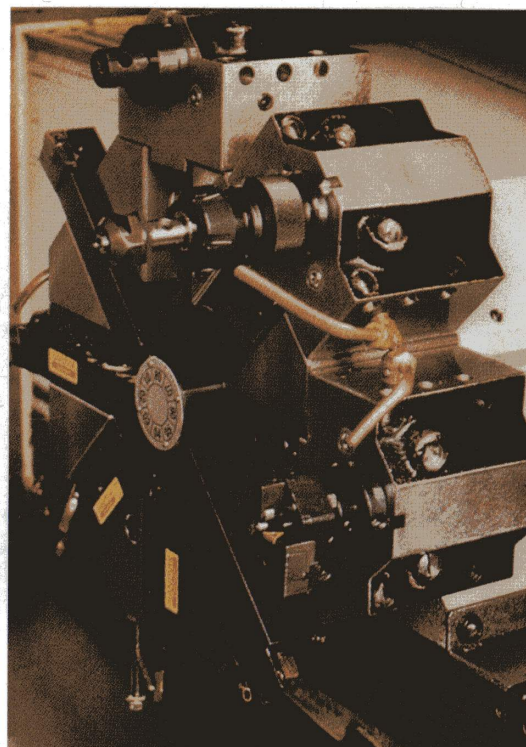
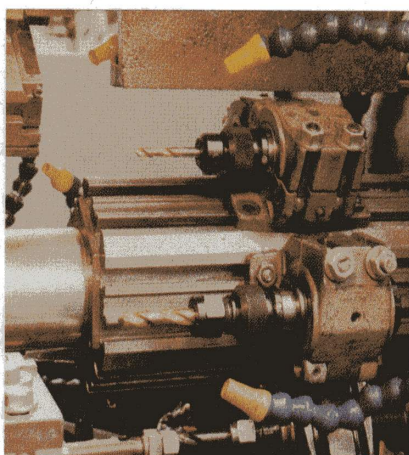
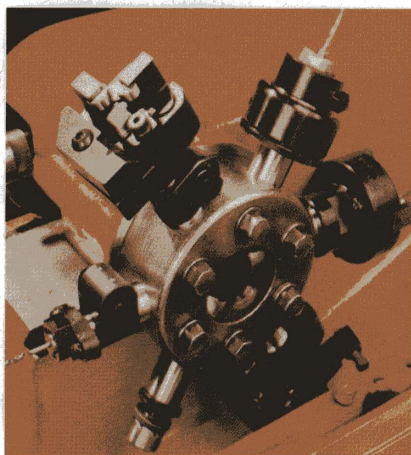


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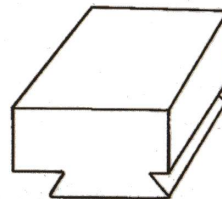


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For screw machines, NC and turret lathes, automatics, and CNC turning

Boyar-Schultz SMT presents a new standard in ruggedness and precision for you that means superior performance, whatever your machining requirements.

Higher metal removal rates, tight dimensional tolerances, and exceptional finish capabilities are all operating characteristics of these tools on a wide range of applications.

You also can expect longer tool life than you have experienced with any other tooling. The extra rigidity designed and built into Boyar-Schultz SMT tooling delivers the consistent results required, even under abusive conditions.

Boyar-Schultz SMT tooling can be integrated into many applications on vertical and horizontal machining centers, multi-spindle bar machines, and even special application machines. The introduction of quick-change tooling will reduce setup time and cost.

In short, an investment in Boyar-Schultz SMT tooling will provide you the uncommon benefit of fast payback from productivity improvements combined with amortization over considerably longer usable life than customarily associated with ordinary cutting tools.



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Copper Head Laps



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**Tool
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Rapid Change Tooling

Special Tools



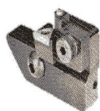
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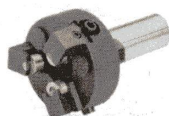


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**Roller and
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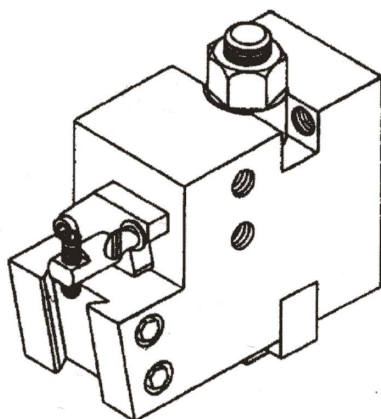
Tooling Components

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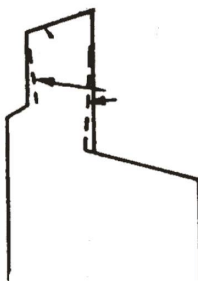
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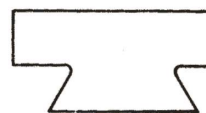
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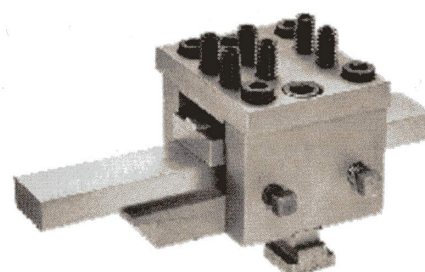
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Skiving Tool Holder

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Model T

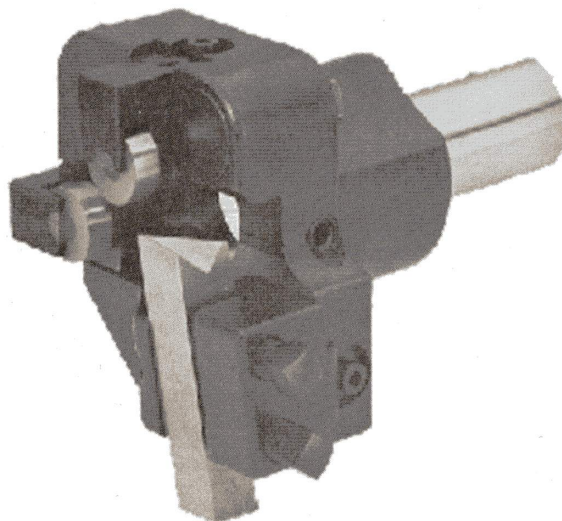
Box tools are used in the turrets of screw machines, turret lathes, and CNC lathes. They are recommended for turning diameters where straightness, accuracy, and finish are of primary importance.

These rigid tools are designed to take a medium to heavy cut where a single pass cut is feasible, but not to exceed one-quarter of the stock diameter. The tool holder has two-axis adjustment, permitting proper orientation of tool bit to the workpiece. Ample space is provided for chip clearance and coolant flow.

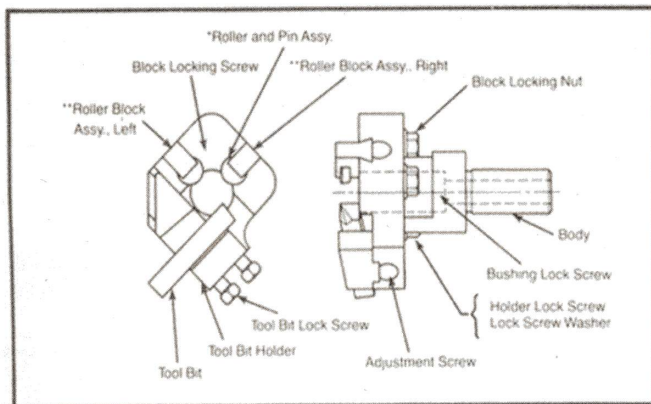
Individually adjustable rollers provide support, assure proper spindle-to-turret alignment, are set off-center away from each other to permit turning small diameters, and produce a burnished finish.

Changing roller blocks: Upper and lower roller blocks are not interchangeable.

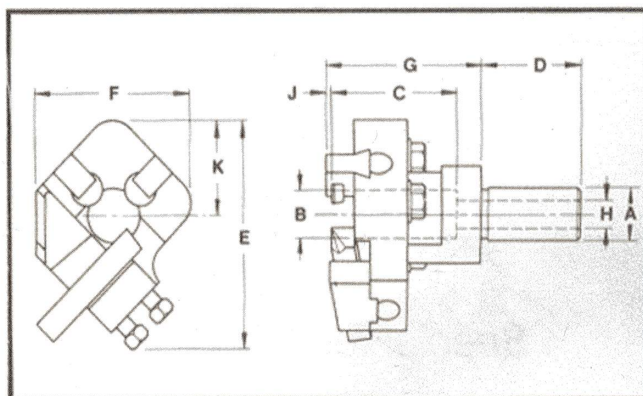
Changing rollers: Rollers taper to a smaller diameter at the back. Note carefully in mounting.



"Some left hand holders now available"



Extra-high roller blocks are available to provide support on the unturned diameter of the workpiece. Carbide rollers and pins are available for extended wear.



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Model	000RT Δ	00RT	0RT	2RT	3RT	4RT
Std. Ordering Number	5700	5040	5140	5240	5350	5300
With Extended Rollers	113356	113357	113358	113359	---	---

DIMENSIONS

Turning Capacity	3/32 to 3/8	3/32 to 3/8	3/16 to 5/8	1/4 to 7/8	5/16 to 1-1/4	5/16 to 1-1/4
A	5/8	5/8	3/4	1	1-1/4	1-1/2
B	7/16	7/16	3/4	1	1-5/16	1-5/16
C	1-1/4	1-5/16	1-11/16	2-7/16	3-1/4	3-1/4
D	1-3/8	1-3/8	1-1/2	2	4	4
E	2-5/16	2-13/16	3-3/4	4-5/16	5-7/16	5-7/16
F	1-5/8	1-11/16	2-11/16	3-1/16	4-1/16	4-1/16
G	1-1/2	1-1/2	2-1/8	3-1/16	3-7/8	3-7/8
H	3/8	3/8	3/8	9/16	7/8	7/8
J	3/32	3/32	3/32	3/32	1/8	1/8
K	15/16	1-3/16	1-5/8	1-3/4	2-1/4	2-1/4
Tool Bit Size (Sq.) \diamond	1/4	1/4	3/8	1/2	1/2	1/2

Replacement Parts

Body	5701	5046	5146	5246	5351	51503
Tool bit Holder	5702A	5002A	5102A	5202	5302	5302
Roller Block Assy., Right**	5707	5067	5167	5267	5307	5307
Roller Block Assy., Left **	5708	5068	5168	5268	5308	5308
Block Locking Screw (2 Req.)	5719	5049	5149	5249	5319	5319
Block Locking Nut (2 Req.)	6232	6232	6332	6332	6483	6483
Adjustment Screw (3 Req.)	5734	7406	5134	5234	5334	5334
Holder Lock Screw	5035	5035	5135	5235	5335	5335
Lock Screw Washer	5743	5043	5143	5243	5343	5343
Tool Bit	5045	5045	5145	5245	5245	5245
Tool Bit Lock Screw (2 Req.)	5737	5037	5137	5237	5337	5337
Tool Bit Lock Screw					5336	5336
Tool Bit Set Screw	1210	1210				
Bushing Lock Screw	6236	5044	6344	5244	5344	5344
Roller and Pin Assy.*	105162	105163	105164	105165	105166	105166

Optional Parts

Roller Block Assy., Right Ex. High	5709	5069	5169	5269	5309	5309
Roller Block Assy., Left Ex. High	5710	5070	5170	5270	5310	5310
Carbide Roller	5720C	5020C	5120C	5220C	5320C	5320C
Carbide Roller Pin	5725C	5025C	5125C	5225C	5325C	5325C
Spare Parts Kit***	113049	113050	113051	113052	113053	113053

* Included in Roller Block Assy. See page 45 for complete List of parts.

** Roller Block Assy. Consists of Roller Block, Roller, Roller Pin, and Lock Screw. See Page 45 for complete list of parts.

*** Includes 2 Roller and Pin Assemblies, 1 Tool Bit, 2 Adjustment Screws, 2 Tool Bit Lock Screws.

\diamond Non-Ground tool supplied. For more information on Grinding Tool bit see page 40.

Δ NOTE: Min. Turning diameter is .130" when rollers are on finish diameter 3/32" diameter with rollers on the stock diameter of .130" plus.

4RT tools are made to order and are not stocked.

Model RTC

Carbide Insert

Carbide insert box tools are used in the turrets of screw machines, turret lathes, and CNC lathes for taking extra-heavy, rapid cuts in workpieces.

Using triangular carbide throw-away inserts, downtime for tool bit sharpening is eliminated. You get a higher production rate at the lowest cost per cutting edge by removing stock 30% to 50% faster than with conventional cutters.

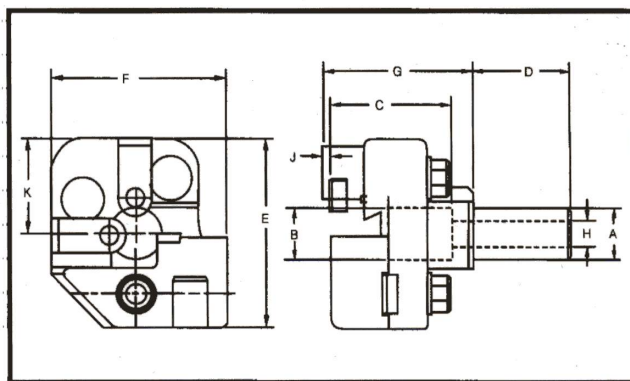
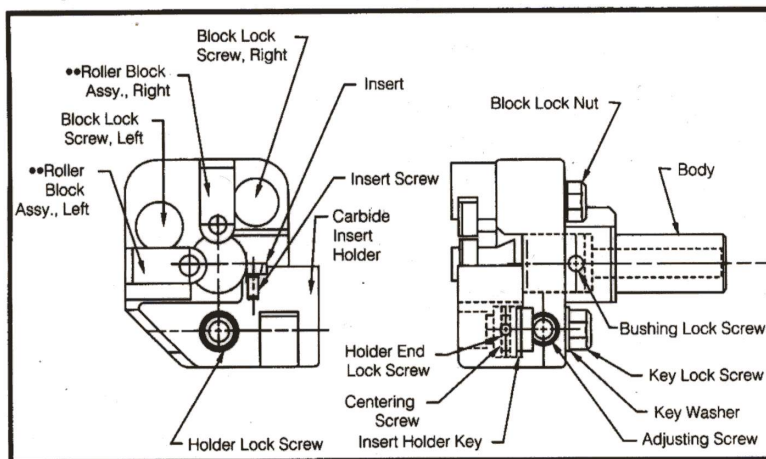
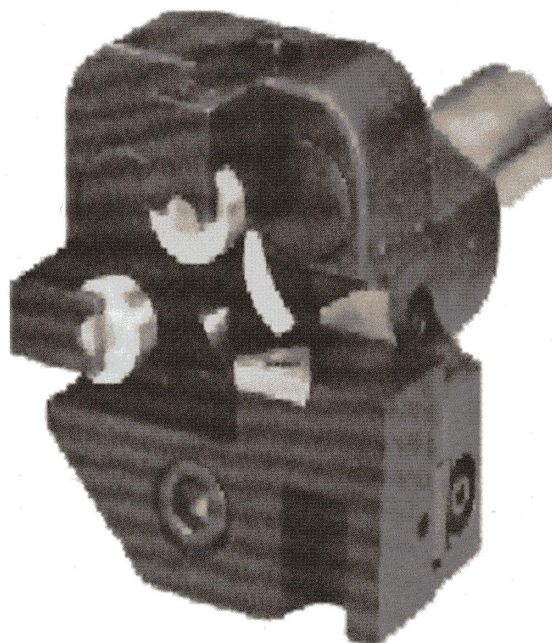
The triangular carbide insert can be changed from one edge to another in less than a minute. Centerline is maintained when replacing the insert. Chips are controlled at any speed, feed rate, or material by a built-in molded chip breaker.

Extra-high roller blocks are available to provide support on the unfinished diameter of the workpiece.

Carbide rollers and pins are available for extended wear.

Standard carbide inserts have a $1/64$ " radius on corners; inserts with $1/32$ " radius are available and must be used with rollers that have a $1/64$ " chamfer.

Old Style parts listed on page 45. All parts are available except the block.



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Model	00RTC	ORTC	2RTC	3RTC
Std. Ordering Number	94200	94300	94400	94500
With Extended Rollers	113431	113430	113432	113433
30° Angled Block Box Tool	96250	96350	96450	96550
45° Angled Block Box Tool	96200	96300	96400	96500

Dimensions

Turning Capacity	.09-.38 Δ	.18-.63	.25-.88	.31-1.25
A	0.625	0.75	1.00	1.50
B	0.44	0.75	1.00	1.31
C	1.38	1.81	2.44	3.25
D	1.38	1.50	2.00	4.00
E	2.125	2.75	3.125	3.66
F	1.81	2.50	2.88	3.88
G	2.00	2.25	3.06	3.88
H	0.38	0.38	0.56	0.88
J	0.09	0.09	0.09	0.12
K	0.94	1.25	1.53	1.75

Replacement Parts

Body	51203	51303	51403	51503
Holder, Carbide Insert***	94204	94304	94404	94504
Roller Block Assy, Right**	51202	51302	51402	51502
Roller block Assy, Left**	51201	51301	51401	51501
Block Lock Screw (2 Req'd.)	5049	5149	5249	5319
Block Lock Screw, Right	51212			
Block Lock Nut (2 Req'd.)	6232	6332	6332	6483
Adjustment Screw (3 Req'd.)	7406	5134	5234	5334
Insert Holder Key	51205	51305	51405	51506
Key Lock Screw	51208	51308	51408	51508
Key Washer	5043	5143	5234	5343
Holder Lock Screw***	51209	51309	51409	51509
Holder End Lock Screw	51214	51214	51314	51514
Centering Screw	51213	51313	51413	51513
Insert Lock Screw***	113223	113223	113224	113224
Carbide Inserts***	113272	113272	113230	113230
Wrench, Torx Lock***	113225	113225	113226	113226
Bushing Lock Screw	5044	6344	5244	5344
Roller and Pin Assy*	105170	105171	105172	105173

Optional Parts

Roller Block Assy., Right Ex. High	51228	51327	51428	51528
Roller block Assy., Left Ex. High	51227	51328	51427	51527
Carbide Insert, 1/32 Radius	113270	113270	113229	113229
Roller, 1/64 Chamfer	51220	51320	51420	51520
Carbide Roller	5020C	5120C	5220C	5320C
Carbide Roller, 1/64 Chamfer	51220C	51320C	51420C	51520C

* Included in roller block Assy., See page 45 for details.

** Roller block Assy. consists of Roller Block, Roller, Roller Pin, and Lock Screw.
See page 45 for a complete list of parts.

*** Included in block Replacement Kit 94210 94310 94410 94510

Δ Min. turning diameter is .130" when rollers are on finish diameter, .090" with rollers on the stock diameter of .130" plus.

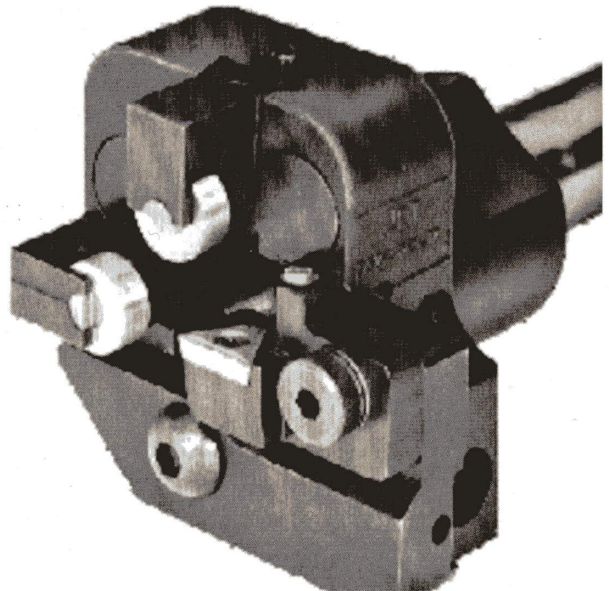
Model TC-R

Carbide Insert Self-Releasing

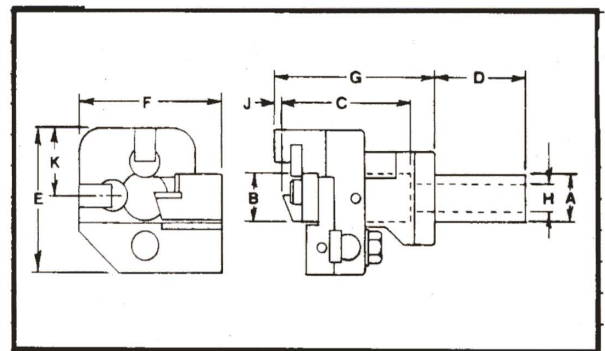
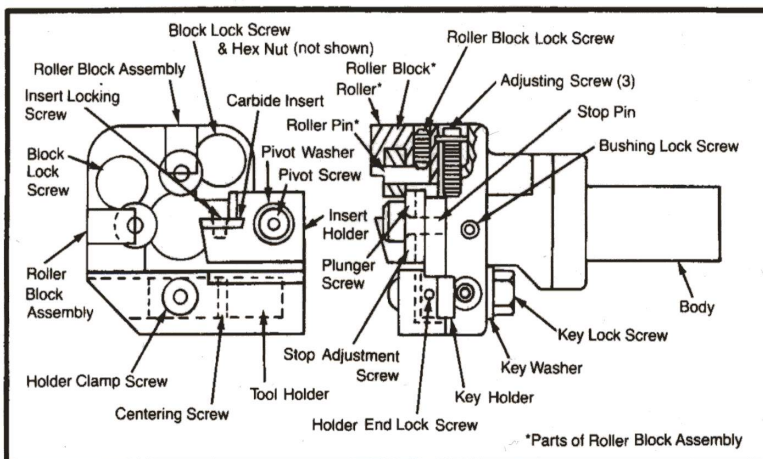
The carbide insert box tool is equipped with a special self-releasing mechanism that moves away from the stock at the same time the turret pulls away from the workpiece. With this new machining innovation, you can eliminate scroll marks caused by cutter drag. Scrolling occurs when the cutter leaves the workpiece on standard carbide insert box tools. Not with the new TC-R box tool. Carbide insert box tools are used in the turrets of screw machines and turret lathes for taking extra heavy, rapid cuts in workpieces.

By using triangular carbide throw-away inserts, you get higher production per cutting edge. And you remove 30% to 50% more stock than with conventional cutters. You can change from one edge to another in less than a minute. Center line is maintained when replacing insert. Chips are controlled for any speed, feed rate, or material by a patented chip breaker.

Extra-high roller blocks are available to provide support on an unfinished diameter of a workpiece. Carbide rollers and pins are available for extended wear.



Standard carbide inserts have 1/64" radius on corners, inserts with 1/32" radius are available and must be used with rollers that have a 1/64" chamfer.



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Model	00TC-R	OTC-R	2TC-R	3TC-R
Std. Ordering Number	113274	113284	113294	113304
With Extended Rollers	113385	113386	113387	113389

Dimensions

Turning Capacity	.09-.38 ***	.18-.63	.25-.88	.31-1.25
A	5/8	3/4	1	1-1/2
B	7/16	3/4	1	1-5/16
C	1-1/2	2-1/16	2-9/16	3-3/8
D	1-3/8	1-1/2	2	4
E	2-1/8	2-3/4	3-1/8	3-11/16
F	1-15/16	2-3/4	3-1/4	4
G	1-11/16	2-3/8	3-3/16	4
H	3/8	3/8	9/16	7/8
J	3/32	3/32	3/32	1/8
K	15/16	1-1/4	1-17/32	1-3/4

Replacement Parts

Body	51203	51303	51403	51503
Insert Holder	113286	113286	113296	113296
Key Holder	51205	51305	51405	51506
Tool Holder	113275	113285	113295	113305
Bushing Lock Screw	5044	6344	5344	5344
Key Lock Screw	51208	51308	51408	51508
Stop Pin	113282	113282	113282	113282
Stop Adjustment Screw	3667	3667	3667	3667
Spring Plunger Screw	113290	113290	113300	113300
Centering Screw	51213	51313	51413	51513
Holder Clamp Screw	113281	113291	113301	113311
Pivot Screw	113277	113277	113297	113297
Holder End Key Lock Screw	51214	51314	51314	51514
Insert Locking Screw	113223	113223	113224	113224
Carbide Insert**	113272	113272	113230	113230
Roller Block Assy., Left	113354	51328	51427	51501
Roller Block Assy., Right	113355	51327	51428	51502
Key Washer	5043	5143	5243	5343
Pivot Washer	113278	113278	113298	113298
Block Lock Screw (2 Req'd.)	5049	5149	5249	5319
Block Lock Screw, Right	51212			
Block Lock Nut (2 Req'd.)	6232	6332	6332	6483
Adjusting Screw (3 Req'd.)	7406	5134	5234	5334
Insert Lock Wrench (Not Shown)	113225	113225	113226	113226

Optional Parts

Roller*	5020	5120	5220	5320
Carbide Roller (Std)	5020C	5120C	5220C	5320C
Carbide Roller, 1/64 Chamfer	51220C	51320C	51420C	51520C
Roller, 1/64 Chamfer	51220	51320	51420	51520
Roller Pin	5025	5125	5225	5325
Carbide Roller Pin*	5025C	5125C	5225C	5325C
Roller Block, Left Ex. High*	113368	113372	113378	51527
Roller Block, Right Ex. High*	113369	113373	113379	51528
Roller Block Lock Screw	5039	5039	5039	5339

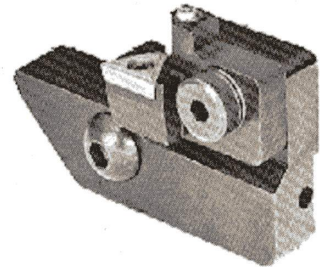
Model TC-RA

Retrofit Kits

Releasing carbide insert adapters can be retrofitted to present box tools in the field in minutes to eliminate scroll marks that are a result of cutter drag caused by the cutter leaving the workpiece.

