Training Supplement

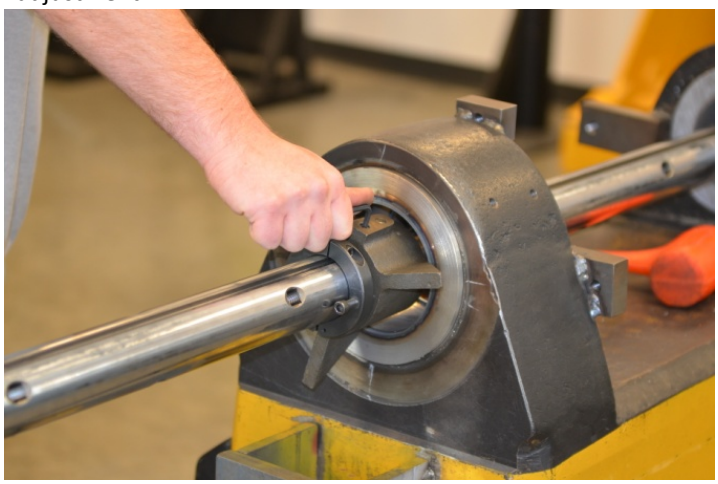
Quick Reference Guide

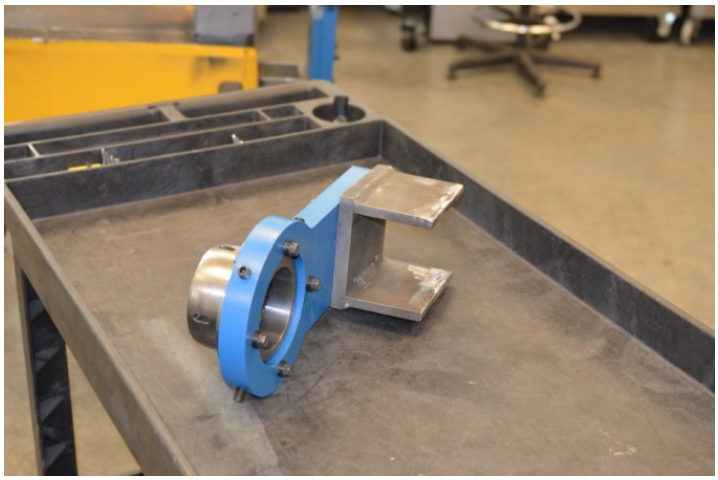
This Quick Reference Guide is intended for use by Climax Portable Machine Tool customers who have previously completed a full training program administered by a CPMT certified Trainer. This material is not intended to be used as a standalone training curriculum. For a full training program please contact your CPMT Regional Sales Manager at, info@CPMT.com or (503)538-2185.

How to set up a BB5000

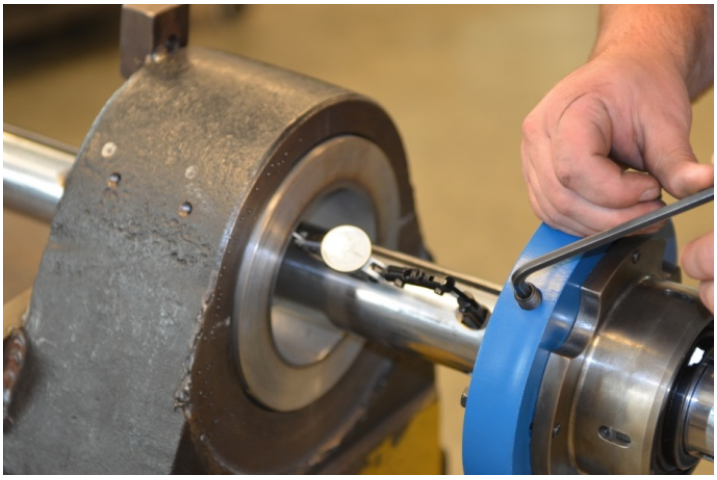
NOTE: Your set up procedure is the most important part of line boring, take your time and make it as rigid and accurate as possible!

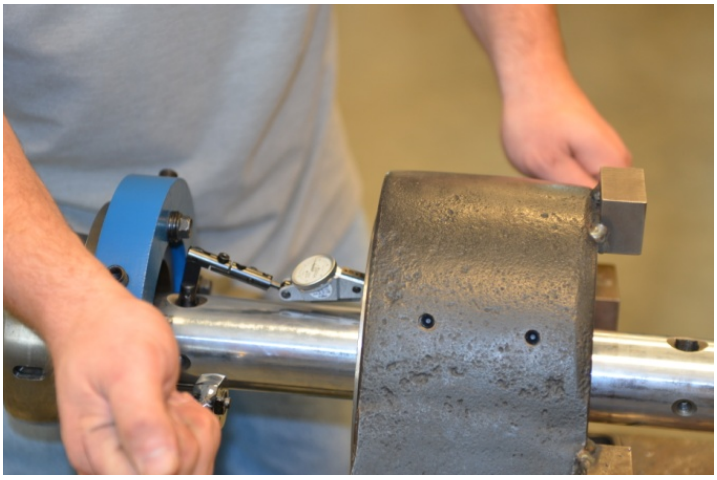
Step 1: The set up cones are used to find the rough center of the boring bar to the bore. Use jacking collar to tighten the cones to the bore. Then add tack blocks to the bearings mounts, before putting the bearings onto bar. Find the best and most ridged place to weld them to work piece. Only mount the bearings on the farthest points of bore remember to put the bearings in the center of the mounts so you have some adjustment.



