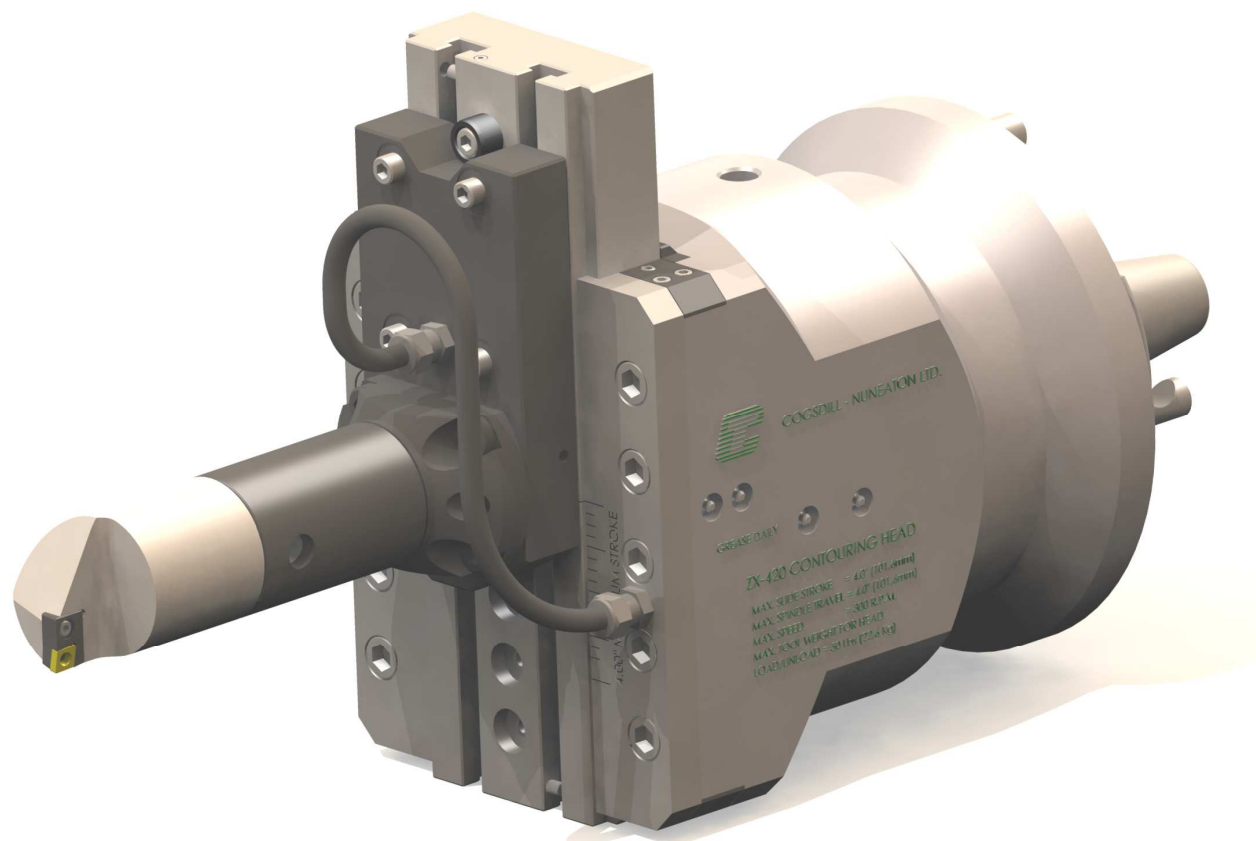




COGSDILL – NUNEATON LTD.

Precision Engineers



ZX420-TC

Facing & Contouring Head

Service Manual

PRECISION ENGINEERS

ZX420-TC Facing & Contouring Head Service Manual

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Customer Order Details



Customer :

**When contacting
Cogsdill-Nuneaton
for information
about your order,
please have this
sheet to hand.**

Quote No :

Works Order No :

Sales Order Processing No :

Additional Notes and Related Tooling :