The unique self-releasing adapter is available in a wide range of sizes and allows economical replacement of damaged parts while at the same time modernizing your current Boyar-Schultz SMT box tools with the latest machining innovation.

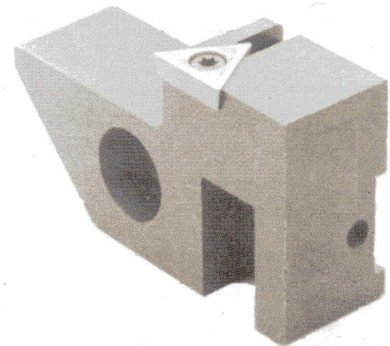
The adapter kits come complete with extra high roller block assemblies, keyholder, insert, and toolholders to make the retrofit quick and easy.



Model RTC-RA

Retrofit Blocks

The old RTC, BTT, and BTTC Box tools can be retrofitted with the new style BLOCK without any modifications to the current holders. The NEW BLOCK Kit comes complete with inserts and screws to mount directly to your old holder. The NEW BLOCK improves performance, gives longer tool life, has fewer parts to replace, and costs less. The NEW BLOCK will pay for itself in weeks if not days. The New 94 model will bring new life to your old holders.



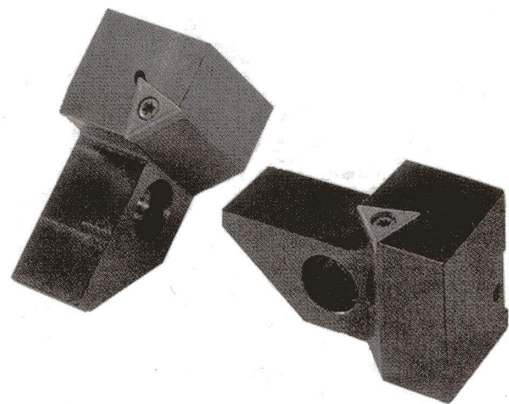
Model RTC-AB

Angled Insert Blocks

By angling the insert on the block, the NEW Boyar-Schultz SMT Angled Insert Block lets you turn the outside diameter of the part and leave the desired angle at the end of the cut...all with one pass. Easily turn the lead angles for threaded parts or a chamfer on mating diameters.

Angled Blocks reduce the need for multiple tools and operations and eliminate using a second tool and pass to achieve an angle on the part.

The NEW Blocks mount on all current (RTC) carbide insert type box tools without any modifications. They easily adapt to Boyar-Schultz SMT box tool bodies and standard roller blocks. Available for RTC Box Tools only.



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Model	00TC-RA	OTC-RA	2TC-RA	3TC-RA
Ordering Number	113315	113316	113317	113318

Replacement Parts

Insert Holder	113286	113286	113296	113296
Key Holder*	51205	51305	51405	51506
Tool Holder	113275	113285	113295	113305
Stop Pin	113282	113282	113282	113282
Stop Adjustment Screw	3667	3667	3667	3667
Spring Plunger Screw	113290	113290	113300	113300
Centering Screw	51213	51313	51413	51513
Holder Clamp Screw	113281	113291	113301	113311
Pivot Screw	113277	113277	113297	113297
Holder End Key Lock Screw	51214	51314	51314	51514
Insert Locking Screw	113223	113223	113224	113224
Carbide Insert**	113272	113272	113230	113230
Roller Block Assy., Left Ex. High	113354	51327	51427	51501
Roller Block Assy., Right Ex. High	113355	51328	51428	51502
Pivot Washer	113278	113278	113298	113298
Insert Lock Wrench *	113225	113225	113226	113226

*

Not shown but standard on retrofit kits.

**

Supplied with tool. See optional parts list for other sizes.

**BOYAR-SCHULTZ SMT NEW BLOCK KIT
FOR RTC MODELS**

Model	00RTC	ORTC	2RTC	3RTC
Ordering Number	94210	94310	94410	94510

Holder Lock Screw	51209	51309	51409	51509
Insert Lock Screw	113223	113223	113224	113224
Carbide Inserts	113272	113272	113230	113230
Wrench, Torx Lock	113225	113225	113226	113226

FOR BALANCED BTT-C MODELS

Model	00BTT-C	OBTT-C	2BTT-C
Ordering Number	94610	94710	94810

Holder Lock Screw	51209	51309	51409
Insert Lock Screw	113223	113223	113224
Carbide Inserts	113272	113272	113230
Wrench, Torx Lock	113225	113225	113226

NEW BOYAR-SCHULTZ SMT ANGLED BLOCKS

Model	00RTC	ORTC	2RTC	3RTC
30° Block	96260	96360	96460	96560
45° Block	96210	96310	96410	96510

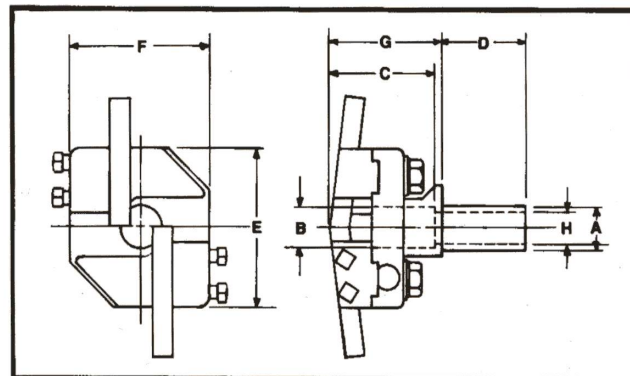
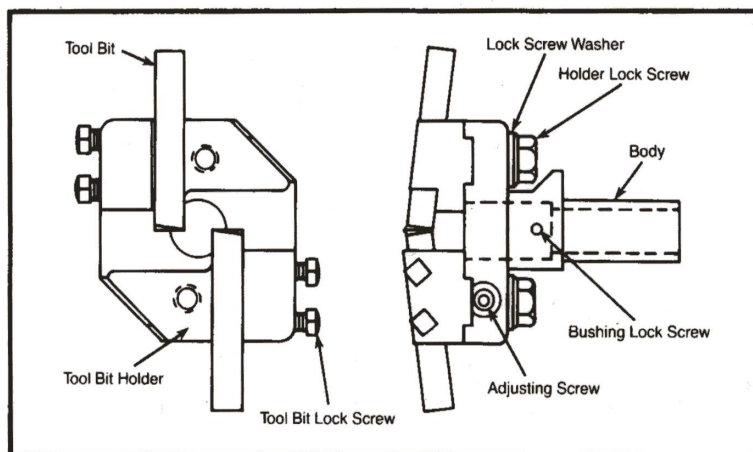
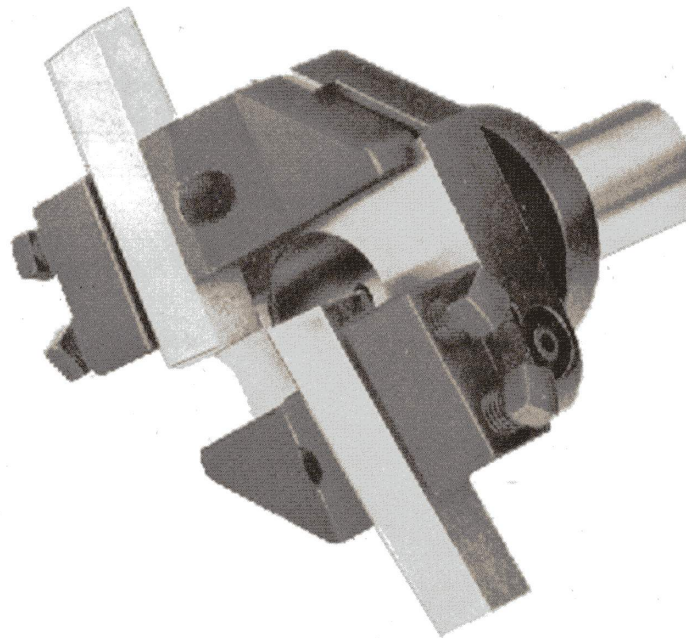
Note: Inserts and screws are the same as above

Model BTT

Balanced Turning Tool

Balanced turning tools are used in the turrets of screw machines and turret lathes, and are the best tools for rough turning. Balanced turning tools will remove a greater amount of material than any other turning tool available because of the rugged construction and dual cutting tools. The two high-speed steel blades cut freely, are inexpensive to replace, and adjustment permitting proper orientation of the tool bit to the workpiece can be made in a matter of minutes. Although designed primarily for rough turning, these tools will produce a good finish cut where a high degree of accuracy and fine finish are not necessary. Balanced turning tools are often used for finish-turning thread diameters, and are excellent on all types of material, including brass.

Cutter adjustment can be easily made in a matter of minutes. The two blades are adjusted to the required diameter. Both blades simultaneously remove the same amount of material, creating a balanced cut. This will produce a good part finish at a reasonable feed rate. Or, approximately 80 percent of the material can be removed with one blade, and remaining material with the other blade for finish turning. For rough turning, the blades may be set so each blade removes only one-half of the required cut. This is especially productive when removing large amounts of material.



Model	000BTT	00BTT	0BTT	2BTT
Ordering Number	112474	112475	112476	112477
<i>Dimensions</i>				
Turning Capacity	5/64 to 3/8	3/32 to 3/8	5/32 to 5/8	3/16 to 7/8
A	5/8	5/8	3/4	1
B	7/16	7/16	3/4	1
C	1-1/4	1-5/16	1-11/16	2-7/16
D	1-3/8	1-3/8	1-1/2	2
E	1-3/4	2-1/8	2-3/4	2-1/8
F	1-5/8	1-13/16	2-1/2	2-7/8
G	1-3/8	1-3/8	2	2-13/16
H	3/8	3/8	3/8	9/16
Tool Bit Size (Sq.)	1/4	1/4	3/8	1/2

Replacement Parts

Body	112478	112479	112480	112481
Tool Bit Holder	5702A	5002A	5102-A	5202
Adjusting Screw	5734	7406	5134	5234
Tool Bit Lock Screw	5737	5037	5137	5237
Holder Lock Screw	5035	5035	5135	5235
Tool Bit	5045	5045	5145	5245
Lock Screw Washer	5743	5043	5143	5243
Bushing Lock Screw	1210	1210	6344	5244

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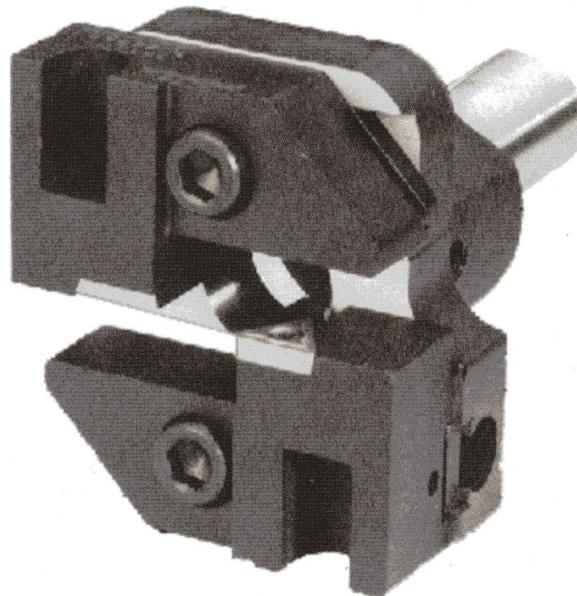
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Model BTT-C

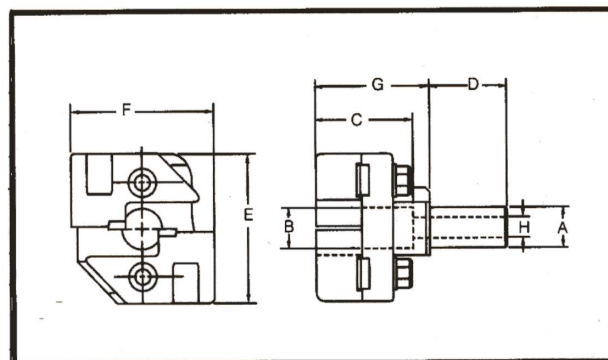
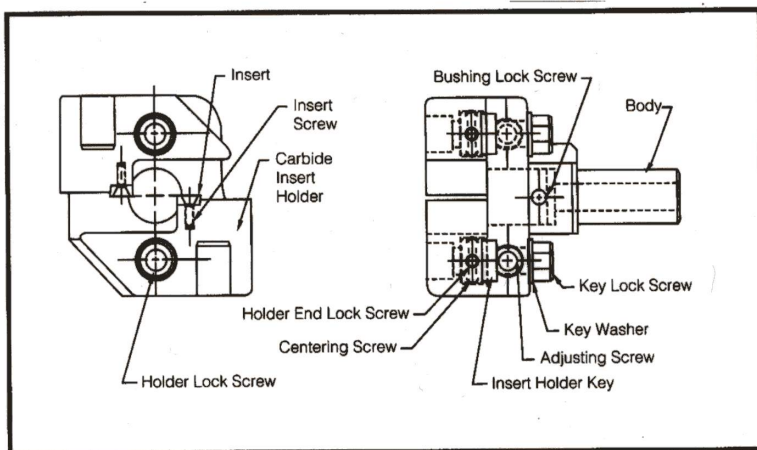
Carbide Balanced Turning Tool

Balanced turning tools are used in the turrets of screw machines and turret lathes, and CNC lathes, and are the best tools for rough turning. Balanced turning tools will remove a greater amount of material than any other turning tool available because of the rugged construction and two carbide cutting tools. Tools are always on center line, and the two-axis adjustment compensates for any misalignment between turret and workpiece. Adjustment is easily made by a fine adjusting screw to align the insert and correct misalignment between turret and workpiece. The disposable carbide inserts are indexable with three cutting edges per insert and can be easily replaced in minutes by simply loosening the insert screw and inserting a new carbide insert. The new insert is automatically returned to the center line position and requires little or no adjustment to return to the proper turning diameter.



Approximately 80 percent of the material can be removed with one cutter, and the remaining material with the other cutter for finish turning. For rough turning, the cutter may be set so each insert removes only one-half of the required cut. This is especially productive when removing large amounts of material.

Standard carbide inserts have $1/64$ " radius on corners. Carbide inserts with $1/32$ " radius are also available. The inserts may be set in different manners, depending on the nature of the work and the material, and on the preference of the operator.



Model	00BTT-C	0BTT-C	2BTT-C
Ordering Number	94600	94700	94800

Dimensions

Turning Capacity	.09 -.38	.16-.63	.25-.88
A	0.63	0.75	1
B	0.44	0.75	1
C	1.38	1.81	2.44
D	1.38	1.50	2
E	2.12	2.75	3.12
F	1.81	2.50	2.88
G	1.53	2.50	2.96
H	0.38	0.38	0.56

Replacement Parts

Body	112479	112480	112481
Holder, Carbide Insert***	94604	94704	94804
Adjustment Screw (2 Reqd.)	7406	5134	5234
Insert Holder Key	51205	51305	51405
Key Lock Screw	51208	51308	51408
Key Washer	5043	5143	5243
Holder Lock Screw***	51209	51309	51409
Holder End Lock Screw	51214	51314	51314
Centering Screw	51213	51313	51413
Insert Lock Screw***	113223	113223	113224
Carbide Inserts***	113272	113272	113230
Wrench, Torx Lock***	113225	113225	113226
Bushing Lock Screw	5044	6344	5244

*** Included in Replacement Block Kit
2 blocks required for each tool

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Drill & Reamer Holders

Model D

Floating

Floating holders are used for holding drills, reamers, and other cutting tools in screw machines, turret lathes, CNC lathes, and CNC turning centers.

These holders are designed with full floating feature to correct the misalignment that so often occurs between tool and workpiece.

The holder floats freely on a ball bearing operating between hardened, ground, highly-polished rolls which provide automatic radial adjustment to insure alignment of the cutting tool with a previously drilled hole, eliminating chatter, bell-mouthed, and egg-shaped holes. Adjustment is quick and easy with a simple spanner nut. Boyar-Schultz SMT Model D Floating Reamer Holder is also adaptable for floating drills on special drilling operations.

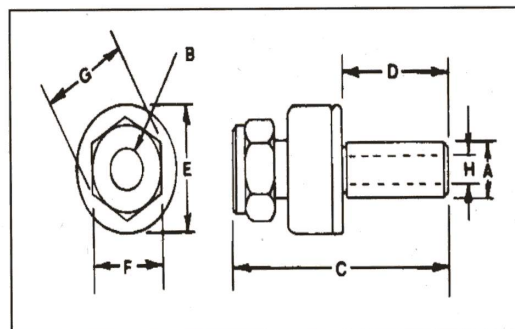
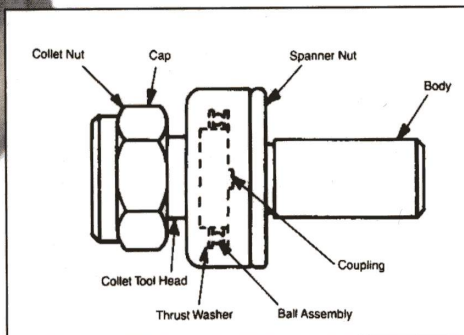
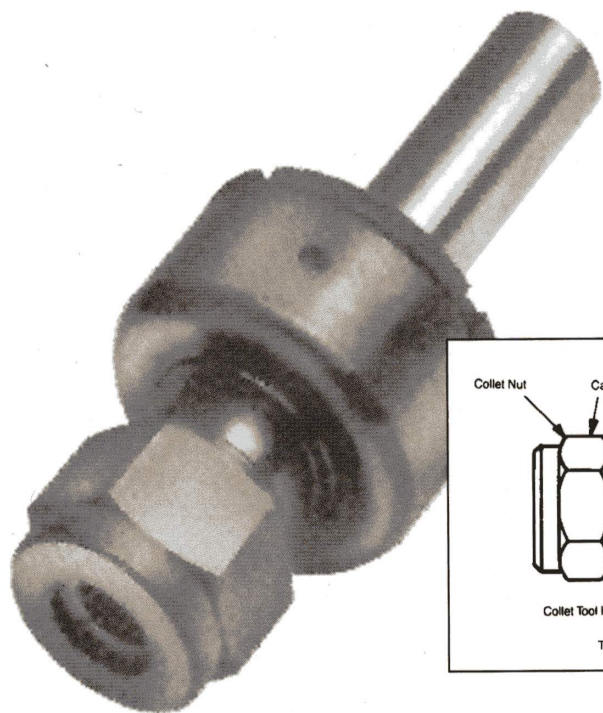
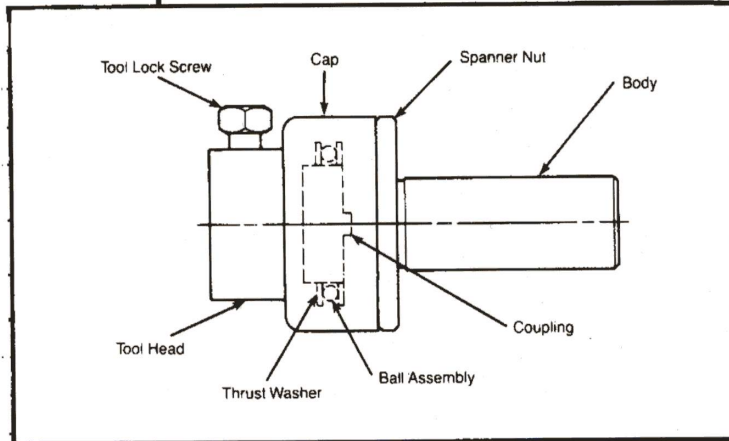
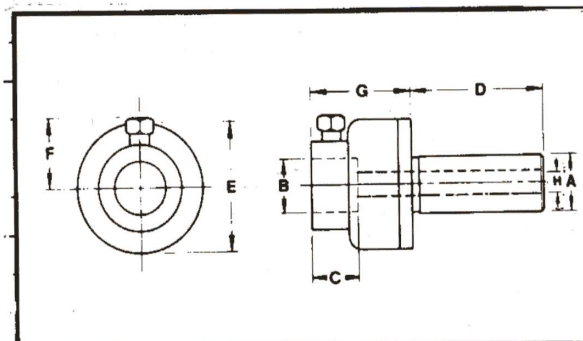
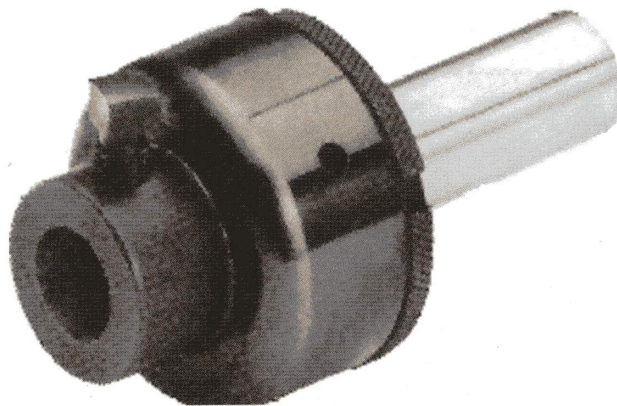
Bushings can be utilized to accept various size tool shanks.

The full-floating collet type holder provides Boyar-Schultz SMT reliability with the added feature of replaceable double-angle collets.

This new design allows for retrofitting of the older Model D floating holder. The nosepiece assembly will fit current holder, and they can be converted in the customer's plant in less than three minutes.

Model DC

Floating Collet Type



Model DCR

Retrofit Kit – Includes Head & Collet Nut Assembly

Model	000D	00D	0D	2D	3D	4D **
Ordering Number	7675A	7700A	7725A	7750A	8000A	8025A
<i>Dimensions</i>						
A	5/8	5/8	3/4	1	1-1/4	1-1/2
B	1/4	1/2	5/8	1	1	1-1/4
C	9/16	5/8	13/16	15/16	1-1/2	1-1/2
D	1-3/8	1-3/8	2-1/8	2-1/2	4	4
E	1-3/8	1-5/8	2	2-5/16	3-3/8	3-3/8
F	5/8	13/16	1-1/16	1-5/16	1-3/4	1-3/4
G	1-7/16	1-9/16	1-13/16	2	2-7/8	2-7/8
H	.31	.34	.41	.53	.78	.78
<i>Replacement Parts</i>						
Tool Head	7676A	7701A	7726A	7751A	8001A	8026A
Body	7682	7707	7732	7757	8007	8032
Top Lock Screw	7677	7702A	7727	7752	8002	8027
Cap	7678A	7703A	7728A	7753A	8003A	8003A
Spanner Nut	7681	7706	7731	7756	8006	8006
Coupling	7679A	7704A	7729A	7754A	8004A	8004A
Thrust Washer (2 Req'd.)	7683	7708	7733	7758	8010	8010
Ball Assembly	7680	7705	7730	7755	8009	8009

Model	000DC	00DC	0DC	2DC	3DC	4DC**	5DC**	6DC**
Ordering Number	113180	113181	113182	113183	113184	113185	113186	113187
<i>Dimensions</i>								
A	5/8	5/8	3/4	1	1-1/4	1-1/2	1-3/4	2
B	1/32-1/4	3/64-25/64	3/64-9/16	1/32-3/4	1/32-3/4	1/32-3/4	3/32-1	3/32-1
C	3-3/8	3-5/8	4-3/4	5-7/16	7-1/8	7-1/4	8-5/8	8-5/8
D	1-3/8	1-3/8	2-1/8	2-1/2	4	4	5	5
E	1-3/8	1-5/8	2	2-5/16	3-3/8	3-3/8	3-7/8	3-7/8
F	11/16	1	1-1/4	1-1/2	1-1/2	1-1/2	2-1/4	2-1/4
G	.79	1.16	1.42	1.72	1.72	1.72	2-1/2	2-1/2
H	.31	.34	.41	.53	.78	.78	.91	.91
Collet Size	300	200	100	180	180	180	400	400

** 4DC, 5DC & 6DC are special and have 1.0" diameter maximum capacity

Model	000DCR	00DCR	0DCR	2DCR	3DCR	4DCR*	5DCR*	6DCR*
Ordering Number (Kit)	113210	113211	113212	113213	113214	113214	113215	113215
<i>Replacement Parts</i>								
Collet Nut Assy.	113195	113196	113197	113199	113199	113199	113198	113198
Collet Tool Head	113190	113191	113192	113193	113194	113194	113189	113189

* Collets are not supplied with tool holder. They can be ordered separately by collet size and I.D. size.

