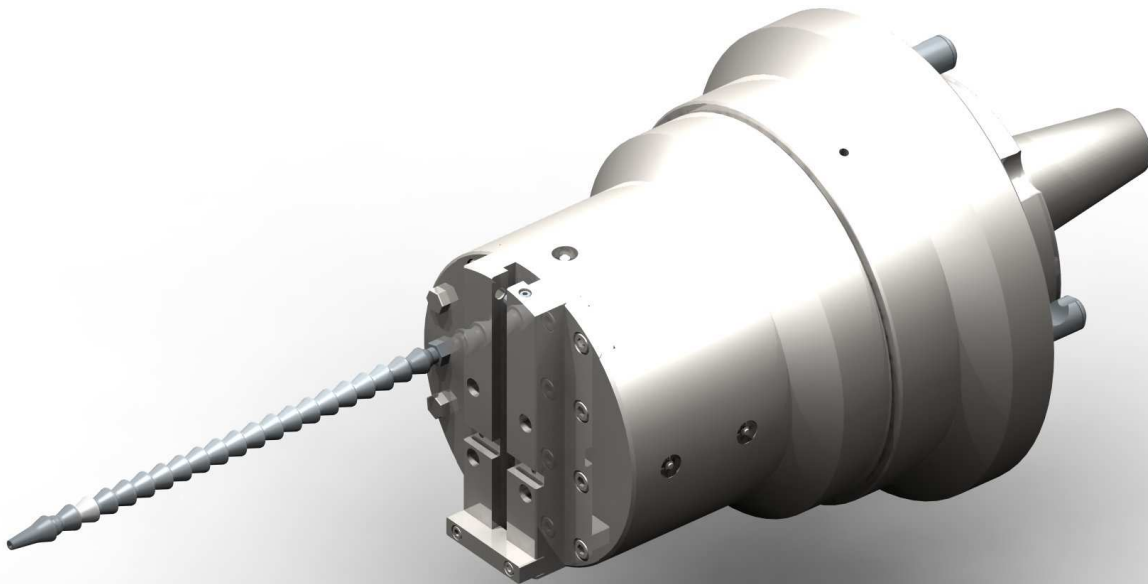




COGSDILL – NUNEATON LTD.

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Precision Engineers



ZX200-TC  
Facing & Contouring Head  
Service Manual

PRECISION ENGINEERS

# **ZX200-TC Facing & Contouring Head Service Manual**

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# Customer Order Details

**Customer :**

**Quote No :**

**Works Order No :**

**Sales Order Processing No :**

**Additional Notes and Related Tooling :**

Blank input area for additional notes and related tooling, consisting of six horizontal bars.

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

## Introduction

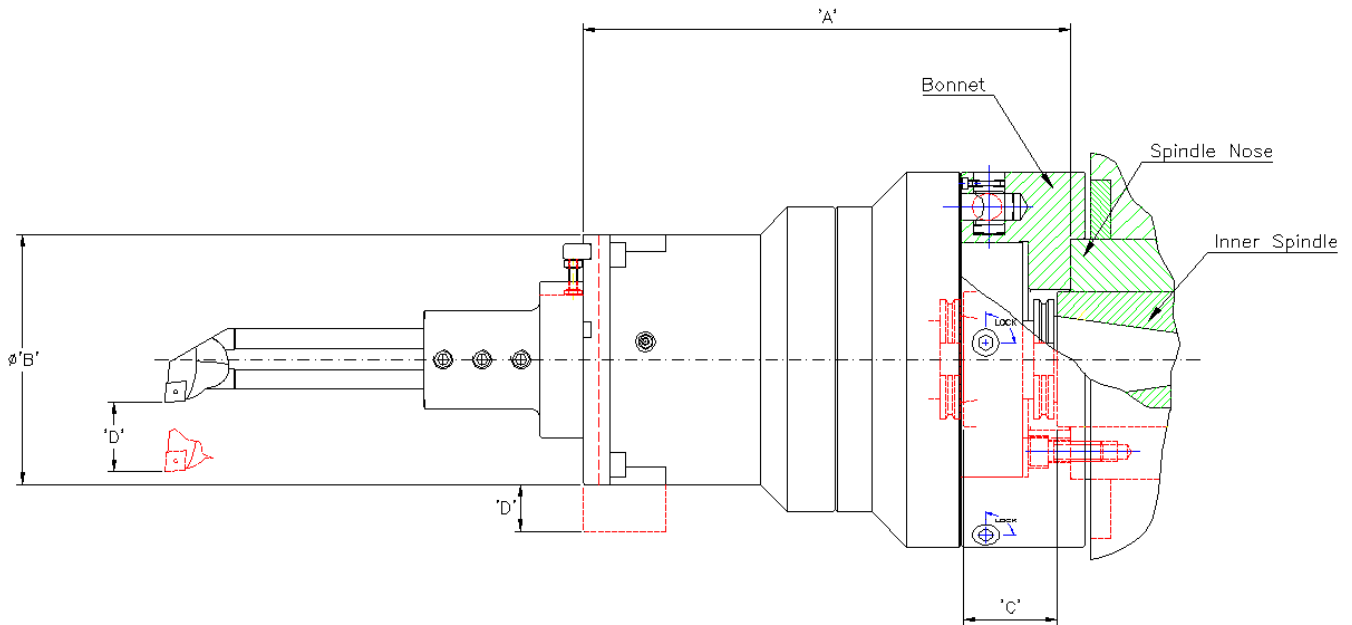
**C**ogsdill-Nuneaton's Facing heads are designed to work on machines with live spindles, such as horizontal boring machines with C.N.C. controls. The combination of the spindle feed (z-axis) and the work piece (w-axis) enables most profiles to be accurately machined. The independent spindle feed (z-axis) 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 work piece 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 4, 5 & 6 Inch Spindles**