Introduction

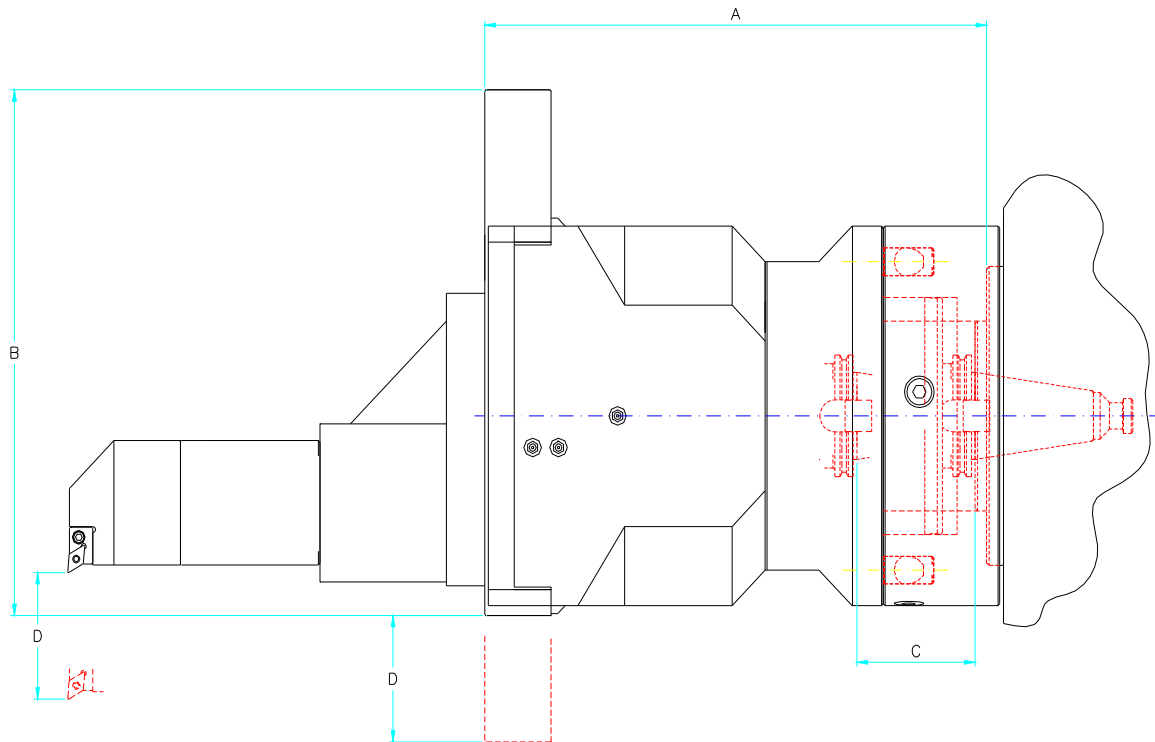
Cogsdill-Nuneaton's Facing heads are designed to work on machines with live spindles, such as horizontal boring machines with C.N.C. controls. The combination of the spindle feed (z-axis) and the workpiece (w-axis) enables most profiles to be accurately machined. The independent spindle feed (z-axis) is utilised to actuate the feed out mechanism in the facing head. Different makes of horizontal boring machine or machining centre, will have different home positions for their inner spindle (Shank gauge line to the spindle nose face). Cogsdill – Nuneaton's facing heads are individually set to suit each customer's machines if our standard home position will not fit.

Use the Cogsdill – Nuneaton facing and contouring heads to machine large castings or components that are awkward for holding or rotating for conventional machining. External turning, grooving, taper boring, radius forming, chamfering, recessing, threading can all be finished in one set-up without removing the workpiece from the machine tool table.

Cogsdill – Nuneaton's development of quality tooling and pursuit for continuous improvement in our product lines, has now resulted in a proven rugged design for it's facing heads. All moving parts are precision ground and heat-treated to ensure lasting accuracy with next to no backlash. Oilways are built into internal slide mechanisms and lubrication is through easily accessible grease nipples. Cross-slides and actuators may be coated with a friction reducer to reduce actuation pressures, resulting in improved machining capabilities and reduced wear to critical parts upon request.

When you the customer feel it necessary to design and manufacture your own tooling, please feel free to consult us about your intention. We can provide any information to you that you might need. Our aim is to serve and satisfy you the customer, please take advantage of this offer.

