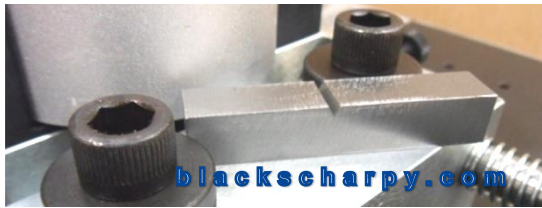


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10. Safe Operation Procedure for cutting Charpy/Izod Notch

10mm Specimen with 2mm V Notch

Caution notes

- a) **DO NOT STALL THE MACHINE! ATTEMPTING TO CUT A MATERIAL WHICH IS TOO HARD OR USING A BROACH WHICH IS NOT SHARP, CAN STALL THE MACHINE AND CAUSE DAMAGE. STOP THE MACHINE IMMEDIATELY WITH THE STOP BUTTON. RELEASE AND REMOVE THE SPECIMEN. SELECT THE 'UP' STROKE DIRECTION.**
- b) **Non-coated Broaches are supplied for notching carbon steel materials up to Rockwell 42C.**
- c) **It is essential that the component is properly clamped before the broaching stroke commences.**
- d) **It is essential that a component, once cut, be removed from the clamp before the 'Up' stroke switch is operated.**

Check Type of Broach Keep Fitted

Use Table 1 to ensure the correct broach keep is fitted, for the broach being used

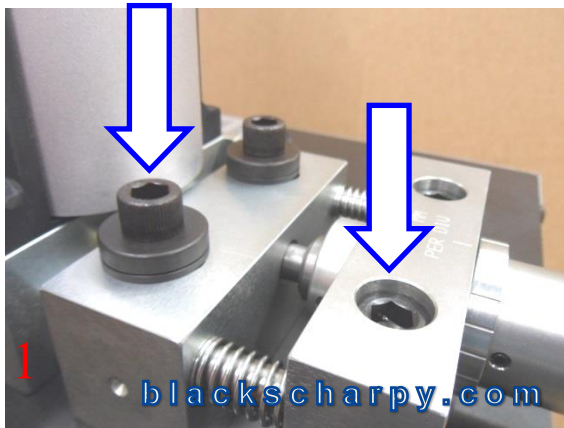
**Table: 1**

NOTCH	BROACH TYPE	BROACH	BROACH KEEP
2mm 'V'	C	CNB30-027A2	X
2mm 'U'	P	CNB30-006A2	Y
3mm 'U'	N	CNB30-005A2	Y
5mm 'U' (2 Cuts)	JS	CNB30-004A2	Y
0.13"/3.3mm "V"	H	CNB30-002A2	X
2mm 'V' Sub-size	C	CNB30-027A2	W

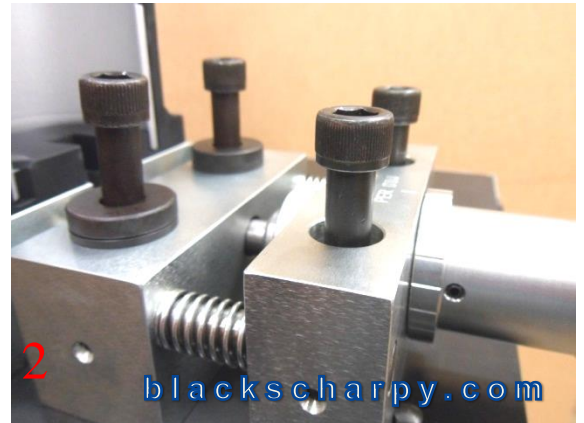
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10 A. How to change Broach Keep



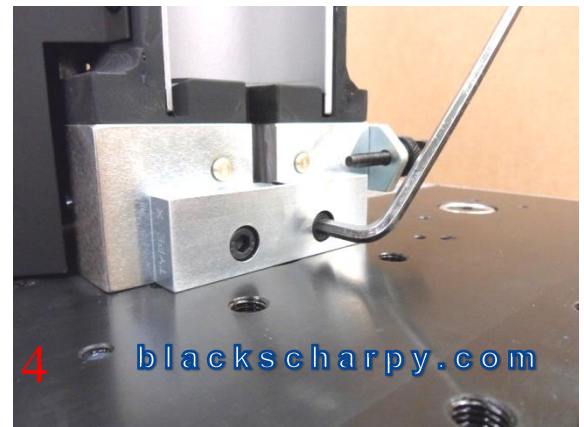
Remove clamping screws



Remove clamp assembly



Clamp assembly removed



Remove broach keep clamping screws



Remove broach keep



Fit the broach keep required

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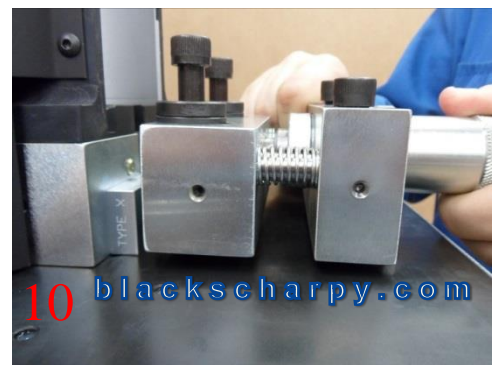
Tighten clamping screws