DETAILS	DIM'N	(INCHES)	(mm)
LENGTH EXCLUDING TOOLING	A	15.600	396
SLIDE LENGTH	B	7.880	200
MACHINE SPINDLE TRAVEL	C	3.000	76
TOOL AND SLIDE TRAVEL	D	1.500	38
GENERAL CAPACITY		0 - 15	0 - 380
MAXIMUM RECOMMENDED SPEED		800 R.P.M.	-
WEIGHT (WITH ZX420-53 ADAPTOR NOSE)		236 Lbs	107 Kg

## Installation of Head

1. Locate Bonnet onto spindle nose of machine, ensuring both bonnet and spindle location faces are free from swarf chips and other foreign matter. Secure in position with four socket head screws.

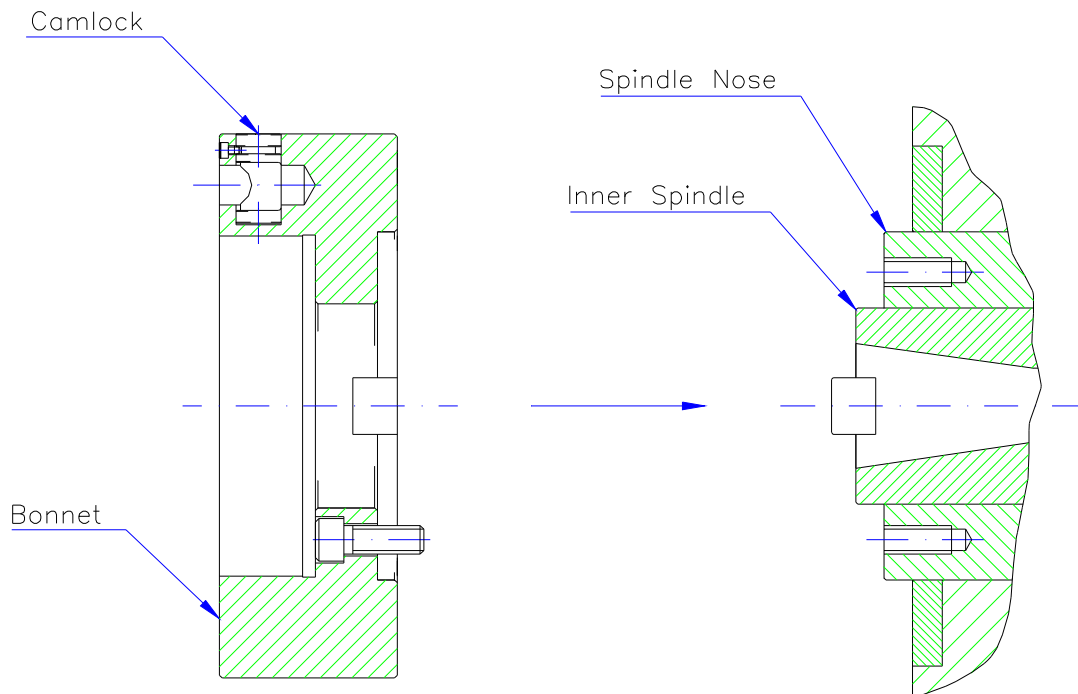


FIGURE 1.01 *Loading Bonnet to Machine Spindle*

- Before commencing to load, the Contouring and Facing head onto the machine spindle nose. Check that the camlocs in the bonnet are in their open position. The camlocs are spring loaded and will pop up above the bonnet diameter approximately 2,00mm (.079") when they are in the open position.

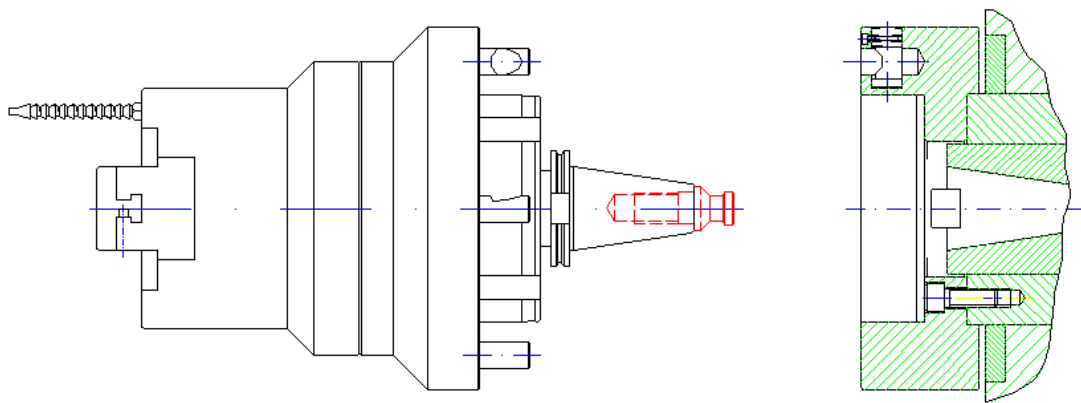


FIGURE 1.02

- Wind out Inner spindle of machine so that it protrudes the bonnet face
- Load Contouring and Facing head into the spindle of the machine and clamp in position via drawbar or pullstud.