Suitable for Horizontal Boring Machines with Size 5, 6 & 7 Inch Spindles



DETAILS	DIMN	(INCHES)	(mm)
LENGTH EXCLUDING TOOLING	A	17.000	432
SLIDE LENGTH	B	16.630	422
MACHINE SPINDLE TRAVEL	C	4.000	102
TOOL AND SLIDE TRAVEL	D	4.000	102
DIAMETER RANGE		0 - 25	0 - 635
MAXIMUM RECOMMENDED SPEED		300 R.P.M.	-
WEIGHT		385lbs	175kg

Installation of Head

1. Using an eyebolt and ensuring both the bonnet and spindle nose location diameters are thoroughly clean carefully lift the bonnet and locate it onto the spindle nose of the machine,. Secure the bonnet in position with the four socket head cap screws (See *fig 1.01*)

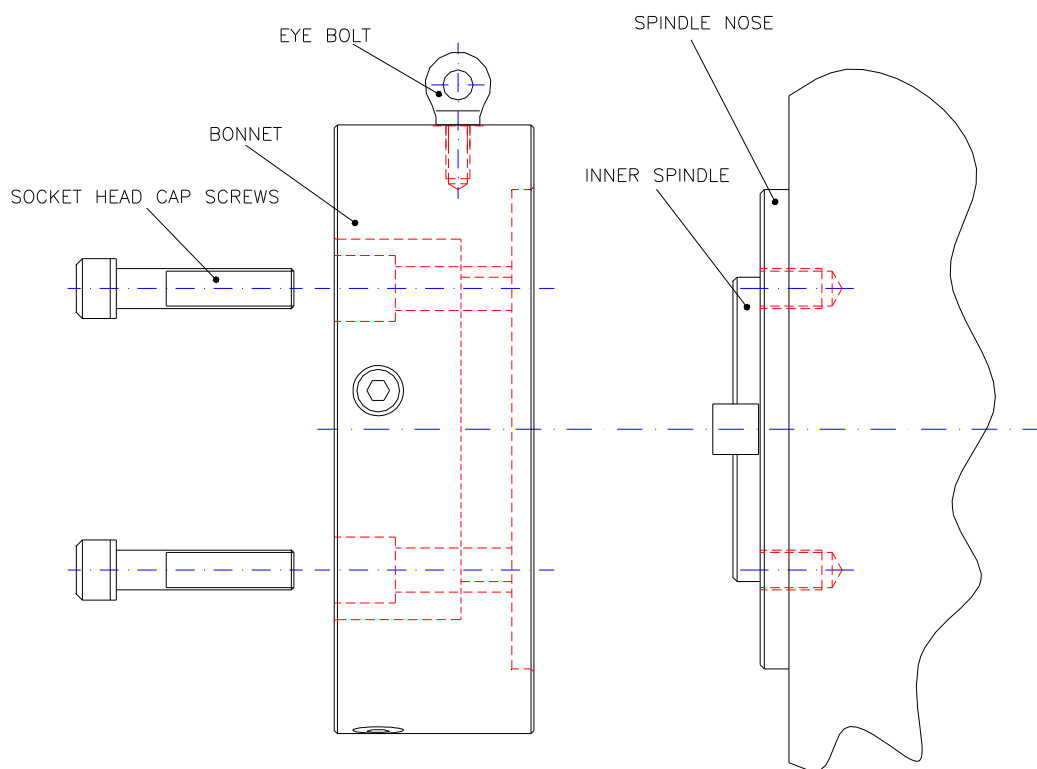


Fig 1.01 Fitting the bonnet to the spindle nose

2. Before commencing to load the ZX 420 head onto the machine, ensure all top tooling and slide adaptors are removed from the slide. Check that the camlocs in the bonnet are in their open position. The camlocs are spring loaded and will click into their open position when turned with an allen key. Using a crane, and with the ZX420 carefully slung lift into it in to a load position fully making sure the camloc studs are in line with their respective holes (See fig 1.02)

