TOOL SPINDLE

STOP-BLOCK CODE 311201-025 MOUNTING

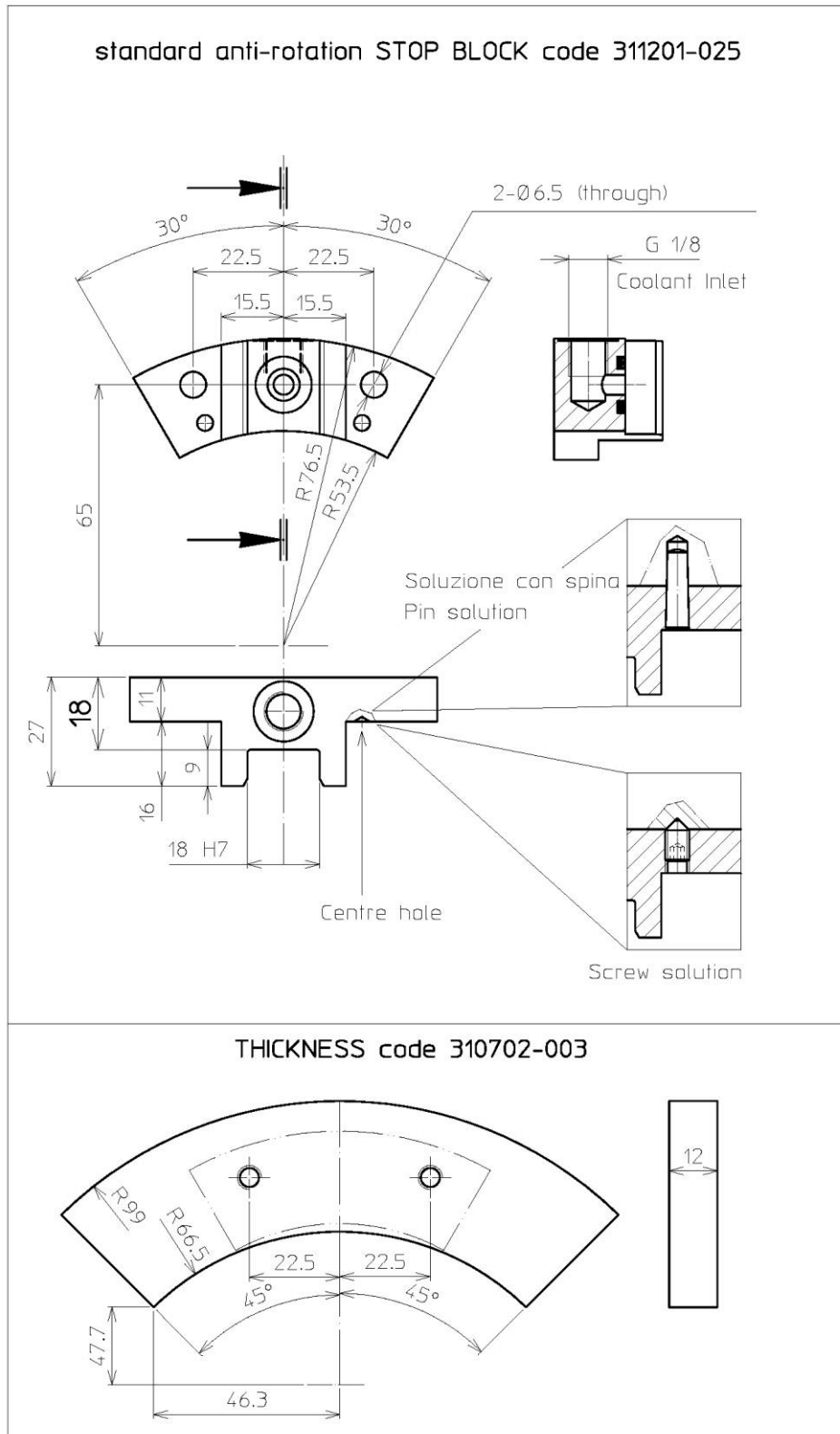
- step 1 – mounting temporarily the head on machine tool spindle (without anti-rotation stop-block)
- step 2 – take the measure **(A)** between machine tool spindle plane and stop-bar pin



- step 3 – from taken measure (A), please deduct 18 mm concerning the entry length of stop-bar pin into the given standard anti-rotation stop-block (you get measure B)



- step 4 – the taken measure (**B**) is the height at which it should be adapted the given spacer



- step 5 – after having removed the head from machine tool spindle, drill the thickness, adapted in order to fit it on machine tool spindle. Use only the existing hole on machine tool spindle (do not tighten the screws).



Caution:

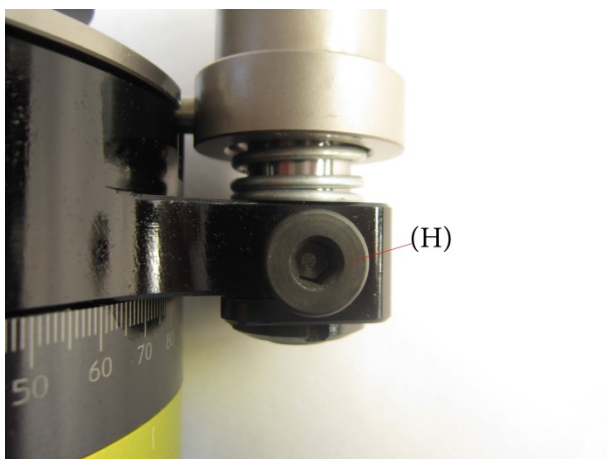
If it is not possible to use the existing hole on machine tool spindle, please contact machine tool's manufacturer or contact MPA engineering dept. in order to manufacture a customized stop-block.