Broach Keep fitted



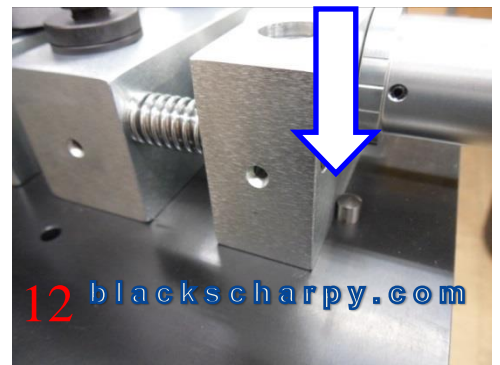
Check free movement of broach



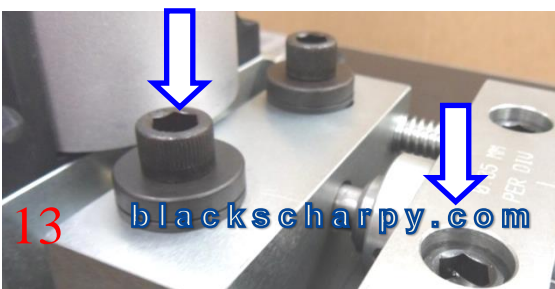
Refit clamp assembly



Refitting clamp assembly



Ensure clamp is pressed up against the 2 dowels



Tighten clamping screws

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10 B. Fitting the Broach



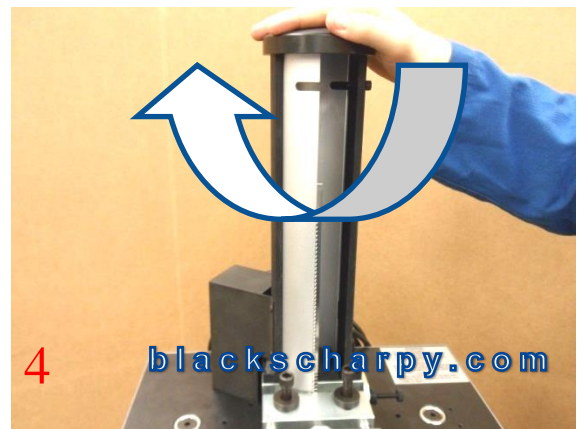
1
Close broach guard shield with no specimen loaded



2
CNB31– Press “up” to raise broach to upper position



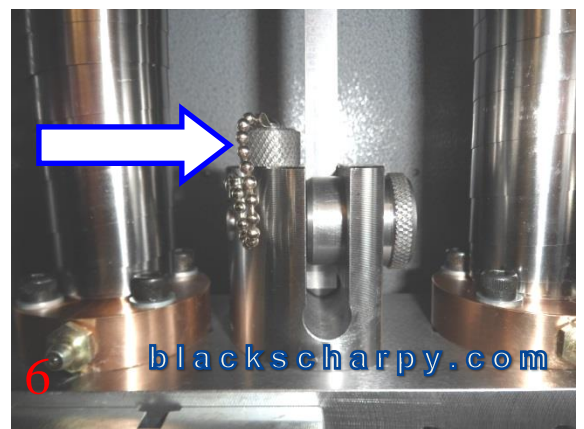
3
CNB34– Turn “up” to raise broach to upper position