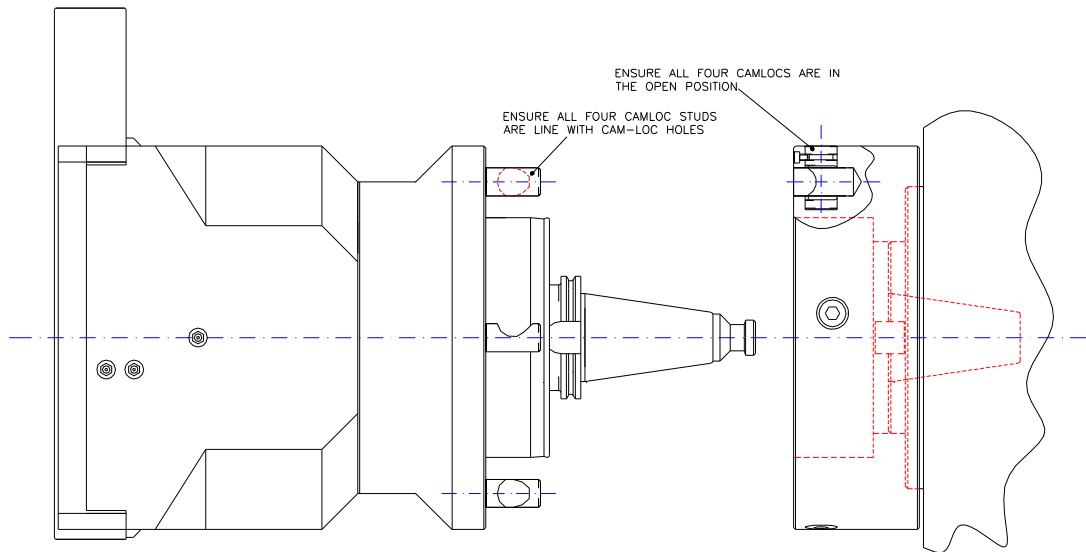


Fig 1.02 camlocs in their open position and aligned with camloc studs

3. Wind out the inner spindle of the machine so that it protrudes from the bonnet face
4. Make sure that the ZX420 head taper and the machines inner spindle taper are thoroughly clean
5. Locate the shank of the ZX420 head into the taper of the machines inner spindle and clamp it into the spindle using the machines pull-stud or draw bar arrangement. (See fig 1.03)

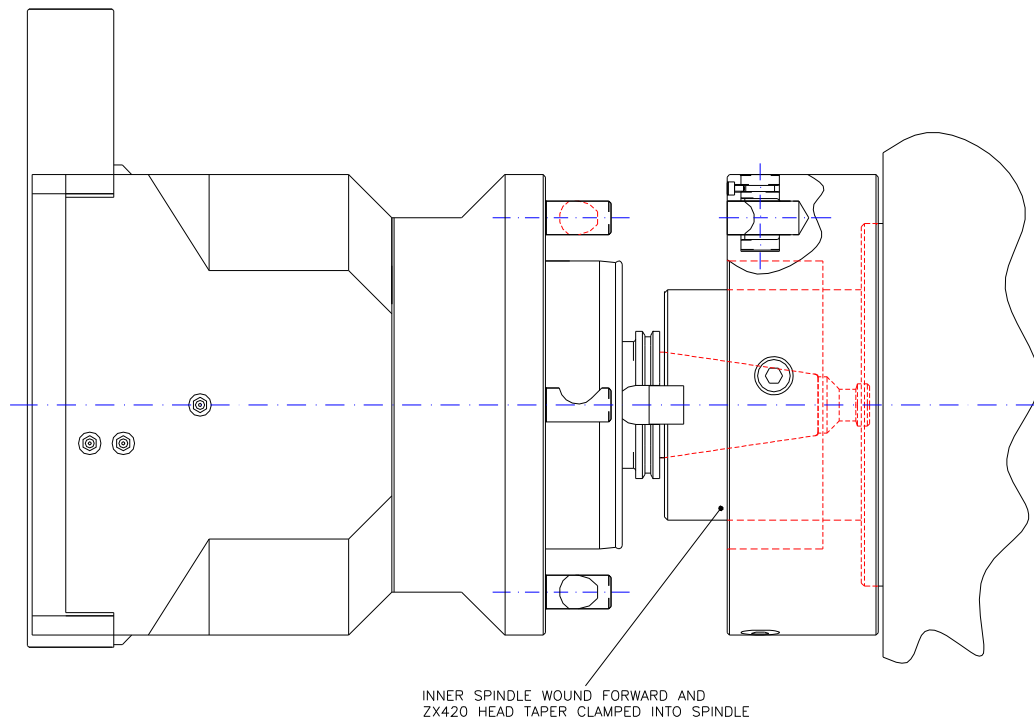


Fig 1.03 Locating and clamping the ZX420 head into the inner spindle

6. Slowly wind back the inner spindle, locating the ZX420 head into the bonnet, until the mating faces are just clear or touching each other.
7. Clamp the ZX420 head into the bonnet by depressing the camlocs, then using an allen key turn the camlocs into their locked position.

