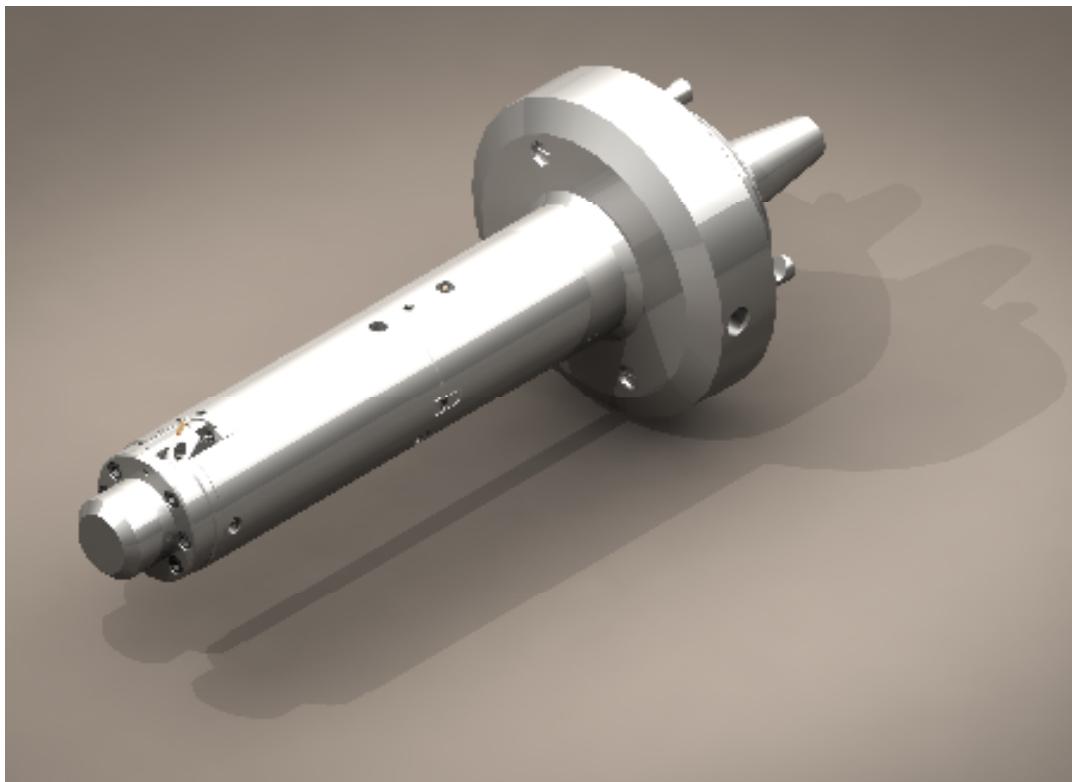




COGSDILL – NUNEATON LTD.

Precision Engineers



**Service Manual
for
‘ZX’ Modular Boring
Tools**

P R E C I S I O N E N G I N E E R S

ZX M.B.T.

Service Manual

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Customer Order Details



Customer :

Quote No :

Works Order No :

Sales Order Processing No :

Drawing Number :

Additional Notes and Related Tooling :

When contacting
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information
about your order,
please have this
sheet to hand.

Introduction

Cogsdill-Nuneaton's Modular Boring Tools are designed to work on Horizontal boring Machines (H.B.M.) with Live Spindles and C.N.C. controls. The proven rugged design is used to effectively machine deep bore cavities and contours in large castings or components, leading to reduced manufacturing lead times and improved machining characteristics on this type of component.

The combination of the spindle feed (z-axis) and the work piece (w-axis) enables most cavities and contours to be accurately machined. The independent spindle feed (z-axis) is utilised to actuate the toolslide feed out mechanism in the seat pocket tool. For ease of programming the actuation ratio (inner spindle movement: tool-slide feed out movement) for the Modular Boring Tools supplied is as follows:-

Different makes of horizontal boring machines can have different home positions for their inner spindle (shank gauge line to the spindle nose face). Cogsdill - Nuneaton's Modular Boring Tools are individually set to suit each customer's machine requirements, if our standard home position will not fit.