- step 6 - fit the anti-rotation stop-block on the thickness, using the appropriate hole and given screws (do not tighten the screws)
- step 7 – mount the head on machine spindle, pay attention to match coupling perfectly stop-bar pin and anti-rotation stop-block:
 - tighten the screws of the thickness
 - tighten the screws of the stop.block

COOLANT THROUGH STOP-BAR PIN

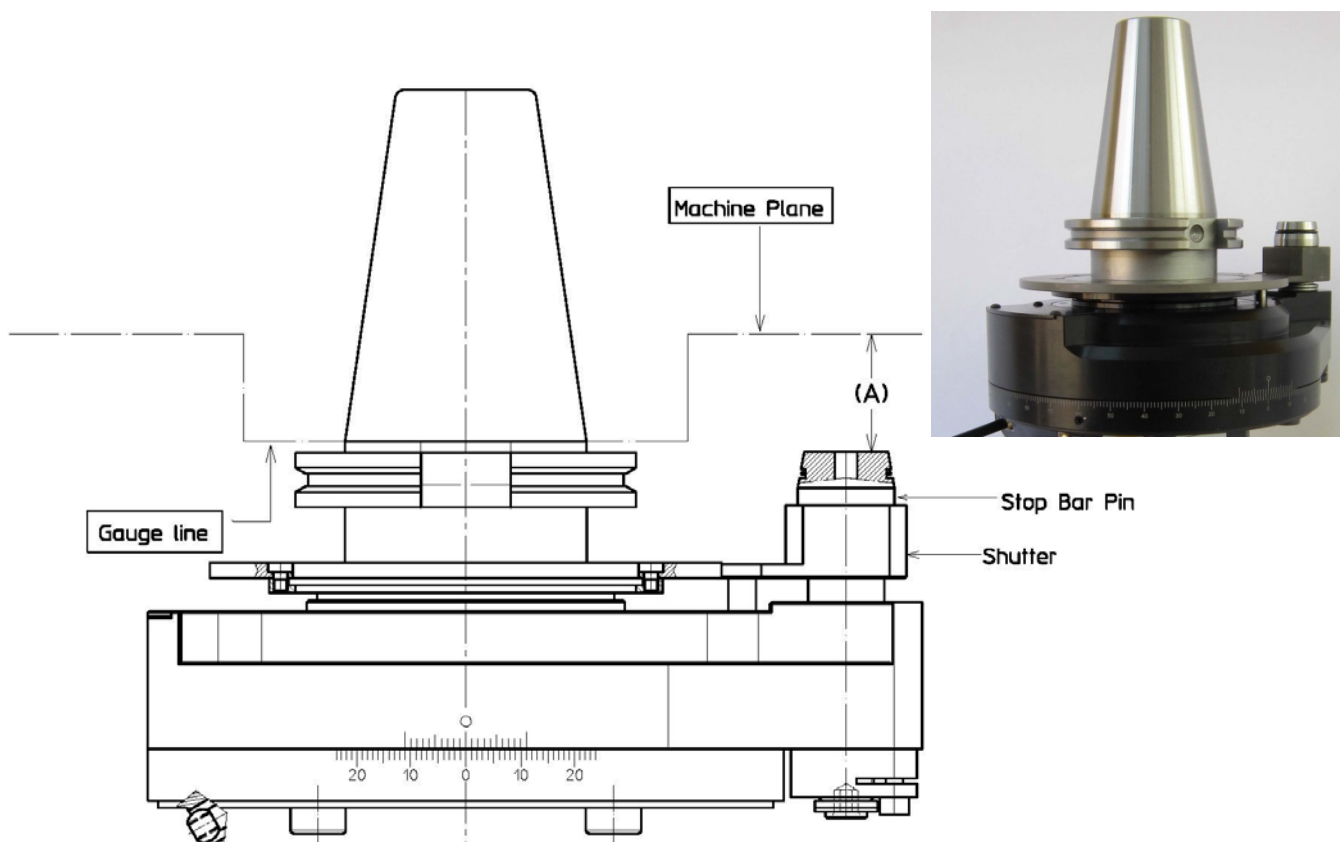
If your machine tool is provided of coolant through anti-rotation stop-block, remove one of the two plugs **(H)** replacing it with a joint

If instead your machine tool is not provided of coolant through anti-rotation stop-block, you can use the hole **(G1/8)** on our standard given anti-rotation stop-block.