8. Remove the sling that was used to lift the ZX420 head.
9. Set inner spindle into its **HOME** position
10. Fit required tooling
11. The ZX420 head is now ready for use (*See fig 1.04*)

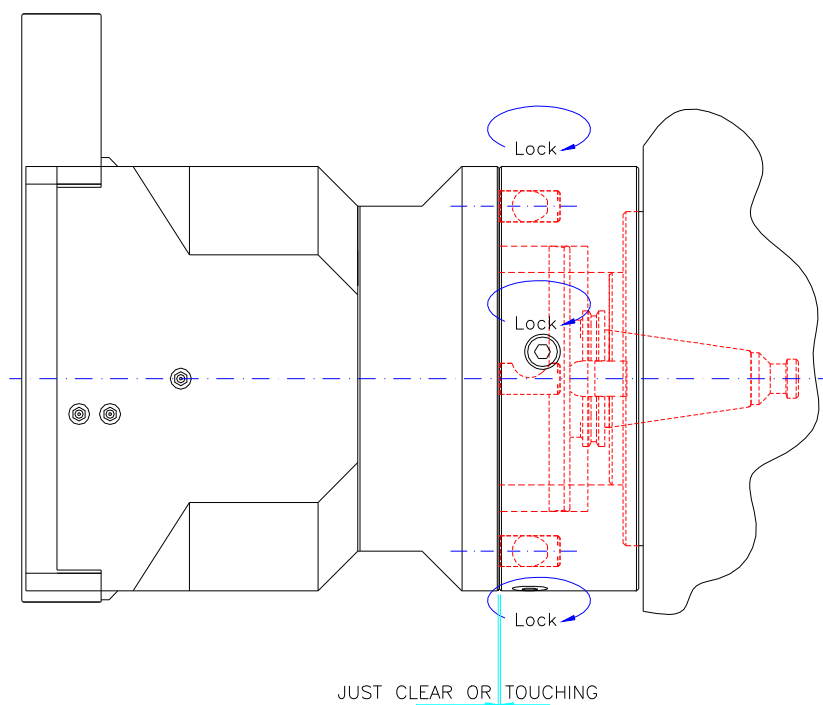


Fig 1.04 Locating and clamping the ZX 420 onto the machine

IMPORTANT!

Do not exceed the slide stroke of 4"

Camloc Adjustment

1. In the locked position, the indicator mark on the camloc should be in between the two lines indicated by the arrow and lock mark on the bonnet.

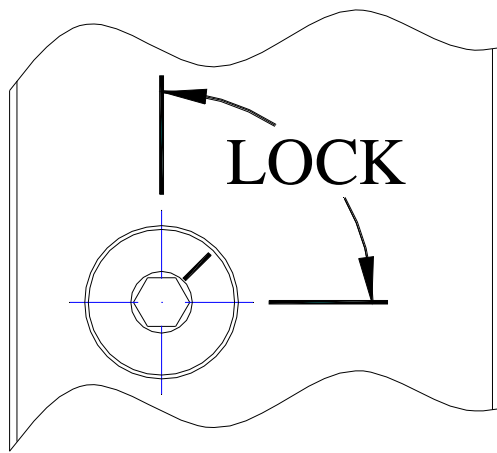


Figure 2.01 camloc stud in locked position

2. If the camloc does not lock, i.e. the indicator mark does not fall within the lock position, then the camloc stud needs to be adjusted

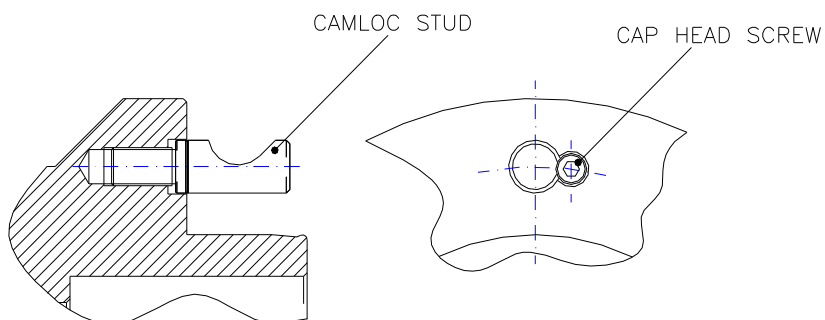


Figure 2.02 Adjustment of camloc stud

3. To adjust, remove the cap head screw that retains the camloc stud and screw in or out to suit. Replace and tighten the cap head screw after adjustment.