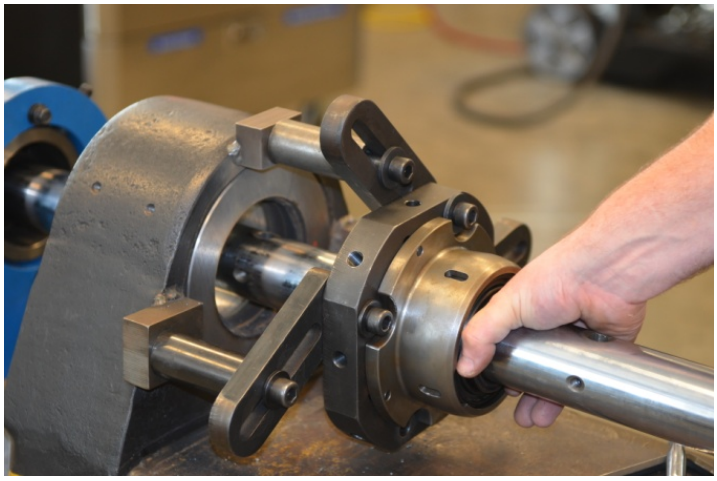


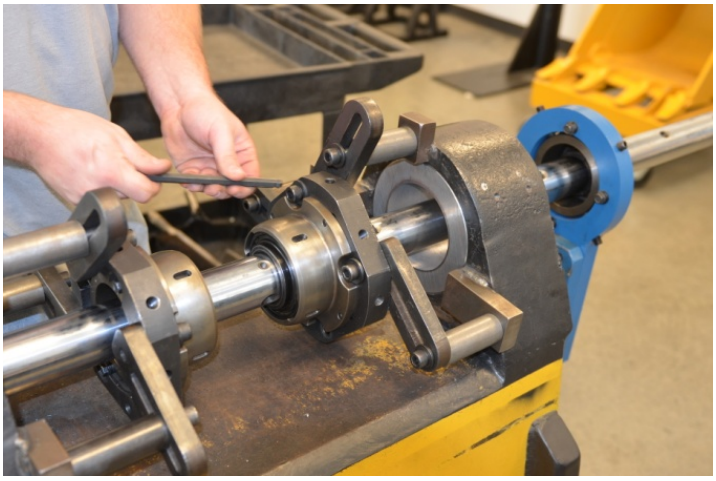
Step 2: After mounting the bearings to the work piece, remove set up cones and indicate the bore to ensure that the bar is in the center of the hole. Use the 4 adjusting set screws to center the bearing. You will have to go back and forth a couple of times to make sure that adjusting one end does not move the other end. After the bar is in the correct spot tighten all the bolts then re-check.