The Modular Boring Tools are supplied are of a twin-tool-slide design, which offers the benefit of a balanced cutting action when machining at higher speeds. The tool slides use interchangeable end-mount cartridges, various cartridge styles have been supplied to enable the machining of your range of components, the cartridges are tabulated on the general arrangement drawings. The tables give an overview of the cartridges machining range. As the name suggests the Modular Boring Tools are of a modular construction, allowing extra extensions to be easily fitted or removed to vary the tool length to suit new components, without the need for a completely new tool. The extensions feature a simple coupling mechanism which allows for quick easy assembly and dismantling. A camloc bonnet is secured to the H.B.M. spindle, to allow for fast and easy tool loading and unloading. With four-camloc pins and a substantial location diameter you can be sure that the tool is securely held to the H.B.M. spindle.

A wide range of inter-changeable cartridges to suit standard ISO inserts is available for all tools. These cartridges cover most machining possibilities from front and back boring, chamfering contouring etc. If necessary we can also supply special cartridges if your needs are not met by our standard range.

Cogsdill – Nuneaton's development of quality tooling and pursuit of continuous improvement in our product lines has resulted in a proven rugged modular design. All moving parts are precision ground and heat-treated to ensure lasting accuracy. Tool lubrication is through easily accessible grease nipples.

Chapter

1

Mounting the Tool onto the Machine

1. Before the Modular Boring Tool is installed onto the machine spindle, ensure all locating faces are free from swarf chips and foreign matter & thoroughly clean.
2. Advance the machine spindle forward through the cam loc bonnet.
3. Mount the Modular Boring Tool into the spindle and actuate the pull stud clamp.
4. Retract the spindle slowly until the Modular Boring Tool flange is within 1,0mm of bonnet face.
5. Check with the home position reading from the C.N.C. control
6. Retract the spindle to its home position.
7. Tighten the four camlocs in the camloc bonnet.
8. Before machining commences check tip height
(measure the tool block-housing diameter and divide by a factor of 2 for radial dimension from centre).
9. Measure the amount, which the insert edge protrudes from the tool block housing.
10. Add this figure to the tool block housing Radial dimension, to get the tip height
(Multiply by 2 for diameter).

Chapter**2**

Toolblock Housing

Removal & Re-fitting

1. Load seat pocket tool into a vice, gripping the stub sleeve next to the section to be removed, alternatively load into the machine spindle.
2. Actuate the shank to its home position. The toolslide should now be in the central position in the tool block housing.
3. Remove the three taper lock screws (detail 10). [Fig. 1]
4. Remove the cover screw (detail 112) to gain access to the push rod. [Fig. 1]
5. Load the Allen Key through the cover screw hole into the taper lock screws and undo until the screws bottoms out. Wind back one-quarter turn to avoid damage to the stub sleeve bore. [Fig. 2]
6. Leaving the Allen Key in position; pull off the tool block housing assembly.

Note: The Allen Key should be left in place in both assemblies whenever possible to prevent the push rod moving. [Fig. 3]