** Sizes 4, 5 & 6 D & DC are non-stock tool—made to order.

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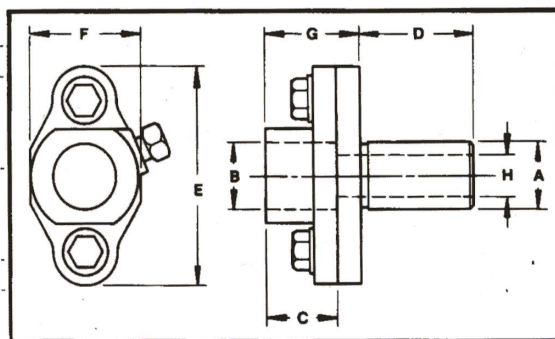
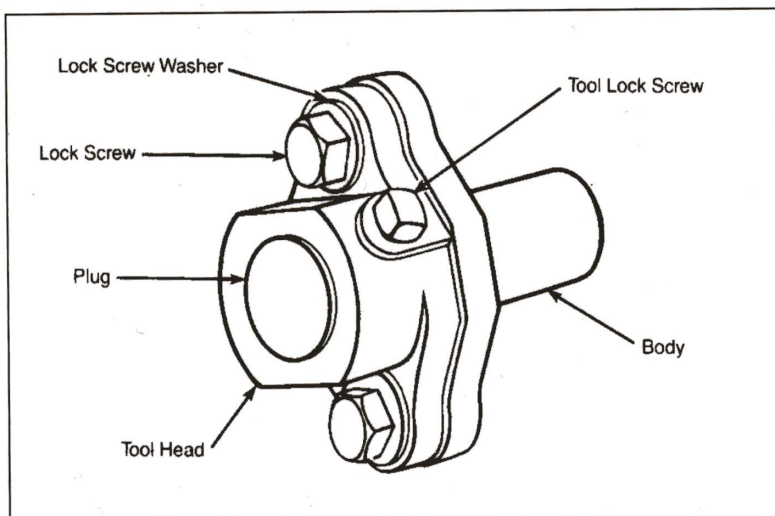
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Drill & Reamer Holders

Model DRH

Adjustable

Adjustable holders are used for holding drills, reamers, and other cutting tools in screw machines, turret lathes, and CNC lathes. This precision holder is adjustable to accurately align the cutting tool with the workpiece. The cutting tool is mounted directly in the tool head or in a bushing supplied with the holder, which can be machined to accept various size tool shanks. Rugged construction is designed to take the strain of heavy production runs. Available in long and short shank lengths.



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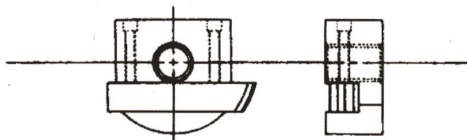
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Model Ordering Number	00DRH/S 7770	00DRH/L 7776	0DRH 7780	2DRH/S 7790	2DRH/L 7796
<i>Dimensions</i>					
A	5/8	5/8	3/4	1	1
B	1/2	1/2	5/8	1	1
C	5/8	5/8	13/16	1-1/8	1-1/8
D	1-1/8	1-7/16	2	1-3/4	2-1/2
E	1-15/16	1-15/16	2-5/8	3-1/4	3-1/4
F	1	1	1-1/4	1-3/4	1-3/4
G	7/8	7/8	1-1/8	1-1/2	1-1/2
H	3/8	3/8	7/16	5/8	5/8
<i>Replacement Parts</i>					
Tool Head	7772A	7772A	7782	7792	7792
Body	7771A	7777A	7781	7791	7797
Top Lock Screw	7702A	7702A	7727	7793	7793
Lock Screw (2 Reqd.)	7774	7774	7784	7794	7794
Lock Screw Washer (2 Reqd.)			7785	7795	7795
Plug	7779	7779	7789	7799	7799

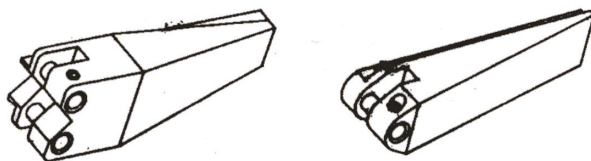
FLAT FORM TOOL CIRCULAR HOLDER



CAT. NO.	MACHINE SIZE	HOLE	TOOL BIT
1800	#00	3/8-16	5/16 sq.
1820	#0	1/2-13	3/8 sq.
1830	#2	5/8-11	1/2 sq.
1860	Dav.	9/16-REAM	3/8 sq.

STICK TOOL HOLDER. READY TO ACCEPT YOUR GROUND OR WIRED FLAT TOOL. A MUST FOR SHORT RUNS AND FAST DELIVERIES. TOOL BIT NOT INCLUDED.

VERTICAL SLIDE KNURL HOLDERS



CAT. NO.	MACHINE	SINGLE OR DOUBLE	KNURL
SVS 8	00	Single	1/2 x 3/16 x 3/16
DVS 8	00	Double	1/2 x 3/16 x 3/16
SVS 11	0-2G	Single	3/4 x 3/8 x 1/4
DVS 11	0-2G	Double	3/4 x 3/8 x 1/4

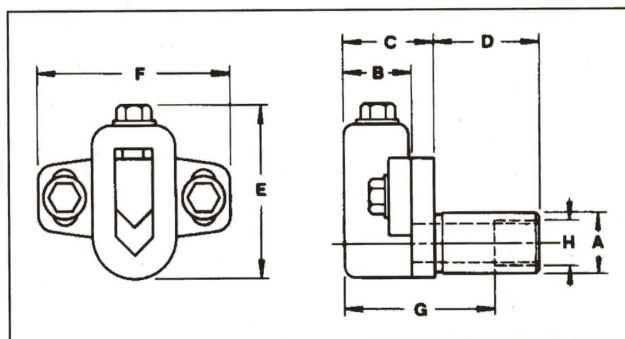
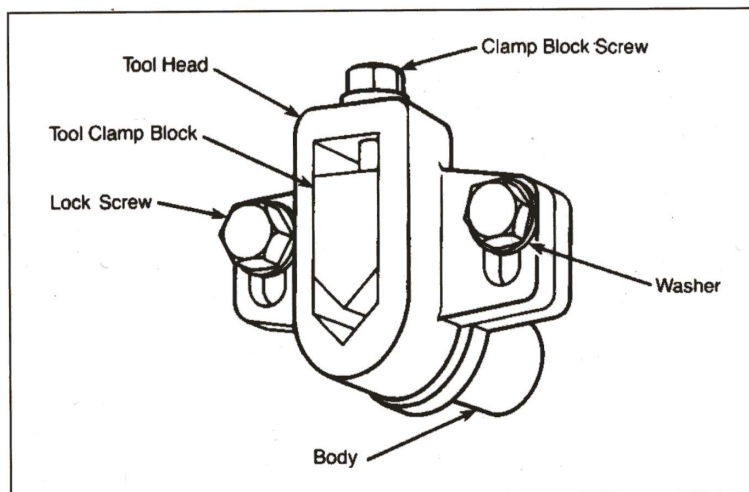
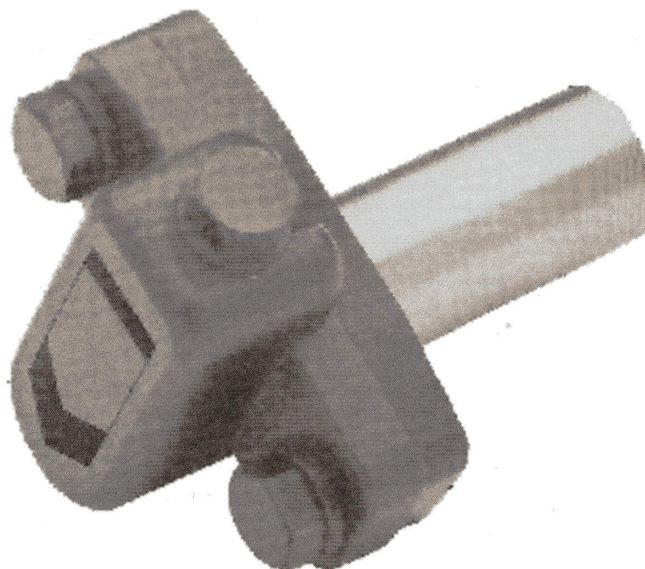
HOLDERS ARE PROVIDED WITH CARBIDE PIN. KNURLS NOT INCLUDED. A UNIQUE OPPORTUNITY TO USE YOUR VERTICAL SLIDE FOR KNURLING OR BURNISHING.

Drill & Reamer Holders

Model U

Universal Adjustable

Universal adjustable holders are used for holding drills, reamers, and other cutting tools in screw machines, turret lathes, and CNC lathes. This precision holder is adjustable to accurately align the cutting tool with the workpiece. A single holder will accommodate any diameter tool shank within its capacity without the need for bushings. Uniform clamping pressure of the clamping block on the full length of the tool shank provides the most effective means of retaining the cutting tool. The end of the shank is tapped to accept a stop screw, permitting fine adjustment of the cutting tool without disturbing set-up. Available in long and short shank lengths.



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Model	00U/SA	00U/LA	00U/LB	0U/A	0U/B	2U/SA	2U/LA	2U/LB
Ordering Number	9325	9340	9342	9350	9360	9375	9385	9387
<i>Dimensions</i>								
Tool Capacity	0 to 1/4	0 to 1/4	1/4 to 1/2	0 to 5/16	5/16 to 5/8	0 to 1/2	0 to 1/2	1/2 to 1
A	5/8	5/8	5/8	3/4	3/4	1	1	1
B	5/8	5/8	5/8	13/16	13/16	1-1/8	1-1/8	1-1/8
C	13/16	13/16	13/16	1-1/8	1-1/8	1-1/2	1-1/2	1-1/2
D	1-1/8	1-7/16	1-7/16	2	2	1-3/4	2-1/2	2-1/2
E	1-5/8	1-5/8	1-7/8	2	2-5/16	2-3/4	2-3/4	3-1/8
F	1-11/16	1-11/16	1-11/16	2-1/4	2-1/4	3	3	3
G	1-3/16	1-1/2	1-1/2	2-3/8	2-3/8	2-1/2	3-1/4	3-1/4
H	7/16-14	7/16-14	7/16-14	1/2-20	1/2-20	3/4-16	3/4-16	3/4-16
<i>Replacement Parts</i>								
Tool Head	9331	9331	9333	9356	9357	9381	9381	9382
Body	9326	9332	9332	9351	9351	9376	9383	9383
Tool Clamp Block	9327	9327	9334	9352	9358	9377	9377	9384
Clamp Block Screw	9328	9328	9335	9353	9359	9379	9379	9379
Lock Screw (2 Req'd.)	9329	9329	9329	7821	7821	7871	7871	7871
Washer (2 Req'd.)	5743	5743	5743	7820	7820	6442	6442	6442

Adjustable Knee Turners

Our newest time saving toolholder, the Adjustable Knee Turner, saves valuable production time and takes the guesswork out of adjustments.

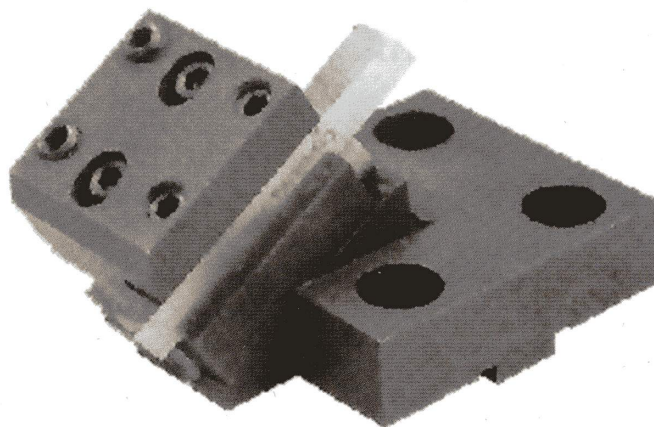
Adjusts from either side

Travel of .125"

Allows for microfine adjustments

A variety of sizes fit National Acme's Automatic screw Machines and many flat slide turret machines.

Machine Size	Part Numbers	Tool Bit Size
9/16 & 1.0"	93000	1/2"
1-1/4	93025	1/2"
1-5/8"	93050	5/8"
2-5/8"	93075	5/8"



Type III Turrets Only

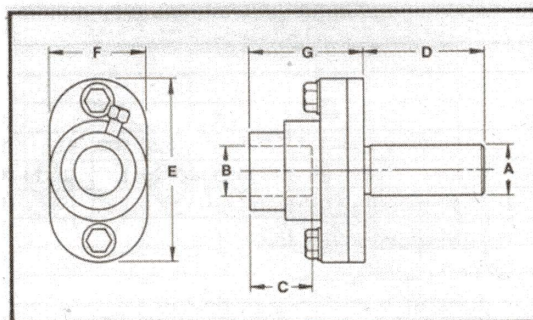
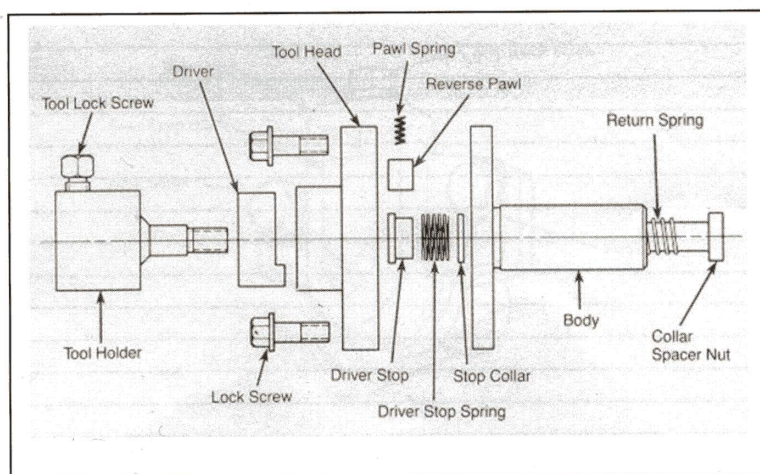
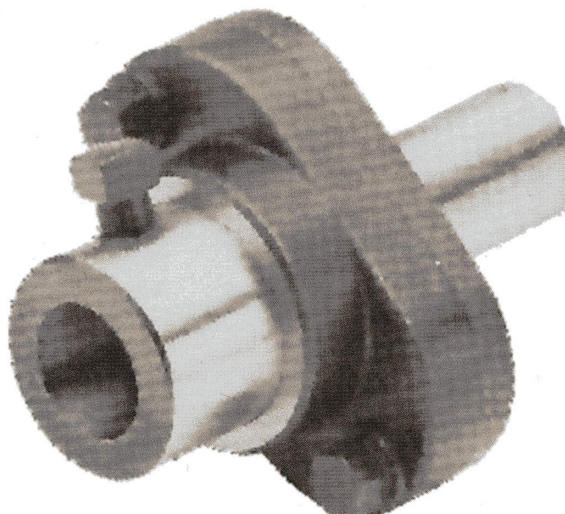
Tap Holders

Model AR

Adjustable Releasing

Adjustable releasing tap holders are used in screw machines, turret lathes, CNC lathes, and reversing spindle automatic screw machines. The tap is mounted in the tool holder directly or in a bushing; the holder assembly is adjustable to accurately align the tap with the workpiece. After it is started into the workpiece, the tap leads itself to a preset depth and draws the tool holder out of drive engagement with the tool head assembly, which permits the holder to rotate freely with the workpiece. Spindle reversal re-engages the tool holder, withdrawing the tap from the hole, and returns the tool holder to its original position.

The tool is easily changed from right to left-hand operation with a simple adjustment.



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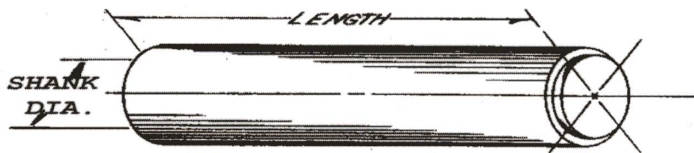
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Model Ordering Number	00AR 6000	0AR 6025	2AR 6050	3AR 6075
<i>Dimensions</i>				
Tool Capacity				
A	5/8	3/4	1	1-1/4
B	1/2	5/8	1	1
C	3/4	15/16	1-5/16	1-3/16
D	1-1/8	2	2-1/2	3-1/4
E	2	2-7/16	3-7/16	4
F	1-1/8	1-3/8	2	2-1/4
G	1-3/8	1-11/16	2-3/8	2-5/8
Pull Out	3/32	1/8	1/8	1/8
<i>Replacement Parts</i>				
Tool Head	6001	6026	6051A	6076
Body	6002	6027	6052	6077
Tool Holder	6003A	6028A	6053A	6078
Tool Lock Screw	5810	6038	6063	6088
Lock Screw (2 Reqd.)	6005	6030	6055	6080
Driver	6004	6029	6054	6079
Driver Stop	6008	6033	6058	6083
Driver Stop Spring	6009	6034	6059	6084
Reverse Pawl (2 Reqd.)	6006	6031	6056	6081
Pawl Spring (2 Reqd.)	6007A	6032A	6057A	6082A
Stop Collar	6010	6035	6060	6085
Collar Spacer Nut	6012	6037	6062	6087
Return Spring	6011A	6036A	6061A	6086A

**GROUND TOOL BITS &
STOCK STOP - CIRCULAR TOOL HOLDER**



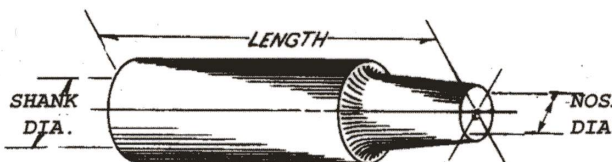
CARBIDE FACED STOCK STOP



CAT NO.	SHANK DIA.	LENGTH
1460	5/8	2
1490	5/8	2-3/4
1520	3/4	2-1/2
1550	3/4	3-5/8
1660	1	2-7/8
1680	1	4-5/16

MADE WITH ALL USA PRODUCTS. PUNCH GRADE CARBIDE INSERT ALLOWS YEARS OF RUNNING WITH LITTLE OR NO WEAR.

SOLID STEEL FACED STOP



CAT. NO.	SHANK DIA.	LENGTH	NOSE DIA.
1102	5/8	2	1/4
1140	5/8	2-1/2	1/4
1250	3/4	2-3/4	5/16
1280	3/4	3-1/4	5/16
1310	1	3-1/4	3/8
1330	1	4	3/8

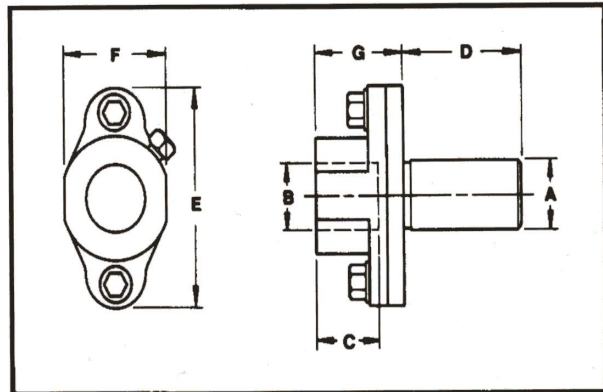
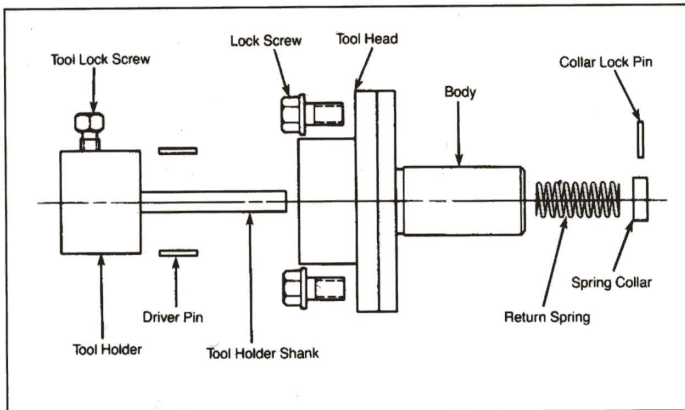
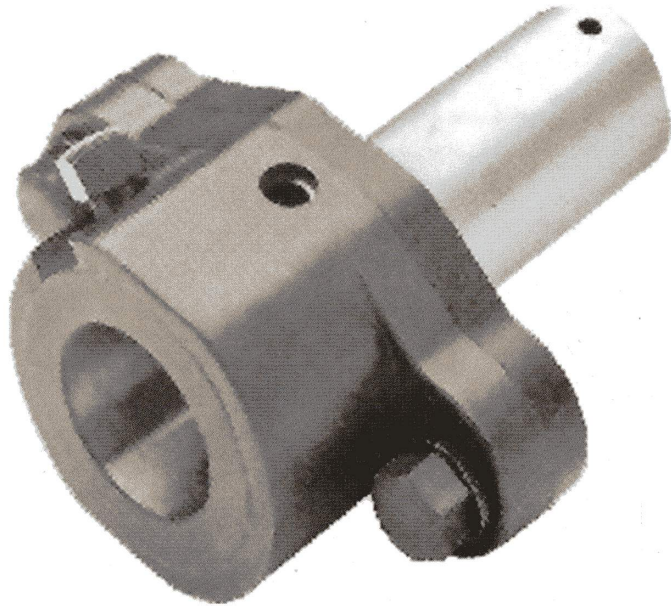
ECONOMICAL TOOL STEEL STOCK STOP, HARDENED AND GROUND FOR YEARS OF USE.

Tap Holders

Model AT

Adjustable Non-Releasing

Adjustable non-releasing tap holders are used in reversing spindle automatic screw machines and CNC lathes. The tap is mounted in the tool holder directly or in an appropriately sized bushing. The tool holder assembly is adjustable to accurately align the tap with the workpiece. The non-rotating tool holder is free to move axially, permitting the tap to lead itself after being started in the workpiece. Automatic spindle reversal withdraws the tap from the hole and a spring draws the tool holder back into the head when the tap clears the workpiece.



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Model	00AT	0AT	2AT
Ordering Number	5800	5825	5850

Dimensions

Tool Capacity

A	5/8	3/4	1
B	1/2	5/8	1
C	5/8	7/8	1-1/16
D	1-1/8	1-1/2	2
E	1-15/16	2-5/8	3-1/4
F	1	1-1/4	1-3/4
G	1	1-7/16	1-1/2

Replacement Parts

Tool Head	5801	5826	5851
Body	5803A	5828	5853
Tool Holder	5802A	5827A	5852A
Tool Lock Screw	5810	5835	7727
Lock Screw (2 Req'd.)	5804	5829	5854
Driver Pin (2 Req'd.)	5809	5834	5859
Tool Holder Shank	5812	5837	5862
Return Spring	5805	5830	5855
Spring collar	5807	5832	5857
Collar Lock Pin	5808	5833	5858
Pull Out	.200	1/4	5/16

Model C**Model 3KN****Model 3RR*****Burnishing and Knurling Tool***

This tool is ideal for use where a surface smoother than the usual machined finish is required. It is a rugged, easily-adjusted burnishing tool. In many instances it may be used to eliminate an extra operation.