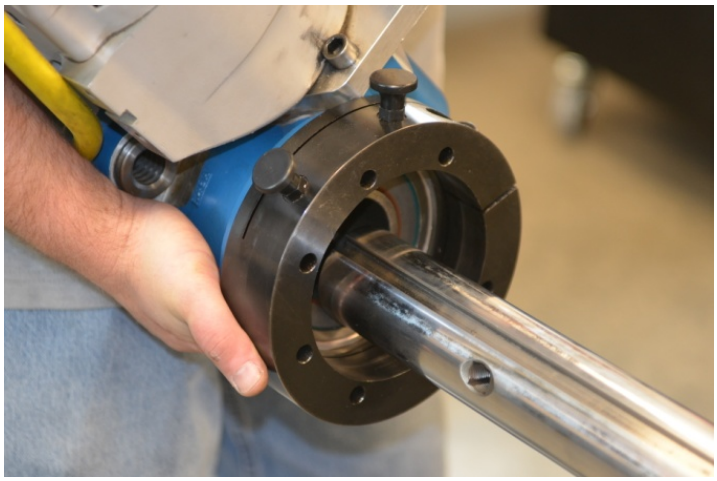


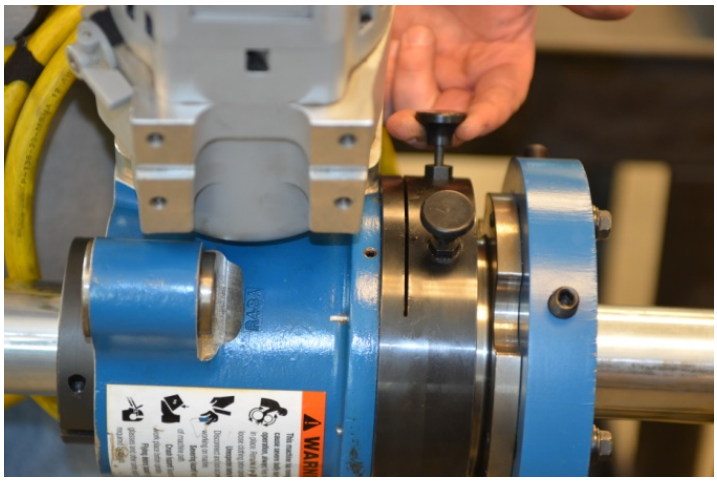
Step 3: Add your center bearings one at a time, remember to use the 7 times the bar diameter rule before setting your support bearings. RIGIDITY, RIGIDITY, RIGIDITY. Make sure that the bearing will rotate freely around the bar (floating the bearing) and that the bar slides freely.



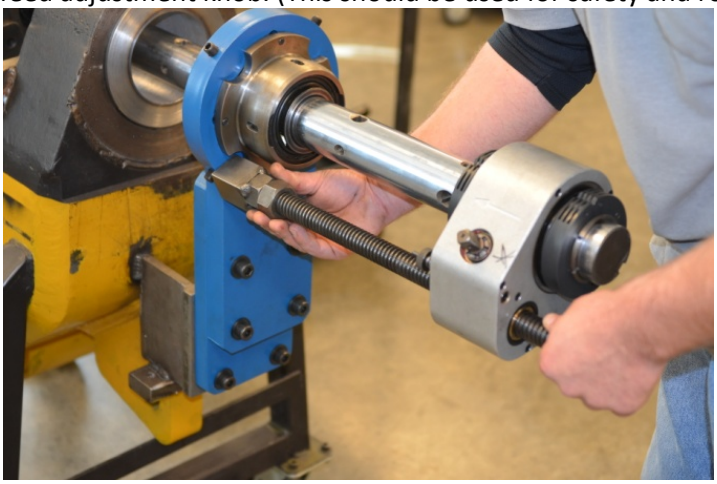


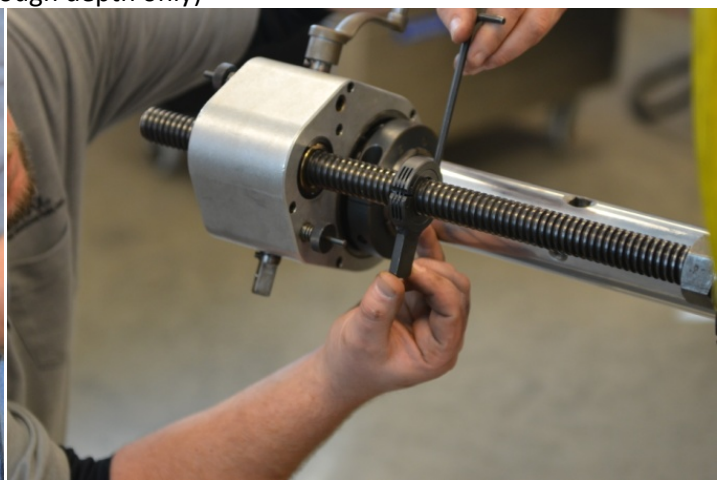
Step 4: Add the rotational drive unit (RDU), using the spring plunger to position the RDU is for set up only, you will be able to rotate the RDU every 22.5 degrees. Then make sure to tighten the 5/8 socket head cap screw to hold the RDU in place. Do not tighten the clamp ring on the back of the RDU this is used only when you do not want the bar to travel (Example: facing operation).



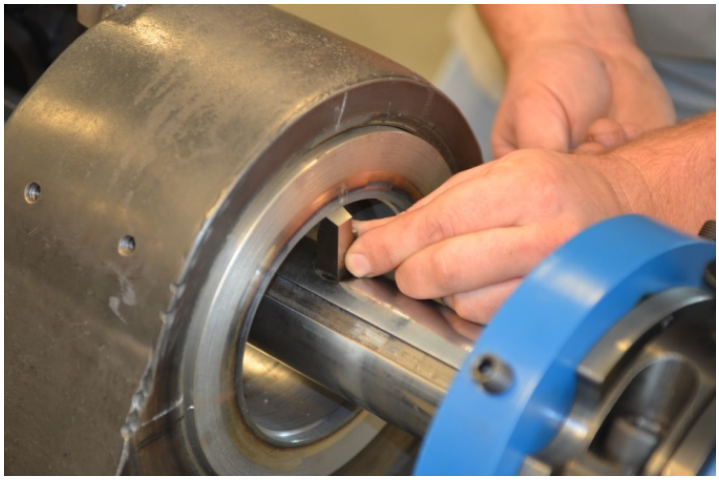
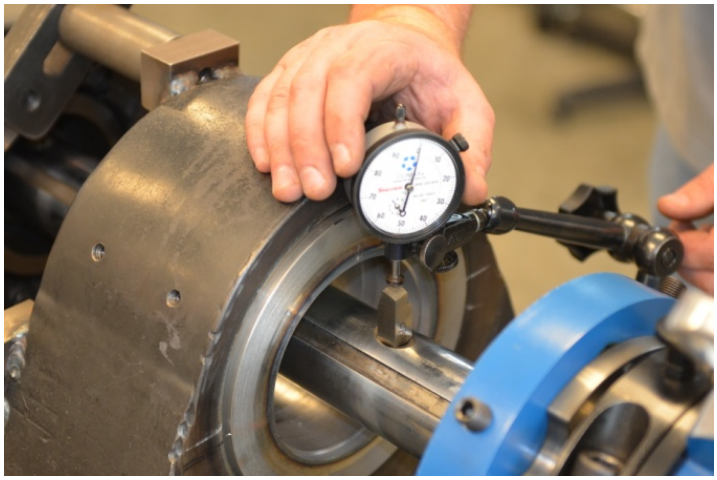