Gib Strip Adjustment

1. Slacken the four adjusting screws (*detail 31*)

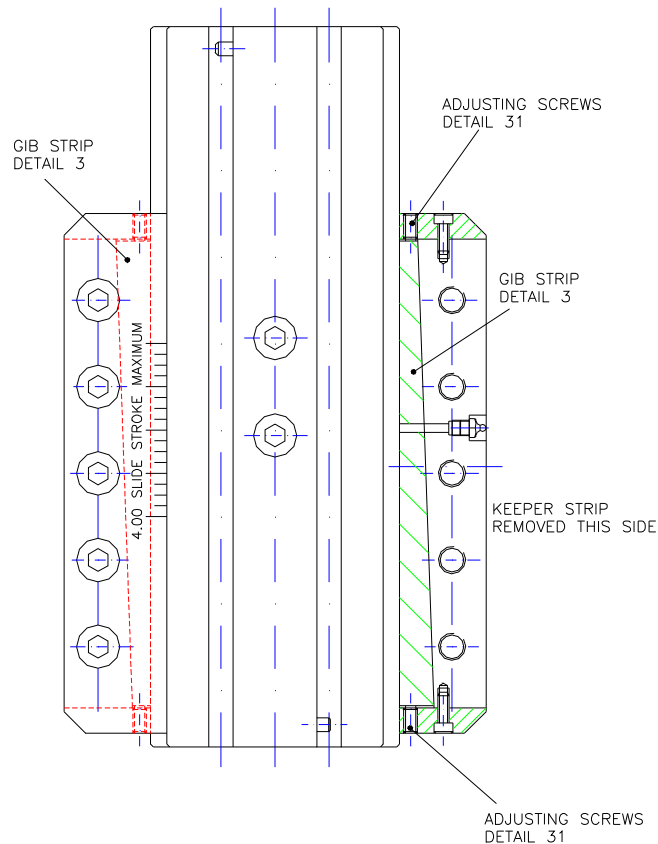
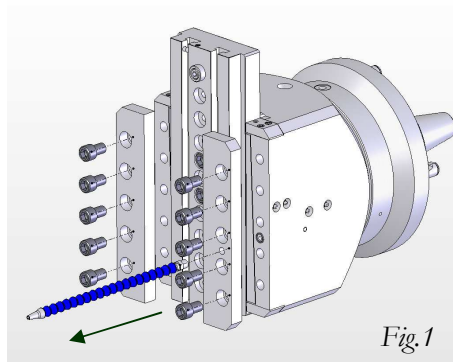


Fig 2.03 Gib strip adjustment

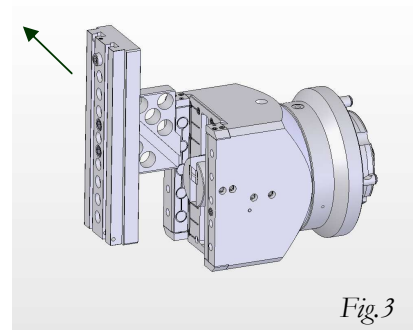
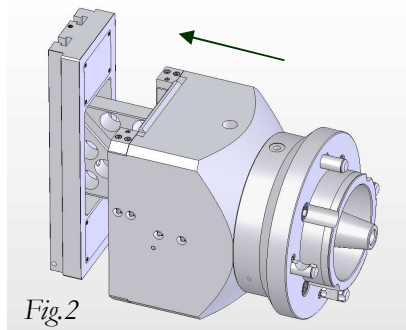
2. The actuator should centralize the slide in the main body
3. Tighten the adjusting screws (*detail 31*) until the gib strips grip the cross slide
4. Carefully slacken the adjusting screws (*detail 31*) until minimum clearance is achieved (*See fig 2.03*)

Dismantling & Assembly

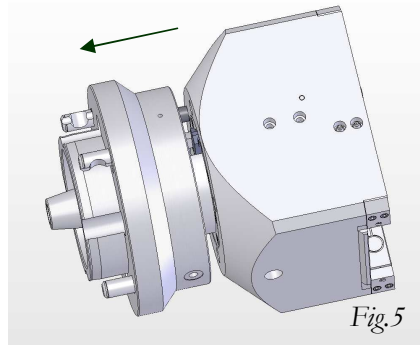
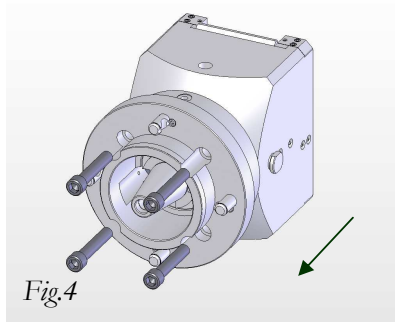
1. Remove contouring head from the machine, reverse procedure as described in chapter one *'installation of head'*.
2. Remove any tooling fitted to the cross-slide, making sure to carefully mark the tooling position on the cross-slide for accurate re-assembly.
3. Remove five caphead screws (detail 107) from each keeper plate (detail 1) on the front of the contouring head, both left hand and right hand keeper plates. Make careful note of which keeper plate is fitted to which side of the body, to ensure correct re-assembly.