Hardened adjustable rollers* exert pressure on the work surface to smooth out fine lines left by the turning tool.

Diameter reductions are minimal and depend upon material, work diameter, and surface condition:

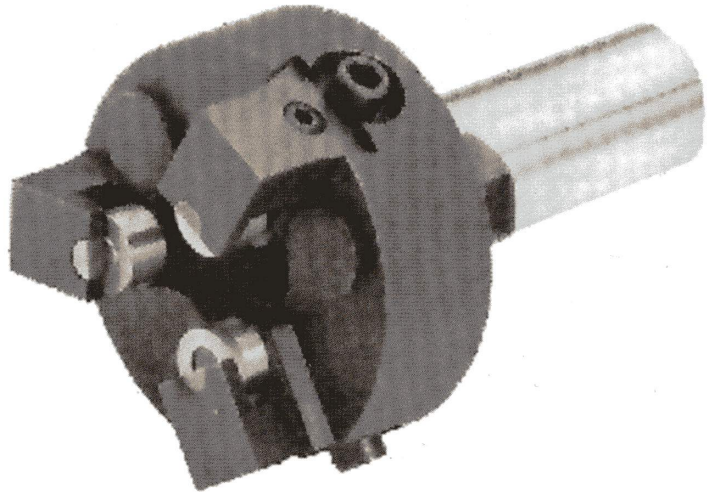
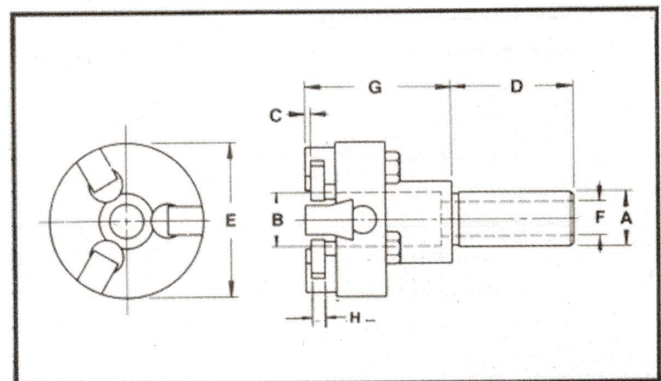
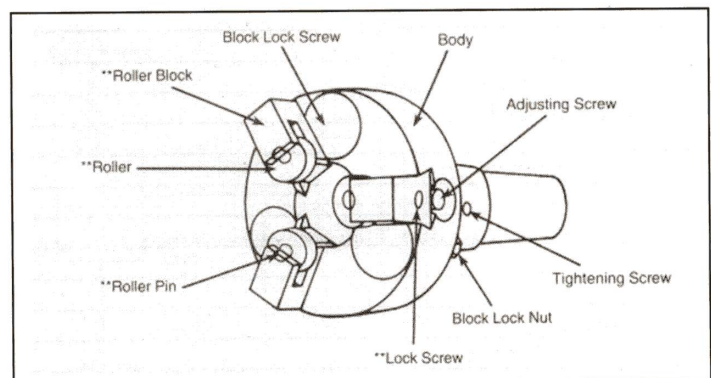
Stainless steel	.0004 to .0006
Cold drawn steel	.0006 to .0008
Bronze	.0007 to .0009

This tool can also be used for knurling by replacing the burnishing rollers and with knurling block assemblies.

* Rollers taper to a smaller diameter toward the shank end.

3 Roller

Roller rests are used in screw machines and turret lathes to provide support for a workpiece undergoing a cross slide operation. Hardened, precision free-turning rollers eliminate galling and marring of the workpiece. With a third roller, you get more stability and less chatter. Rollers are individually adjustable to compensate for workpiece misalignment and wear. A third roller rest gives more stability to the workpiece when cutting long pieces.

**** In Roller Block Assembly**

Model	OOC	OC	2C	003KN	03KN	2-3KN	003RR	03RR	2-3RR
Ordering Number	7400	7425	7450	113346	113347	113348	112152	112153	112154
<i>Dimensions</i>									
Diameter	1/16-3/8	3/32 to 9/32	1/8-15/16	1/16-3/8	3/32-19/32	1/8-15/16	1/16-9/32	3/32-19/32	1/8-15/16
Length	1-7/32	1-19/32	2-15/32	1-7/32	1-19/32	2-15/32	1-7/32	1-19/32	2-15/32
A	5/8	3/4	1	5/8	3/4	1	5/8	3/4	1
B	7/16	5/8	1	7/16	5/8	1	7/16	5/8	1
C	3/32	3/32	3/32	3/32	3/32	3/32	3/32	3/32	3/32
D	1-1/2	2-5/16	2-5/16	1-1/2	2-5/16	2-5/16	1-1/2	2-5/16	2-5/16
E	1-11/16	2-1/2	2-7/8	1-11/16	2-1/2	2-7/8	1-11/16	2-1/2	2-7/8
F	5/16	1/2	5/8	5/16	1/2	5/8	5/16	1/2	5/8
G	1-7/16	1-7/8	2-3/4	1-7/16	1-7/8	2-3/4	1-7/16	1-7/8	2-3/4
H	3/16	1/4	1/4	3/16	1/4	1/4	3/16	1/4	1/4
Roller Diameter	5/16	1/2	5/8	1/2	5/8	5/8	5/16	1/2	5/8
<i>Replacement Parts</i>									
Body	7401	7426	7451	7401	7426	7451	7401	7426	7451
Block Lock Screw (3)	7404	7429	7454	7404	7429	7454	7404	7429	7454
Block Lock Nut (3)	6232	6332	6332	6232	6332	6332	6232	6332	6332
Block Adj. Screw (3)	7406	7431	7456	7406	7431	7456	7406	7431	7456
Lock Screw (3 Req'd.)	7407	5039	5039	7407	5039	5039	7407	5039	5039
Tightening Screw	7408	7408	6444	7408	7408	6444	7408	7408	6444
Roller Block Screw	7409	5039	5039	7409	5039	5039	7409	5039	5039
<div> <i>Parts for Burnishing</i> <i>Parts for Knurling</i> <i>Parts for 3 Roller Rest</i> </div>									
Roller Block	7402	7427	7452	7412	7437	7452	7402	7427	7452
Roller	5020	5120	5220				112066	112068	112067
Roller Pin	5025	5125	5225	7415	5125	5225	5025	5125	5225
Straight Knurl				7818 (35TPI)	7868 (29TPI)	7868 (29TPI)			

	<i>Roller Block Assembly**</i>		<i>Roller Pin Assembly**</i>		
Burnishing Tool*	7410	7435	7460	105163	105164
Knurling Tool*	113334	113335	113336	113337	113338
Roller Rest*	113340	113341	113342	113343	113344
				105165	113339
					113345

* 3 Required for each tool.

** See page 45 for complete list of assembly parts.

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Model K

Swing Tool

A knurling tool is designed to operate from the screw machine turret. The knurling action is developed from the front cross slide working against the lever arm of the tool, moving both knurling arms from open position to the correct knurled diameter.

The design of this tool makes place knurling at various lengths possible. Knurling between and behind shoulders of small pieces is accomplished with Model K Knurling Tool with no bending or distortion.

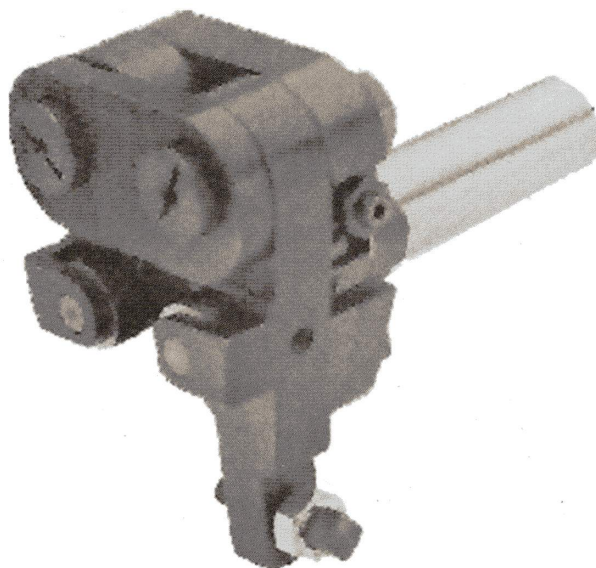
Adjustable lever mounting plate compensates for any misalignment between turret and work.

Capacity:

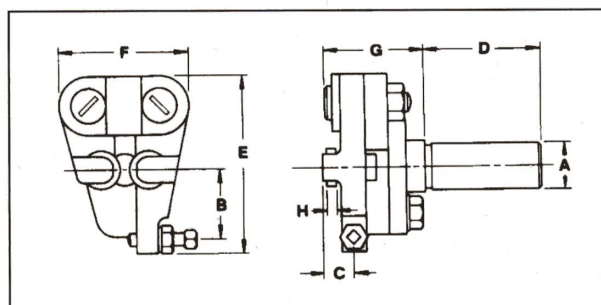
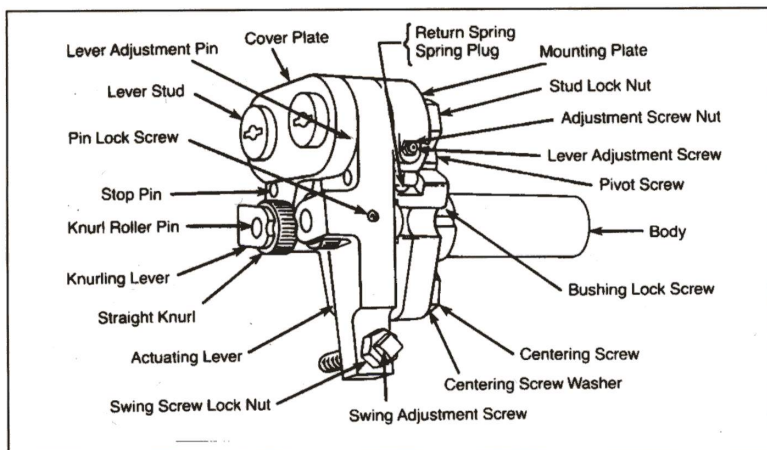
Model 00K from 3/64" to 3/8"
maximum

Model 0K from 3/16" to 5/8"
maximum

Model 2K from 1/4" to 7/8"
maximum



Made of high quality materials and to the high standard of workmanship of Boyar-Schultz SMT. All parts are hardened and ground. Model K Knurling Tool is a time saver in any screw machine shop.



Model Ordering Number	00 K 7800	0 K 7850	2 K 7900
<i>Dimensions</i>			
Capacity	3/8" dia..-15/16" max. length - stock diameters 5/16" and under can be fed thru shank of tool.	5/8" dia..-23/32" max. length - stock diameters 3/8" and under can be fed thru shank of tool.	7/8" dia..-25/32" max. length - stock diameters 5/8" and under can be fed thru shank of tool.
A	5/8	3/4	1
B	15/16	1-3/8	1-1/2
C	7/16	5/8	11/16
D	1-11/16	2-1/16	2-5/8
E	2-7/16	3-5/16	3-13/16
F	1-11/16	2-1/4	2-3/4
G	1-9/16	2	2-3/16
H	3/16	1/4	1/4
Knurl Diameter	1/2	5/8	3/4
<i>Replacement Parts</i>			
Body	7801	7851	7901
Knurling Lever	7824	7874	7904
Actuating Lever	7823	7873	7903
Mounting Plate	7802	7852	7902
Cover Plate	7805	7855	7905
Lever Stud (2 Req'd.)	7806	7856	7906
Stud Lock Nut (2 Req'd.)	6332	6383	7920
Swing Adjustment Screw	7815	7815	7915
Swing Screw Lock Nut	6232	6232	6332
Return Spring	7810	7860	7910
Spring Plug (2 Req'd.)	7809	7859	7909
Stop Pin (2 Req'd.)	7812	7862	7912
Centering Screw	7821	7871	7921
Centering Screw Washer	7820	7870	7922
Lever Adjustment Pin	7812	7862	7911
Lever Adjustment Screw	5039	7863	7913
Adjustment Screw Nut	7819	7869	7869
Pivot Screw	7817	7867	7917
Straight Knurl (2 Req'd.) Standard	7818 (35 TPI)	7868 (29 TPI)	7918 (25 TPI)
Knurl Roller Pin (2 Req'd.)	7808	7858	7908
Pin Lock Screw (2 Req'd.)	7814	7814	6234
Bushing Lock Screw	637084	5044	6344
<i>Optional Parts</i>			
Carbide Roller Pin	7808C	7858C	7908C
Long Roller Pin	7808B	7858B	7908B

* Special Knurls Available (Quoted)

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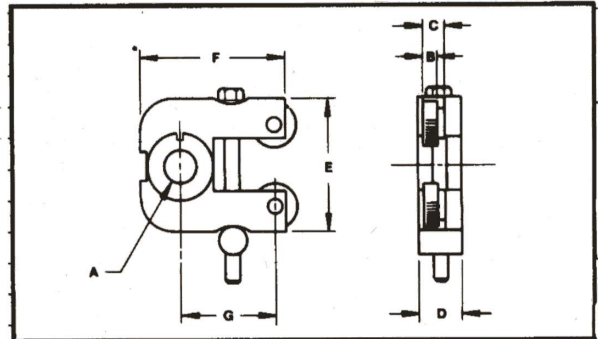
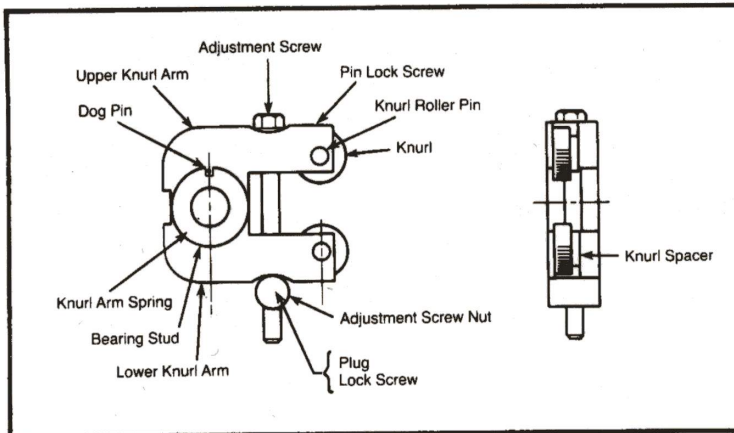
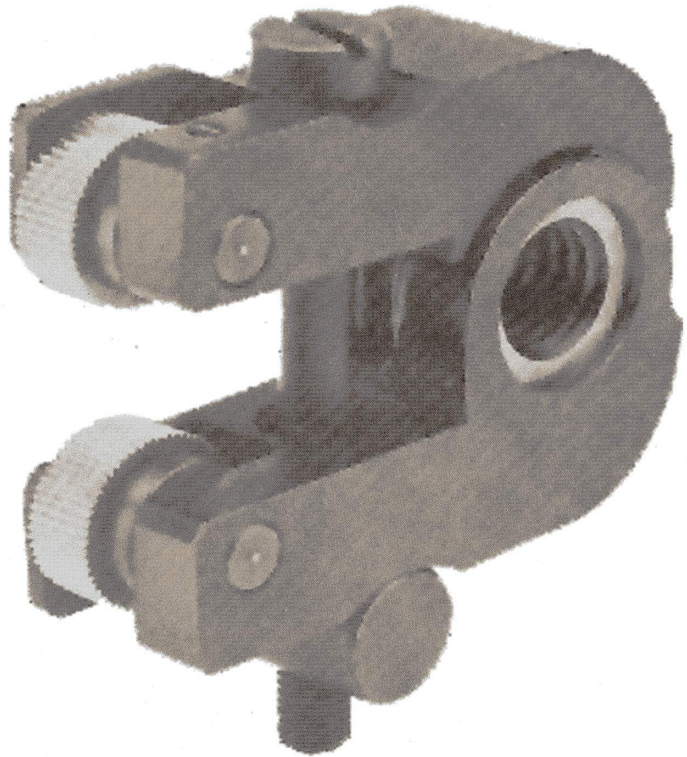
Model SK

Cross Slide

Cross slide Knurling tools are used on single-spindle screw machines, multi-spindle screw machines, turret lathes, and CNC lathes.

This tool has a floating, self-centering design to compensate for any center misalignment, and can be mounted on either front or back tool posts in the same manner as circular form tools.

Simple and easy to adjust, its design permits knurling and thread rolling close to the collet, and dual rollers provide support for the workpiece, eliminating the need for an auxiliary support tool.



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Model	00SK	0SK	2SK
Ordering Number	8900	8925	8950
<i>Capacity</i>	<i>Dimensions</i>		
	0 to 1/2	0 to 3/4	1/8 to 1-1/4
A	3/8 - 16	1/2 - 13	5/8 - 11
B	3/16	1/4*	1/4*
C	3/16	3/8	3/8
D	5/8	3/4	3/4
E	1-1/2	1-3/4	2-1/4
F	1-13/16	2-3/16	2-1/2
G	1-5/32	1-7/16	1-5/8
Knurl Diameter	1/2	5/8	3/4
<i>Replacement Parts</i>			
Lower Knurl Arm	8901	8926	8951
Upper Knurl Arm	8902	8927	8952
Bearing Stud	8903	8928	8953
Knurl Arm Spring	8908	8934	8956
Dog Pin	8907	8932	8932
Adjustment Screw	8905A	8930A	8954A
Adjustment Screw Nut	8909	8933	8933
Plug	8911	8911	8911
Lock Screw	8912	8935	8935
Knurl Roller Pin (2 Req'd.)	8904	8929	8929
Pin Lock Screw (2 Req'd.)	8910	8910	8910
Straight Knurl (2 Req'd.)	7818 (35TPI)	7868 (29 TPI)	7918 (25 TPI)
Knurl Spacer (2 Req'd.)		8955	8955
Optional Part			
Carbide Roller Pin	8904C	8929C	8929C

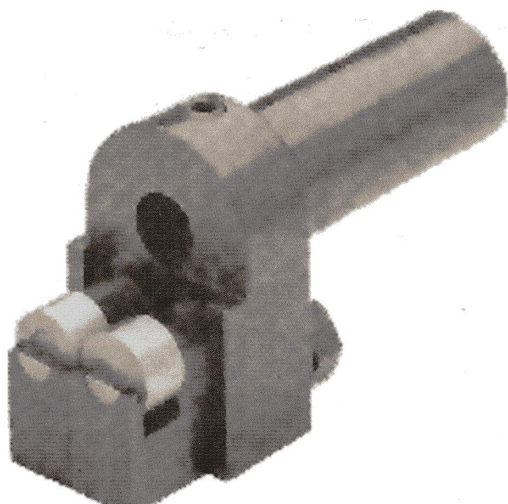
* Standard with tool. Tool will accept 3/8" wide knurls.

Roller Rests

Model RR

2 Roller

Roller rests are used in screw machines, turret lathes, and CNC lathes to provide support for a workpiece undergoing a cross slide operation. Hardened, precision free-turning rollers eliminate galling and marring of the workpiece. Rollers are individually adjustable to compensate for workpiece misalignment and wear. The end of the shank is tapped to accept a stop screw to permit adjustments without disturbing tool set-up.



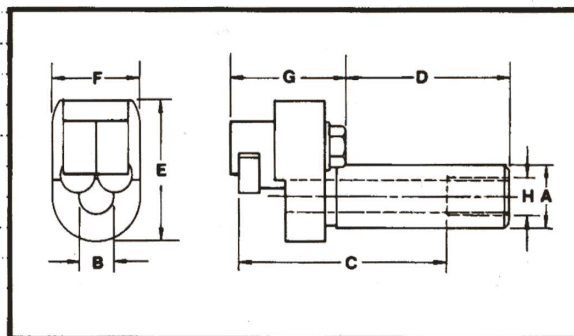
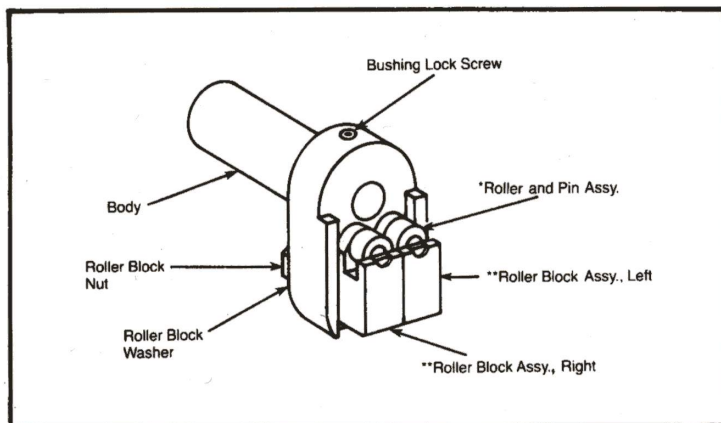
Model	OORR	ORR
Ordering Number	5500	5525
<i>Dimensions</i>		
Support Capacity	3/32 to 1/2	1/4 to 5/8
A	5/8	3/4
B	5/16	3/8
C	1-15/16	2-1/16
D	1-1/2	1-7/16
E	1-1/2	1-11/16
F	1	1-1/16
G	1-3/16	1-1/2
H	3/8 - 24	7/16 - 20

Replacement Parts

Body	5501A	5526
Roller Block Assy., Right**	5506	5531
Roller Block Assy., Left**	5507	5532
Roller Block Nut (2 Reqd.)	7869	6232
Roller Block Washer (2 Reqd.)	5511	5743
Bushing Lock Screw	6234	6344
Roller and Pin Assy.*	105197	105198

* Included in Roller Block Assy. See page 45 for complete list of parts.

** Roller Block Assy. Consists of Roller Block, Roller Pin, and Lock Screw.



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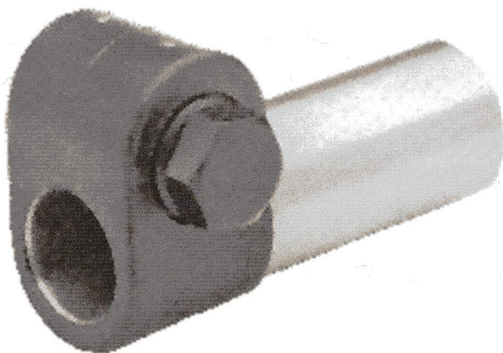
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Model H

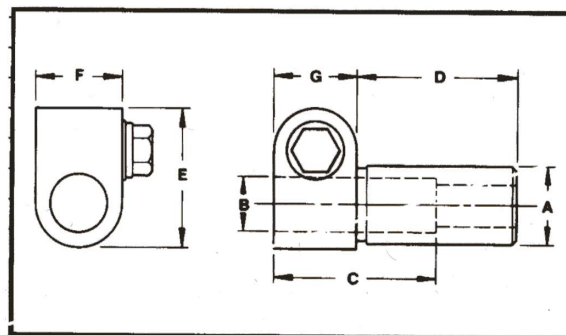
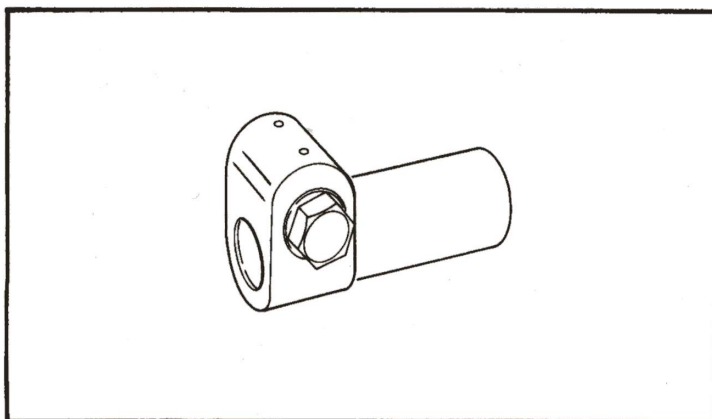
Precision Tool Adapter



Precision tool adapters are used in screw machines, turret lathes, and CNC lathes. The precision adapter is designed to allow the use of turret tools in machines larger than those for which the tools were designed. The adapter is of particular advantage when working on small diameters or on long pieces where interferences occur with larger-size tools built for a particular machine. The adapter permits the use of smaller-diameter shank tools in machines with larger shank capacities.

Model	00 / 0H	00 / 2H	0 / 2H
Ordering Number	8525	8550	8575
<i>Dimensions</i>			
A	3/4	1	1
B	5/8	5/8	3/4
C	1-7/16	1-1/2	2-1/16
D	1-1/2	2	2
E	1-7/16	1-3/4	1-3/4
F	1-1/8	1-1/8	1-1/8
G	3/4	1/16	1-1/16

This tool is made from hardened high alloy steel, and the outside and inside diameters are ground to insure concentricity.