Step 5: One of the nice options with the BB5000 is that you can separate the axial feed unit (AFU) from the RDU in case there is a clearance issue with your set up. By using the lead screw tack weld block it is possible to locate the AFU in a different location if needed. (See picture below). In normal operation the RDU and AFU will mount together. Align the stop with the plunger pin on feed adjustment knob. (This should be used for safety and rough depth only)

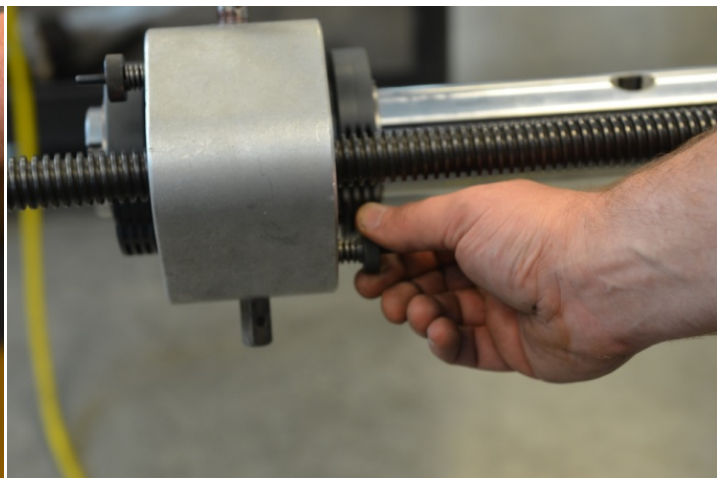




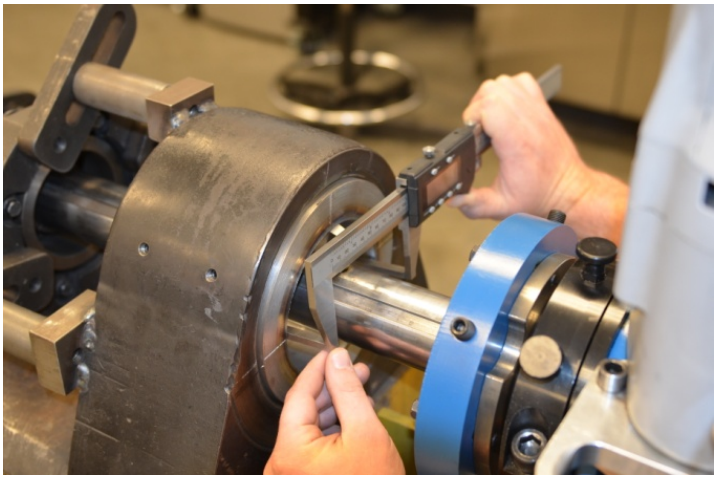
Step 6: Setting your tool. ALWAYS unplug your controller or power source before working with the tool bit! Set the tool bit to the bore and then use a dial indicator to adjust the depth of cut.

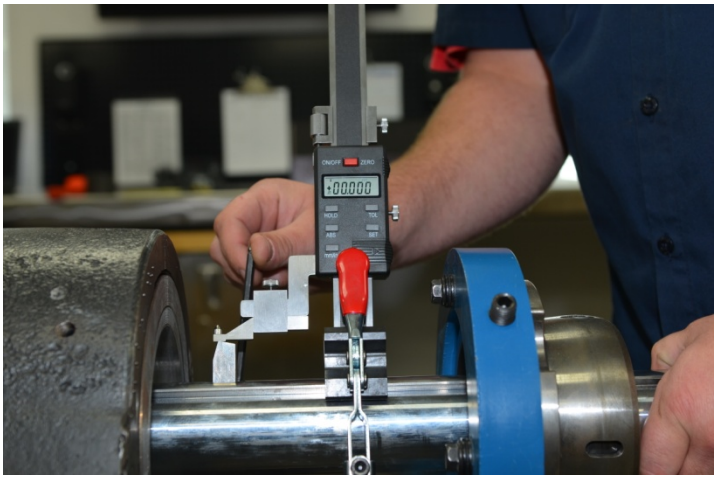



Step 7: The feed box will allow you to set the direction of cut and also the feed rate per revolution (.000-.020) when getting started turn the feed knobs all the way in, this will be zero feed. Using the arrows on the AFU to determine direction then engage the feed shaft into the drive bushing using the feed adjustment knob on the side that you engaged to set feed rate. See below charts to determine RPM and feed rates.