4
Remove broach guard shield



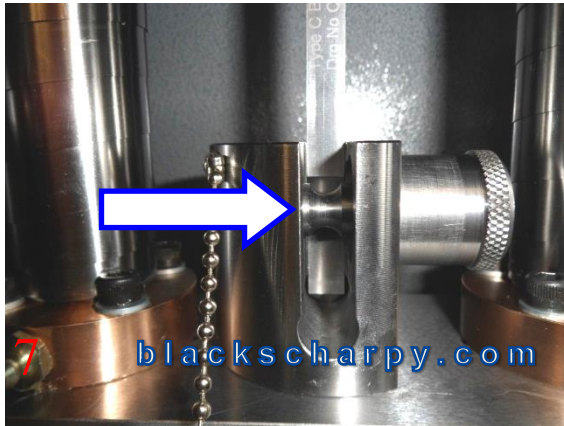
5
Remove 7 screws and top panel



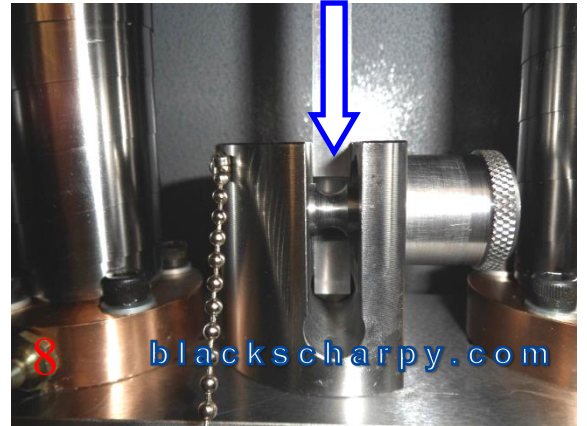
6
View inside top cover. Remove broach anchor locking pin

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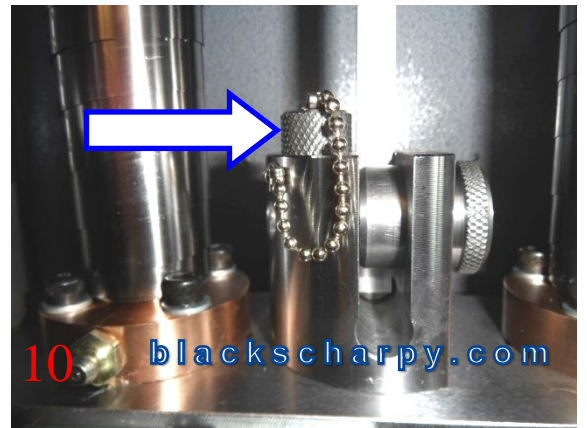
7 Withdraw broach anchor pin



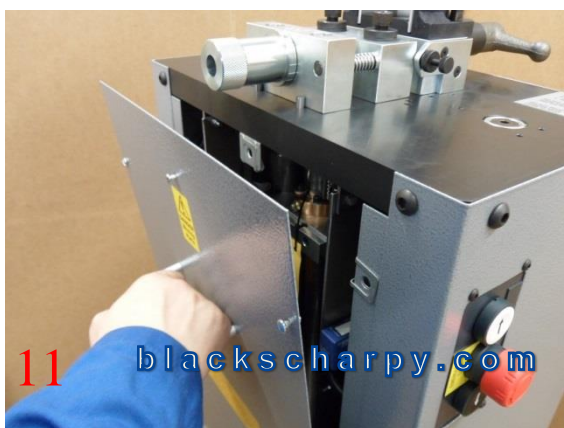
8 Feed broach through top plate to broach anchor pin



9 Fit broach anchor pin



10 Fit broach anchor locking pin



11 Replace top cover



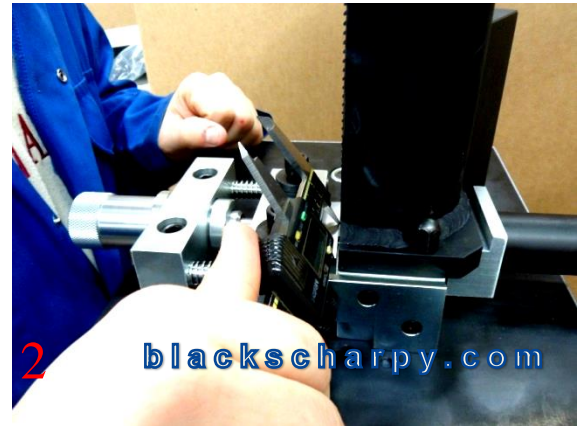
12 Refit broach guide shield

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10 C. Setting specimen Axial Position