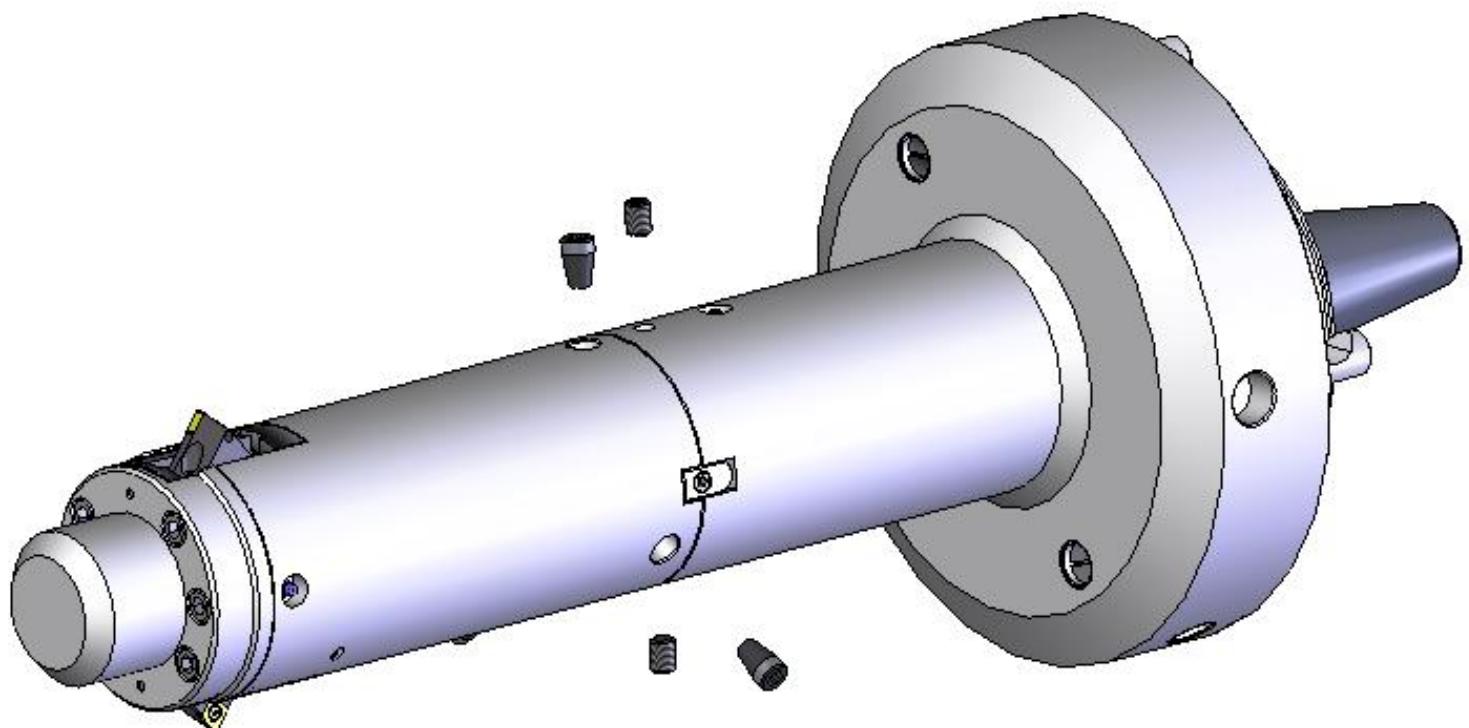
The tool block housing should be held across the toolslide during removal to restrict actuator movement.

7. Reverse the above procedure for re-fitting. Tighten