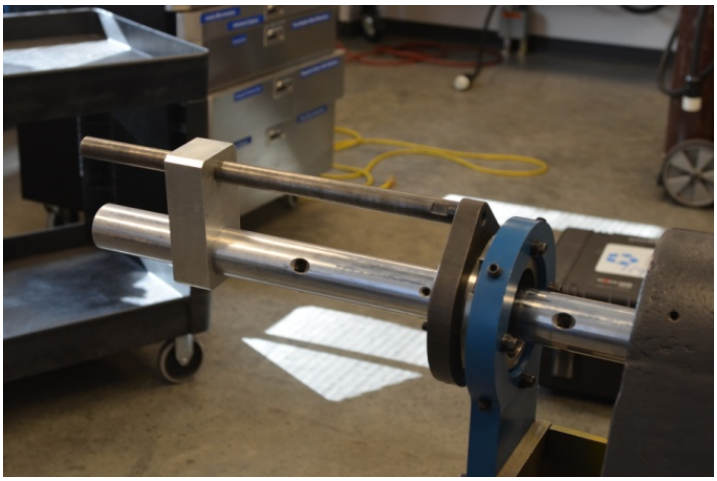
Step 8: Use the Climax over the bar Caliper to measure the bore and make adjustments with the Climax Bore Measuring and Presetting Tool.

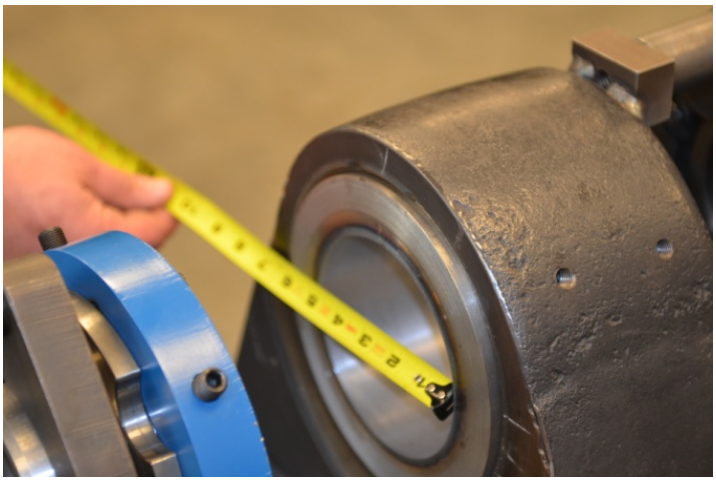




BW3000 Set-up

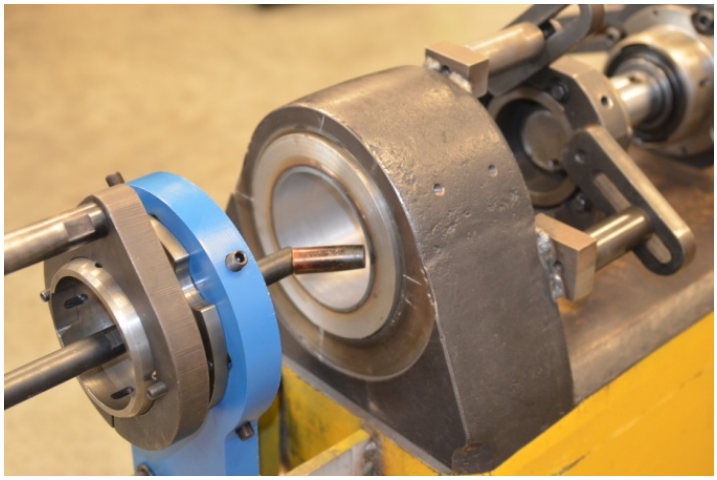
Step 1. . Install Adapter ring, Mounting Rod and Alignment Fixture. Tighten SHCS in Adapter Ring just tight enough to hold its own weight until after you get the Bar and Bearing out. Then lock down the Adapter Ring so it can support the weight of the Bore Welder.