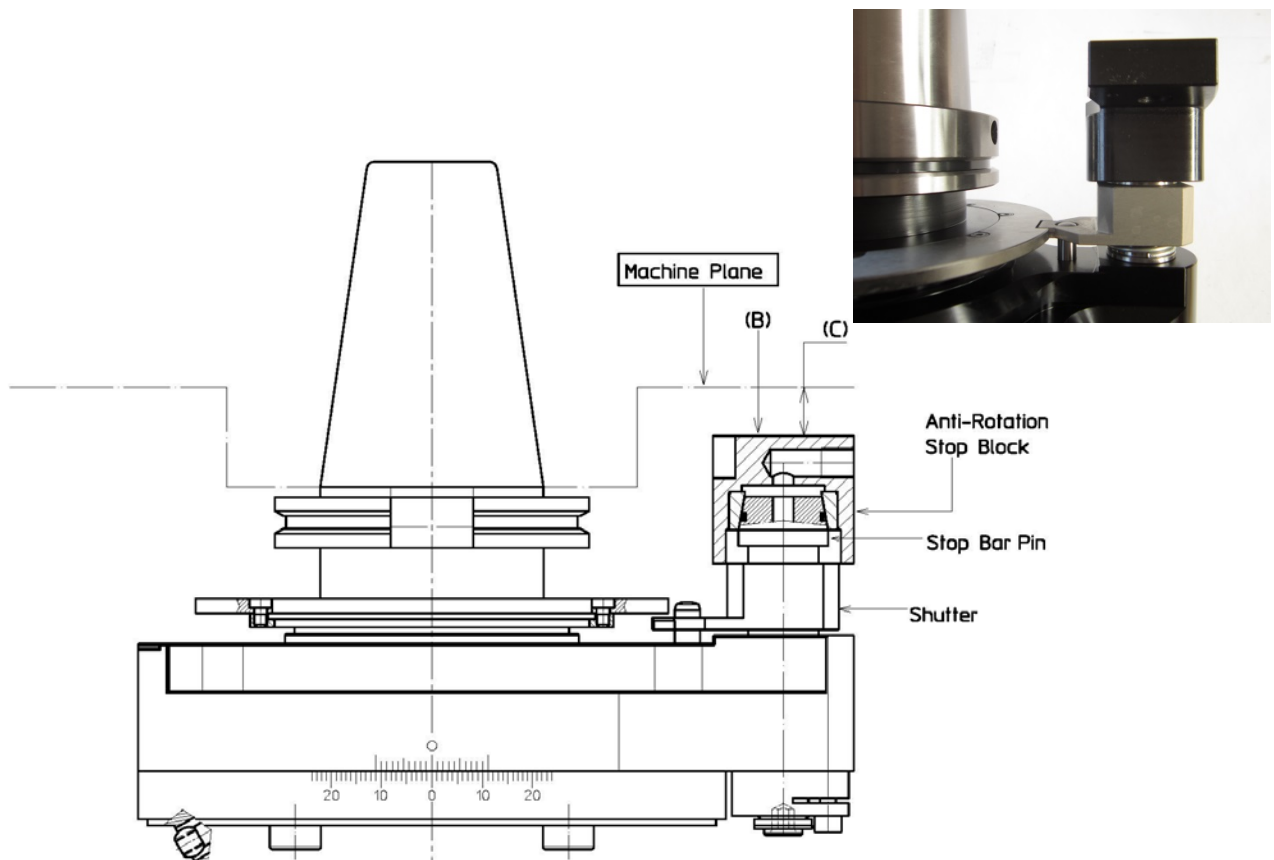


5-1-3 ANTI-ROTATION STOP-BLOCK NOT EXISTING ON MACHINE TOOL SPINDLE NOSE
STOP-BLOCK CODE 311201-026 MOUNTING

- step 1 - anti-rotation stop bar pin of the head, has been axially pre-adjusted as per manufacturer values. You must not absolutely modify this value now.
- step 2 - mount temporarily the head on machine spindle without anti-rotation stop-block
- step 3 - take the measure (A) between machine tool plane and stop-bar pin plane