1
Load 10mm specimen into clamp assembly so that the specimen is contacting the axial adjusting screw



2
Check axial position & broach a specimen



3
Check axial position and re-adjust position if required

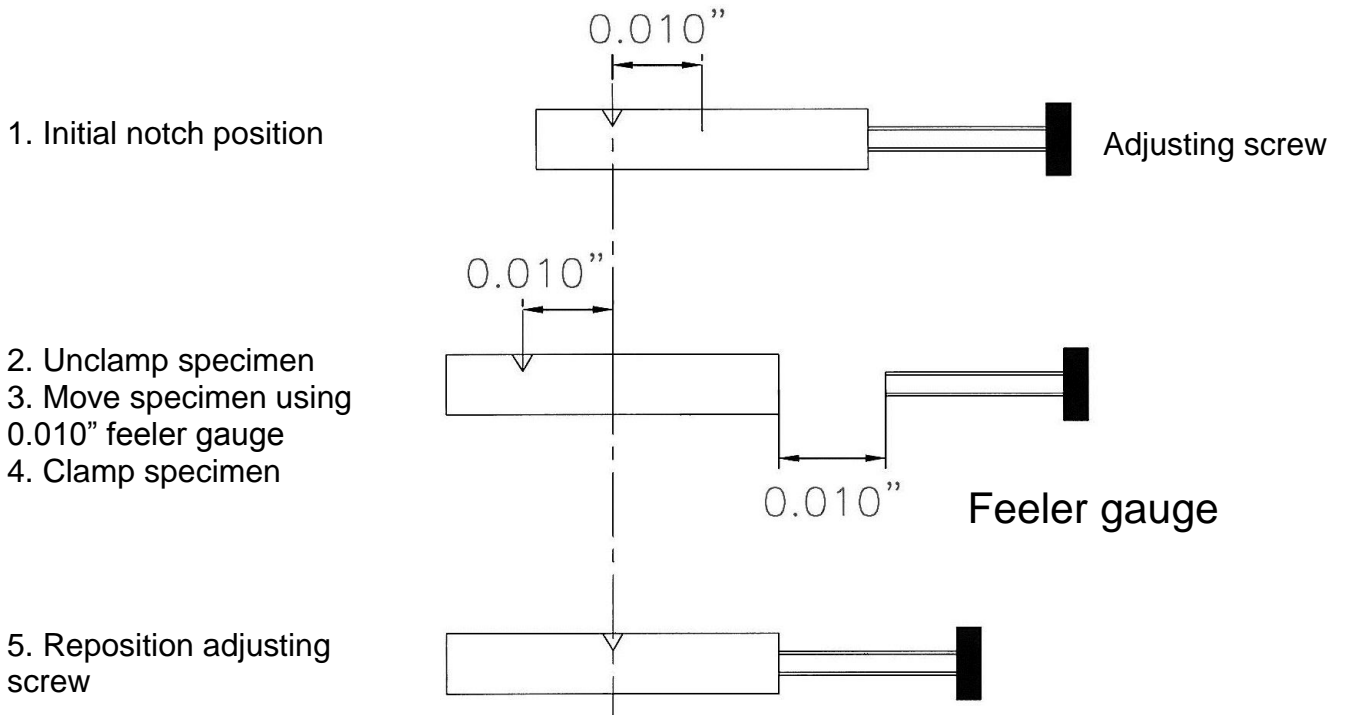


4
Tighten the locking nut, so securing the adjusting screw position

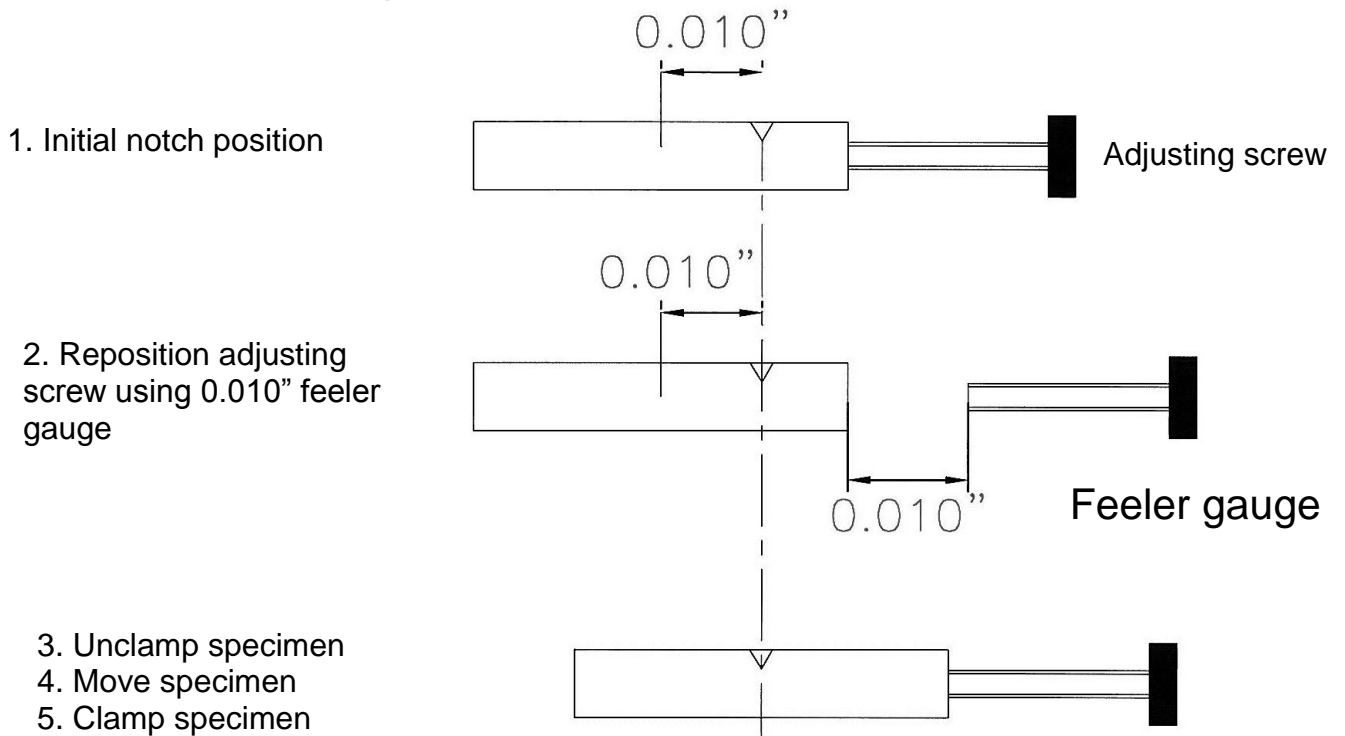
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CUSTOMER TO CHECK AXIAL POSITION,
WITH THEIR OWN EQUIPMENT