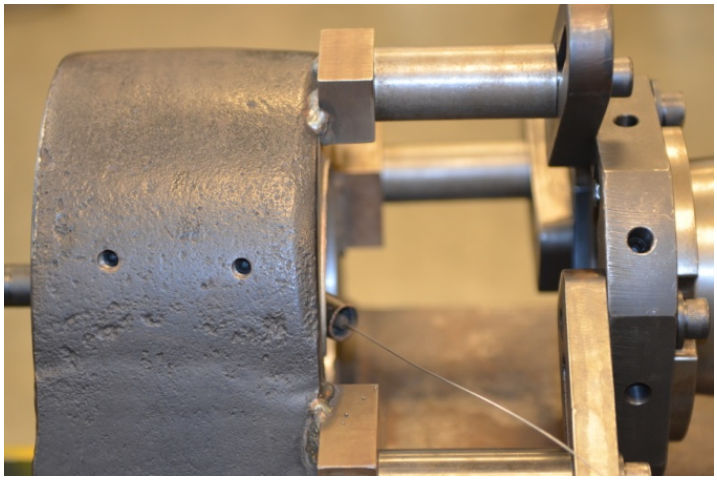




Step 2. Measure bore diameter to select the appropriate torch. Attach torch and extensions, making sure you check where the stroke of the machine is so it will weld thru the whole bore if possible. Snug up the radial mount so the welder stays in position.

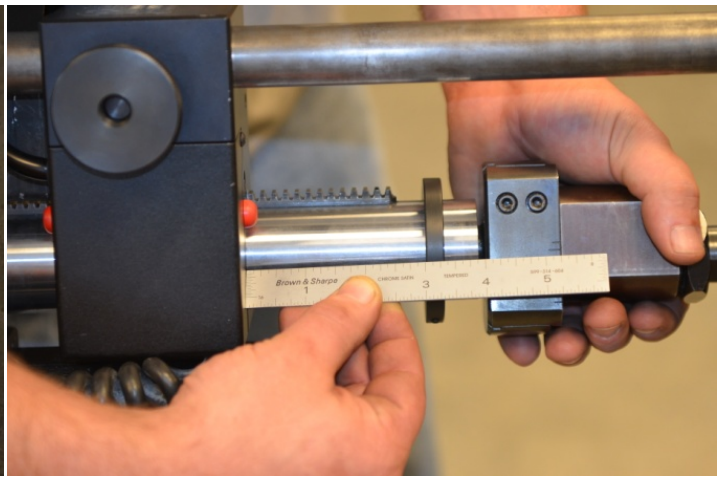
Step 3. Center the torch in the bore by adjusting the dovetail slide (the gap between torch and bore should be approximately 1/8") and bumping the machine left or right on the mounting rod while rotating the torch from left to right and back, checking the gap between the torch and the bore. When centered within 1/16" or better lock the machine down with the radial mount.





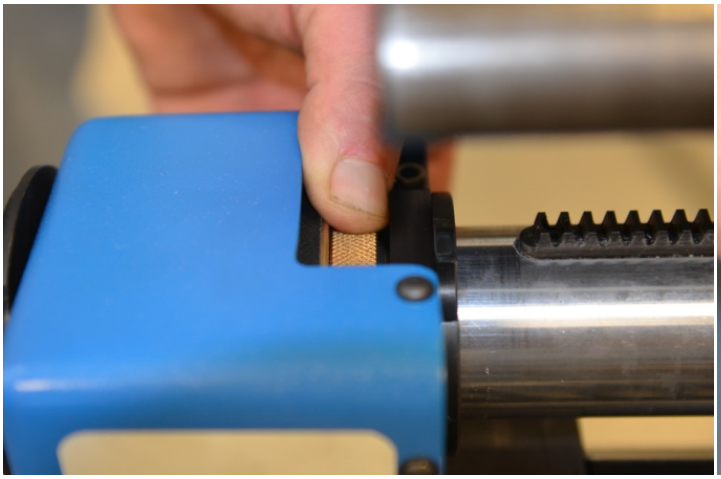
Step 4. To set the rotation speed, use this equation: Diameter X 8.5 = Seconds per Revolution. Wire speed should be set at 25 inches in 6 seconds. Set the Voltage to 17.5-18.5 to start. Set the shielding gas to 35 cu.ft./hr.

Step 5. All Settings are adjusted on the control Pendant other that the shielding gas which is adjusted on the regulator. All cables must be hooked up to the control pendant before the control will power up fully. IF all cables are connected but control will not power up, check that the E-Stop button is reset.



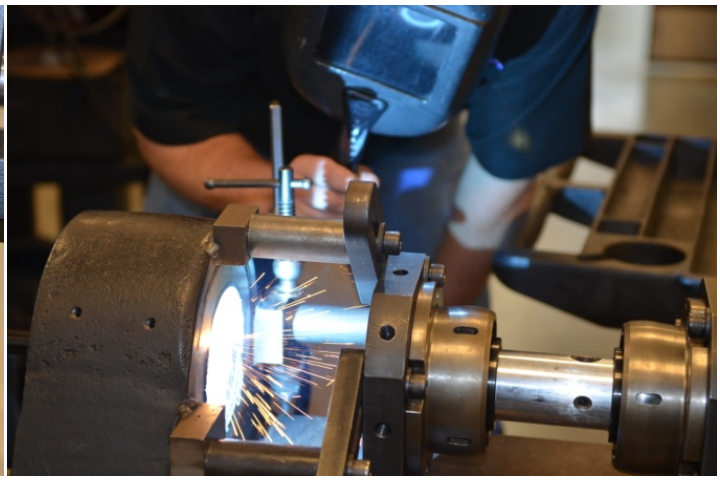
Step 6. To check the step size, use a scale or tape to measure between the machine and the spindle quill and record the measurement. Press and hold the Function button first and the Rotation Initialize button second (must hold both buttons together). The machine will retract the set step amount. Adjust dial on control pendant, and recheck until step size in 1/8".