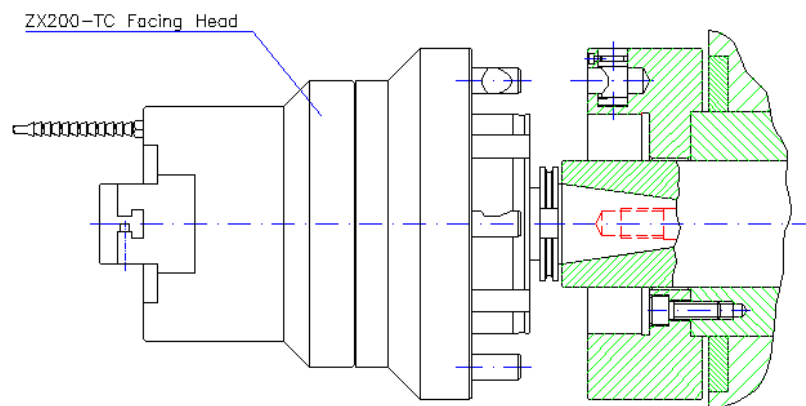


FIGURE 1.03 *Load head to spindle and clamp in place via pullstud or drawbar.*

5. Slowly wind back the spindle, locating facing head into bonnet, until location faces are just clear or touching each other.
6. Clamp facing head in position by pushing down on the camlocs and turning them into the lock position.
7. Set inner spindle of machine to its home position.
8. The head is now ready for use.

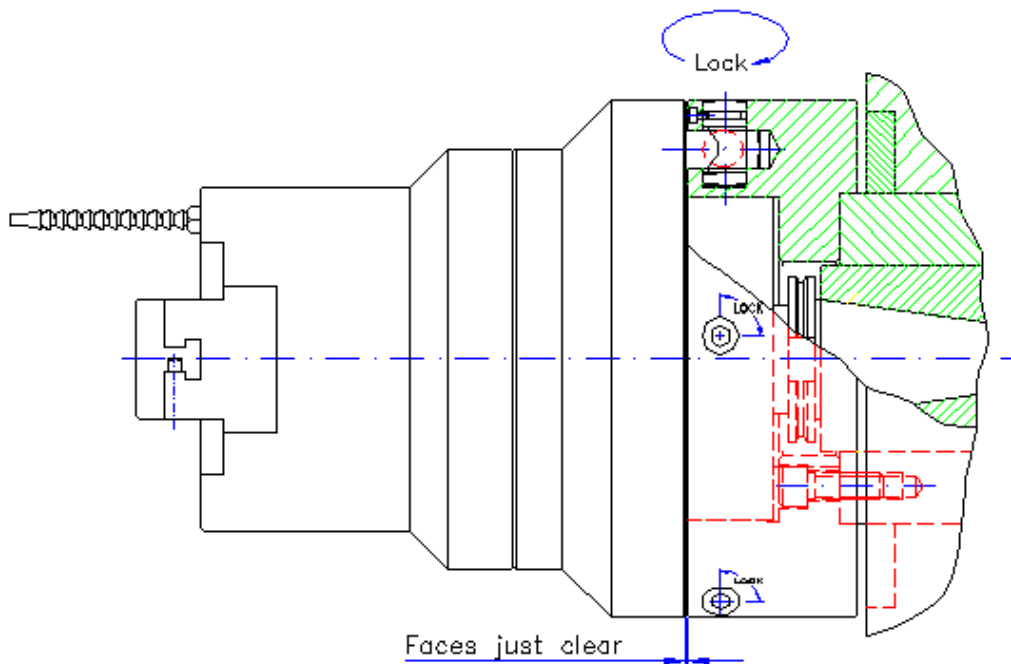


FIGURE 1.04 *Wind back machine spindle, and secure head in position by turning Camlocs to lock position.*

## Camloc Adjustment

In the locked position, the indicator mark on the Camloc should be in between the two lines indicated by the arrow and lock marked on the Bonnet.

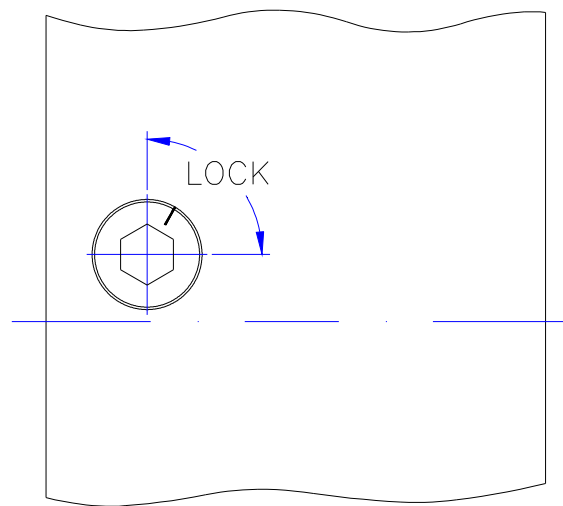


FIGURE 1.05 *Camloc Pin in locked position.*

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.