the three taper lock screws with a torque wrench to 28 NM².

Note !

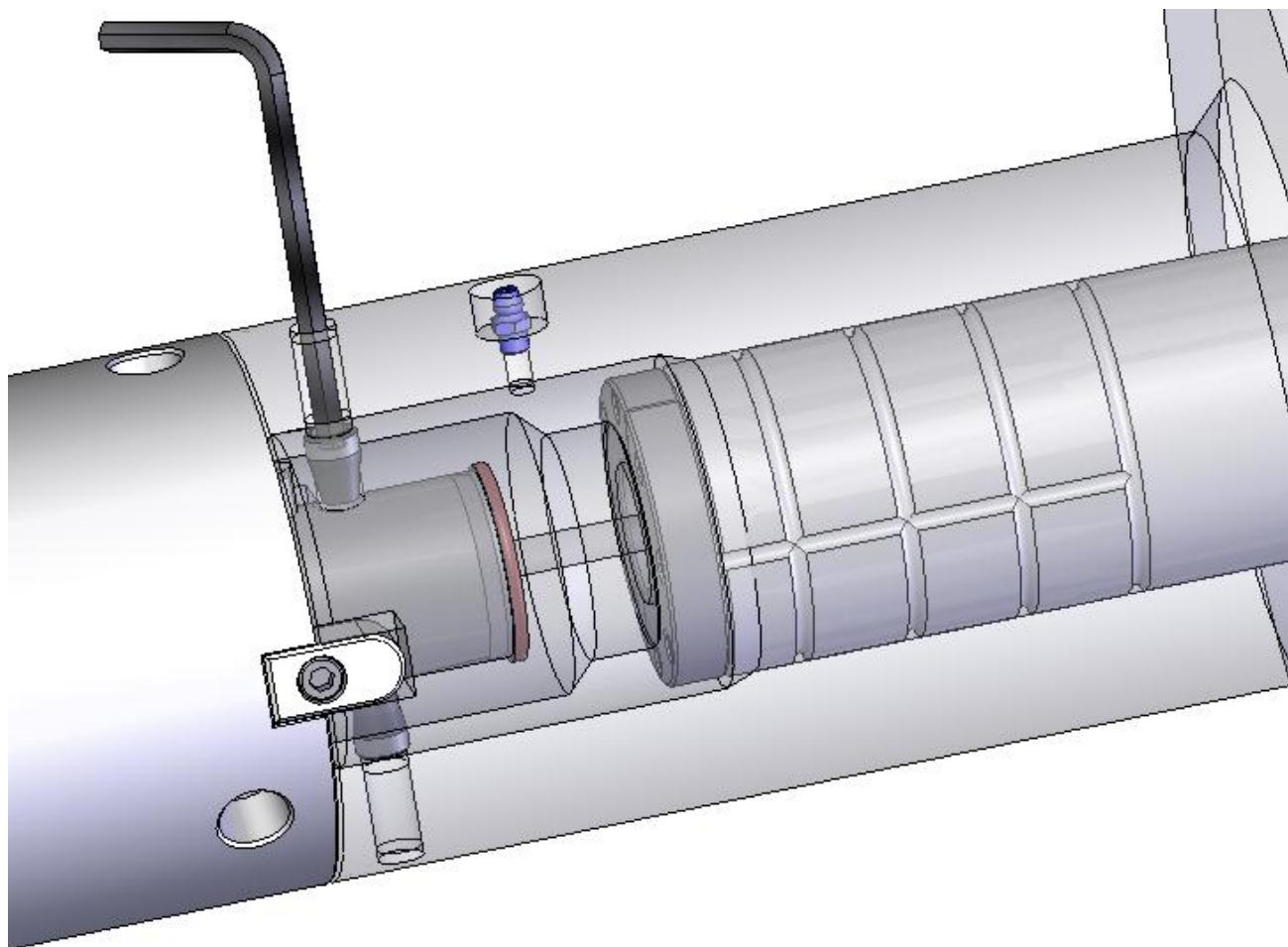
The above procedure should be carried out by referring to the appropriate assembly drawing