Notch to left of specimen centre line, by say 0.010"



Notch to right of specimen centre line, by say 0.010"



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10 D. Setting Broach Depth



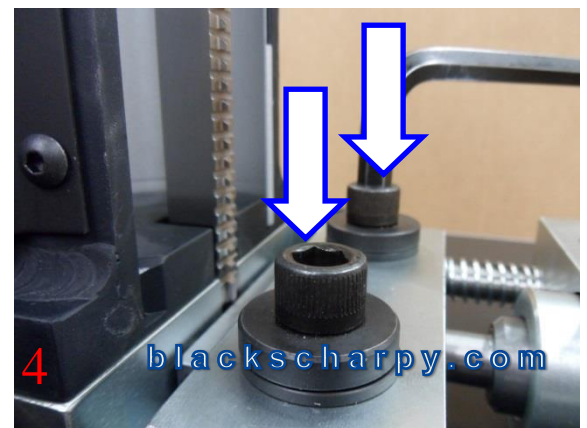
1 CNB31– Press “up” to raise broach to upper position, with no specimen loaded



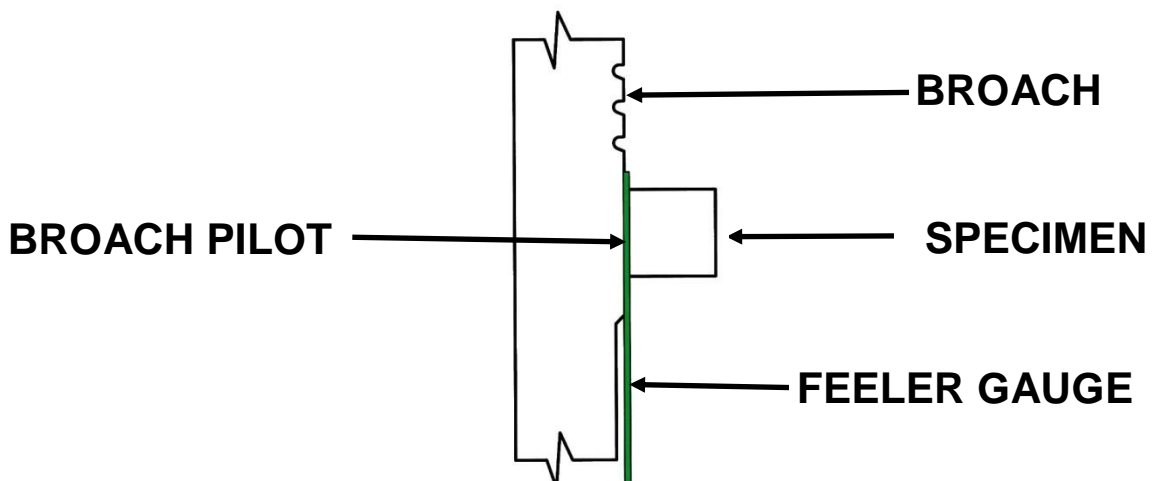
2 CNB34– Turn “up” to raise broach to upper position, with no specimen loaded



3 Open broach guard shield and determine feeler gauge thickness for broach type being used, from Table 2



4 Release two clamping screws of the adjustable clamp jaw



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Table 2

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NOTCH	BROACH TYPE	BROACH	FEELER GAUGE THICKNESS
2mm 'V'	C	CNB30-027A2	0.005"
2mm "U"	P	CNB30-006A2	0.016"
2mm 'U'	N	CNB30-005A2	0.055"
3mm 'U'	N	CNB30-005A2	0.016"
5mm 'U' (2 Cuts)	JS	CNB30-004A2	0.005" 1st CUT
0.13"/3.3mm "V"	H	CNB30-002A2	0.004"
2mm 'V' Sub-size	C	CNB30-027A2	0.005"