Revolving Stock Stops

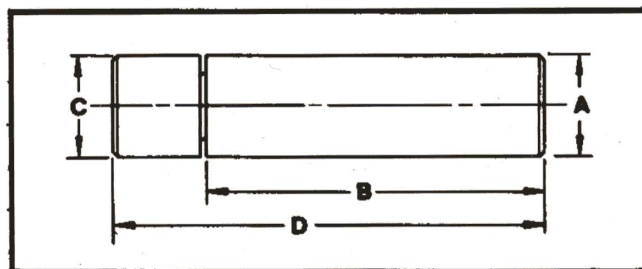
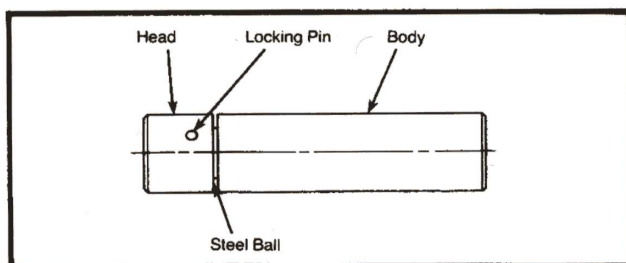
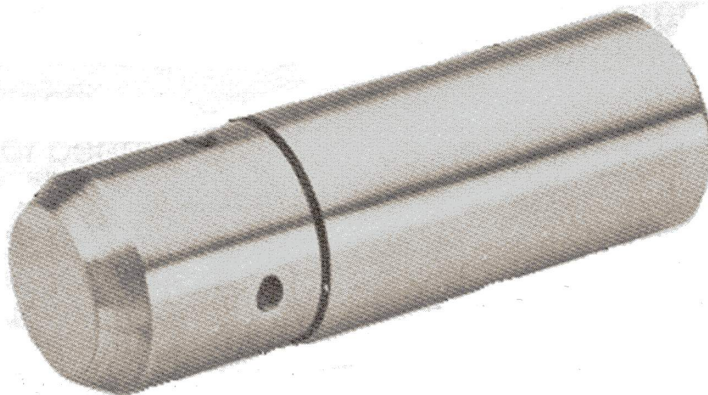
Model RS

Fixed Length

Revolving Stop has a free-turning live head which eliminates friction between work and stop. This prevents marring of the finished end during stock feed-out. Greater uniformity of part lengths is the result.

Precision made of highest quality materials and hardened to withstand repeated impacts.

Internal ball race is enclosed, preventing entrance of chips and foreign matter. The tool can be used on CNC bar feed applications.



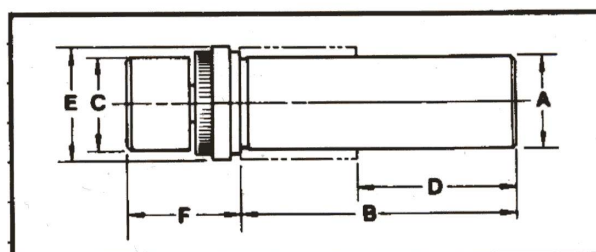
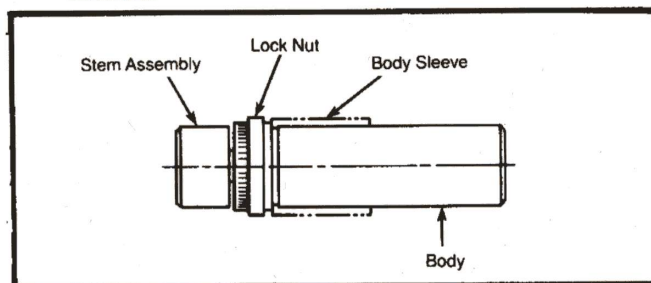
Model RSA

Adjustable

A precision revolving stop with many features:

- Double-row ball-bearing head to provide greater rigidity and longer life.
- Shoulder stop on body to provide fast set-up and positive length for long runs.
- Ground threads on head assembly insures easy adjustment and accurate settings.
- Greater length of adjustment to handle more jobs.
- Removable shoulder sleeve furnished with long models.

Available in both long and short models to meet every requirement. The free-turning head eliminates friction between work and stop. Made from heat-treated alloy steel with ground body and head to insure accuracy and long life.



Model	00RS/A	00RS/B	00RS/C	ORS/A	ORS/B	2RS/A	2RS/B	4RS*	5RS*
Ordering Number	7520	7510	7500	7535	7525	7560	7550	7575	7590
<i>Dimensions</i>									
A	5/8	5/8	5/8	3/4	3/4	1	1	1-1/2	1-3/4
B	1	1-1/2	2-1/4	1-5/8	3-1/8	2	4	5	6-3/8
C	19/32	19/32	19/32	23/32	23/32	31/32	31/32	1-1/2	1-3/4
D	1-3/4	2-1/4	3	2-1/2	4	3	5	6-5/16	7-7/16
<i>Replacement Parts</i>									
Body	7521	7511	7501	7536	7526	7561	7551	7576	7591
Head	7502	7502	7502	7527	7527	7552	7552	7577	7592
Locking Pin	7503	7503	7503	7528	7528	7553	7553	7578	7593
Steel Ball	7504(5)	7504(5)	7504(5)	7529(6)	7529(6)	7554(7)	7554(7)	7579(9)	7594(8)
<i>Optional Part</i>									
Head Blank	7507	7507	7507	7532	7532				

* 4RS & 5 RS are non-stocked made-to-order.

Model	00RSA/S	00RSA/L	ORSA/S	ORSA/L	2RSA/S	2RSA/L
Ordering Number	7600	7610	7617	7625	7634	7640
<i>Dimensions</i>						
A	5/8	5/8	3/4	3/4	1	1
B	1-1/8	1-7/8	1-3/8	2-3/8	1-5/8	3-1/8
C	5/8	5/8	3/4	3/4	1	1
D		1-1/8		1-3/8		1-5/8
E Hex	3/4	3/4	7/8	7/8	1-1/8	1-1/8
F	3/4	3/4	7/8	7/8	1-1/16	1-1/16
Adjustment	13/16	13/16	1-1/16	1-1/16	1-5/16	1-5/16
<i>Replacement Parts</i>						
Body	7602	7611	7619	7626	7636	7641
Stem Assembly	7600-1	7600-1	7617-1	7617-1	7634-1	7634-1
Lock Nut	7604	7604	7621	7621	7638	7638
Body Sleeve		7612		7627		7642

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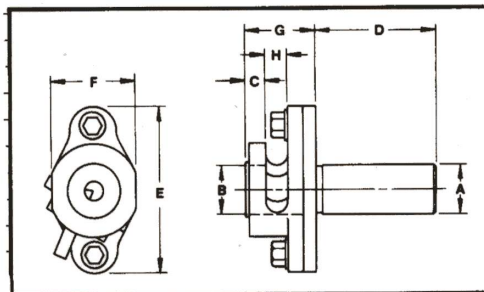
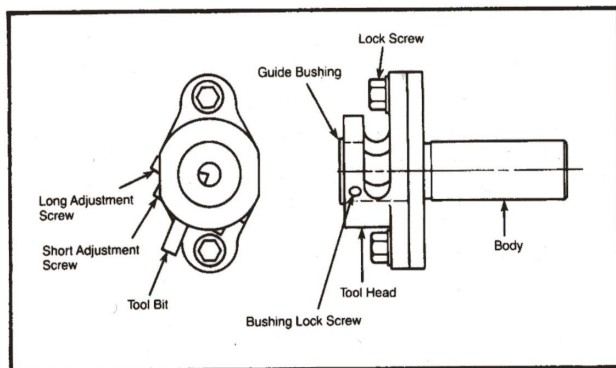
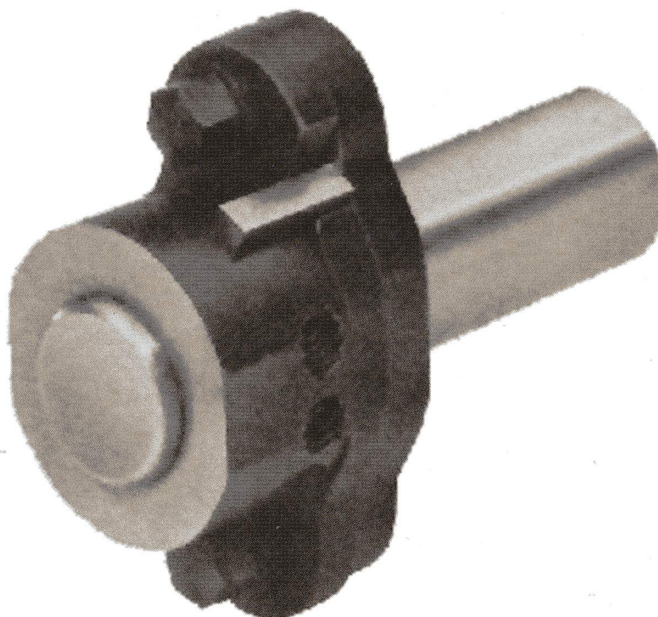
Model AP

Adjustable Pointing Tool

Adjustable pointing tools are used to point, form, or face the end of a workpiece. The blank bushing furnished can be machined to size for proper support of the workpiece. The shank mounts in the turret of a screw machine, turret lathe, or CNC lathe. The tool is adjustable to accurately compensate for misalignment between turret and spindle. This universal tool can be used for right-or-left-hand operation simply by reversing the tool bit.

These features make it a superior tool:

- Universal, because same tool can be used for right-or-left-hand jobs. Four easily accessible set screws bring in tool bit from right to left.
- Adjustable to compensate for misalignment between turret and spindle.
- Special rectangular FLAT tool can be ground with four shapes which can be sharpened by taking a cut off the flat side, like a flat form tool.
- Easy adjustment brings tool back to center after sharpening.
- Also used for turning diameters smaller than can be turned with box tools.



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Model
Ordering Number

00AP
6500

OAP
6525

2AP
6550

Dimensions

A	5/8	3/4	1
B	1/2	3/4	1
C	5/16	7/16	7/16
D	1-7/16	2	2-1/2
E	1-15/16	2-5/8	3-1/4
F	1	1-1/4	1-3/4
G	1	1-3/8	1-1/2
H	5/16	3/8	7/16
Tool Bit Size	.12x7/8x.5	.19x1-1/4x.62	.25x1-1/2x.75

Replacement Parts

Tool Head	6501	6526	6551
Body	6502A	6527	6552
Guide Bushing	6503	6528	6553
Lock Screw (2 Req'd.)	5804	5829	5854
Tool Bit	6504	6529	6554
Short Adjustment Screw (2 Req'd.)	6506	6531	6530
Long Adjustment Screw (2 Req'd.)	6505	6530	6555
Bushing Lock Screw	6507	6506	6531

SEMI-STANDARD CAM BLANKS

THESE MILD STEEL CAM BLANKS ARE PRECISELY MADE TO THE SAME DEMANDING QUALITY STANDARDS THAT DETTERBECK HAS USED FOR OVER SEVENTY-FIVE YEARS.

SCRIBED CAMS are furnished blued and marked
With 100 equal cam spaces on full round cams and
50 equal spaces on half cams.

UNSCRIBED CAMS are furnished ready for your
own bluing and scribing.

FULLY SCRIBED

UNSCRIBED

FULL BLANKS

FULL BLANKS

	CAT. NO.	DIA.	THICKNESS	HOLE		MACHINE SIZE	CAT. NO.	DIA.	THICKNESS	HOLE
#00	SCB00-4.5	4-1/2	1/4	1"	#00	RC00-4.5	4-1/2	1/4	1"	
	SCB00-5	5	1/4	1"		RC00-5	5	1/4	1"	
	SCB00-5.5	5-1/2	1/4	1"		RC00-5.5	5-1/2	1/4	1"	
#0 B & S	SCB0-6	6	5/16	1-1/8	#0 B & S	RC0-6	6	5/16	1-1/8	
	SCB0-6.5	6-1/2	5/16	1-1/8		RC0-6.5	6-1/2	5/16	1-1/8	
	SCB0-7	7	5/16	1-1/8		RC0-7	7	5/16	1-1/8	
#2 B & S	SCB2-7	7	3/8	1-1/4	#2 B & S	RC2-7	7	3/8	1-1/4	
	SCB2-8	8	3/8	1-1/4		RC2-8	8	3/8	1-1/4	
	SCB2-9	9	3/8	1-1/4		RC2-9	9	3/8	1-1/4	
	SCB2-10	10	3/8	1-1/4		RC2-10	10	3/8	1-1/4	
DAVENPORT	SCDAVCAM-6	6	3/8	2	DAVENPORT	DAVCAM 6	6	3/8	2	
	SCDAVCAM-7.5	7-1/2	3/8	2		DAVCAM 7.5	7-1/2	3/8	2	

HALF BLANKS

HALF BLANKS

MACHINE SIZE	CAT. NO.	THICKNESS	HOLE	MACHINE SIZE	CAT. NO.	THICKNESS	HOLE
#00	SHCB00-4.5	1/4	1"	#00	RHC00-4.5	1/4	1"
#0	SHCB-6	5/16	1-1/8"	#0	RHC-6	5/16	1-1/8"
#2	SHCB2-7	3/8	1-1/4"	#2	RHC2-7	3/8	1-1/4"

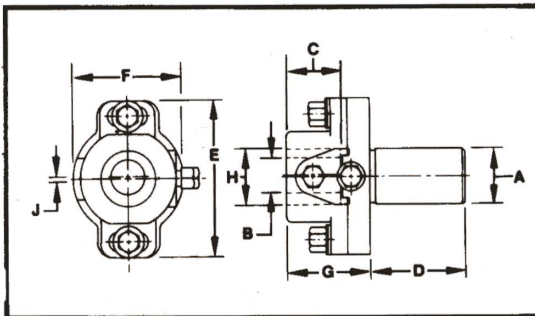
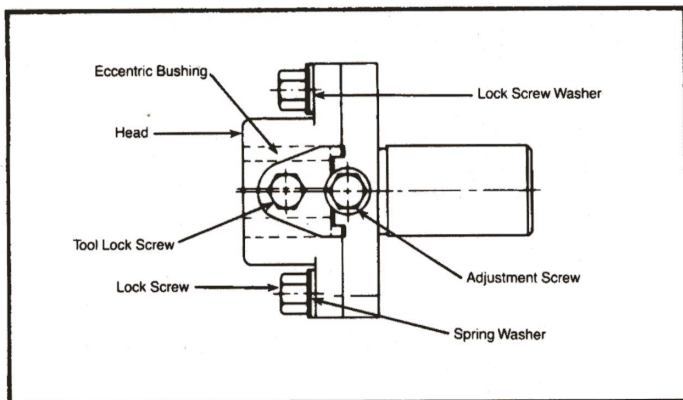
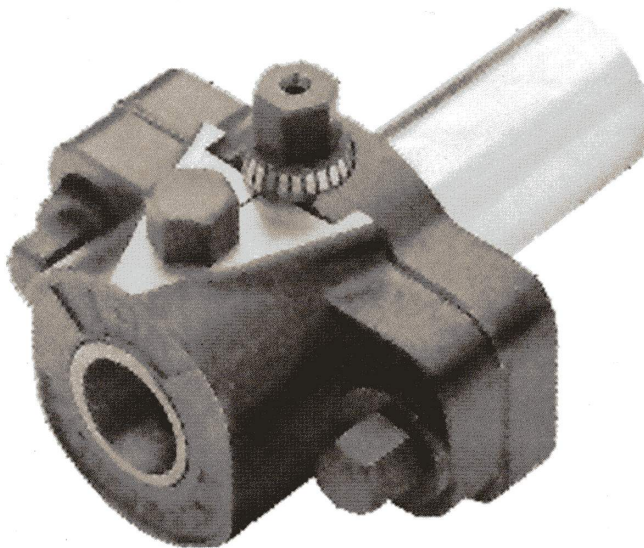
STOCK - 1 DAY

STOCK

Model BT

Adjustable Boring Tool Holder

The BT adjustable boring tool is used in screw machines, turret lathes, and CNC lathes for fast set-up when boring from the turret. A reversible eccentric bushing, furnished with the tool, permits either right or left hand boring. The micrometer adjusting screw graduated in .001" is used for close tolerances. Mating surfaces, bores, and shanks are precision ground to assure parallelism and squareness.



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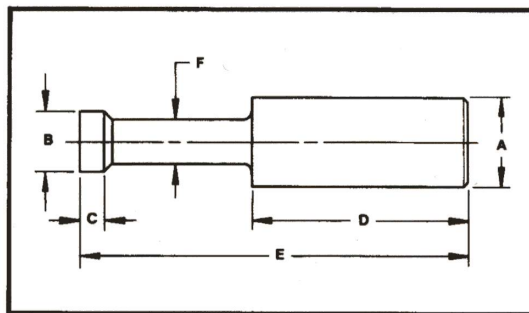
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Model Ordering Number	00BT 7040	0BT 7060	2BT 7080
<i>Dimensions</i>			
A	5/8	3/4	1
B	5/16	1/2	5/8
C	5/8	13/16	1
D	1-1/8	1-1/2	1-3/4
E	1-15/16	2-3/16	2-13/16
F	1-7/16	1-7/16	2
G	1-1/16	1-1/4	1-1/2
H	1/2	5/8	1
J	.010"	.015"	.020"
Travel	1/8	3/16	1/4

<i>Replacement Parts</i>			
Body	7041	7061	7081
Head	7042	7062	7082
Eccentric Bushing	7043	7063	7083
Adjustment Screw	7044	7044	7084
Tool Lock Screw	7045	7064	7085
Lock Screw (2 Req'd.)	7046	7046	7086
Lock Screw Washer (2 Req'd.)	7047	7047	7820
Spring Washer (2 Req'd.)	7048	7048	7087

Recessing Tool Blank

Made of hardened high speed steel, recessing tools are used to cut a groove in the I.D. or to recess the back end of a part before it is cut off. Sizes are available to fit all recessing tool holders. They are adaptable to single-and multiple-spindle screw machines, CNC lathes, and engine lathes.



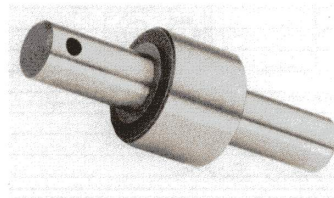
Ordering

Number	105185	105186	105187	105188	105189	105190	105191	105192	105193	105194	105195	105196
<i>Dimensions</i>												

A	1/4	1/4	1/4	5/16	5/16	5/16	3/8	3/8	3/8	1/2	1/2	1/2
B	.140"	.190"	.240"	.220"	.260"	.300"	.240"	.300"	.360"	.270"	.330"	.400"
C	.030"	.030"	.030"	.040"	.040"	.040"	.045"	.045"	.045"	.050"	.050"	.050"
D	9/16	9/16	9/16	3/4	3/4	3/4	15/16	15/16	15/16	1-1/4	1-1/4	1-1/4
E	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2	1-1/2	1-5/8	1-3/4	1-7/8	2	2-1/4
F	.080"	.110"	.150"	.150"	.180"	.210"	.180"	.220"	.250"	.200"	.250"	.300"

Screw Machine Cam Rollers and Pins

Made from hardened high-alloy steel, these rollers and pins are precision machined to a high finish to assure the accuracy necessary for proper operation of screw machines.



Ordering Number	105174	105175	105176	105178	105179	105180	105182	105183	105184
<i>Specifications</i>									
Screw Machines	00 & 00G	00 & 00G	00 & 00G	0 & 0G	0 & 0G	0 & 0G	2 & 2G	2 & 2G	2 & 2G
Serial Number	Over 12851 & 542-00-3300 & up	Over 12851 & 542-00-3300 & up	Over 12851 & 542-00-3300 & up	Over 8019	Over 8019	Over 8019	Over 7350	542-2-3100 & up	Under 7351
Used On	Lead Lever	Cross & Vert. Slides	Lead Lever, Cross & Vert. Slides	Lead Lever	Cross & Vert. Slides	Cross & Vert. Slides	Lead Lever, Cross & Vert. Slides	Lead Lever	Lead Lever & Cross Slide
Roller Diameter*	1/2	1/2	1/2	9/16	9/16	9/16	5/8	5/8	5/8
Roller Length*	3/8	3/8	3/8	7/16	7/16	3/8	1/2	1/2	7/16
Roller Pin Diameter*	1/4	1/4	1/4	1/4	1/4	1/4	5/16	5/16	5/16
Roller Pin Length*	1-5/16	1-1/16	1-1/4	1-5/16	1-1/16	1-1/4	1-5/16	1-13/16	1-3/16
Used With	Cotter Pin	Cotter Pin	Cotter Pin	Cotter Pin	Cotter Pin	Cotter Pin	Cotter Pin	Cotter Pin	Set Screw

* Sold as Roller and Pin Assembly only.

Model G

Universal Tool Bit Grinding Fixture

You have undoubtedly discovered through long experience the correct chip breaker angle that works best for you. You have also found that even the most skilled operators have difficulty in duplicating the desired grind by hand. It is easy with Boyar-Schultz SMT Model G Fixture to duplicate any cutting angles proved superior for your work.

The fixture is graduated in degrees for grinding either right or left hand tool bits. To operate, scale is set at zero and bit is ground to a fixed clearance angle. Finished surface of the fixture is then placed against the back rail of chuck and scale set to desired degree. Chip breaker angle is then ground.



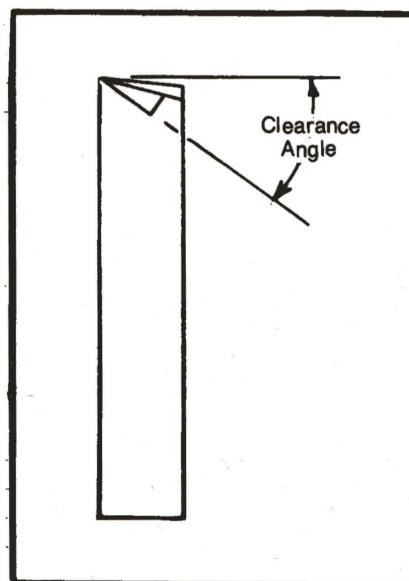
Bits ground with this fixture hold cutting loads longer, giving more pieces per grind. For long production runs, a quantity of bits can be ground and stored. A dull tool bit is replaced in seconds by a sharp one of exactly the same grind. This time-saving tool will eliminate many hours of down time. Holds tool bits from 1/4" to 1/2". Non ground tool bits supplied with fixture.

Ordering Number is 8425.

Recommended grinds of angle for chip clearance

For use with Model G Grinding Fixture

Material to be Turned	Clearance Angle	Land
Bronze	25°	.005
		.007
Brass	25°	.005
		.007
C.R.S. (SAE 1020)	30°	.003
		.005
Screw Machine Stock (SAE 1112)	30°	.003
		.005
Stainless Steel	45°	.003
		.005



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Copper Head Laps

Boyar-Schultz SMT makes the only *copper* head laps available. Copper extends the life span of the sleeve, thereby reducing downtime for lap changes.

The design of our copper sleeves allows more lapping compound to be held and slowly distributed during any finishing process.

Available in both standard and expansion form.

Standard Copper Head Laps

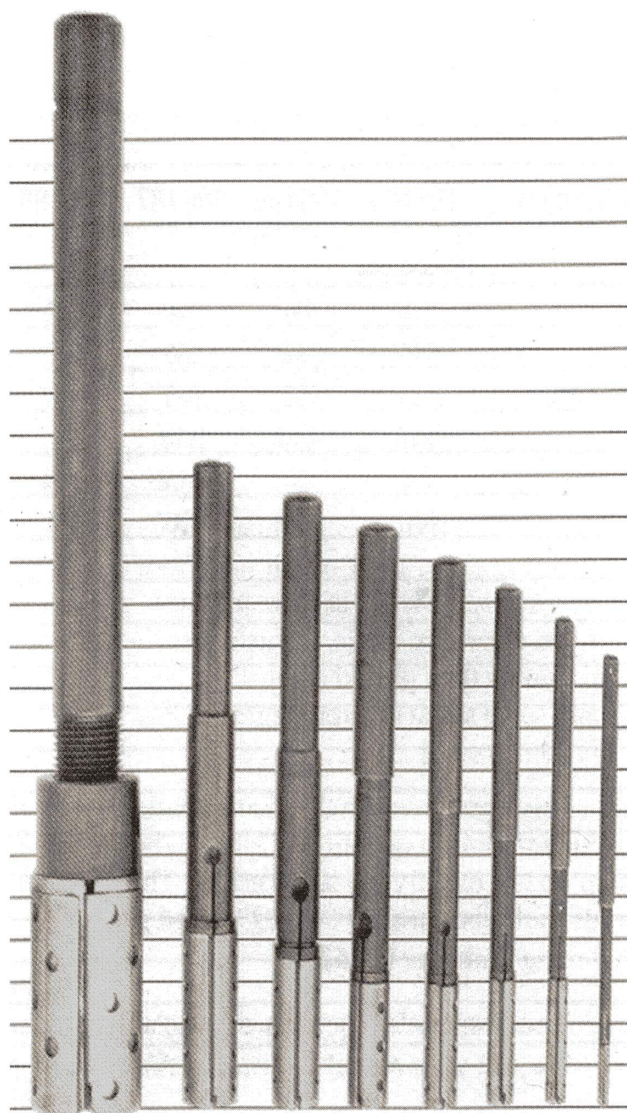
The Standard Copper Head Lap consists of a steel arbor and replaceable copper sleeve. Extra sleeves are included with each lap as shown in the product list.