To adjust, remove the caphead screw that retains the Camloc Stud and screw in or out to suit, replace the caphead screw after adjustment.

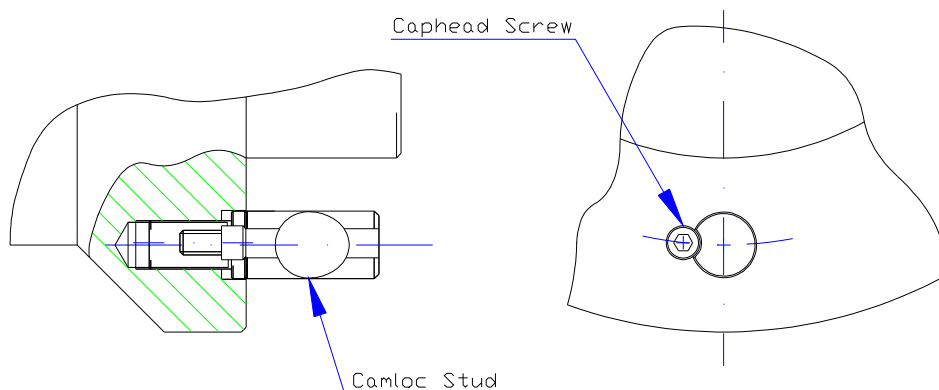


FIGURE 1.06 *Camloc Stud can be adjusted to ensure Camloc locks up.*

## Maintenance

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 ZX200-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

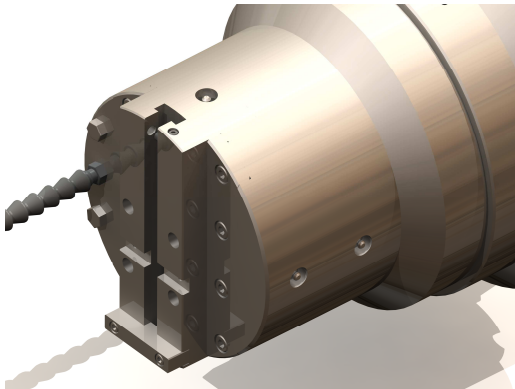
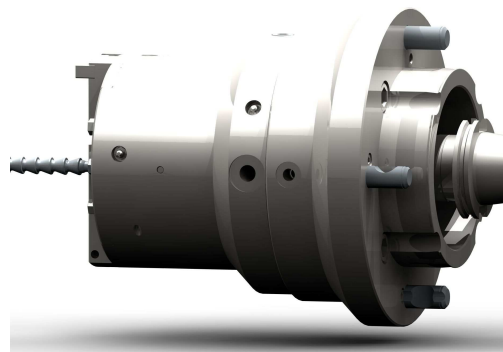


FIGURE 2.01

*Lubrication Points on Main Body & Cross-slide*

FIGURE 2.02

*Lubrication Points on Main Body.*

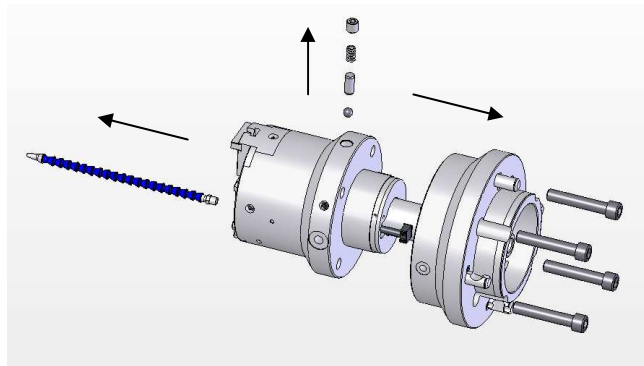


## Dismantling of Facing Head.

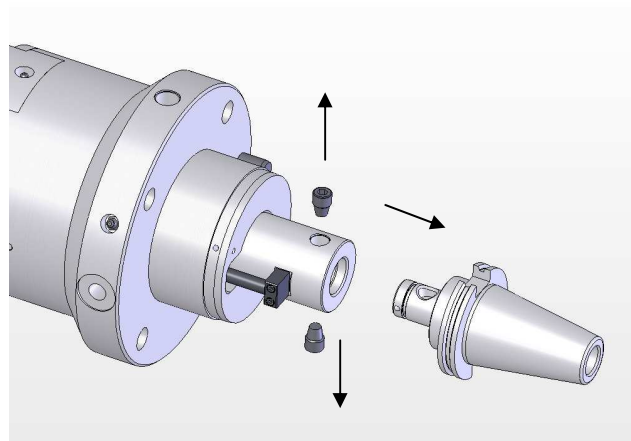
Remove facing head from machine spindle (reverse instructions of Chapter 1) and remove any tooling fitted to cross-slide. Ensure prior to dis-mantling that items are suitably marked to ensure accurate re-assembly. Due to the close manufacturing tolerances, problems may occur if this method is not adhered to.