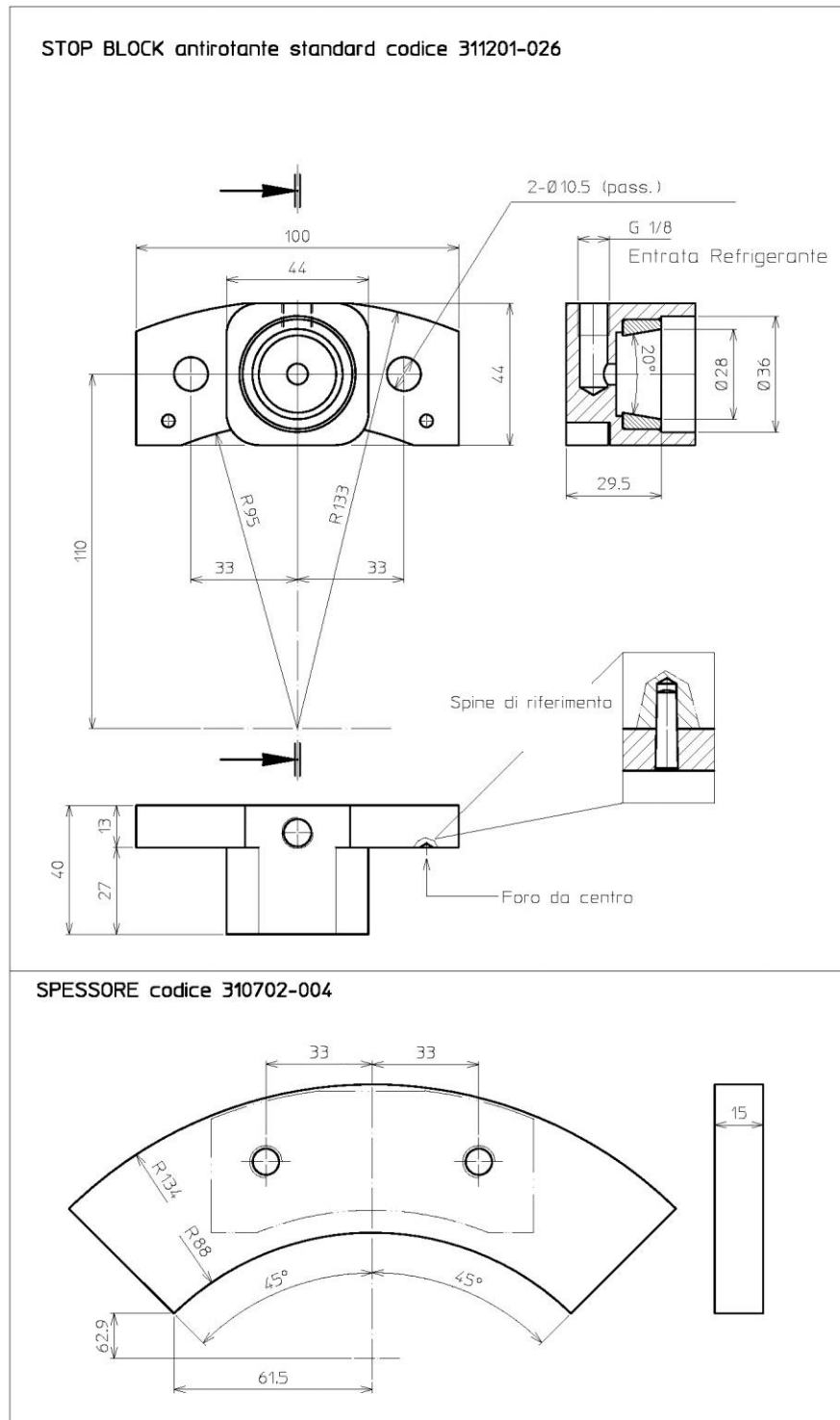
- step 4 – if the detected measure **(A)** is more than 20 mm, proceed as follows:
 - disassemble the head and mount it again on machine spindle with anti-rotation stop-block on stop-bar pin
 - push on plane **(B)** to the end of the stroke and detect the measure **(C)**
 - the detected measure **(C)** is the height at which must be adjusted the given thickness



Caution:

If instead the detected measure **(A)** is less than 20 mm, remove from given anti-rotation stop-block spindle contact plane, the difference between detected measure and 20 mm.

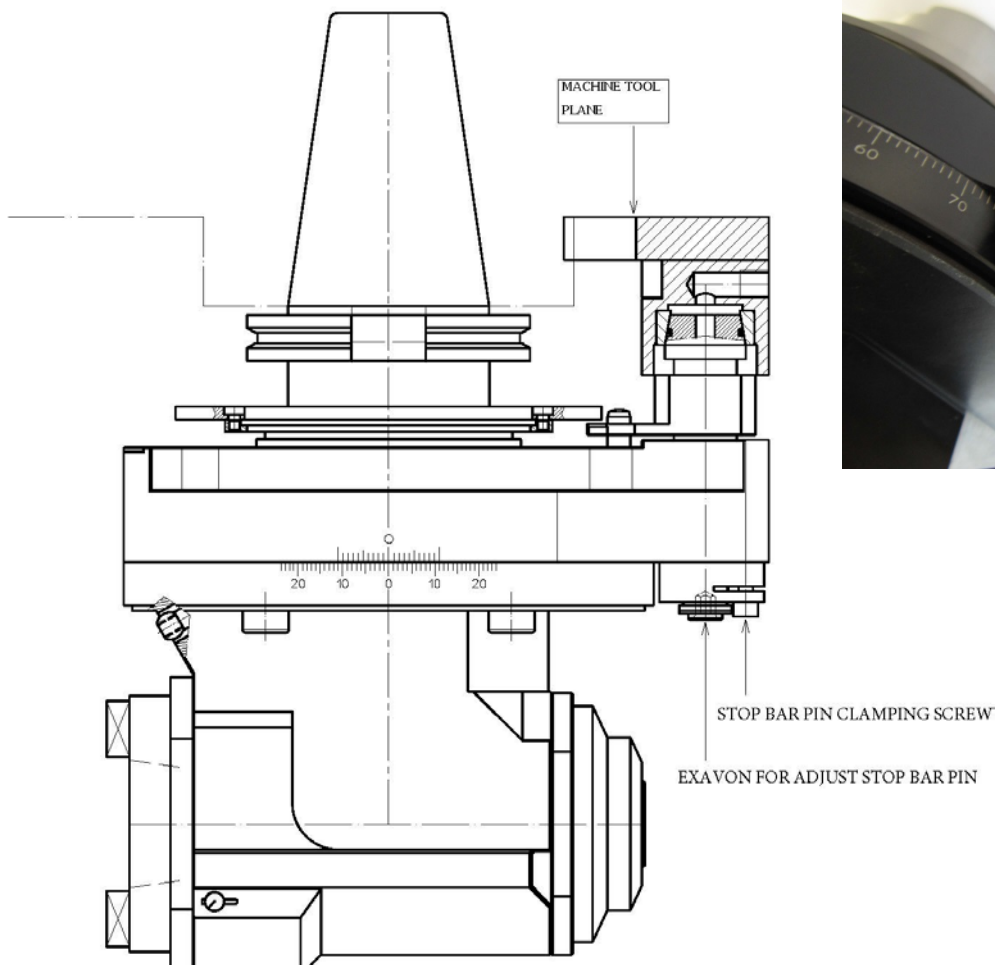
- step 5 – drill the given and adjusted thickness, in order to fit it on machine spindle, using the machine spindle existing holes. Pay attention do not tighten the screws



Caution:

If it is not possible to use the existing hole on machine tool spindle nose, please contact machine tool's manufacturer or contact MPA engineering dept. in order to manufacture a customized stop-block.