Part No.	Size	Part No.	Size
Six copper sleeves are included with each of the following:			
104217	1/8"	104248	7/16"
104221	5/32"	104251	15/32"
104224	3/16"	104254	1/2"
104227	7/32"	104257	9/16"
104230	1/4"	104260	5/8"
104233	9/32"	104263	11/16"
104236	5/16"	104266	3/4"
104239	11/32"	104269	13/16"
104242	3/8"	104272	7/8"
104245	13/32"	104275	15/16"

Expansion Copper Head Laps

The Expansion Copper Head Lap consists of the arbor, socket wrench, and replaceable copper sleeve. (The arbor is made up of arbor expansion body, arbor shank, locking collar washer, and socket-head screw.) Extra sleeves are included.

Part No.	Size
Six copper sleeves are included.	
104278	1"



Lapping Compound

Our lapping compound has been developed for use with our special copper head lap sleeves. We recommend the use of this lapping compound with our laps.

Furnished in 1 lb. Containers only.



Part No.	Grain
104352	100
104353	150
104354	180
104355	240
104256	320

Versatility

Boyar-Schultz SMT Copper Head Laps can be used on practically any material—hardened steel, carbide, chrome, ceramics, etc. We offer both standard sizes and special expansion sizes. Simply give us a call with any special lapping need.

Copper Head Lap Sleeves

The only part that wears on our copper head laps is the replaceable copper sleeve. Boyar-Schultz SMT Copper Sleeves wear longer than any other sleeves on the market, thereby reducing replacement costs. When a copper sleeve does wear out, simply discard and replace with a new correct sized sleeve. Ordering information for replacement sleeves is listed.

Extra Sleeves

For best economy, we recommend the purchase of extra sleeves with each lap ordered.

Tool Maker's Bench Lap Set

Our special bench lap set saves valuable time in tool and die work providing a supply of the seven most commonly used lap sizes.

Every tool maker should have one for his own personal use. Supplied with a convenient base.

104357 Lap Set

Tool Maker's Set includes:

- Die cast base – black enameled
- 1 Lap each – 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2"
- 6 copper sleeves of each of above size

NOTE: All specifications subject to change without notice.



Sold only in Packages of 24		Sold only in Packages of 12	
Part No.	Size	Part No.	Size
104218	1/8"	104258	9/16"
104222	5/32"	104261	5/8"
104225	3/16"	104264	11/16"
104228	7/32"	104267	3/4"
104231	1/4"	104270	13/16"
104234	9/32"	104273	7/8"
104237	5/16"	104276	15/16"
104240	11/32"	104279	1"
104243	3/8"		
104246	13/32"		
104249	7/16"		
104252	15/32"		
104255	1/2"		

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Oscillating Drilling Tool Holders

Model BBMRDA

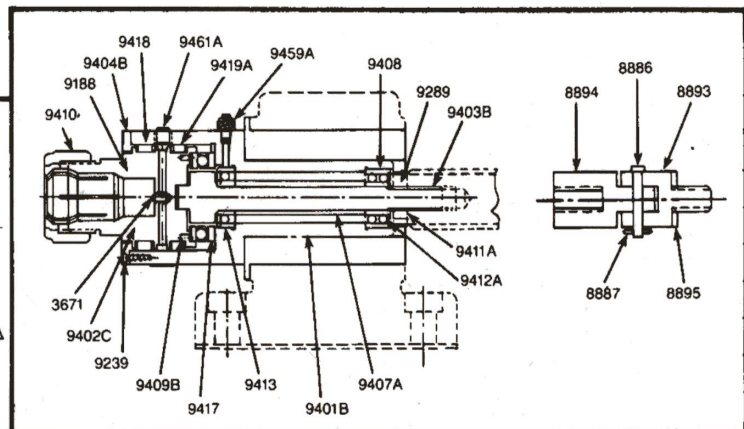
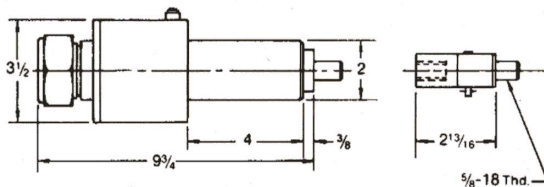
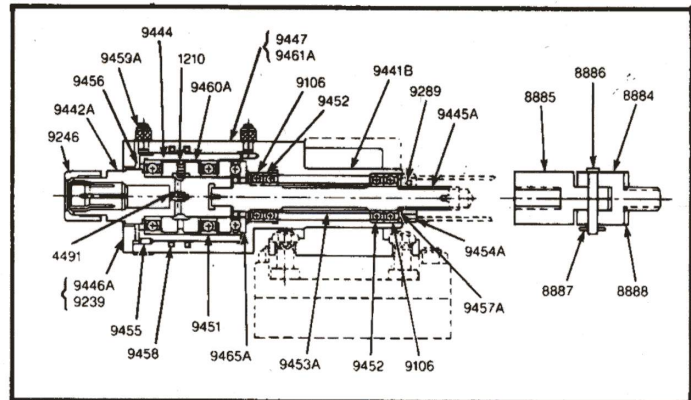
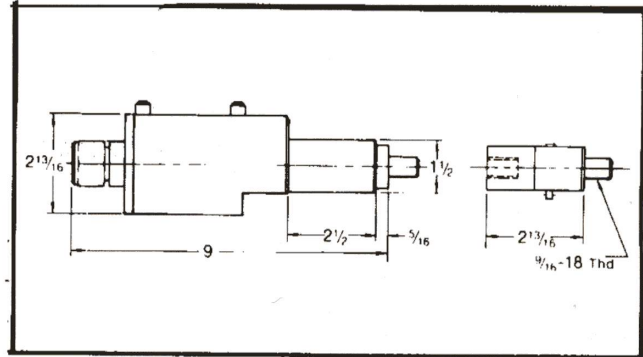
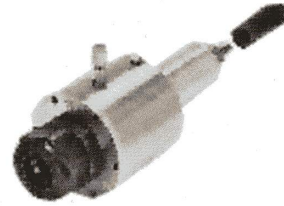
Multiple Spindle

Heat, long stringy chips, and drill breakage are all factors which must be considered in drilling operations. The oscillating action of the deep-hole drilling tool breaks the chips into fine granules, eliminating the chip problem and affording longer drill life through cooler running. In addition, finer finishes, closer tolerances, and better concentricity are maintained.

The oscillating motion is derived from a flutter or wave cam built into the tool. It oscillates .006", three times per revolution of the drill. The tool is driven by the drill speed spline shaft.

In order to cut freely, a drill must run at the highest surface speed possible without burning the drill. If the spindle speed of the job is not high enough, the revolving type tool is used to increase sfm. By revolving the drill in the opposite direction from the spindle, it is possible to attain improvement in concentricity. It will also afford faster cycle time and longer drill life.

Variations in drill speed can be attained by utilizing the various gear ratios available on the drill speeder drive of the machine. Four sizes of Boyar-Schultz SMT Tools are available.



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Model
Ordering Number

70MRDA
9400B
Specifications

Model
Ordering Number

BBMRDA
9440B

Type	Revolving	Type	Revolving
Screw Machine Capacity	1-1/4 and larger	Screw Machine Capacity	9/16 and larger
Rise	.006"	Rise	.006"
Oscillations / Rev'n.	6	Oscillations / Rev'n.	6
Collet*	Erickson #400	Collet*	Erickson #100
Drill Capacity	3/32 to 1"	Drill Capacity	3/64 to 9/16

* Collets not furnished with Tool Holders

Replacement Parts

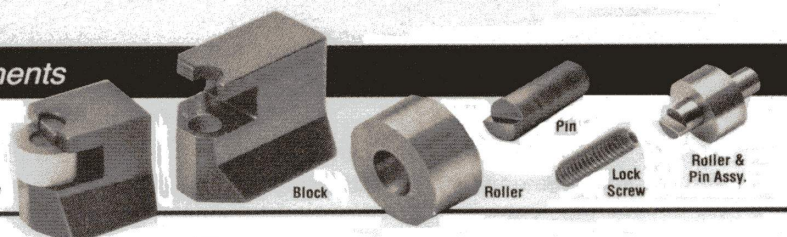
Holder Screw	3671	Collar Lock Screw (4 Reqd.)	1210
Shear Pin	8886	Holder Screw	4491
Cotter Pin	8887	Driver	8884
Driver	8893	Coupling	8885
Coupling	8894	Shear Pin	8886
Space Washer	8895	Cotter Pin	8887
Set Screw (4 Reqd.)	9188	Space Washer	8888
Cover Screw	9239	Ball Bearing (2 Reqd.)	9106
Lock Nut Screw	9289	Cover Screw (6 Reqd.)	9239
Body	9401B	Collar Nosepiece	9246
Tool Holder	9402C	Lock Nut Screw	9289
Drive Shaft	9403B	Body	9441B
Retaining Cover	9404B	Tool Holder	9442A
Bearing Spacer	9407A	Bearing Sleeve	9444
Ball Bearing	9408	Drive Shaft	9445A
Bearing Retaining Pin (2 Reqd.)	9409B	Retaining Cover	9446A
Collet Nosepiece	9410	Coolant Intake	9447
Bearing Lock Nut	9411A	Ball Bearing (2 Reqd.)	9451
Bearing Washer	9412A	Ball Bearing (2 Reqd.)	9452
Ball Bearing	9413	Bearing Spacer	9453A
Cam Bearing	9417	Bearing Lock Nut	9454A
Needle Roller (43 Reqd.)	9418	Retaining Pin (2 Reqd.)	9455
Needle Roller (43 Reqd.)	9419A	Spring (6 Reqd.)	9456
Oil Cup	9459A	Bearing Washer	9457A
Pipe Plug	9461A	"O" Ring (2 Reqd.)	9458
		Oil Cup (2 Reqd.)	9459A
		Tool Holder Collar	9460A
		Pipe Plug	9461A
		Cam Bearing	9465A

	Type	Machine Size	Capacity
Other Sizes Available	8975 Non-Revolving	1-1/4 & larger	15/32 - 1.0
	9420B Revolving	7/16 & 9/16	1/64 - 1/4

Tooling Components



Roller Block Assembly



ASSEMBLY NUMBER	BLOCK	ROLLER	PIN	LOCK SCREW	TOOLS USED ON	ROLLER & PIN ASSY.	ASSEMBLY NUMBER	BLOCK	ROLLER	PIN	LOCK SCREW	TOOLS USED ON	ROLLER & PIN ASSY.
5067	5047	5020	5025	5039	5040 113357	105163	6303*	6307	5120	6325	5039	MODEL B TOOLS ONLY	105168
5068	5048	5020	5025	5039	5040 113357	105163	6304*	6308	5120	6325	5039	MODEL B TOOLS ONLY	105168
5069 EXH	5005A	5020	5025	5039	5040	105163	6305 EXH*	6310	5120	6325	5039	MODEL B TOOLS ONLY	105168
5070 EXH	5006A	5020	5025	5039	5040 113357	105163	6306 EXH*	6310	5120	6325	5039	MODEL B TOOLS ONLY	105168
5077 LH*	5097	5020	5025	5039	5040 113357	105163							
5078 LH*	5098	5020	5025	5039		105163	6403*	6407	5220	6425	5039	MODEL B TOOLS ONLY	105169
5079EXHLH*	5055	5020	5025	5039		105163	6404*	6408	5220	6425	5039	MODEL B TOOLS ONLY	105169
5080EXHLH*	5056	5020	5025	5039		105163	6405 EXH*	6409	5220	6425	5039	MODEL B TOOLS ONLY	105169
							6406EXH*	6410	5220	6425	5039	MODEL B TOOLS ONLY	105169
5167	5147	5120	5125	5039	5140 113358	105164							
5168	5148	5120	5125	5039	5140 113358	105164	7410 BN	7402	5020	5025	7407	7400	105163
5169 EXH	5105A	5120	5125	5039	5140 113358	105164	7435 BN	7427	5120	5125	5039	7425	105164
5170 EXH	5106A	5120	5125	5039	5140 113358	105164	7460 BN	7452	5220	5225	5039	7450	105165
5177 LH*	5197	5120	5125	5039		105164							
5178 LH*	5198	5120	5125	5039		105164	51201	5006A	5020	5025C	5039	94200 96200 96250	105170
5179EXHLH*	5155	5120	5125	5039		105164	51202	5005A	5020	5025C	5039	94200 96200 96250	105170
5180EXHLH*	5156	5120	5125	5039		105164	51227 EXH	51229	5020	5025C	5039	94200 96200 113431	105170
							51228 EXH	51230	5020	5025C	5039	94200 96200 113431	105170
5267	5247	5220	5225	5039	5240 113359	105165	51301	5106A	5120	5125C	5039	94300 96300 96350	105171
5268	5248	5220	5225	5039	5240 113359	105165	51302	5105A	5120	5125C	5039	94300 96300 96350	105171
5269 EXH	5205A	5220	5225	5039	5240 113359	105165	51327 EXH	51329	5120	5125C	5039	94300 96300 113284	105171
5270 EXH	5206A	5220	5225	5039	5240 113359	105165						113316 113430	
5277 LH*	5297	5220	5225	5039		105165	51328 EXH	51330	5120	5125C	5039	94300 96300 113284	105171
5278 LH*	5298	5220	5225	5039		105165						113316 113430	
5279EXHLH*	5255	5220	5225	5039		105165	51401	5248	5220	5225C	5039	94400 96400 96450	105172
5280EXHLH*	5256	5220	5225	5039		105165	51402	5247	5220	5225C	5039	94400 96400 96450	105172
							51427 EXH	5206A	5220	5225C	5039	94400 96400 113294	105172
5307	5303	5320	5325	5339	5300 5350	105166						113317 113432	
5308	5304	5320	5325	5339	5300 5350	105166	51428 EXH	5205A	5220	5225C	5039	94400 96400 113294	105172
5309 EXH	5305	5320	5325	5339	5300 5350	105166	51501	5304	5320	5325C	5339	94500 96500 96550	105173
5310 EXH	5306	5320	5325	5339	5300 5350	105166	51502	5303	5320	5325C	5339	94500 96500 96550	105173
							51527 EXH	5306	5320	5325C	5339	94500 96500 113304	105173
5506 STEM	5502	5508	6225	6240	5500 2RR	105197						113318 113389	
5507 STEM	5503	5508	6225	6240	5500 2RR	105197	51528 EXH	5305	5320	5325C	5339	94500 113304 96500	105173
5531 STEM	5527	5533	5534	7407	5525 2RR	105198						113318 113433	
5532 STEM	5528	5533	5534	7407	5525 2RR	105198	113334 KN	7412	7818KN	7415	7409	113346	
							113335 KN	7437	7868KN	5125	5039	113347	
5707	5703	5720	5725	7407	5700 113356	105162	113336 KN	7452	7868KN	5225	5039	113348	
5708	5704	5720	5725	7407	5700 113356	105162	1133403RR	7402	112066	5025	7407	112152	
5709 EXH	5705	5720	5725	7407	5700 113356	105162	1133413RR	7427	112068	5125	5039	112153	
5710 EXH	5706	5720	5725	7407	5700 113356	105162	1133423RR	7452	112067	5225	5039	112154	
5757 LH*	5753	5720	5725	7407		105162	113354	113352	5020	5025C	5039	113274	
5758 LH*	5754	5720	5725	7407		105162	113355	113353	5020	5025C	5039	113274	
5759EXHLH*	5755	5720	5725	7407		105162	113368EEXH	113370	5020	5025C	5039	113385	
5760EXHLH*	5756	5720	5725	7407		105162	113369EEXH	113371	5020	5025C	5039	113385	
6207*	6203	5020	6225	6240	MODEL B TOOLS ONLY	105167	113372EEXH	113374	5120	5125C	5039	113386	
6208*	6304	5020	6225	6240	MODEL B TOOLS ONLY	105167	113373EEXH	113375	5120	5125C	5039	113386	
6209 EXH*	6305	5020	6225	6240	MODEL B TOOLS ONLY	105167	113378EEXH	113376	5220	5225C	5039	113387	
6210 EXH*	6306	5020	6225	6240	MODEL B TOOLS ONLY	105167	113379EEXH	113377	5220	5225C	5039	113387	

* COMPLETE TOOLS & ROLLER BLOCKS AND ASSEMBLIES NO LONGER STOCK ITEM – ROLLER & PIN ARE AVAILABLE.

Carbide Pins are available for all tools except the Model B Tools and 7415 size tool.

Inserts For Boyar-Schultz SMT Box Tools

Insert	Size and Radius	Box Tool and Adapter Size
51218	1/4 IC .015R UC	All "00" & "0" Size Tools
51219	1/4 IC .031R UC	All "00" & "0" Size Tools
51418	3/8 IC .015R UC	All "2" & "3" Size Tools
51419	3/8 IC .031R UC	All "2" & "3" Size Tools
112422	1/4 IC .015R C	All "00" & "0" Size Tools
112429	3/8 IC .015R C	All "2" & "3" Size Tools
112814	1/4 IC .031R C	All "00" & "0" Size Tools
112815	3/8 IC .031R C	All "2" & "3" Size Tools

New Screw On Type Inserts For TC-R Units

Insert	Size and Radius	Box Tool and Adapter Size
113227	3/8 IC .008R C LF	All "2" & "3" Size Tools
113228	3/8 IC .015R C LF	All "2" & "3" Size Tools
113229	3/8 IC .031R C LF	All "2" & "3" Size Tools
113230	3/8 IC .015R C MF	All "2" & "3" Size Tools
113231	3/8 IC .031R C MF	All "2" & "3" Size Tools
113232	3/8 IC .031R C MF	All "2" & "3" Size Tools
113268	1/4 IC .008R C LF	All "00" & "0" Size Tools
113269	1/4 IC .015R C LF	All "00" & "0" Size Tools
113270	1/4 IC .031R C LF	All "00" & "0" Size Tools
113271	1/4 IC .008R C MF	All "00" & "0" Size Tools
113272	1/4 IC .015R C MF	All "00" & "0" Size Tools
113273	1/4 IC .031R C MF	All "00" & "0" Size Tools

LF = Light Feed; MF = Medium Feed

Spare Parts Kits

Kit No.	Roller Pin Assy.	Tool Bit	Adjust. Screw	Tool Bit Lock Screw	Tool Bit Lock Screw
113049	105162	5045	5734	5737	
113050	105163	5045	7406	5037	
113051	105164	5145	5134	5137	
113052	105165	5245	5234	5237	
113053	105166	5245	5334	5337	5336

Kit No.	Roller Pin Assy.	Carbide Insert	Carbide Shim	Chip-Breaker	Chipbreaker Adjust. Screw	Adjust. Screw	Low Hd. Cap Screw
113055	105170	51218	51215	51217	51211	7406	
113056	105171	51218	51215	51217	7406	5134	
113057	105172	51218	51415	51417	7406	5234	
113058	105173	51218	51415	51417	7406	5334	
113059	105170	112422	51215	51217	51211	7406	112434
113060	105171	112422	51215	51217	7406	5134	112435
113061	105172	112429	51415	51417	7406	5234	112435
113062	105173	112429	51415	51417	7406	5334	112435
113063		112422	51215	51217	51211		112434
113064		112422	51215	51217	7406		112435
113065		112429	51415	51417	7406		112435
113067		51218	51215	51217	51211	7406	
113068		51218	51215	51217	7406	5138	
113069		51218	51415	51417	7406	5234	



Types of Machinery Using Boyar-Schultz SMT Screw Machine Tooling

All Brown & Sharpe Hand and Automatic Screw Machines, TAR-M/S Turning Machines CNC and PTC

BSA
Bardons & Oliver
Clausing
Covel
F.W. Derbyshire
Gisholt
Hjorth
Index

Jones & Lamson
Leavitt
Logan
Monarch
National Acme
Rivett
Sheldon
South Bend

Wade
Warner & Swassey
Wickman AutoMatics
Traub
Tornos-Bechler
Hardinge
Conomatics
Basically any turning type machine



RAPI-CHANGE Tooling System

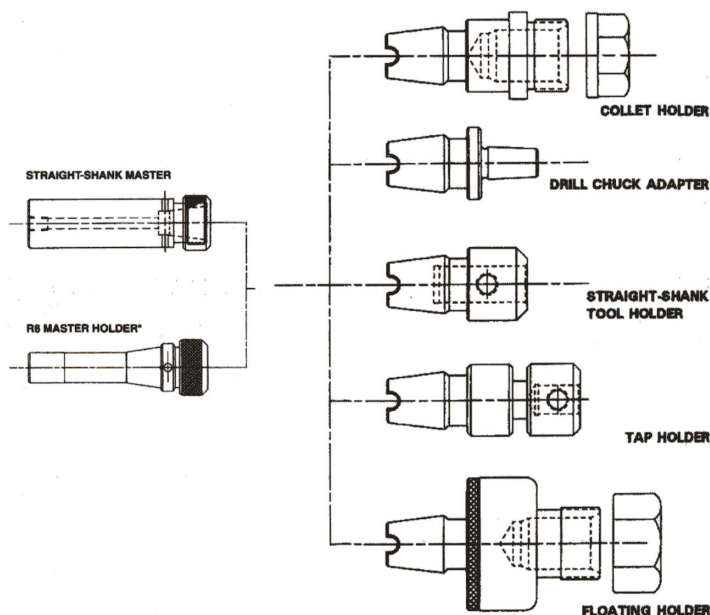
...the quick and simple low-cost way to boost productivity and increase machine utilization

A management tool for controlling costs, RAPI-CHANGE is a tooling **system** proven to help management gain and maintain closer control over the **total** cost of manufacturing:

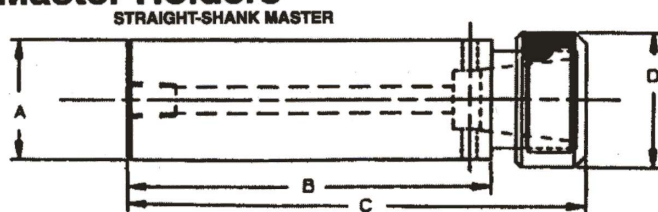
- Lower cost per piece—higher productivity per machine
- Faster job setups and changeovers—including use of preset tooling
- Reduced tooling expense and inventory costs—integrated system allows easy interchanging of standard tools
- Smaller tool crib space requirements
- Lower cutting tool expense
- Reduced administrative costs—simplified tooling specification and selection
- Faster machine payback—lower interest costs

The RAPI-CHANGE Tooling System illustrated below shows a choice of master holders for single or multi-spindles. Both allow very simple hand changing of all the tool types in only seconds.

The master holders have a simple master nut which locks the secondary holders into the spindle during the heaviest of cutting operations.