Step 7. The default rotation direction is clockwise on the bore welder. The rotation Initialize point should be somewhere between 3 o'clock and 6 o'clock. This is the point in the rotation where the machine will retract/step. Rotate the knurled brass ring to adjust the rotation initialize point.



Step 8. Use the Extend button to adjust the torch forward till it is past the edge of the bore. Then use the Retract button to move the torch approximately 3/8 to 1/2 from the back of the bore to ensure the wire does not run out past the bore when welding has started. Check the Cams on the back of the machine to ensure they are all the way closed if a continuous weld is desired.

Step 9. Ensure all cables are connected at both ends, positive lead and negative clamp are correctly attached to the machine and work piece, shielding gas is on, suitcase is closed and sitting in the upright position and the torch is at the rotation initialize point.



Step 10. Ensure any necessary safety equipment is in place including PPE. Press the Purge button to ensure shielding gas is coming out torch and immediately after press the Weld button. Observe the voltage and amperage on the power supply and adjust as necessary to achieve 17.5-18.5 V and 125-135 Amps. The wire speed adjustment will affect the amperage. Inspect the actual bead in the bore and the sound the welder is making to make fine adjustments.

Cutting Speed - Surface Feet Per Minute (SFPM)

Bar Speed (rpm)	Bore Diameter (inches)													
	1	2	3	4	6	8	10	12	18	24	30	36	48	60
5	1	3	4	5	8	10	13	16	24	31	39	47	63	79
10	3	5	8	10	16	21	26	31	47	63	79	94	126	157
20	5	10	16	21	31	42	52	63	94	126	157	188	251	314
30	8	16	24	31	47	63	79	94	141	188	236	283	377	471
40	10	21	31	42	63	84	105	126	188	251	314	377	503	628
50	13	26	39	52	79	105	131	157	236	314	393	471	628	785
60	16	31	47	63	94	126	157	188	283	377	471	565	754	942
70	18	37	55	73	110	147	183	220	330	440	550	660	880	1100
80	21	42	63	84	126	168	209	251	377	503	628	754	1005	1257
90	24	47	71	94	141	188	236	283	424	565	707	848	1131	1414
100	26	52	79	105	157	209	262	314	471	628	785	942	1257	1571
125	33	65	98	131	196	262	327	393	589	785	982	1178	1571	1963
150	39	79	118	157	236	314	393	471	707	942	1178	1414	1885	2356
175	46	92	137	183	275	367	458	550	825	1100	1374	1649	2199	2749

	HSS Recommended. Best range for field machining.
	HSS/Carbide Recommended. Must have rigid set-up
	Carbide Recommended. Must have rigid set-up, no interrupted cuts.
	Carbide Recommended. Must have rigid set-up, light finish cuts only.
	Not Recommended for field machining

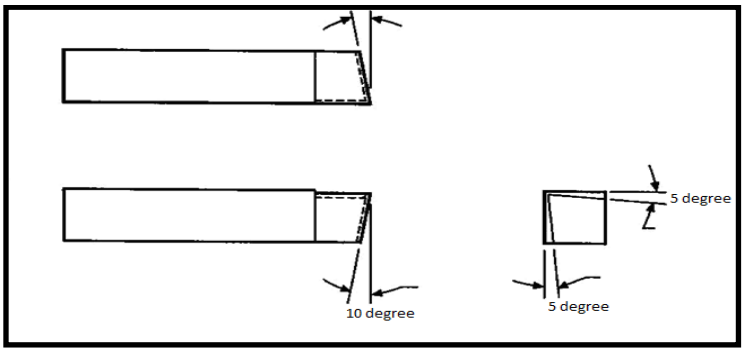
WELDING PARAMETERS

ROTATION SPEED	Horizontal Ø x 8.5 ⟺	Vertical Ø x 10.4 ⇕
WIRE SPEED	25" OF WIRE IN 6 SEC	
STEP SIZE	1/8 IN OR 3MM	
GAS	75 AR 25 CO_2 @35 $FT^3/_{HR}$	
WIRE	.035 ER70-S6 SOLID CORE	
VOLTAGE	17.5v	

TORCH	BW1000 BW2600	BW3000
00	.88-1.8	.88-1.8
0	1.8-3.0	1.8-3.0
1	2.7-8.2	2.75-5.5
2	8.0-12.0	4.5-7.5
3	NA	6-9
4	NA	8-11
5	NA	10-13

Once you start welding the amps should be about 105-135amps. To adjust the amps you increase/decrease your wire feed.