FIGURE 1

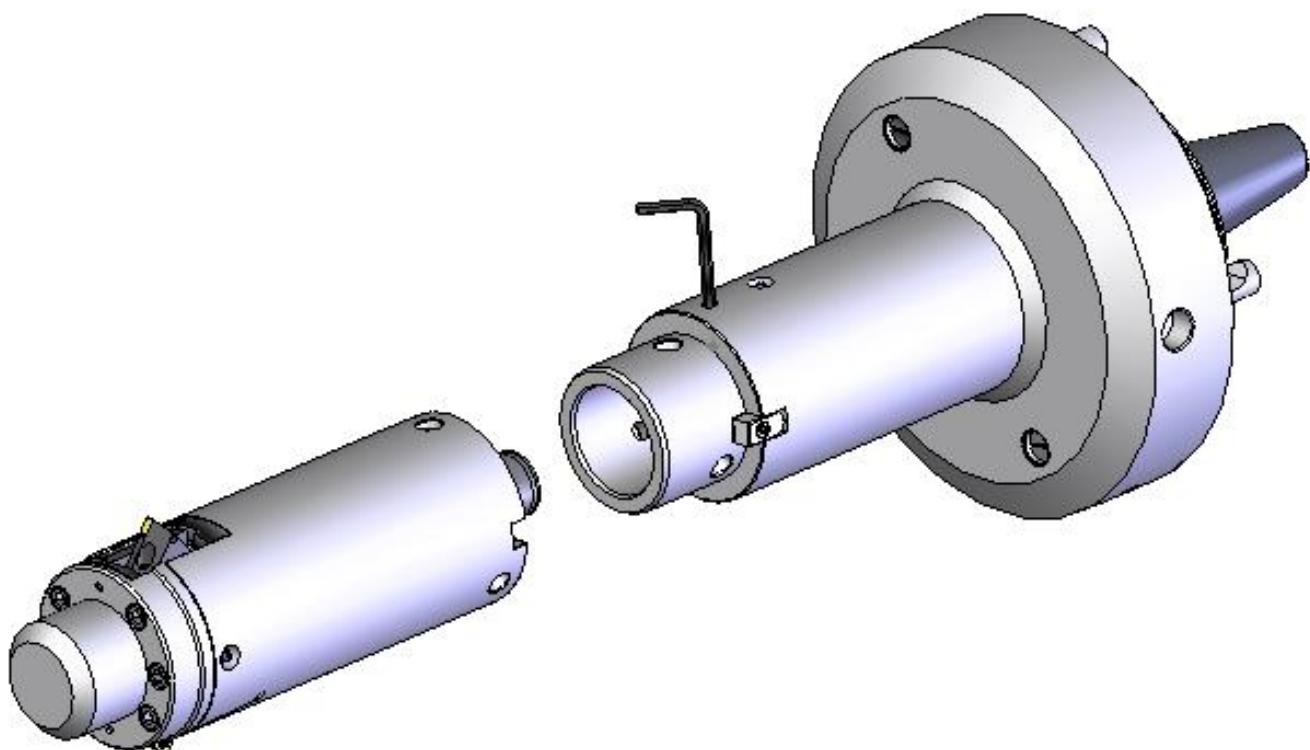


Remove three taper lock screws and one or two cover screws (See assembly drawing for quantity).

FIGURE 2



Load allen key/ hexagon wrench through cover screw holes to undo pushrod taper lock screws. Undo until taper lock screw bottoms out and then wind back one turn.

FIGURE 3

Leaving allen key/hexagon wrench in position, pull off toolblock housing from stub sleeve. Remember to hold toolblock housing across the toolslides to prevent any movement of the actuator.

Chapter
3

Changing the Toolslide

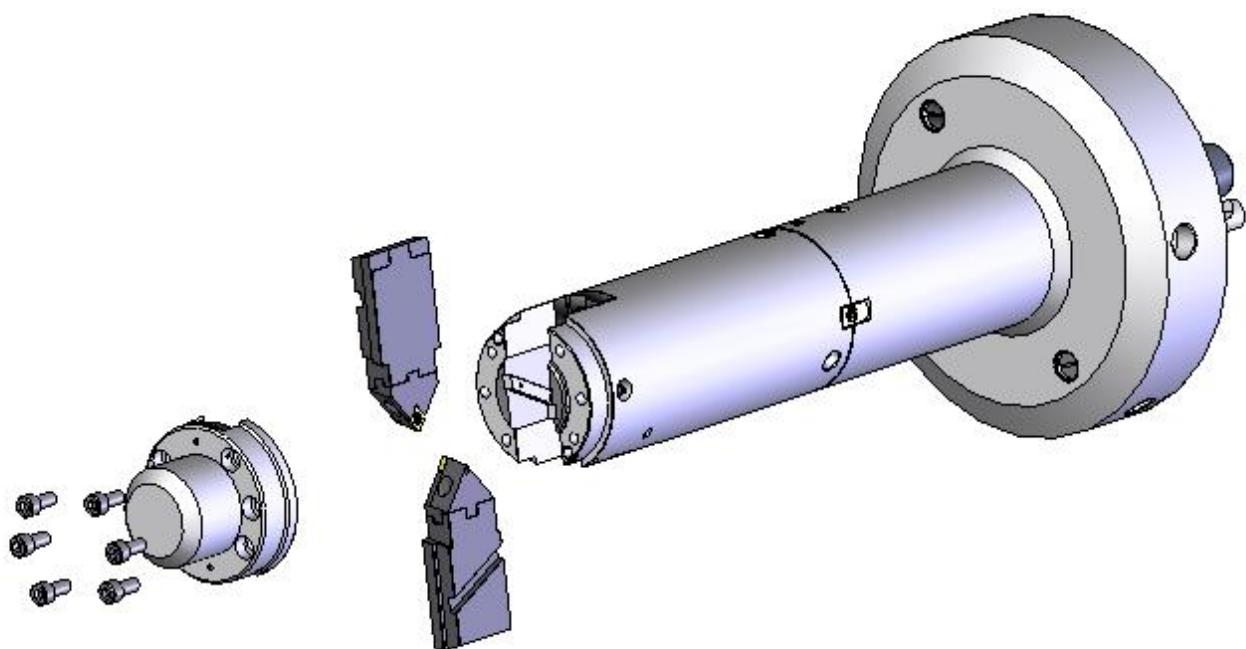
Mount the Modular Boring Tool into the machine spindle – See Chapter 1

- 1 Remove the end cap by unscrewing the cap head screws (detail 101). *[Fig. 4]*
3. Actuate the machine spindle forward (approximately 1.500"), the tool-slides (detail 5) will push forward enabling their removal.
4. Inspect and replace toolslide if necessary ensuring that all items are clean and free from swarf, making sure that the toolslide is the right way round and properly located on the keyway in the actuator (detail 9).
5. Actuate the machine spindle and move to the home position.
6. Replace the end cap ensuring that the location faces are free from swarf.
7. Tighten up the five cap head screws (detail 101).