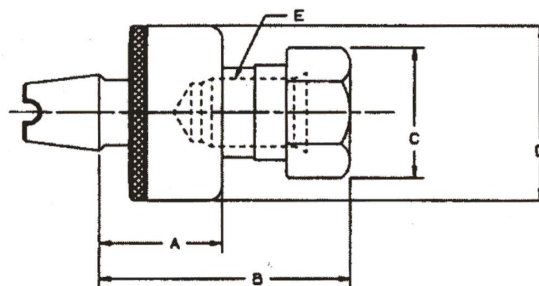


Master Holders



PART NO.	A	B	C	D	TOOL SIZE
0207102	.75	3.0	4.30	1.25	RC-0
0207103	1.00	3.0	4.30	1.25	RC-0
0217103	1.00	3.0	4.50	1.75	RC-1
0217104	1.00	4.0	5.50	1.75	RC-1
0217123	1.25	3.0	4.50	1.75	RC-1
0217124	1.25	4.0	5.50	1.75	RC-1
0217153	1.50	3.0	4.50	1.75	RC-1
0217154	1.50	4.0	5.50	1.75	RC-1
0227203	2.00	3.0	4.75	2.38	RC-2
0227206	2.00	6.0	7.75	2.38	RC-2
0227213	2.125	3.0	4.75	2.38	RC-2
0227216	2.125	6.0	7.75	2.38	RC-2
0227223	2.25	3.0	4.75	2.38	RC-2
0227226	2.25	6.0	7.75	2.38	RC-2
0227254	2.50	4.0	5.75	2.38	RC-2
0227256	2.50	6.0	7.75	2.38	RC-2
0237206	2.00	6.0	8.00	2.94	RC-3
0237216	2.125	6.0	8.00	2.94	RC-3
0237224	2.25	4.0	6.00	2.94	RC-3
0237228	2.25	8.0	10.00	2.94	RC-3
0237256	2.50	6.0	8.00	2.94	RC-3

Floating Holder DA Collets



PART NO.	A	B	C	D	E	COLLET RANGE	TOOL SIZE
0210375	1.33	3.01	1.16	2.12	100DA	.250-.562	RC-1
0210380	1.62	3.31	1.72	2.31	180DA	.250-.750	RC-1
0210385	1.20	2.64	1.42	1.62	200DA	.125-.375	RC-1

ER collet holders are available upon request.

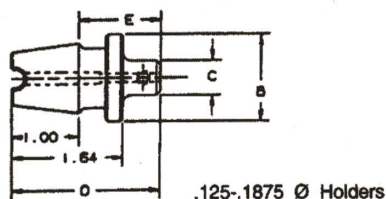
ALSO

Complete line of RAPI-CHANGE tooling for your secondary operators on mills, bridgeports and lathes. Special holders available upon request.

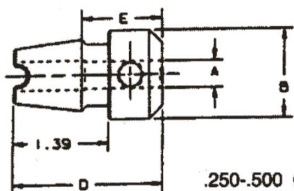
* R8 Master part no. :0212000

Other sizes available upon request.

End Mill/Straight Shank Tool



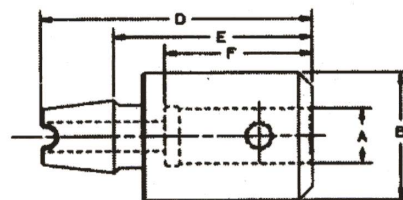
.125-.1875 Ø Holders



.250-.500 Ø Holders

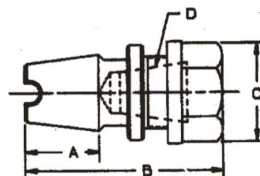
PART NO.	A DIA.	B DIA.	C DIA.	D	E	TOOL SIZE
0210111	.125	1.25	.50	2.19	1.19	RC-1
0210117	.1875	1.25	.50	2.19	1.19	RC-1
0210125	.250	1.25		2.19	1.19	RC-1
0210131	.3125	1.25		2.19	1.19	RC-1
0210138	.375	1.25		2.19	1.19	RC-1
0210140	.4375	1.25		2.19	1.19	RC-1
0210150	.500	1.25		2.19	1.19	RC-1

Tap Holders (Tension-Compression)

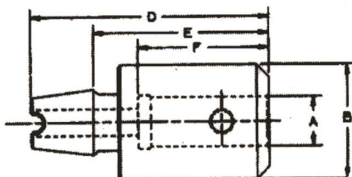


PART NO.	A	B	C	D	TAP CAPACITY	TOOL SIZE
0210500	.500	1.25	2.38	3.38	0 - 1/2	RC-1
0210510	.625	1.38	2.50	3.50	0 - 5/8	RC-1
0220500	.500	1.25	2.38	4.11	0 - 1/2	RC-2
0220510	.625	1.38	2.50	4.34	0 - 5/8	RC-2

DA and ER Collet Holders



Single-End Holders



.625 + Ø Holders

PART NO.	A DIA.	B DIA.	C	D	E	F	TOOL SIZE
0210162	.625	1.25		2.40	1.40	1.62	RC-1
0210176	.750	1.75		3.75	2.75	2.03	RC-1
0210210	1.000	2.00		4.30	3.30	2.60	RC-1
0220162	.625	1.75	1.25	5.50	3.75	3.50	RC-2
0220176	.750	1.75		5.50	3.75	3.88	RC-2
0220210	1.000	2.00		5.75	4.00	4.44	RC-2
0230176	.750	2.25	1.75	5.46	3.00	3.88	RC-3
0230210	1.00	2.25	2.00	6.46	4.00	4.44	RC-3
0230225	1.250	2.50		6.46	4.00	3.50	RC-3
0230250	1.500	2.62		7.10	4.62	4.50	RC-3

PART NO.	A	B	C	D	COLLET RANGE	TOOL SIZE
0200300	.68	2.00	.69	300DA	.015-.250	RC-0
0200305	.68	2.70	.99	200DA	.125-.375	RC-0
0210310	1.00	2.80	1.24	100DA	.250-.562	RC-1
0210315	1.00	3.65	1.50	180DA	.250-.750	RC-1
0210305	1.00	2.50	.99	200DA	.125-.375	RC-1
0220310	1.74	3.55	1.24	100DA	.250-.562	RC-2
0220315	1.74	3.80	1.50	180DA	.250-.750	RC-2
0220305	1.74	3.74	.99	200DA	.125-.375	RC-2
0230315	2.44	4.10	1.50	180DA	.250-.750	RC-3
0230320	2.44	4.50	2.22	400DA	.090-1.00	RD-3
0200405	.68	1.70	.50	ER8	.020-.197	RC-0
0200411	.68	2.20	.75	ER11	.020-.276	RC-0
0210411	1.00	2.50	.75	ER11	.020-.276	RC-1
0210416	1.00	2.62	1.10	ER16	.020-.394	RC-1
0210420	1.00	2.80	1.34	ER20	.040-.512	RC-1
0210425	1.00	3.25	1.65	ER25	.040-.630	RC-1
0210432	1.00	3.60	1.96	ER32	.080-.787	RC-1
0210440	1.00	4.00	2.48	ER40	.118-1.024	RC-1
0220420	1.74	3.00	1.34	ER20	.020-.394	RC-2
0220425	1.74	3.12	1.65	ER25	.040-.512	RC-2
0220432	1.74	3.30	1.96	ER32	.080-.787	RC-2
0220440	1.74	3.50	2.48	ER40	.118-1.024	RC-2

Boyar - Schultz SMT

a Division of **Lester Detterbeck Enterprises Ltd.**



**3390 US - 2 East
Iron River, MI 49935**

1-906-265-5121

1-800-533-3328

FAX 1-906-265-6195

www.boyar-schultzsmt.com

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Dovetail Form Tool Blanks

Our Precision Ground Dovetails Offer One Of The Largest In-Stock Selections On The Market



Hard & Ground

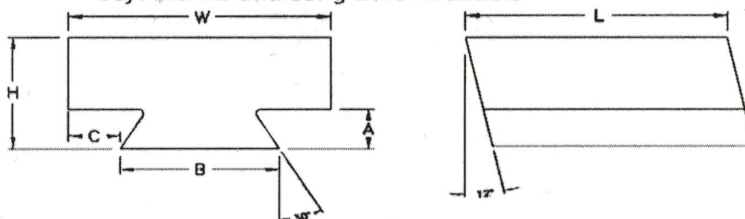
Form Tool Only

To Fit	H	W	L	A	B	C	TAP	M-2	M-42	T-15	HS 76
3/8	3/4	1	1 1/2	19/64	0.700	1/4		4040M	4040R	4040W	4040U
5/8	1	1	2 1/4	19/64	0.951	1/16		4200M	4200R	4200W	4200U
5/8	1	1 1/4	2 1/4	19/64	0.951	5/16		4205M	4205R	4205W	4205U
5/8	1	1 1/4	2 1/4	19/64	0.951	0		4210M	4210R	4210W	4210U
5/8	1	1 1/2	2 1/4	19/64	0.951	9/16		4215M	4215R	4215W	4215U
5/8	1	1 1/2	2 1/4	19/64	0.951	0		4225M	4225R	4225W	4225U
5/8	1 1/2	1 1/2	2 1/4	19/64	0.951	9/16		4230M	4230R	4230W	4230U
5/8	1	2	2 1/4	19/64	0.951	17/32		4245M	4245R	4245W	4245U
5/8	1 1/2	2	2 1/4	19/64	0.951	17/32		4250M	4250R	4250W	4250U
1 1/4	1 1/2	2	2 1/4	35/64	1.882	1/8		4420M	4420R	4420W	4420U
1 1/4	1 1/2	2	3	35/64	1.882	1/8		4430M	4430R	4430W	4430U
1 1/4	1 1/2	2 1/2	2 1/4	35/64	1.882	9/16		4440M	4440R	4440W	4440U
1 1/4	1 1/2	2 1/2	2 1/4	35/64	1.882	0.055		4450M	4450R	4450W	4450U
1 1/4	1 1/2	2 1/2	3	35/64	1.882	9/16		4460M	4460R	4460W	4460U
1 1/4	2	2 1/2	2 1/4	35/64	1.882	9/16	7/16-14	4462M	4462R	4462W	4462U
1 1/4	2	2 1/2	3	35/64	1.882	9/16	7/16-14	4465M	4465R	4465W	4465U
1 1/4	1 1/2	3	2 1/4	35/64	1.882	9/16		4480M	4480R	4480W	4480U
1 1/4	1 1/2	3	2 1/4	35/64	1.882	0.055		4485M	4485R	4485W	4485U
1 1/4	1 1/2	3	3	35/64	1.882	9/16		4490M	4490R	4490W	4490U
DAV	1	1 1/2	1 1/2	19/64	0.951	19/64	1/4-28	4500M	4500R	4500W	4500U
DAV	1	1	1 1/2	19/64	0.951	1/16	1/4-28	4550M	4550R	4550W	4550U
ACME	3/4	3/4	1	13/64	0.500	1/4		8050M	8050R	8050W	8050U
ACME	3/4	1	1	13/64	0.500	3/8		8080M	8080R	8080W	8080U
GREENLEE	15/16	1	2 1/4	9/32	0.914	5/64		8240M	8240R	8240W	8240U
GREENLEE	15/16	1 1/2	2 1/4	9/32	0.914	37/64		8260M	8260R	8260W	8260U
GREENLEE	1 1/8	1 3/4	2 1/4	9/32	1.484	1/4		8330M	8330R	8330W	8330U
GREENLEE	1 1/8	2	2 1/4	9/32	1.484	1/2		8350M	8350R	8350W	8350U
1	1 1/2	2	3	35/64	1.614	3/16		8400M	8400R	8400W	8400U
1	1 1/2	2 1/2	3	35/64	1.614	7/16		8445M	8445R	8445W	8445U
1	1 1/2	3	3	35/64	1.614	11/16		8455M	8455R	8455W	8455U
1 5/8	1 1/2	3	3	35/64	2.238	3/8		8565M	8565R	8565W	8565U
2 1/8	1 1/2	3	3	43/64	2.883	1/8		8665M	8665R	8665W	8665U
NB	1 1/2	1 1/2	2	9/16	1.253	1/4		8815M	8815R	8815W	8815U
NB	1 1/2	2	2	9/16	1.253	3/8		8820M	8820R	8820W	8820U
NB	1 1/2	2 1/2	2	9/16	1.253	5/8		8825M	8825R	8825W	8825U
NB	1 1/2	3	2	9/16	1.253	7/8		8830M	8830R	8830W	8830U
00	3/4	1 1/4	1	13/64	0.714	17/64	10-32	8900M	8900R	8900W	8900U
0	1	1 1/2	1 5/16	19/64	0.951	9/32	1/4-20	8935M	8935R	8935W	8935U
2	1 1/2	2	1 7/16	7/16	1.250	3/8	1/4-20	8980M	8980R	8980W	8980U

Tolerances on Dovetail Shave Tool Blanks

	Soft	Hard
Height "H" X Width "W"	+0.015; +0.030	+1/32; -0
Length "L"	+1/64; -0	±1/32
Dimension "A"	+1/64; -0	+1/64; -0
Dimension "B"	+0.020; +0.040	±0.003
Dimension "C"	+1/64; -0	±0.005

Soft Blanks and Long Bars Available

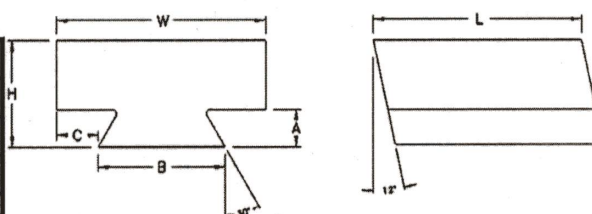


To Fit	H	W	L	A	B	C	M-2	M-42	T-15	HS 76
1/2	5/8	1 1/4	1 1/8	13/64	0.71	3/8	2050M	2050R	2050W	2050U
5/8	3/4	1	1 1/2	17/64	0.91	3/32	2200M	2200R	2200W	2200U
5/8	3/4	1	1 1/4	17/64	0.91	3/32	2205M	2205R	2205W	2205U
5/8	1	1	1 1/4	17/64	0.91	3/32	2225M	2225R	2225W	2225U
5/8	3/4	1 1/2	1 1/4	17/64	0.91	19/32	2230M	2230R	2230W	2230U
5/8	3/4	1 1/2	1 1/2	17/64	0.91	19/64	2235M	2235R	2235W	2235U
5/8	1	1 1/2	1 1/4	17/64	0.91	19/32	2245M	2245R	2245W	2245U
5/8	3/4	2	1 1/4	17/64	0.91	35/64	2250M	2250R	2250W	2250U
5/8	3/4	2	1 1/2	17/64	0.91	35/64	2255M	2255R	2255W	2255U
5/8	1	2	1 1/4	17/64	0.91	35/64	2280M	2280R	2280W	2280U
1	3/4	1 1/2	1 3/4	17/64	1.29	7/32	2325M	2325R	2325W	2325U
1	1	1 1/2	1 3/4	17/64	1.29	7/32	2330M	2330R	2330W	2330U
1	1 1/4	1 1/2	1 3/4	17/64	1.29	7/32	2335M	2335R	2335W	2335U
1	3/4	2	1 3/4	17/64	1.29	23/64	2340M	2340R	2340W	2340U
1	1	2	1 3/4	17/64	1.29	23/64	2345M	2345R	2345W	2345U
1	1	2	1 3/4	17/64	1.29	23/32	2350M	2350R	2350W	2350U
1	1 1/4	2	1 3/4	17/64	1.29	23/32	2360M	2360R	2360W	2360U
1 1/4	3/4	2	1 3/4	17/64	1.55	11/32	2440M	2440R	2440W	2440U
1 1/4	1	2	1 3/4	17/64	1.55	11/32	2450M	2450R	2450W	2450U
1 1/4	1 1/4	2	1 3/4	17/64	1.55	11/32	2480M	2480R	2480W	2480U
1 1/4	1 1/2	2 1/2	1 3/4	17/64	1.55	5/8	2490M	2490R	2490W	2490U
1 1/2	3/4	2	1 7/8	17/64	1.79	7/32	2565M	2565R	2565W	2565U
1 1/2	1	2	1 7/8	17/64	1.79	7/32	2585M	2585R	2585W	2585U
1 1/2	1 1/2	2	1 7/8	17/64	1.79	7/32	2590M	2590R	2590W	2590U
1 5/8	1 1/2	2 1/2	2 9/16	25/64	2.06	11/32	2630M	2630R	2630W	2630U
1 5/8	1 3/4	2 1/2	2 9/16	25/64	2.06	11/32	2640M	2640R	2640W	2640U

Tolerances on Dovetail Shave Tool Blanks

Soft Blanks and Long Bars Available

	Soft	Hard
Height "H" X Width "W"	+0.015; +0.030	+1/32; -0
Length "L"	+1/64; -0	±1/32
Dimension "A"	+1/64; -0	+1/32; -0
Dimension "B"	+0.020; +0.040	±0.003
Dimension "C"	+1/64; -0	±0.005



Rollers

Diameter	Width	Hole	
1	11/16	3/8	RA16
1 1/8	11/16	3/8	RA18
1 1/4	11/16	3/8	RA20

WIRE EDM AND CUTTING TOOLS

These days more and more tools are being produced by wire EDM.

Where all high-speed steel and carbide materials can be wired, materials high in cobalt do offer potential problems. Where cobalt

is a major key to wear resistance, it offers a large unstable grain

condition when wired. Powdered metals do reduce these possible problems, but do not alleviate them.

Since high cobalt materials are here to stay we offer the following recommendations:

1. Avoid deep forms in high cobalt materials, if possible.
2. Avoid ever cutting deeper than 2/3 the thickness of any brazed carbide tools.
3. Avoid sharp corners when wiring, and use radiuses whenever possible.
4. Avoid major high reductions of blanks. Match the blanks used to the job; you might need to order semi-standard blanks.
5. Always support the part of the tools you are wiring off to reduce stress. Done correctly, this will also help flushing.

Carbide Tipped Dovetail Blanks

Highest Quality Dovetail Blanks C2 Grade Brazed on 4140 Hardened Body



TCT DOVETAIL FORM TOOL BLANKS

CAT.NO.	H	W	L	A	B	C	D	E	F	TAP	ANGLE	GRADE
4200C	1	1	1 3/4	19/64	0.951	1/16	3/8	1/2	1		12°	C2
4200C17-C6	1	1	1 3/4	19/64	0.951	1/16	3/8	9/16	1		17°	C6
4218C	1	1 1/2	1 3/4	19/64	0.951	9/16	3/8	1/2	1		12°	C2
4218C17-C6	1	1 1/2	1 3/4	19/64	0.951	9/16	3/8	9/16	1		17°	C6
4219C	1	1 1/2	1 3/4	19/64	0.951	9/16	3/8	1/2	1 1/2		12°	C2
4219C17-C6	1	1 1/2	1 3/4	19/64	0.951	9/16	3/8	9/16	1 1/2		17°	C6
4420C	1 1/2	2	1 3/4	35/64	1.882	1/8	1/2	3/4	1		12°	C2
4420C17-C6	1 1/2	2	1 3/4	35/64	1.882	1/8	1/2	13/16	1		17°	C6
4421C	1 1/2	2	1 3/4	35/64	1.882	1/8	1/2	3/4	2		12°	C2
4421C17-C6	1 1/2	2	1 3/4	35/64	1.882	9/16	1/2	13/16	2		17°	C6
4440C	1 1/2	2 1/2	1 3/4	35/64	1.882	9/16	1/2	3/4	1		12°	C2
4440C17-C6	1 1/2	2 1/2	1 3/4	35/64	1.882	9/16	1/2	13/16	1		17°	C6
4441C	1 1/2	2 1/2	1 3/4	35/64	1.882	9/16	1/2	3/4	2		12°	C2
4441C17-C6	1 1/2	2 1/2	1 3/4	35/64	1.882	9/16	1/2	13/16	2		17°	C6
4500C	1	1 1/2	1 1/4	19/64	0.951	19/64	3/8	1/2	1	1/4 28	12°	C2
4500C17-C6	1	1 1/2	1 1/4	19/64	0.951	19/64	3/8	9/16	1	1/4 28	17°	C6
4510C	1	1 1/2	1 1/4	19/64	0.951	19/64	3/8	1/2	1 1/2	1/4 28	12°	C2
4510C17-C6	1	1 1/2	1 1/4	19/64	0.951	19/64	3/8	9/16	1 1/2	1/4 28	17°	C6
4550C	1	1	1 1/4	19/64	0.951	1/16	3/8	1/2	1	1/4 28	12°	C2
4550C17-C6	1	1	1 1/4	19/64	0.951	1/16	3/8	9/16	1	1/4 28	17°	C6
8951C	1 1/2	2	1 7/16	7/16	1.250	3/8	1/2	3/4	1 1/2	1/4 20	12°	C2

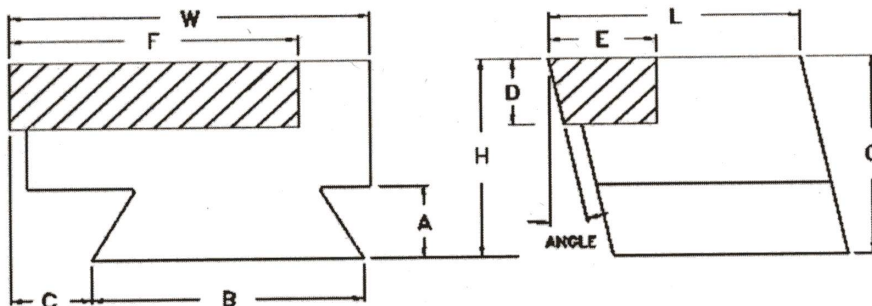
TCT DOVETAIL SHAPE TOOL BLANKS

2050C	3/4	1 1/4	1	13/64	0.714	3/8	1/2	1/2	1 1/4		0°	C2
2050C-C6	3/4	1 1/4	1	13/64	0.714	3/8	1/2	1/2	1 1/4		0°	C6
2050C SOLID	3/4	SOLID	1 1/16	13/64	0.714	3/8	3/4	1 1/16	1 1/4	SOLID	0°	C2 SOLID
2230C	3/4	1 1/2	1 1/4	17/64	0.912	19/32	3/8	1/2	1 1/2		0°	C2
2330C	1	1 1/2	1 1/2	17/64	1.287	7/32	3/8	1/2	1		0°	C2
2345C	1	2	1 1/2	17/64	1.287	23/64	3/8	1/2	1		0°	C2
2346C	1	2	1 1/2	17/64	1.287	23/64	3/8	1/2	2		0°	C2
2346C-C6	1	2	1 1/2	17/64	1.287	23/32	3/4	1/2	2		0°	C6
2348C	1	2	1 1/2	17/64	1.287	23/32	3/8	1/2	1		0°	C2
2349C	1	2	1 1/2	17/64	1.287	23/32	3/8	1/2	2		0°	C2
2450C	1	2	1 1/2	17/64	1.554	11/32	3/8	1/2	1		0°	C2
2455C	1	2	1 1/2	17/64	1.554	11/32	3/8	1/2	2		0°	C2

Contact us about our "Universal Blanks" for your non-standard needs.

Tolerances Carbide

Height "H" & Width "W"	+ 1/32; -0
Length "L"	± 1/16
Dimension "A"	+ 1/64; -0
Dimension "B"	± .003
Dimension "C" - Offset	+ .015; -.005
Dimension "D"	± 1/64
Dimension "E"	± 1/64
Dimension "F"	± 1/32
Dimension "G" Equal H	+ 0; ± 1/16



For knurl holders see our B&S line.