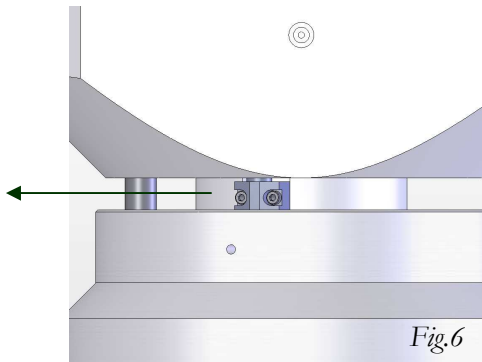
4. Whilst pressing the plunger (detail 30), actuate the shank (detail 16) fully forwards, thus pushing the cross-slide and attached toolslide (details 4 & 5) forwards also, to enable their removal from the head. The cross-slide and attached toolslide can now be pulled off the actuator (detail 7) in a diagonally upwards direction away from the main body.



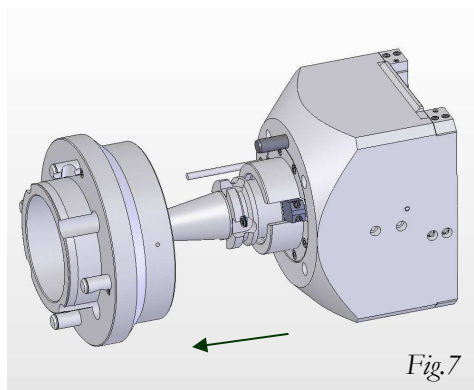
5. Remove four caphead screws (detail 106) securing the adaptor nose (detail 14) to the main body (detail 6). Now pull the adaptor nose off approximately 12 to 20mm, this will give access to the coolant connector block (detail 18).



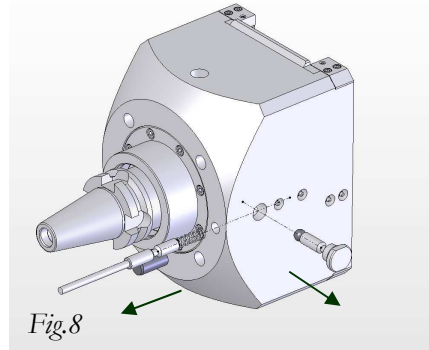
6. Accessing through the 12 to 20mm gap between the main body (detail 6) and adaptor nose (detail 14), actuate the shank backwards until the two caphead screws (detail 117) securing the coolant block (detail 18) to the actuator (detail 7) can be seen through the gap. Loosen these two caphead screws (detail 117) but do not remove them.



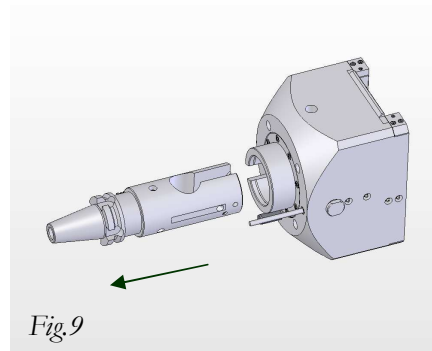
7. The adaptor nose (detail 14) can now be carefully pulled off the back of the main body (detail 6). Make sure to pull the adaptor nose off squarely or damage to the plunger (detail 30) and coolant connector block (detail 18) will occur.



8. The plunger (detail 30) and spring (detail 125) seated behind the plunger can now be pulled out the back of the head. At this point the spring cap (detail 29) on the side of the head can be unscrewed and removed. This will allow removal of the spring (detail 134), locking pin (detail 28) and ball bearing (detail 124).



9. The actuator (detail 7) can now be pulled out of the back of the head. Taking care not to damage the plunger (detail 30) and coolant connector block (detail 18).



10. Once the actuator is removed check the seals on the attached coolant connector block (details 101, 102 & 104) for wear or damage, replace as required.
11. Check actuator keys (detail 9) for wear or damage. If required remove the keys from the actuator (detail 7) by removing the caphead screws (detail 15 & 115). Make note of which key fitted to which actuator slot prior to removal. Also note position the caphead screw (detail 15) as this is also a lube access point to the keys.
12. Assembly is the reverse of steps 1-10.
Important on step 6 do not fully tighten caphead screws (detail 117) securing the coolant connector block (detail 18) to the actuator (detail 7) until the coolant connector block (detail 18) is fully engaged and self centred in the hole in the main body (detail 6).
13. Once assembled adjust the gib strips as detailed in chapter two '*gib strip adjustment*'.