Use feeler gauges placed between the broach pilot and specimen



Advance adjustable clamp jaw, so that the feeler gauges are a sliding fit



Tighten adjustable jaw clamping screws

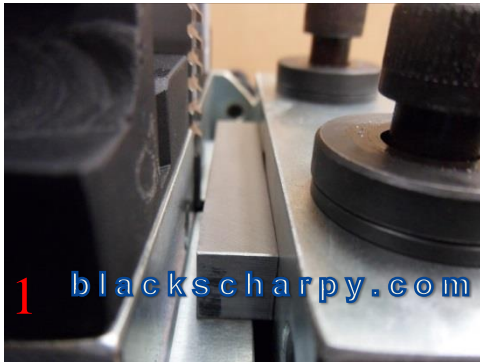


Re-check the feeler gauges are a sliding fit, re-adjust as necessary

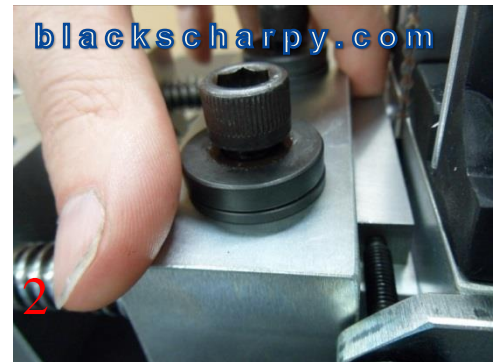
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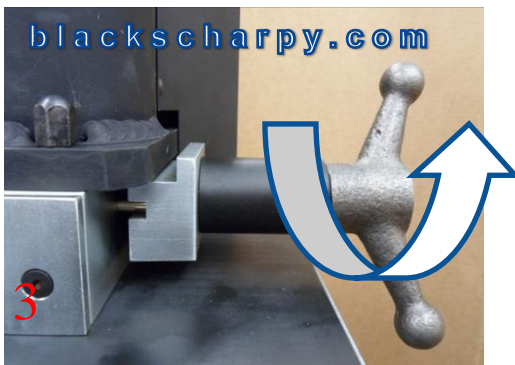
10 E. Broaching Specimen



Load specimen



Push specimen up against axial screw face



Clamp specimen using handle



Clamping pins securing specimen



Apply cutting oil to the broach teeth, using brush supplied with machine.



Close broach guard shield

We recommend RTD metal cutting liquid

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CNB34 Only– Select broach speed

CNB34 Only

The optimum speed has to be determined by tests. If in doubt, start at a slower broach speed.

Typical settings:

Low carbon steels 7

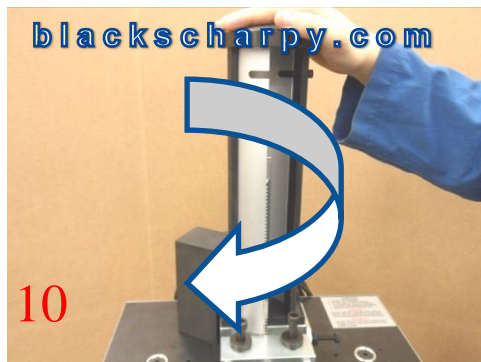
Stainless steel 2



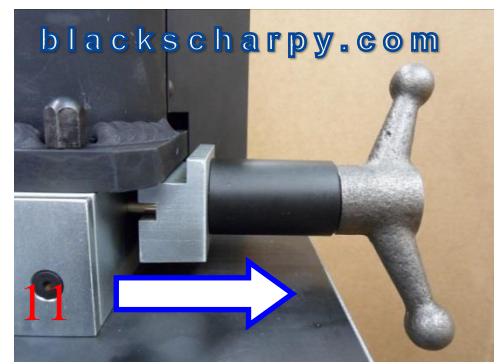
CNB31– Press “down” to broach the Specimen



CNB34– Turn “down” to broach the Specimen



Open broach guard shield



Release the clamp handle

Note:
To prevent damage to broach teeth always remove specimen BEFORE raising the broach