Note !

The above procedure should be carried out by referring to the appropriate assembly drawing

FIGURE 4.



Remove the endcap by unscrewing six caphead screws and pulling off from the tool block housing. Actuate machine spindle forward (1.500" approx.) enabling the easy removal of the toolslides.

Chapter

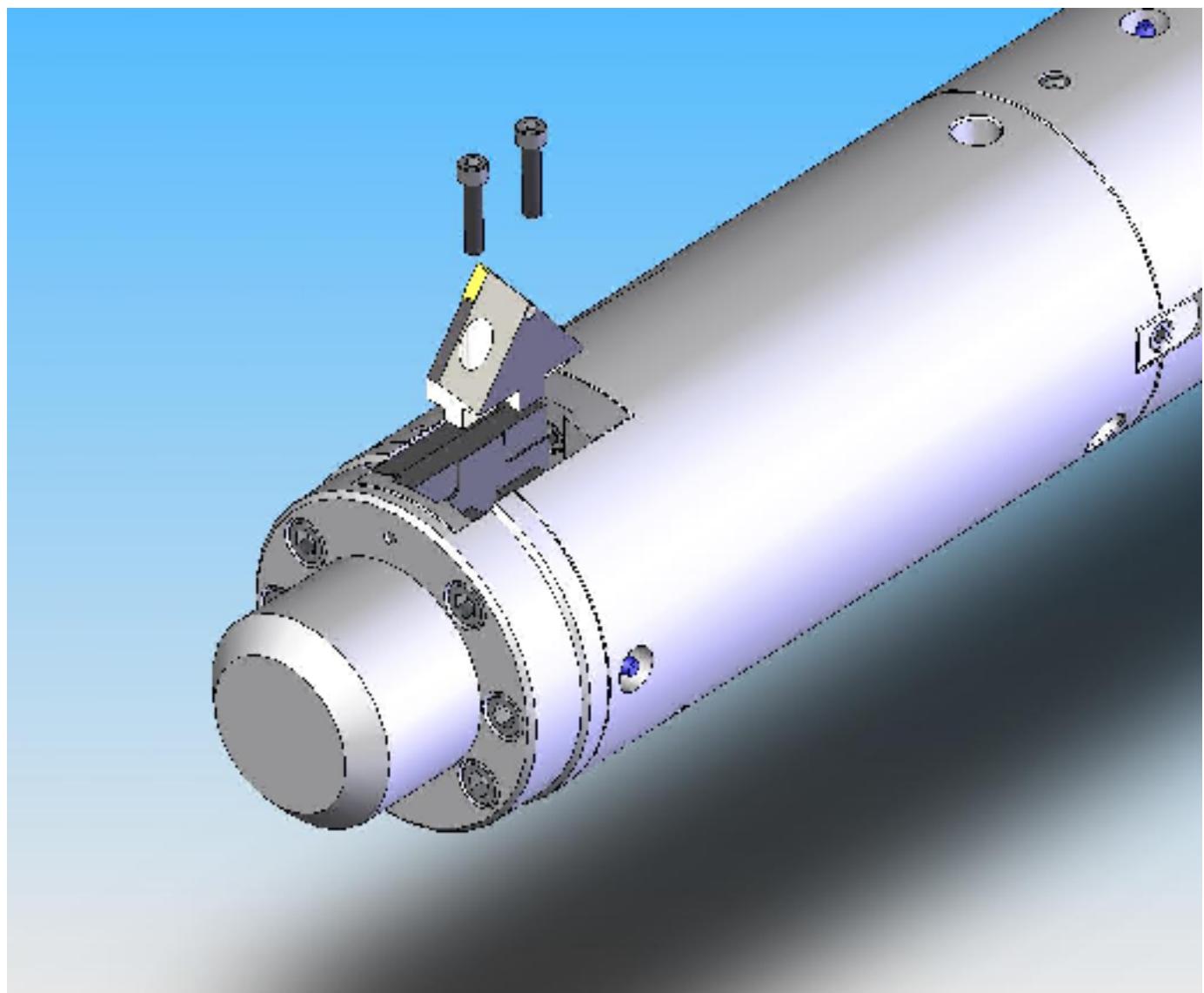
4

Removal of Cartridge

The cartridge can be easily removed for inspection or changed as necessary

1. Using an air-line clean the area around the cartridges
2. Actuate tool to provide easy access to the socket head cap screws
3. Undo socket head cap screws holding the cartridge to the tool-slide
4. Carefully remove cartridges from tool-slide
5. Clean the cartridge seating face
6. Fit cartridge on to tool-slide making sure it is seated correctly and tighten socket head cap screws.*[see fig 5]*

FIGURE 5.



To remove cartridges unscrew caphead screw holding cartridge to toolslide and pull off.

Chapter

5

Maintenance

As long as the Modular Boring Tool is lubricated frequently (see chapter 7) and not accidentally damaged during use it should remain virtually maintenance free, however we recommend the removal and strip of the tool block housing and tool slides every 300 hours. These should then be cleaned thoroughly, checked for signs of damage or wear, re-greased and re-assembled; any parts that should need replacing are available from Cogsdill-Nuneaton and can be identified by referring to assembly drawings (see chapter 8). Alternatively the Modular Boring Tool can be returned to Cogsdill-Nuneaton and for a nominal charge the Modular Boring Tool can be dismantled, checked and re-assembled by one of Cogsdill's skilled fitters.

The Modular Boring Tools should be cleaned free of swarf or other foreign matter after each machining operation. If the Modular Boring Tool is to be stored for any length of time a thin film of oil should be applied to the outer surfaces to prevent corrosion

To ensure the Modular Boring Tools remains in good working order it is recommended that the working parts e.g. the actuators (details 8) and tool-slides (details 5) are well oiled or greased.

This will avoid corrosion from coolants etc. and ensure that the tool is in good working order when next used.

Chapter

6

Recommended Spares

To minimise Seat Pocket Tool down time we recommend you carry spares. Below is a list of the main items that may need replacement through normal wear and tear, which can be easily fitted by you the customer.

- Tool slides