- step 6 - after having removed the head from machine tool spindle fit the anti-rotation stop-block on the thickness, using the appropriate hole and given screws (do not tighten the screws)
 - mounting the head on machine tool spindle
 - unscrew the stop-bar pin locking screw
 - using the appropriate adjusting exagon (+/- 1 mm) of the stop-bar pin, so as to eliminate coupling matching issue
 - tighten the stop-bar pin locking screw
 - pay attention to match coupling perfectly stop-bar pin and anti-rotation stop-block and_
 - tighten the screws of the thickness
 - tighten the screws of the stop.block



COOLANT THROUGH STOP-BLOCK

If your machine tool is provided of coolant through anti-rotation stop-block, remove plugs (**G1/8**) replacing it with a joint

You can use the hole on our standard given anti-rotation stop-block.



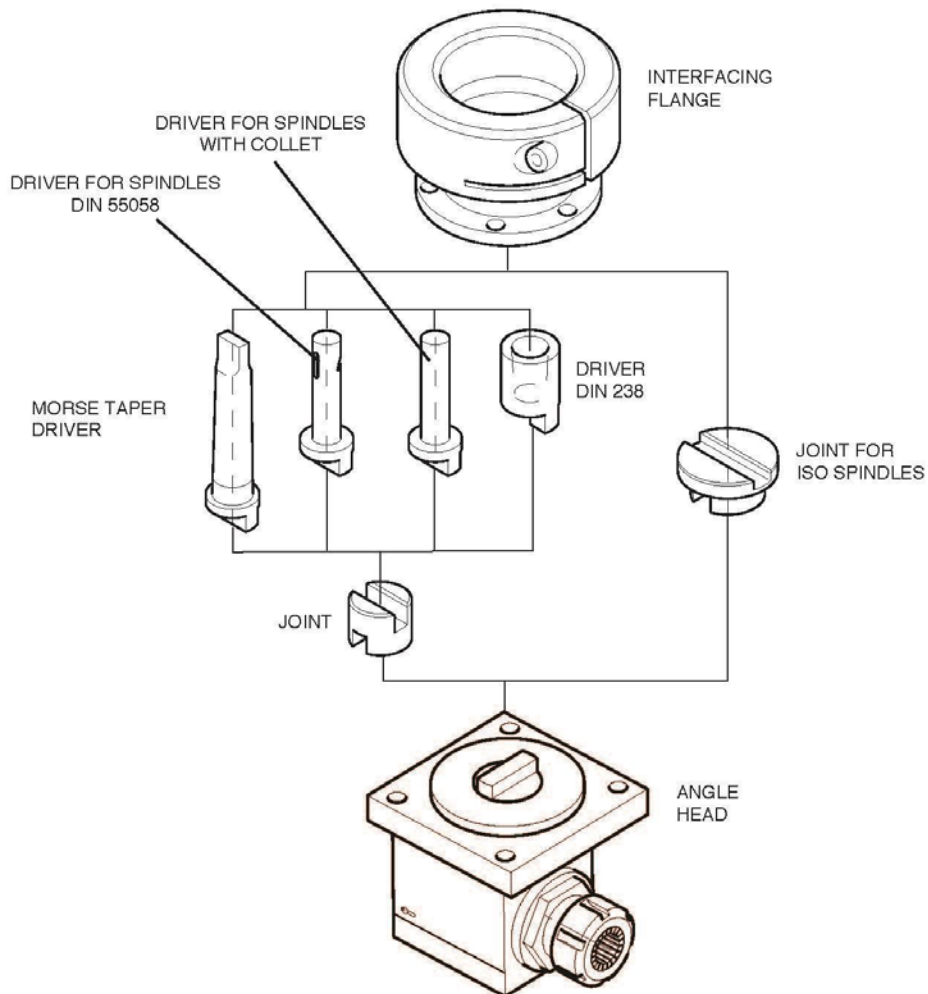
5-1-4 CUSTOMIZED ANTI-ROTATION STOP-BLOCK

If you have purchased a customized anti-rotation stop-block for your machine tool spindle, please follow the instructions below

- mounting the stop-block on machine tool spindle without tighten the screws
- mounting the head on machine tool spindle
- unscrew the stop-bar pin locking screw
- using the appropriate adjusting exagon (+/- 1 mm) of the stop-bar pin, so as to eliminate coupling matching issue
- tighten the stop-bar pin locking screw
- pay attention to match coupling perfectly stop-bar pin and anti-rotation stop-block and:
 - tighten the screws of the thickness
 - tighten the screws of the stop.block

5-2 FLANGE MOUNTING MACHINES

The power transmission can be carried out by means of drivers and joints, depending on the type of connection to the spindle unit, or as otherwise indicated on the technical drawing enclosed.