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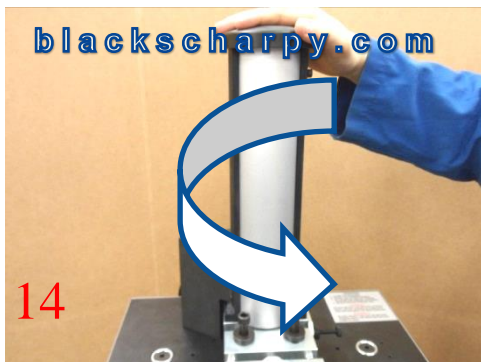
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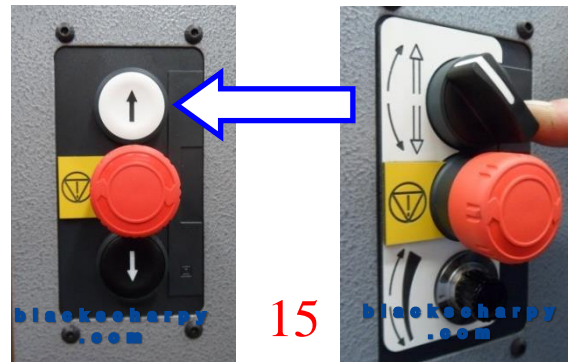
12 Remove the specimen



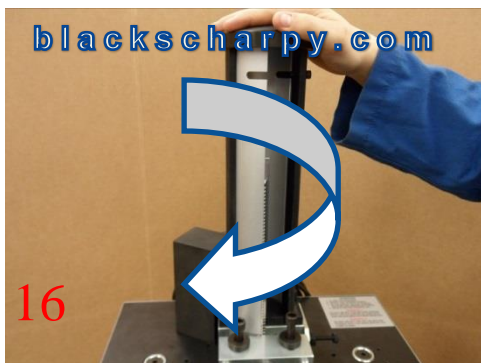
13 Specimen broached



14 Close broach guard shield



15 Raise the broach



16 Open broach guard shield



17 Clean broach teeth using wire brush supplied with machine, ensuring cuttings are removed from teeth gully's



18 Thoroughly clean clamping area and area inside broach guard shield, using brush supplied. The machine is now ready to cut next notch

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10 F. Adjusting Depth of Cut

1
Mark position of index head with a marker

Note:

The index head has graduations.

1 division will alter broach depth by 0.05mm.



Increases the notch depth



Decreases the notch depth



2
Release adjustable jaw clamping screws



3
Adjust index head, by the change in notch depth required.



4
Tighten adjustable jaw clamping screws

Note:

Index head adjustment has backlash.

Always adjust from one direction.



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10 G. JS Broaching

**5mm U notch
1st cut, use feelers as in
Table 2 to set broach
depth**



**1st cut completed producing
a 3mm deep notch**



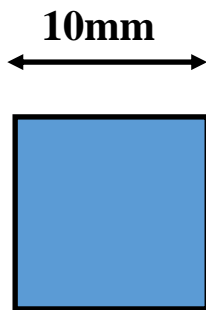
**2nd cut, use the 2mm packer
behind the specimen, to produce
a 5mm deep notch**

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10 H. Broach Keeps, sub-size

Broach Keep “X”, V Notch 2mm deep

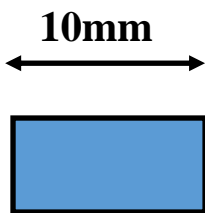


6.7-10mm

“X”



Broach Keep “W”, V Notch 2mm deep (Option)



5-2.5mm

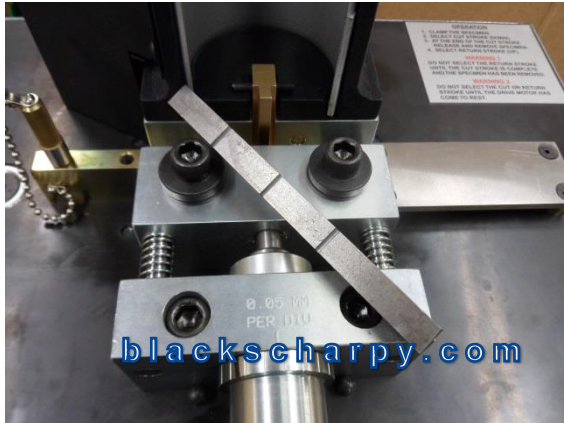
“W”



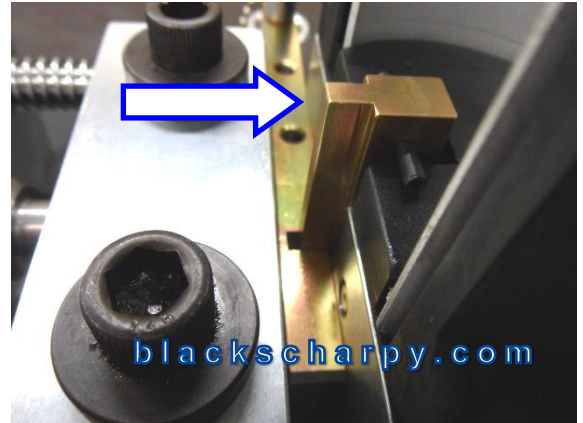
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10 I. Multi Notch(options)