### Step

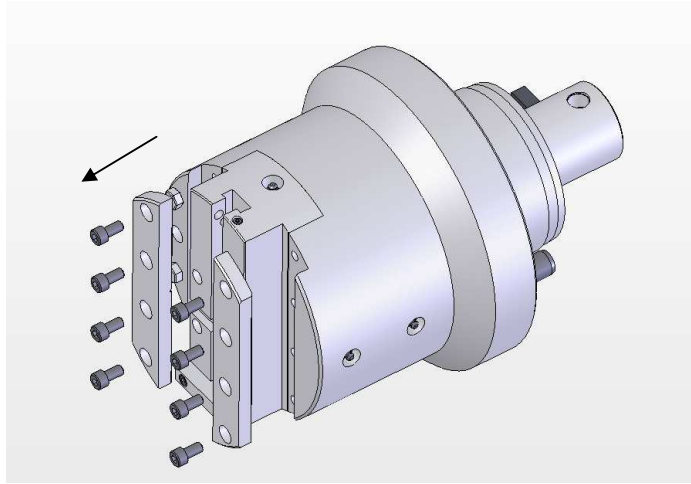
1. Remove adaptor nose (detail-17) from main body (detail-6) by removing four caphead screws (detail-106) and pulling off back of body.
2. Remove locking ball (details-112, 115, 117, 118).



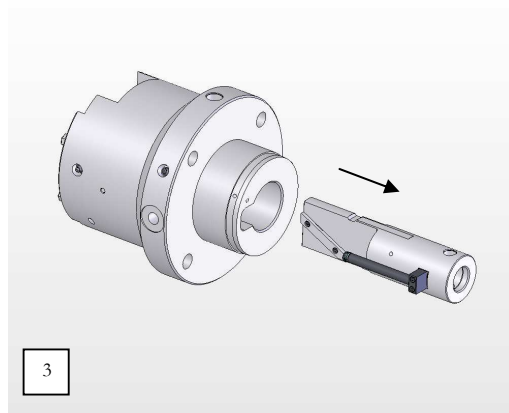
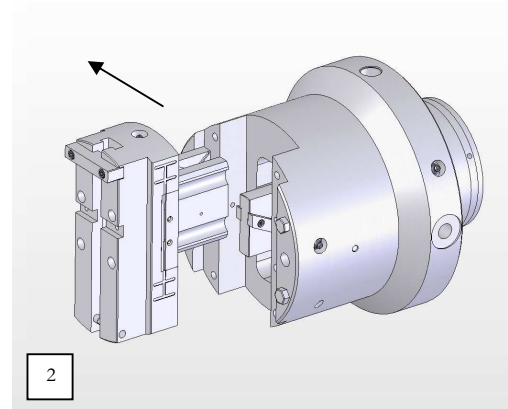
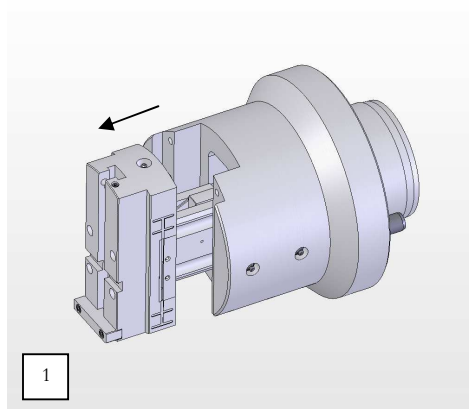
3. Unscrew two taper lock screws (detail-8), and remove shank (detail-9).



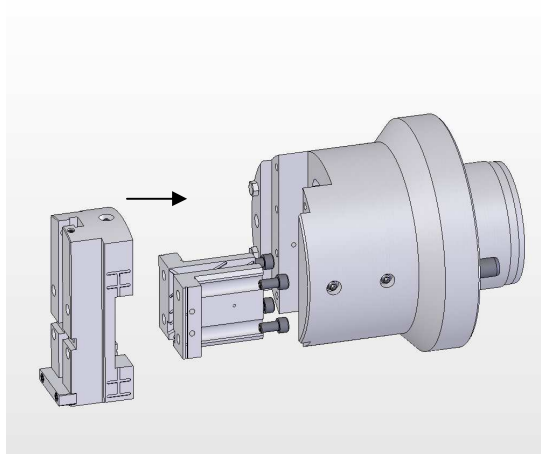
4. Unscrew eight caphead screws (detail-107) and remove two keeper plates (detail-1).



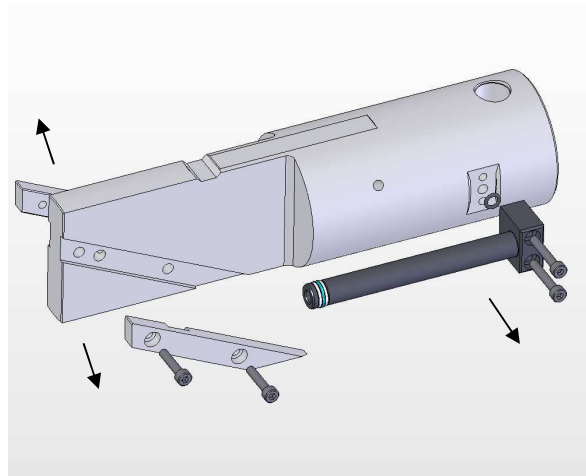
5. Pull away cross-slide (detail-2) and attached slideblocks (details-3 & 4) from body (detail-6), the actuator bar (detail-7) can now be removed by pulling out the back of the head, with attached coolant pipe (detail-13).



- To remove slideblocks (details-3 & 4) from cross-slide (detail-2), unscrew four caphead screws (detail-5) from slideblocks. In removing slideblocks, identify their position with the cross-slide. If necessary, clamp the slideblock in a soft jawed vice and very gently tap the cross-slide free from the slideblocks.