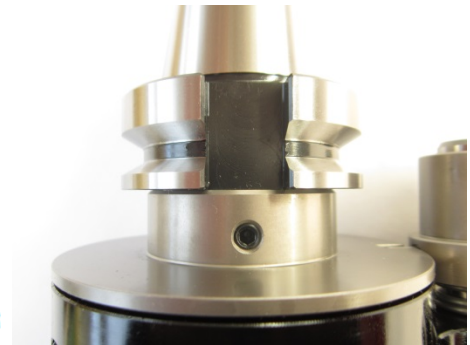
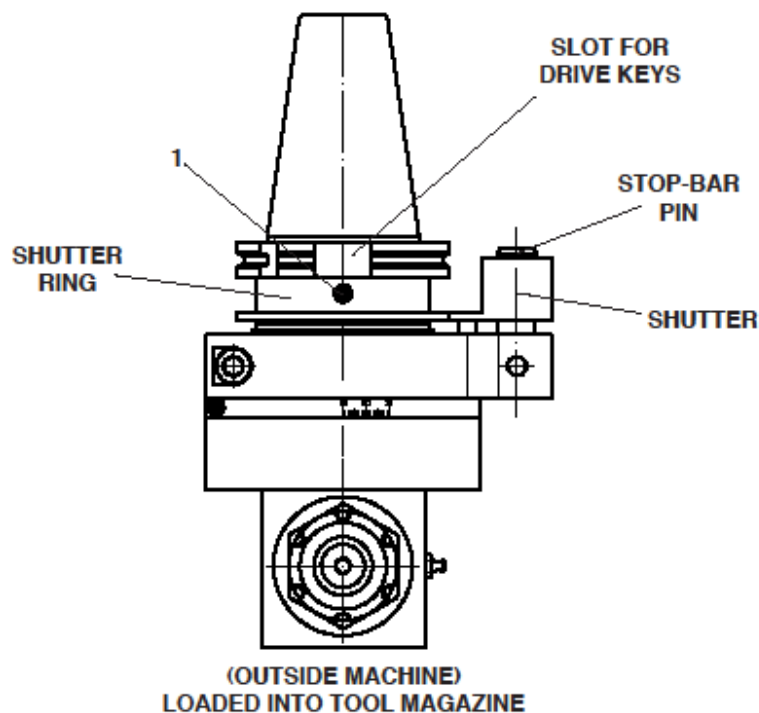


6 ADJUSTMENTS

6-1 ORIENTATION OF THE INPUT DRIVE SHANK

For adjusting orientation of the input drive shank, respect stop-bar pin, proceed as follow:

- step 1 - loosen two screws 1, on the shutter ring
- step 2 – match/coupling slots for drive keys (on the head) with driving dog of machine tool spindle and manually turn the head putting stop-bar pin into the stop-block
- step 3 - lock two screws 1



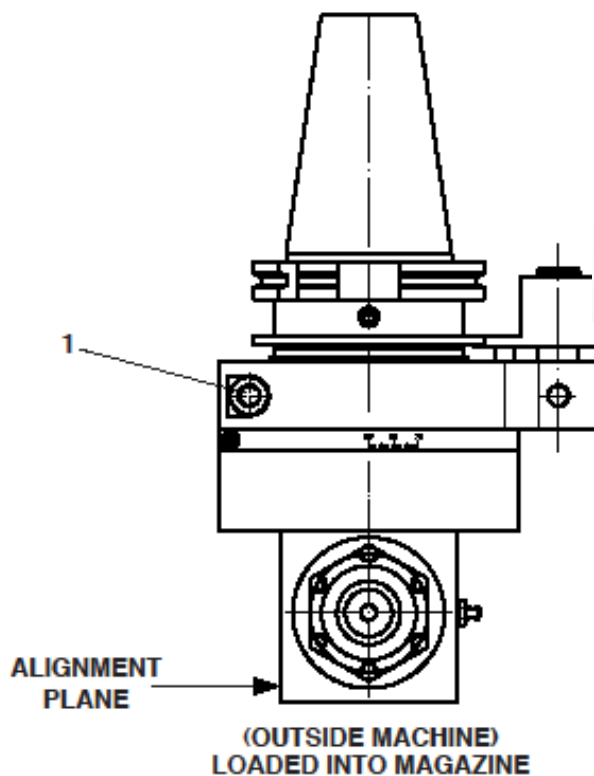
Danger:

- ✓ danger of collision and breakage
- ✓ the locking shutter must engage securely in the shutter ring after the tool change.

6-2 POSITIONING OF THE BODY ON 360°

Proceed as follows to rotate the body of the head at the needed angle position:

- step 1 - mounting the head on machine tool spindle
- step 2 - loosen the screw 1,
- step 3 - rotate manually the body to the needed angle position,
- step 4 - use the alignment plane for a precise adjusting; with a dial gauge move the contact point on the alignment plane of the body side;
- Step 5 - lock the screw 1,