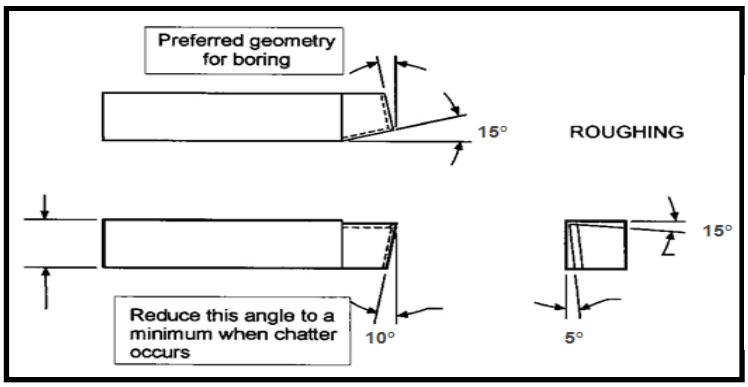
Make sure your wire is always hitting at a 45° angle



ZERO DEGREE RAKE TOOL BIT

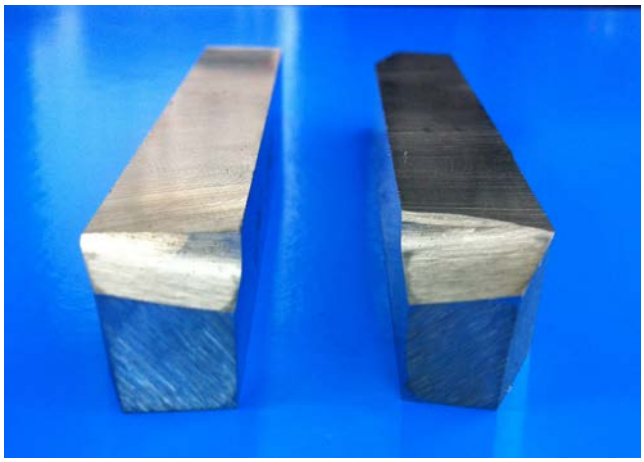
HIGH SPEED STEEL TOOL BIT PART NUMBERS	
Part #	*Tool Description*
31857	TOOL BIT HSS 1/2 X 1.0 0 deg lead
32343	TOOL BIT HSS 1/2 X 2.5 0 deg lead
31841	TOOL BIT HSS 1/2 X 4.0 0 deg lead

"These are common part numbers, call for more options and pricing."



NEGATIVE DEGREE RAKE TOOL BIT

HIGH SPEED STEEL TOOL BIT PART NUMBERS	
Part #	*Tool Description*
31866	TOOL BIT HSS 1/2 X 1.0 LH 15 deg lead
32344	TOOL BIT HSS 1/2 X 2.5 LH 15 deg lead
31868	TOOL BIT HSS 1/2 X 4.0 LH 15 deg lead
25710	TOOL BIT HSS 1/2 X 4.0 LH & RH BOTH ENDS



Left-Handed	Right-Handed

56275-Indexable carbide w/inserts KIT

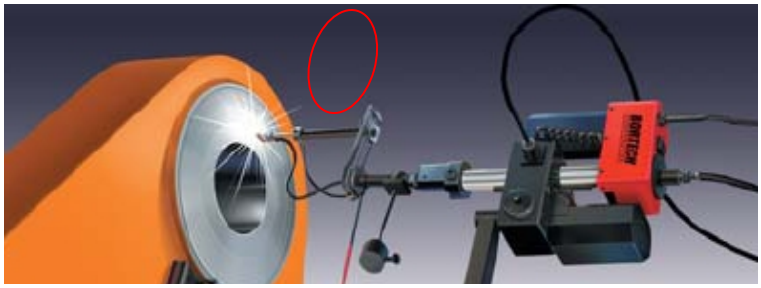
45396 Dial-Indicator, Magnetic-back

53782-Interapid Horizontal Dial

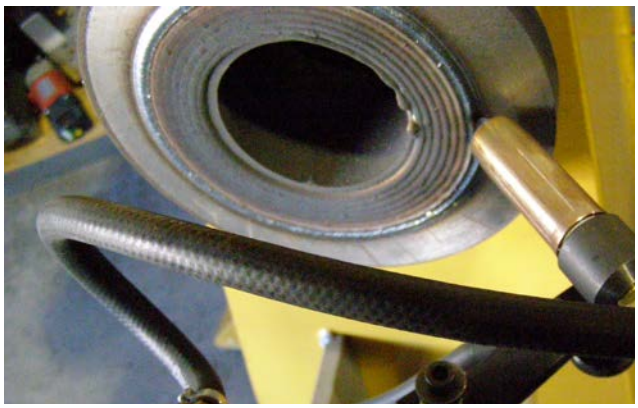
61707-Digital 10” bore-caliper
63330-Digital 24” Bore caliper

79151-BMT Bar mounted Bore-measuring tool

30756-Torch Counter Balance BW3000/BW2600/BW1000



48013-Compact face torch for the BW3000/BW2600



48013-OD Trammel Torch BW3000/BW2600