- The keys (details-10 & 11) can now be removed by unscrewing the two-countersunk head screws (detail 111).
- The Coolant pipe (detail-13) can now be removed from the actuator (detail-7) if required, by removing two caphead screws (detail-110). Care must be taken not to mis-place the o-ring (detail-104) located underneath the coolant pipe. Inspect o-ring (detail-104) and quad ring (detail-101 & 102) for damage. Replace if necessary.

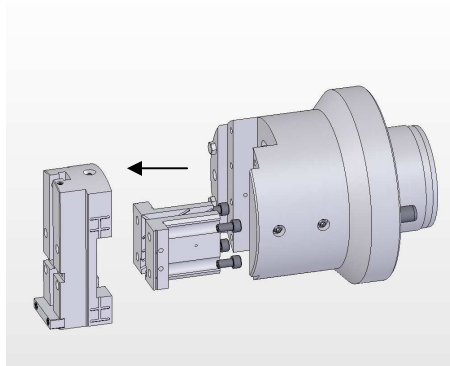


## Assembly of Facing Head.

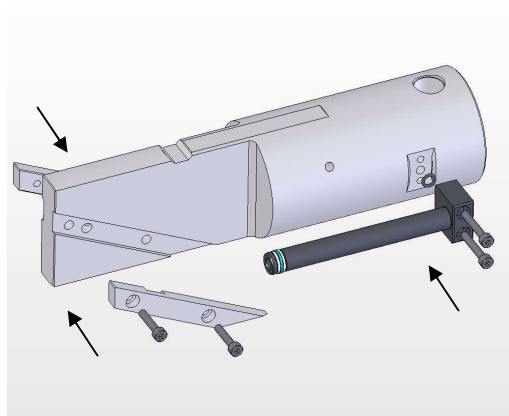
Ensure all parts are thoroughly cleaned and well lubricated before assembly. Make sure all parts are correctly assembled to each other. Use assembly drawing found in chapter 7 when following these assembly steps.

### Step

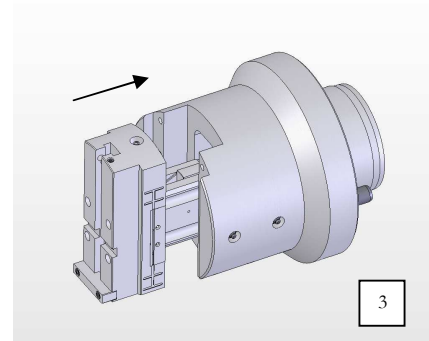
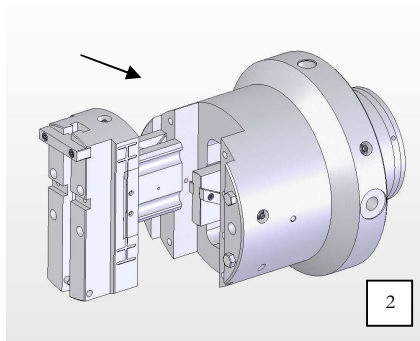
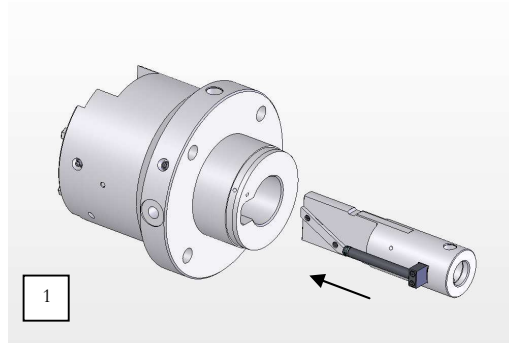
1. Make sure all slideblocks are fitted with spring plungers (detail-123), which on assembly close slideblocks (details-3 & 4) around actuator (detail-7) to produce a precision fit.
2. Fit cross-slide (detail-2) and slideblocks (details- 3 & 4) together. Locate slideblocks in position on the cross-slide with slipper slot facing towards the centre of the cross-slide and fix slideblocks in position with two special caphead screws (detail-5) per slideblock.  
**Do not fully tighten yet.**



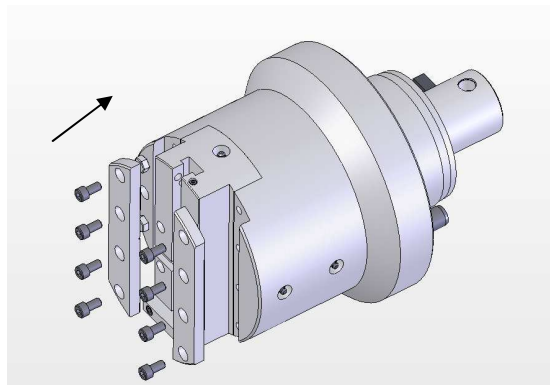
3. Locate keys (details- 10 & 11) in position on actuator bar (detail-7) and secure by two countersunk head screws (detail-111).
4. Inspect o-ring (detail-104) and quad ring (detail-101 & 102) for damage. Replace if necessary. If coolant pipe (detail-13) has been removed from actuator (detail-7) re-fit now with o-ring (detail-104) fitted underneath coolant pipe. Secure coolant pipe in place with two caphead screws (detail-110), **but leave caphead screws loose at this stage.**