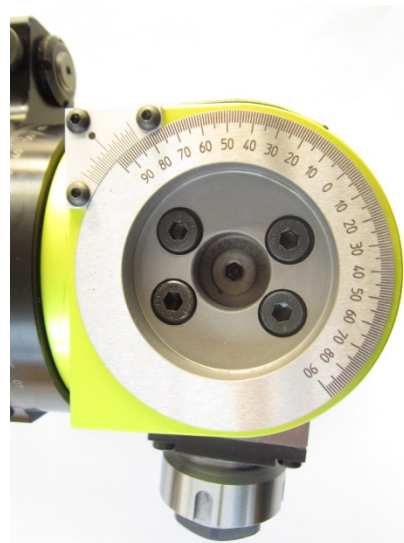
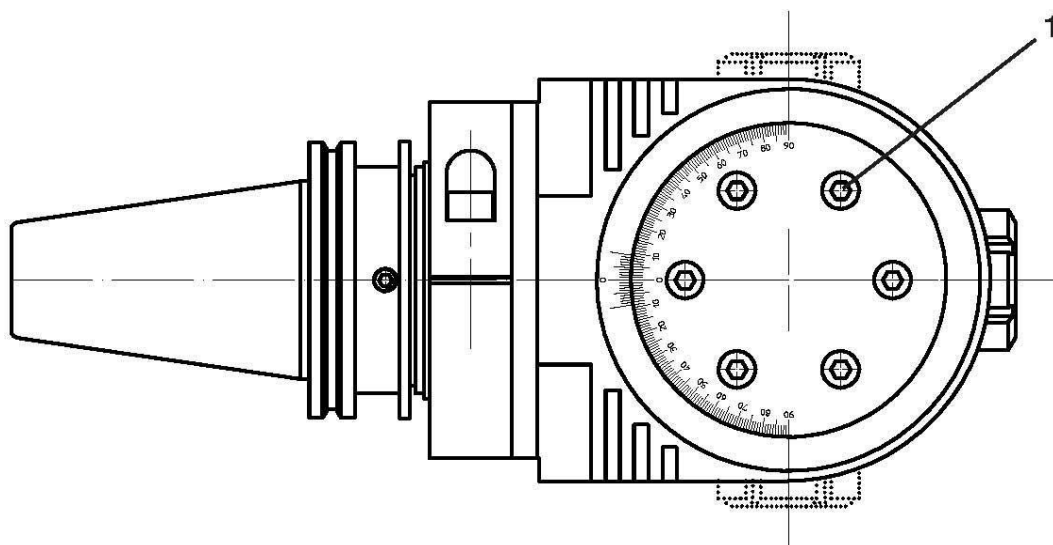


6-3 POSITIONING OF THE OUTPUT SPINDLE TOOL-HOLDER (for tilting heads series, only)

- step 1 - loosen screws 1 (quantity, size and position can be different for each model),
- step 2 - swivel the output spindle tool-holder to the needed angle position, using the graduated scale. For a more accurate positioning, check with a dial gauge on a ground pin clamped into the ER collet and if necessary correct the position before tightening the blocking screws,
- step 3 – lock the screw 1,



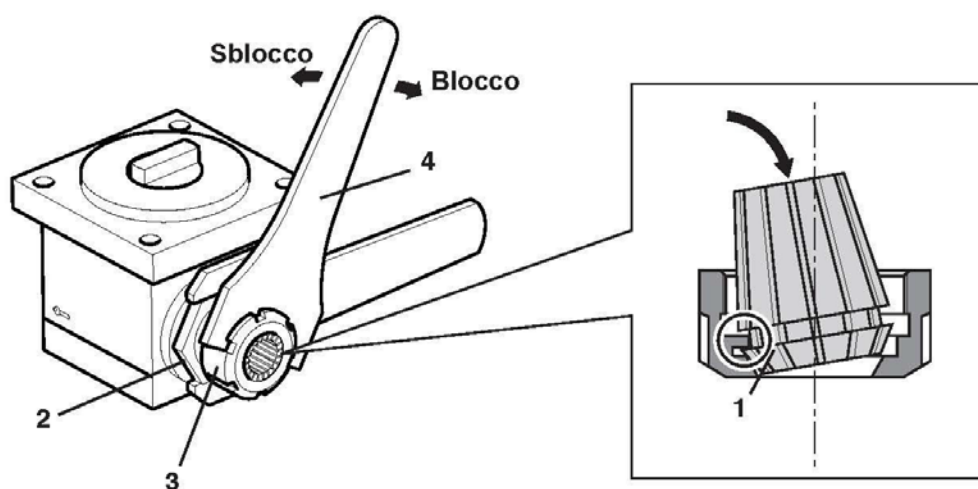
Note: use a torque wrench to tighten screw only. Do not use extension arms or levers.



6-4 ASSEMBLING AND TOOLS ADJUSTING

6-4-1 Output spindle tool-holder for ER collet DIN 6499 shape B

If the head You have purchased is equipped with a spindle tool-holder for ER collet DIN 6499 shape B. The collet shall be inserted into the ER nut; make sure that the ejector **(1)** is connected correctly



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

The type of ER nut varies according to the head clamping capacity.

Table 1 reports the values suggested for the tightening torque of the various types of wrench.

Tabella 1

Ghiera	Codice	Coppia (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



6-5 INTERNAL COOLANT FEED THROUGH THE TOOL
(optional)

If the head You have purchased is suitable for internal coolant through the spindle; please.



Note: never run the product without coolant; the coolant should flow through the tool, before the product 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 product.

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 product; the technical drawing of the product attached to this manual will assist you.



7 WARM-UP PROCEDURE

7-1 Warm-up

A warm-up of the head is accomplished during the test to check

The normal operating temperature of the head should not exceed 70°C.