- Cartridges
- End cap
- Actuator
- Actuator Key
- Seals

Note!

In the event of the M.B.T. being damaged, we strongly advise customers to return the tools to either Cogsdill – Nuneaton Ltd or Cogsdill Tool Products for evaluation and repair.

Lubrication Recommendations

Chapter

7

Operational reliability and trouble free service of high performance machinery and tooling depends on the correct selection and use of high quality specialised lubricants.

1. It is recommended that a water resistant paste (**Klüber - Altemp Q NB 50**) be used in this type of tool. The paste should be applied to all moving parts or surfaces when the tool is disassembled for cleaning and maintenance or when the tool is stored for extended period of time.
2. To lubricate the heads during use, it is recommended that a water resistant paste (**Klüber – Altemp Q NB 50**) should be applied, as a general guideline, every 100 – 200 operating hours or as deemed necessary in practice. The lubrication frequency can vary depending upon the working environment, working speed, coolant used, machine used, number of head actuations and distance stroked by the tool.
3. The Modular Boring Tool lubricated at the various grease points, a lube gun is available from Cogsdill to make routine lubrication easy. (Ref. Part No. CN-D24)

To attain long term, maintenance free operation of Cogsdill tooling it is recommended that the tools be lubricated with Klüber Lubrication's special lubricating paste.

Altemp Q NB 50

The benefits of this tribologically developed lubricant are:

Long term lubrication product for Boundary friction conditions

- Enables precise positional accuracy and repeatability
- Prevents fretting corrosion
- Provides unparalleled resistance to water based coolants
- Resists centrifuging at high rotational speeds
- No workplace contamination

Apply Altemp Q NB 50 paste to all sliding surfaces on assembly of the head and thereafter by high-pressure lever type grease gun. Frequent relubrication with Altemp Q NB 50 is not generally required, depending on service conditions. As a guideline we recommend re application every 200 – 300 operating hours, or as deemed necessary in practice.

**Mixing of lubricants should be avoided and could result in
operational performance deficit**

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General Assembly Drawings & Parts List

Chapter

8

The following general assembly drawings & parts lists should be referred to when carrying out any of the procedures in the previous chapters.