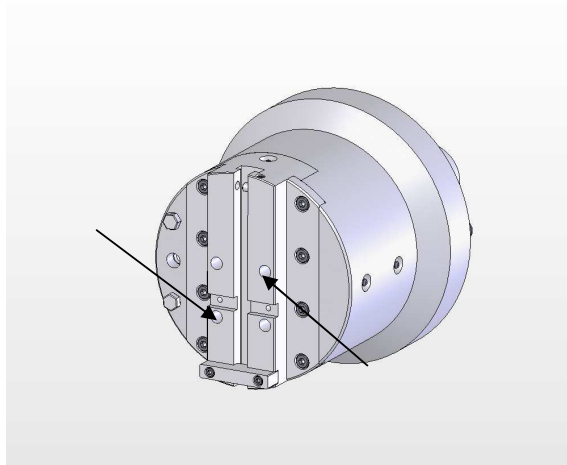
- Position actuator bar (detail-7) into rear of main body (detail-6) with spade end towards the front of the head and vertical with cross-slide cavity and coolant pipe located in hole in main body. (It is helpful to hold the body in a soft jawed vice, to ensure the location diameter is protected). Offer the cross-slide assembly with attached slideblocks onto the actuator and slide the unit down the actuator keys until the spring plungers (detail-123) rest on the keeper plate location face. Using the keeper plates (detail-1), depress the spring plungers simultaneously and push down to the home position. **Damage to the spring plungers will occur if this procedure is not followed.**



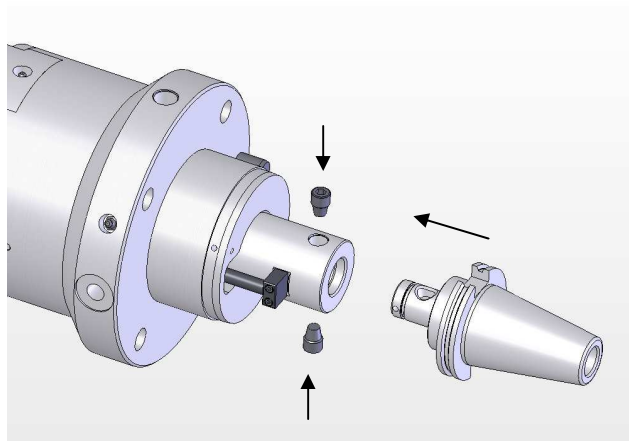
- Replace keeper plates (detail-1) and tighten up eight caphead screws (detail-107) through keeper plates.
- Check actuator (detail-7) moves freely forward & backwards then fully tighten two caphead screws (detail-110) securing coolant pipe (detail-13) to the actuator (detail-7).



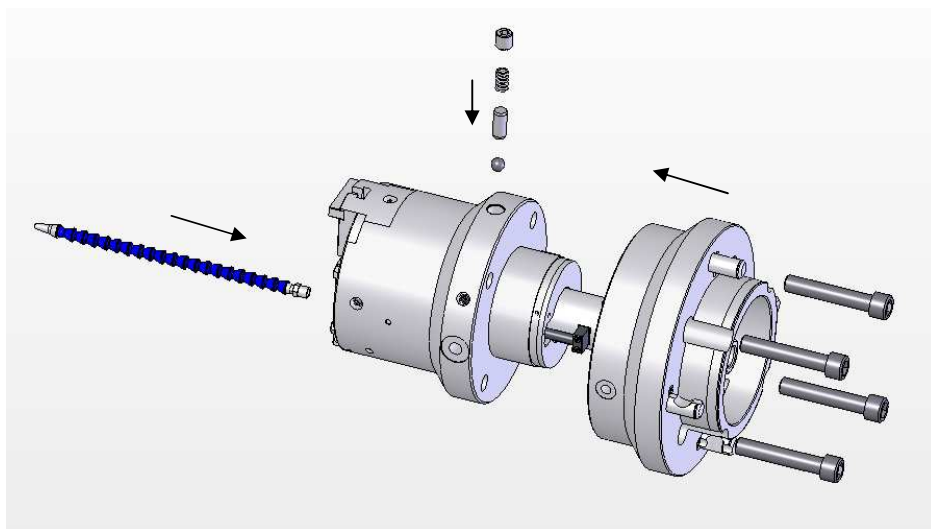
- The spring plungers will push the slideblocks onto the actuator blade and therefore the slideblocks can now be fully tightened by means of four access holes in the top face of the cross-slide (detail-2). Using an Allen key turn the four special caphead screws (detail-5) anti-clockwise to tighten. The following procedure should be adhered to. Lightly nip the four special screws (detail-5) in an anti-clockwise direction, moving the actuator in and out of the head to actuate the slide. Continue to tighten the four special screws and moving the actuator until the screws are fully tightened. **Do not over tighten special screws, as damage to the head will result.**



- Replace shank (detail-9) and secure in position with two taper lock screws (detail-8). Now move shank to home position.



10. Re-fit locking ball (details-112, 115, 117, 118) to hole in main body (detail-6). The ball (detail-118) will seat in a groove in actuator diameter (detail-7) when the shank is set to home position.
11. Refit adaptor nose (detail-17) to main body (detail-6) and secure in position with four caphead screws (detail-106).
12. Actuate head to home position and check head moves freely across full range of stroke.