10mm Multi notch specimen

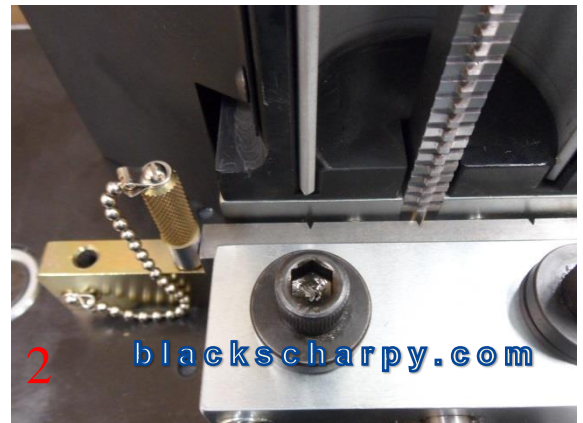


Broach keep type A fitted, with the setting up block accurately positioning the broach keep

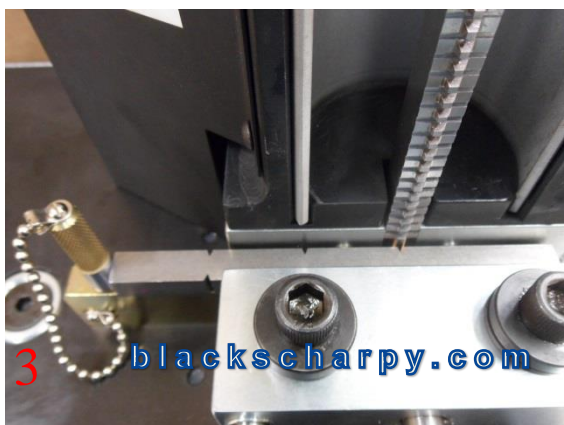
Broaching 10mm Square Multi Notch



Broaching 1st notch



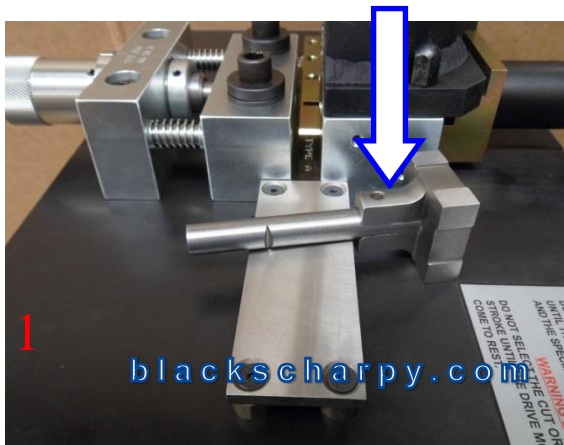
Broaching 2nd notch



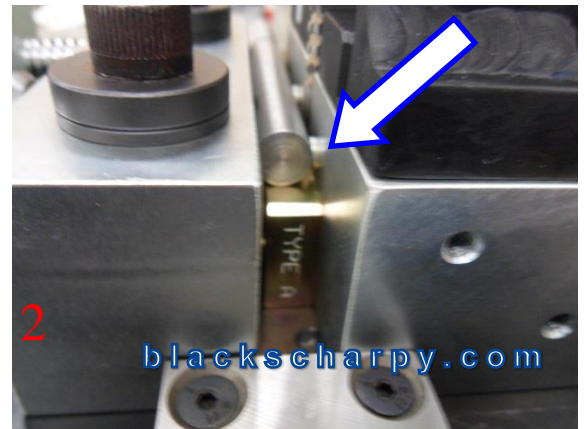
Broaching 3rd notch

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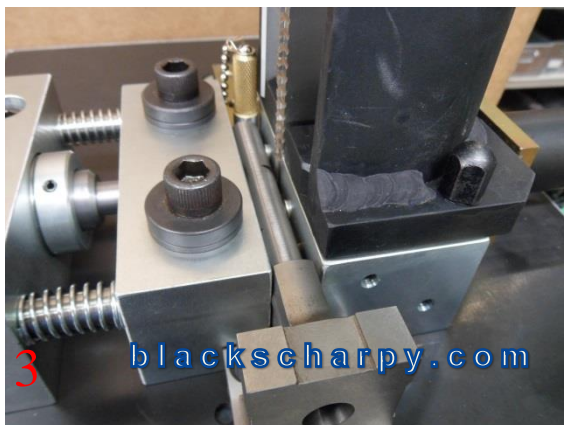
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Broaching 0.45"/11.4mm Round Multi Notch, with "H" broach

Broaching round multi-notch specimens, showing the holding block, which radially positions the notches



Clamping round specimen, with a clamp block which has tapered flats



Broaching 1st notch



Broaching 2nd notch

Note:

Up to 3 notches can be produced in square or round specimens, at a 28mm pitch

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