During the first 40 working hours, the head warms up more than it should because a longer warm-up is necessary to reduce gasket friction and evenly grease distribution; however this should not worry if not associated with abnormal noise.

Before using the head it is necessary to submit it to a warm-up , following this procedure:

- rotation at 500 r.p.m. for 15 minutes
- rotation at 1500 r.p.m. for 10 minutes
- rotation at 3000 r.p.m. for 5 minutes



Note: 5 minutes pause is requested each time that r.p.m. increases.



8 MAINTENANCE

The head is supplied greased and ready for use

8-1 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.

8-2 Maintenance



Danger:

All maintenance operation shall be carried out when the machine tool 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 head. In case of leaks, contact the MPA assistance.
- ✓ If excessive noise levels and vibrations are produced by the head, stop working and contact the MPA technical assistance.
- ✓ when in use, check all moving parts of the product daily for freedom of movement. After storing for longer than 1 month check all moving parts before use for freedom of movement.
- ✓ remove any chips, residues and dirty from the head to ensure the function of all parts and components.



Caution:

no compressed air may be used for cleaning since this blows dirt beneath the seals and the bearings.

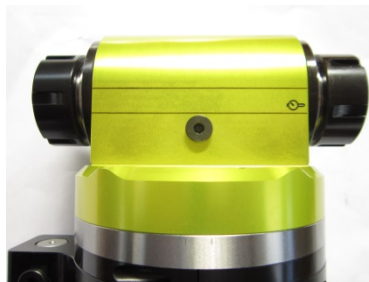
Dedicated staff: Engineer

- every 1000 hours of use:

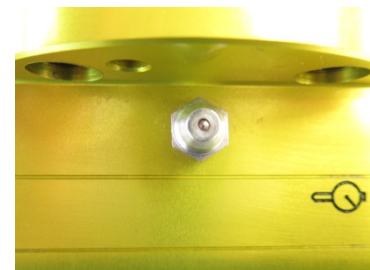
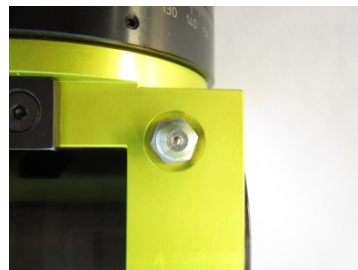
every 1000 hours of use, or judging by experience, re-lubricate the head.

Procedure:

- unscrew the screw/plug, to allow to flow out exhausted grease



- using greasing valve and/or a feeding hole, inject new lubricant grease, specified on the label



- Finished greasing operation, close and tighten the screw/plug and repeat warm-up procedure.



Dedicated staff: Engineer

- every 12 months:

the bearings, bevel gear, gear and sealing components of the head are subject to natural wear and tear. This depends on the following factors:

- the duty cycle;
- the mechanical stress;
- the type of material machined.

We suggest you disassemble the head, 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 head needs to be opened. To carry out this operation, we suggest You contact our technical assistance.



Note: lubricants are very pollutant.

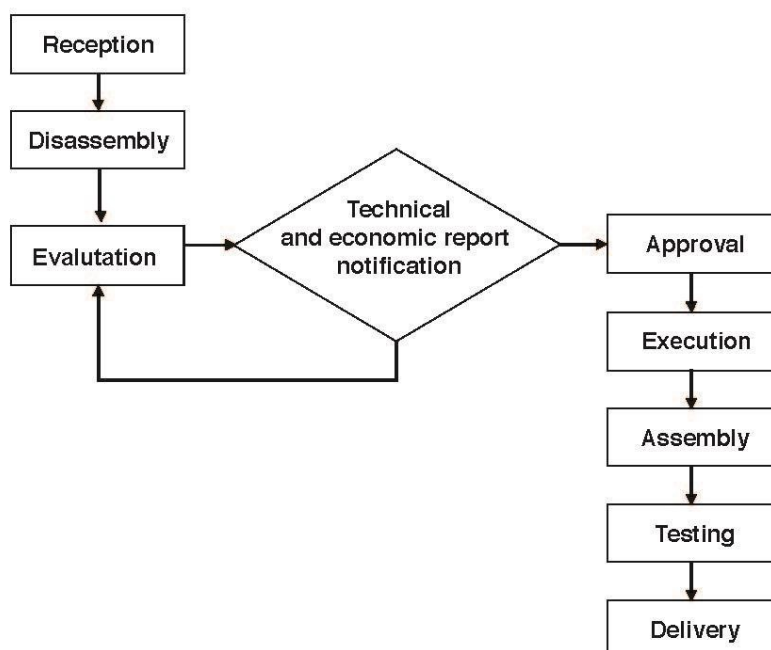
Drain lubricants shall not be disposed of in the environment but delivered to authorised collection centre.

9 SERVICE AND SPARE PARTS

9-1 Technical assistance

MPA guarantee a direct technical assistance for its products all:

Assistance procedure:



9-2 Spare parts

MPA shall consider void and null the warranty covering the product if non-original spare parts are used. Please find attached to this manual the component list relating to Your product and the detailed spare-parts list.

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

- .type and code of Your product;
- .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.



MPA srl

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youtube: [https://www.youtube.com/watch?v= Yl2Pa0CqPE](https://www.youtube.com/watch?v=Yl2Pa0CqPE)