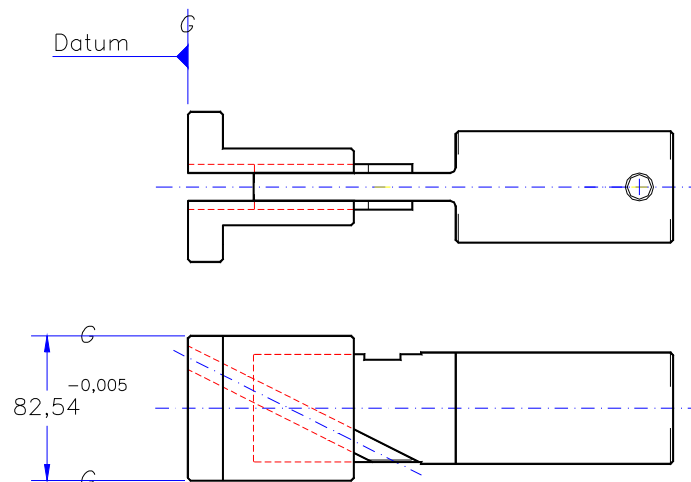


## Adjustment of Facing Head

If adjustment through wear is needed on the slideblocks the following procedure should be followed.

### Step

1. Dismantle the Contouring and Facing head as described previously.  
– Do not remove slideblocks.
2. Replace worn keys in actuator if necessary.
3. Remove one slideblock from cross-slide and check both slideblocks for any wear, replace if necessary.
4. Assemble facing head to procedure previously stated and check actuator can move freely, without play, between slideblocks. The spring plungers should ensure this.
5. Check actuator and cross-slide move freely in body.
6. If actuator, slideblocks or tenon keys are worn, and spares are ordered individually (not in a set), it may be necessary to grind the datum faced marked, once the sides of the slideblocks are set in position (See figure 3.01).



**It is recommended that units are returned for service if repair facilities are not available, matched actuators and slideblocks can be supplied to save down time.**

## **Recommended Spares**

- |                         |            |
|-------------------------|------------|
| 1. Slideblock           | Detail 3.  |
| 2. Slideblock           | Detail 4.  |
| 3. Actuator             | Detail 7.  |
| 4. Key                  | Detail 10. |
| 5. Key                  | Detail 11. |
| 6. O-ring set for head. |            |

# Repair and Overhaul Procedure

Cogsdill can offer the following set maintenance and overhaul service to ensure guaranteed and trouble free operation. Fit this service into your preventative maintenance schedule.

## *Stage*

1. **Over-size keys up to .005 Inches**
  - Slideblocks re-ground.
  - Grease all over.
  - Plus any minor adjustments to slideblocks and keeper plates.
  - All o-rings, screws and plungers to be replaced.
  
2. **Over-size keys up to .010 Inches**
  - Slideblocks re-ground.
  - Hard Chrome and re-grind actuator bore.
  - Re-grind actuator shaft.
  - Grease all over.
  - Plus any minor adjustments to slideblocks and keeper plates.
  - All o-rings, screws and plungers to be replaced.
  
3. **Over-size keys up to .015 Inches**
  - Replace slideblocks.
  - Replace Keys.
  - Grind actuator bore back to original size.
  - Re-grind actuator shaft.
  - Re-fit new actuator.
  - Grease all over.
  - Plus any minor adjustments to slideblocks and keeper plates.
  - All o-rings, screws and plungers to be replaced.

### Note!

**In the event of the Contouring and Facing Head being damaged, we strongly advise customers to return the heads to Cogsdill – Nuneaton Ltd for repair.**



## Torque Settings

All values are based upon plain black finish screws.

DETAIL No.	THREAD SIZE	TORQUE (Nm)
-107	M8	26
-5	M10	26
-111	M4	4
-23	M8	Hand Tight

The above table is intended for general guidance only. In practice, the actual torque tightening value's 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 clamping pressure is to tighten (with an Allen key/hexagon wrench) to finger tight and then a further 30 degrees past this position.

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

## Trouble Shooting

Inevitably, problems occur with any tool. Some of these are due to lack of experience with this type of tooling and others due to wear. Some of these problems can be quickly overcome in your factory and others will necessitate returning the tool to Cogsdill – Nuneaton Ltd for overhaul and repair. To help you to determine which course of action is required, we have listed a few of these points and subsequent checks to help you. If you require further assistance please ask us for help.

### 1. Difficulty in moving actuator when assembled to machine spindle or excessive pressure required moving actuator.

- Check that the actuator moves free off the machine.
- Check concentricity of drawbar.
- Check drawbar has not been over-tightened and has caused damaged to the actuator blade.
- Check that the head has been assembled correctly.
- Check that the retaining screws are not over tight and have not distorted the body.
- Check if using a bonnet face, that it is flat, parallel, and free from any surface imperfections.
- Check all greaseways are clear and not blocked.

### 2. Inconsistency in component sizing.

- Check for radial play in actuator, re-adjust slideblocks against actuator blade.
- Check for wear on keys and key slots in slideblocks – replace as required.
- Insufficient lubrication being used, try lubricating regularly.
- Check for out of balance situation when head is stroked.
- Check clearance between cross-slide and keeper plates.

**On no condition force the actuator for extra movement, but contact Cogsdill – Nuneaton Ltd for advice.**



## **General Arrangement Drawings.**

- General Arrangement drawing of ZX200-TC.
  
- Standard tooling available for ZX200-TC.