Recommended Spares

To minimise downtime of your ZX420 head we recommend you carry spare parts. Below is a list of the main spare items that may need replacement through normal wear and tear. The spare parts can be fitted, by you the customer.

- Actuator ZX420-10
- Toolslide ZX-420-05
- Slipper keys ZX420-TC-20
- O-Ring Set

Note!

In the event of the ZX420 head being damaged we strongly advise customers to return it to Cogsdill-Nuneaton for evaluation and repair.

Lubrication Recommendations

The ZX 420 head requires regular maintenance whilst being used and should be cleaned free from swarf and any other foreign matter.

To ensure the ZX420 con remains in good working order it is recommend that the internal working parts are well greased at regular intervals via the external grease nipples found on the outside of the body .

If the head is to be stored for a long time after the completion of a machining operation, we recommend that the ZX420 head is dismantled and the working and moving parts are checked for wear or damage and then well greased and lubricated before re-assembling for storage. If the ZX420 head is used in a humid or hostile climate it should be sprayed with a proprietary rust inhibitor.

The above procedure will avoid corrosion and ensure that the ZX420 head remains in good working order.

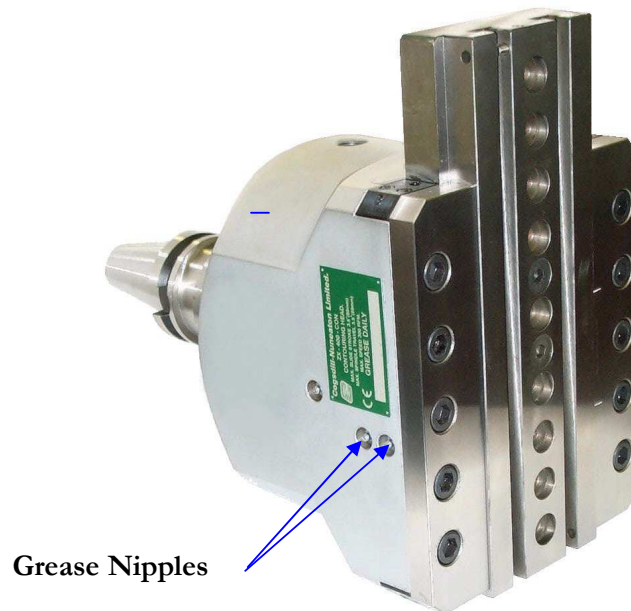


Fig 4.01 Location of external grease nipples

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 recommend 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 dismantled for cleaning and maintenance or when the tool is stored for an extended period of time.
2. To lubricate the ZX420-TC head during use, it is recommended that a low soap grease (**Calcuim Cup No.2**) should be applied via the greae nipples, as a general guideline, every 200-300 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. A lube gun (Ref. part No CN-D24) is available from Cogsdill-Nuneaton to make routine maintainance easy

To attain long term, maintenance free operation of Cogsdill tooling it is recommended that the toolslides and sliding parts be lubricated with Klüber-Altemp Lubrications 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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Chapter

6

Torque Settings

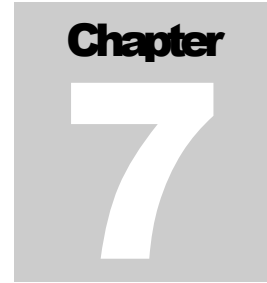
The values are based on black finish alloy screws

ZX 420-Con			
Detail No	Detail	Thread	Torque (Nm)
	Pullstud	M24 or 1" UNC	65
2	Keeper plate cap head screw	M16	45
8	Tool-slide cap head screw	M16	45
21	Slipper key cap head screw	M6	15

The above table is intended for general guidance only. In practice, the actual torque tightening values can vary on whether the screws are lubricated or not. Common sense should prevail in the application of the above values. Another method of determining the correct torque is to tighten the screw with an Allen key /hexagon wrench to finger tight and then a further 30° past this position.

Cogsdill –Nuneaton will not take any responsibility for miss use of this information which leads to damage of the ZX420 head, tooling or personal injury

General Assembly Drawing & Parts List



- General assembly drawing of ZX420-TC head (ZX420-TC-GA).
- Parts list for to be used in conjunction with the above drawing.
- Standard tooling for the ZX420-TC head.