Universal Blanks & Circular Knurl Holders

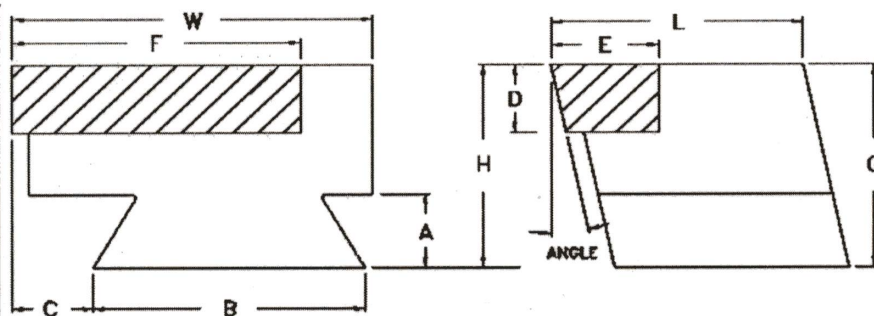


TCT UNIVERSAL BLANKS

CAT.NO.	H	W	L	A	B	C	D	E	F	ANGLE	GRADE
3000C	1 3/8	2	1 1/2	0	0	0	1/2	1/2	1 1/8	0°	C2
3000C-C6	1 3/8	2	1 1/2	0	0	0	1/2	1/2	1 1/8	0°	C6
3020C	1 3/8	2	1 1/2	0	0	0	1/2	1/2	2 1/8	0°	C2
3020C-C6	1 3/8	2	1 1/2	0	0	0	1/2	1/2	2 1/8	0°	C6
3620C	1 1/2	2 1/2	1 3/4	0	0	0	1/2	3/4	2	12°	C2

Tolerances Carbide

Height "H" & Width "W"	+ 1/32; -0
Length "L"	± 1/16
Dimension "A"	+ 1/64; -0
Dimension "B"	± .003
Dimension "C" - Offset	+ .015; -.005
Dimension "D"	± 1/64
Dimension "E"	± 1/64
Dimension "F"	± 1/32
Dimension "G" Equal H	+ 0; ±1/16

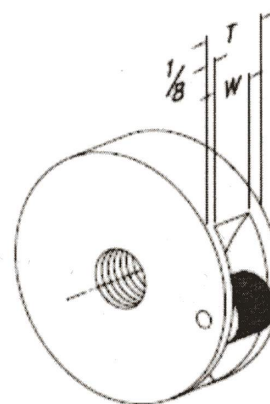


Circular Knurl Holder

CAT. NO.	MACHINE SIZE	DIA.	HOLE	KNURL	WIDTH	A	T
1900	#00	1 3/4	3/8-16	1/2 X 3/16 X 3/16	1/4	1/8	9/16
1940	#0	2 1/4	1/2-13	5/8 X 1/4 X 1/4	5/16	1/8	21/32
1950	#2	3	5/8-11	5/8 X 1/4 X 1/4	3/8	1/8	3/4
1960	Dav.	2	9/16-REAM	3/4 X 1/4 X 1/4	3/8	1/8	23/32

Circular Single Knurling Tool

- Similar to the ones the Detterbecks made in the early 1900's
- Just as useful today
- Can be special ordered for wider knurls
- Knurls not included



TOOLING FOR DAVENPORT MACHINES



Davenport Form Tools 2" DIA. 9/16" RM. 6-P.H. THRU

1/4	DM4BH	DR4BH	DW4BH	DU4BH	1/4
5/16	DM5BH	DR5BH	DW5BH	DU5BH	5/16
3/8	DM6BH	DR6BH	DW6BH	DU6BH	3/8
7/16	DM7BH	DR7BH	DW7BH	DU7BH	7/16
1/2	DM8BH	DR8BH	DW8BH	DU8BH	1/2
9/16	DM9BH	DR9BH	DW9BH	DU9BH	9/16
5/8	DM10BH	DR10BH	DW10BH	DU10BH	5/8
3/4	DM12BH	DR12BH	DW12BH	DU12BH	3/4
7/8	DM14BH	DR14BH	DW14BH	DU14BH	7/8
1	DM16BH	DR16BH	DW16BH	DU16BH	1
1-1/8	DM18BH	DR18BH	DW18BH	DU18BH	1-1/8
1-1/4	DM20BH	DR20BH	DW20BH	DU20BH	1-1/4
1-3/8	DM22BH	DR22BH	DW22BH	DU22BH	1-3/8
1-1/2	DM24BH	DR24BH	DW24BH	DU24BH	1-1/2
1-5/8	DM26BH	DR26BH	DW26BH	DU26BH	1-5/8
1-3/4	DM28BH	DR28BH	DW28BH	DU28BH	1-3/4
1-7/8	DM30BH	DR30BH	DW30BH	DU30BH	1-7/8
2	DM32BH	DR32BH	DW32BH	DU32BH	2

Dav. Size Tool Roll Blanks Rough Ground Only

SIZE CAT. NO.

1/4	DRA4
5/16	DRA5
3/8	DRA6
7/16	DRA7
1/2	DRA8
9/16	DRA9
5/8	DRA10
3/4	DRA12
7/8	DRA14
1	DRA16

DAV Size Tool Shanks 6.30

Davenport Size Tools 1-5/16" DIA. 7/16-20 L.H. THD.

1/4	DSM4BH	DSR4BH	DSW4BH	DSU4BH	1/4
5/16	DSM5BH	DSR5BH	DSW5BH	DSU5BH	5/16
3/8	DSM6BH	DSR6BH	DSW6BH	DSU6BH	3/8
7/16	DSM7BH	DSR7BH	DSW7BH	DSU7BH	7/16
1/2	DSM8BH	DSR8BH	DSW8BH	DSU8BH	1/2
9/16	DSM9BH	DSR9BH	DSW9BH	DSU9BH	9/16
5/8	DSM10BH	DSR10BH	DSW10BH	DSU10BH	5/8
3/4	DSM12BH	DSR12BH	DSW12BH	DSU12BH	3/4
7/8	DSM14BH	DSR14BH	DSW14BH	DSU14BH	7/8
1	DSM16BH	DSR16BH	DSW16BH	DSU16BH	1
1-1/8	DSM18BH	DSR18BH	DSW18BH	DSU18BH	1-1/8
1-1/4	DSM20BH	DSR20BH	DSW20BH	DSU20BH	1-1/4
1-3/8	DSM22BH	DSR22BH	DSW22BH	DSU22BH	1-3/8
1-1/2	DSM24BH	DSR24BH	DSW24BH	DSU24BH	1-1/2

CAM BLANKS

SIZE	SCRIBED	UNSCRIBED
6" Round	DAVCAM 6	DAVCAM 6 UNS
7.5" Round	DAVCAM 7.5	DAVCAM 7.5 UNS

Cam blanks are provided cut round.

M-2 = M

M-42 = R

T-15 = W

HS 76 = U

Dovetail Form Tool Blanks

HARD & GROUND

FORM TOOL ONLY

To Fit	Cat. No.	H	W	L	A	B	C	TAP	M M-2	R M-42	W T-15	U HS 76
DAV	4500	1	1-1/2	1-1/2	19/64	.951	19/64	1/4-28	4500M	4500R	4500W	4500U
DAV	4550	1	1	1-1/2	19/64	.951	1/16	1/4-28	4550M	4550R	4550W	4550U

Carbide Blanks

CAT. #	H	W	L	A	B	C	D	E	F	TAP	ANGLE
4500C	1	1-1/2	1-1/4	19/64	.951	19/64	3/8	1/2	1	1/4-28	12°
4510C	1	1-1/2	1-1/4	19/64	.951	19/64	3/8	1/2	1-1/2	1/4-28	12°
4550C	1	1	1-1/4	19/64	.951	1/16	3/8	1/2	1	1/4-28	12°

*Davenport
Cutoff
Tools Page # 55*

STANDARD TOOLS SHIPPED FROM STOCK SEMI-STANDARD TOOLS (BOLD AREAS): DELIVERY 2-6 DAYS

Lester Dettterbeck Enterprises Ltd.



3390 US - 2 East

Iron River, MI 49935

1-906-265-5121

1-800-533-3328

FAX 1-906-265-6195

www.lesterdettterbeck.com



CIRCULAR FORM TOOL BLANKS

For Brown and Sharpe

Circular Form Tool Blanks for Brown and Sharpe Machines

WIDTH	CAT. NO. M-2 HARD	CAT. NO. M-42 HARD	CAT. NO. T-15 HARD	CAT. NO. HS 76 HARD	WIDTH
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#00 B & S 1-3/4 DIA. 3/8-16

1/4	00M4BH	00R4BH	00W4BH	00U4BH	1/4
5/16	00M5BH	00R5BH	00W5BH	00U5BH	5/16
3/8	00M6BH	00R6BH	00W6BH	00U6BH	3/8
7/16	00M7BH	00R7BH	00W7BH	00U7BH	7/16
1/2	00M8BH	00R8BH	00W8BH	00U8BH	1/2
9/16	00M9BH	00R9BH	00W9BH	00U9BH	9/16
5/8	00M10BH	00R10BH	00W10BH	00U10BH	5/8
3/4	00M12BH	00R12BH	00W12BH	00U12BH	3/4
7/8	00M14BH	00R12BH	00W14BH	00U14BH	7/8
1	00M16BH	00R16BH	00W16BH	00U16BH	1
1-1/8	00M18BH	00R18BH	00W18BH	00U18BH	1-1/8
1-1/4	00M20BH	00R20BH	00W20BH	00U20BH	1-1/4
1-3/8	00M22BH	00R22BH	00W22BH	00U22BH	1-3/8
1-1/2	00M24BH	00R24BH	00W24BH	00U24BH	1-1/2
1-5/8	00M26BH	00R26BH	00W26BH	00U26BH	1-5/8
1-3/4	00M28BH	00R28BH	00W28BH	00U28BH	1-3/4

#0 B & S 2-1/4" DIA. 1/2-13

5/16	0M5BH	0R5BH	0W5BH	0U5BH	5/16
3/8	0M6BH	0R6BH	0W6BH	0U6BH	3/8
7/16	0M7BH	0R7BH	0W7BH	0U7BH	7/16
1/2	0M8BH	0R8BH	0W8BH	0U8BH	1/2
9/16	0M9BH	0R9BH	0W9BH	0U9BH	9/16
5/8	0M10BH	0R10BH	0W10BH	0U10BH	5/8
3/4	0M12BH	0R12BH	0W12BH	0U12BH	3/4
7/8	0M14BH	0R14BH	0W14BH	0U14BH	7/8
1	0M16BH	0R16BH	0W16BH	0U16BH	1
1-1/8	0M18BH	0R18BH	0W18BH	0U18BH	1-1/8
1-1/4	0M20BH	0R20BH	0W20BH	0U20BH	1-1/4
1-3/8	0M22BH	0R22BH	0W22BH	0U22BH	1-3/8
1-1/2	0M24BH	0R24BH	0W24BH	0U24BH	1-1/2
1-5/8	0M26BH	0R26BH	0W26BH	0U26BH	1-5/8
1-3/4	0M28BH	0R28BH	0W28BH	0U28BH	1-3/4
1-7/8	0M30BH	0R30BH	0W30BH	0U30BH	1-7/8
2	0M32BH	0R32BH	0W32BH	0U32BH	2

#2 B & S 3" DIA. 5/8-11

3/8	2M6BH	2R6BH	2W6BH	2U6BH	3/8
7/16	2M7BH	2R7BH	2W7BH	2U7BH	7/16
1/2	2M8BH	2R8BH	2W8BH	2U8BH	1/2
9/16	2M9BH	2R9BH	2W9BH	2U9BH	9/16
5/8	2M10BH	2R10BH	2W10BH	2U10BH	5/8
3/4	2M12BH	2R12BH	2W12BH	2U12BH	3/4
7/8	2M14BH	2R14BH	2W14BH	2U14BH	7/8
1	2M16BH	2R16BH	2W16BH	2U16BH	1
1-1/8	2M18BH	2R18BH	2W18BH	2U18BH	1-1/8
1-1/4	2M20BH	2R20BH	2W20BH	2U20BH	1-1/4
1-3/8	2M22BH	2R22BH	2W22BH	2U22BH	1-3/8
1-1/2	2M24BH	2R24BH	2W24BH	2U24BH	1-1/2
1-5/8	2M26BH	2R26BH	2W26BH	2U26BH	1-5/8
1-3/4	2M28BH	2R28BH	2W28BH	2U28BH	1-3/4
1-7/8	2M30BH	2R30BH	2W30BH	2U30BH	1-7/8
2	2M32BH	2R32BH	2W32BH	2U32BH	2

SOFT BLANKS AVAILABLE

**STANDARD B & S PINHOLES CAN
BE FURNISHED ON ANY BLANK
FOR A SLIGHT ADDITIONAL
CHARGE.**

ADD-ONS FOR B & S TOOL BLANKS WITH PIN HOLES

STANDARD TOOLS SHIPPED FROM
STOCK.

SEMI-STANDARD TOOLS
(**BOLD AREAS**):
DELIVERY 2-8 DAYS.

ALL BLANKS GROUND BOTH SIDES.
O.D. TURNED CONCENTRIC WITH
THREAD.

M - 2 = M

M - 42 = R

T - 15 = W

HS 76 = U

**Lester Detterbeck
Enterprises Ltd.**

3390 US - 2 East
Iron River, MI 49935
1-906-265-5121
1-800-533-3328



FAX 1-906-265-6195
www.lesterdetterbeck.com

CIRCULAR FORM TOOL BLANKS

For Brown and Sharpe



WIDTH	CAT. NO. M-2 HARD	CAT. NO. M-42 HARD	CAT. NO. T-15 HARD	CAT. NO. HS 76	WIDTH
#2 B & S 3" DIA 5/8 - 11					
2-1/8	2M34BH	2R34BH	2W34BH	2U34BH	2-1/8
2-1/4	2M36BH	2R36BH	2W36BH	2U36BH	2-1/4
2-3/8	2M38BH	2R38BH	2W38BH	2U38BH	2-3/8
2-1/2	2M40BH	2R40BH	2W40BH	2U40BH	2-1/2
2-5/8	2M42BH	2R42BH	2W42BH	2U42BH	2-5/8
2-3/4	2M44BH	2R44BH	2W44BH	2U44BH	2-3/4
2-7/8	2M46BH	2R46BH	2W46BH	2U46BH	2-7/8
3	2M48BH	2R48BH	2W48BH	2U48BH	3
3-1/8	2M50BH	2R50BH	2W50BH	2U50BH	3-1/8
3-1/4	2M52BH	2R52BH	2W52BH	2U52BH	3-1/4
3-3/8	2M54BH	2R54BH	2W54BH	2U54BH	3-3/8
3-1/2	2M56BH	2R56BH	2W56BH	2U56BH	3-1/2
3-5/8	2M58BH	2R58BH	2W58BH	2U58BH	3-5/8
3-3/4	2M60BH	2R60BH	2W60BH	2U60BH	3-3/4
3-7/8	2M62BH	2R62BH	2W62BH	2U62BH	3-7/8
4	2M64BH	2R64BH	2W64BH	2U64BH	4



SEMI-STANDARD CIRCULAR BLANKS

For Multiple Spindle Machines

ALL THE BLANKS LISTED ON THIS PAGE ARE AVAILABLE AS A SEMI STANDARD. PLEASE CONTACT OUR OFFICE FOR UP TO DATE PRICING. WE CAN ALTER ANY DIMENSIONS NEEDED.

NEW BRITAIN GRIDLEY MOD. 60 2-1/4" DIA. WITH 6-3/16" PIN HOLES, 5/16" DP. ON 1" DIA. CIRCLE, 5/8" RM. I.D. WITH 1-1/32" CO'BORE

NATIONAL ACME 1-7/8" DIA. WITH 34 SIDE TEETH ON 1-1/8" RM. I.D. WITH 7/8" CO'BORE (1/8" HUB WIDTH NOT INCLUDED IN WIDTH DIMENSION)

NATIONAL ACME 2-3/8" DIA. WITH 34 SIDE TEETH ON 1-1/2" DIA. HUB. 3/4" RM. I.D. WITH 1-1/32" CO'BORE (1/8" HUB WIDTH NOT INCLUDED IN WIDTH DIMENSION)

NATIONAL ACME 3" DIA. WITH 34 SIDE TEETH ON 1-1/2" DIA. HUB. 3/4" RM. I.D. WITH 1-1/32" CO'BORE (1/8" HUB WIDTH NOT INCLUDED IN WIDTH DIMENSION)

NATIONAL ACME 3-3/8" DIA. WITH 34 SIDE TEETH ON 1-3/4" DIA. HUB. 1" RM. I.D. WITH 1-1/4" CO'BORE (1/8" HUB WIDTH NOT INCLUDED IN WIDTH DIMENSION)

CLEVELAND 3" DIA. WITH 14-3/16" PIN HOLES, 5/16" DP. ON 1-1/2" DIA. CIRCLE, 3/4" RM. I.D. WITH 1-1/16" X 5/32" CO'BORE

CLEVELAND 3-1/2" DIA. WITH 6-1/4" PIN HOLES, 5/16" DP. ON 1-7/8" DIA. CIRCLE, 7/8" RM. I.D. WITH 1-1/8" X 3/16" CO'BORE



SEMI-STANDARD CIRCULAR BLANKS

For #4 & #6 Brown and Sharpe Machines

B & S #4 OLD STYLE 3-1/2" DIA. WITH 6-1/4" PIN HOLES, 5/16 DP. ON 1-11/16" DIA. CIR. 3/4 -10 TAPPED HOLE

B & S #4 NEW STYLE 3-1/2" DIA. WITH 6-1/4" PIN HOLES, 5/16" DP. ON 1-7.8" DIA. CIRC., 3/4" RM. I.D. WITH 1-1/32" CO'BORE

B & S #6 4 " DIA. WITH 6-9/32" PIN HOLES, 5/16" DP. ON 1-13/16" DIA. CIR. 3/4 -10 TAPPED HOLE



SELECTING THE PROPER CUTOFF TOOL

The selection of the proper cutoff tools is, of course, one of the most important decisions in laying out your job. Obviously the tool must cut off the part. In addition, a properly designed tool can also chamfer the front end of the next part to the diameter you wish. In particular, this chamfer can be designed to break down the front end sufficiently to prepare for the threading operation.

We recommend the use of our "T" series cutoff tools. The "T" series cutoff tools are designed for use on parts requiring threads from 4-40 to 1-3/8"-12. Each tool is specifically designed for a particular thread size. The blade cuts off the part and the 45° chamfer breaks down the front end of the next part to the proper diameter to start the threading die.

The "T" cutoff tool can also be very useful on jobs without threads. Because the "A" dimension, (or drop from the heel of the cutoff blade to the top of the chamfer) is ground to a decimal dimension, you can set the chamfer to any diameter you wish with a minimum of effort.

Circular Plain Cut-off Tools

#00 B & S 1-3/4" O.D., 3/8-16 THREAD, 1/4"

B	CAT. NO. M-2	CAT. NO. T-15
.025	00M025P	00W025P
.030	00M030P	00W030P
.040	00M040P	00W040P
.050	00M050P	00W050P
.055	00M055P	00W055P
.060	00M060P	00W060P
.070	00M070P	00W070P
.080	00M080P	00W080P
.085	00M085P	00W085P
.090	00M090P	00W090P
.100	00M100P	00W100P
.120	00M120P	00W120P
.140	00M140P	00W140P

CUTOFF WIDTH- AND A WORD OF CAUTION

When using the following table to determine blade width, the following items should be considered:

1.) Least thickness used when cutting off into tapped holes is the lead of two and one-half threads plus .010.

2.) Least thickness used when cutting off into reamed holes smaller than 1/8" diameter is .040.

3.) Thickness used when cutting off tubing is two-thirds B as given below for corresponding diameters of stock.

4.) Thickness used when cutting off the drilled hole is greater than 1/2 the diameter of the stock.

DIAMETER OF STOCK	B THICKNESS
1/16	.025
3/32	.030
1/8	.040
3/16	.050
1/4	.055
5/16	.060
3/8	.070
7/16	.080
1/2	.090
9/16	.100
5/8-3/4	.110
13/16-1"	.120
1-1/16-1-5/16"	.140
1-3/8-1-1/2"	.160

A WORD ABOUT CUTOFF ANGLES

Over the years, there has been quite a debate raised about whether the cutoff blade angle should be 15° or 23°. Theoretically, 15° should be used when cutting steel, iron, bronze, and nickel and 23° when cutting brass, aluminum, free machining copper, silver, and zinc.

It has been our experience that most shops use a 15° cutoff angle blade on almost all runs with good success. They point out that they save in two ways:

1.) They don't have to buy, stock, and keep track of two sets of cutoff tools (one 15° and one 23°).

2.) The "throw" on the cutoff tool is less with the 15° angle blades than with the 23° angle blade. Hence a small time savings on the job may be obtained when using the 15°.

We stock our cutoff tools with a 15° cutoff angle. 23° angle available on request.

M-2 = M
M-42 = R
T-15 = W
HS 76 = U

#2 B & S 3" O.D., 5/8 - 11 THREAD, 3/8" WIDTH

#0 B & S 2-1/4" O.D., 1/2-13 THREAD, 5/16" WIDTH

B	CAT. NO. M-2	CAT. NO. T-15
.030	0M030P	0W030P
.040	0M040P	0W040P
.050	0M050P	0W050P
.055	0M055P	0W055P
.060	0M060P	0W060P
.070	0M070P	0W070P
.080	0M080P	0W080P
.085	0M085P	0W085P
.090	0M090P	0W090P
.100	0M100P	0W100P
.120	0M120P	0W120P
.140	0M140P	0W140P

B	CAT. NO. M-2	CAT. NO. T-15
.040	2M040P	2W040P
.050	2M050P	2W050P
.055	2M055P	2W055P
.060	2M060P	2W060P
.070	2M070P	2W070P
.080	2M080P	2W080P
.085	2M085P	2W085P
.090	2M090P	2W090P
.100	2M100P	2W100P
.120	2M120P	2W120P
.140	2M140P	2W140P
.160	2M160P	2W160P
.180	2M180P	2W180P

#DAVENPORT 2" O.D., 9/16" RM, 6 P.H., 1/4" WIDTH

B	CAT. NO. M-2	CAT. NO. T-15
.030	DM030P	DW030P
.040	DM040P	DW040P
.050	DM050P	DW050P
.055	DM055P	DW055P
.060	DM060P	DW060P
.070	DM070P	DW070P
.080	DM080P	DW080P
.085	DM085P	DW085P
.090	DM090P	DW090P
.100	DM100P	DW100P

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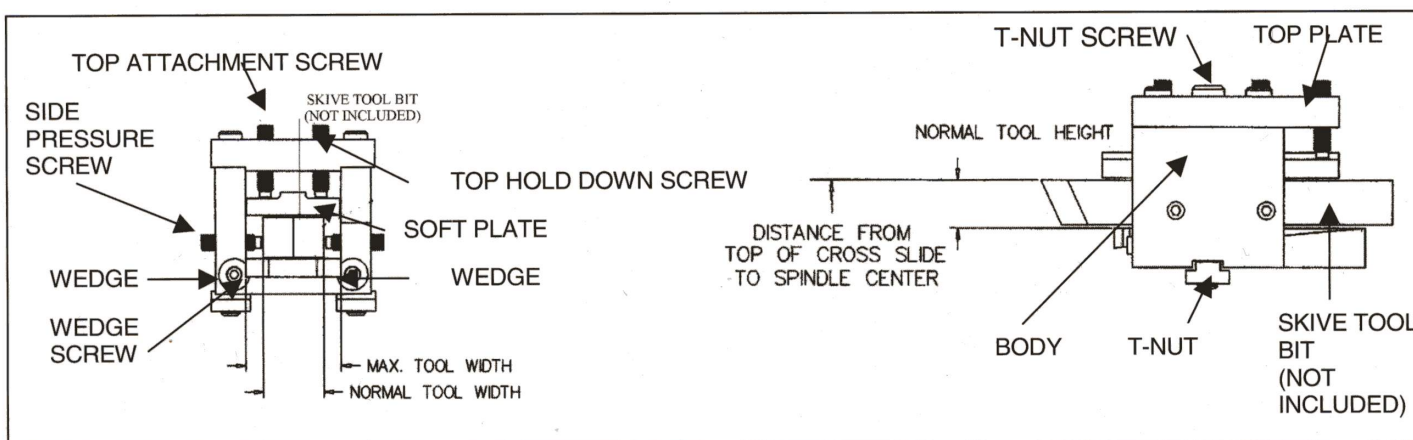
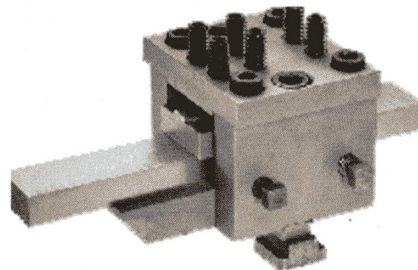
Skiving Tool Holders

Brown & Sharpe Dovetail Form Tool Holder



Skiving Tool Holders for Brown and Sharpe Automatic Screw Machines

This Holder can be used on either the front or back cross slide by changing the position of two nuts, so there is no need for two different holders. Among the salient features is the possibility of setting the tool within a few thousandths, if necessary, of the collet. Also, this is the first holder to our knowledge that permits rolling the tool to correct or straighten diameters. Two tapered wedges, each individually adjusted, will raise or lower one side of the tool without affecting the other side. This eliminates shimming up the holder to get the correct diameters. Standard stock screws are used almost entirely. A soft steel clamp plate is furnished. This plate sits on the skive tool and the lock screws tighten down on this plate. The blank tool is not furnished, however, its size can be determined from the table below.



SKIVE TOOL HOLDER

Model	Skive 00	Skive 0	Skive 2
Ordering Number	0130000	0131000	0132000
Machine Size	#00	#0	#2
Max. Tool Width*	1.110	1.500	2.100
Normal Tool Width	1.000	1.375	2.000
Normal Height to Center Line**	.500	.718	.844

*This can be increased but will not go through holder, thereby limiting useable tool length to length from holder to tip of tool.

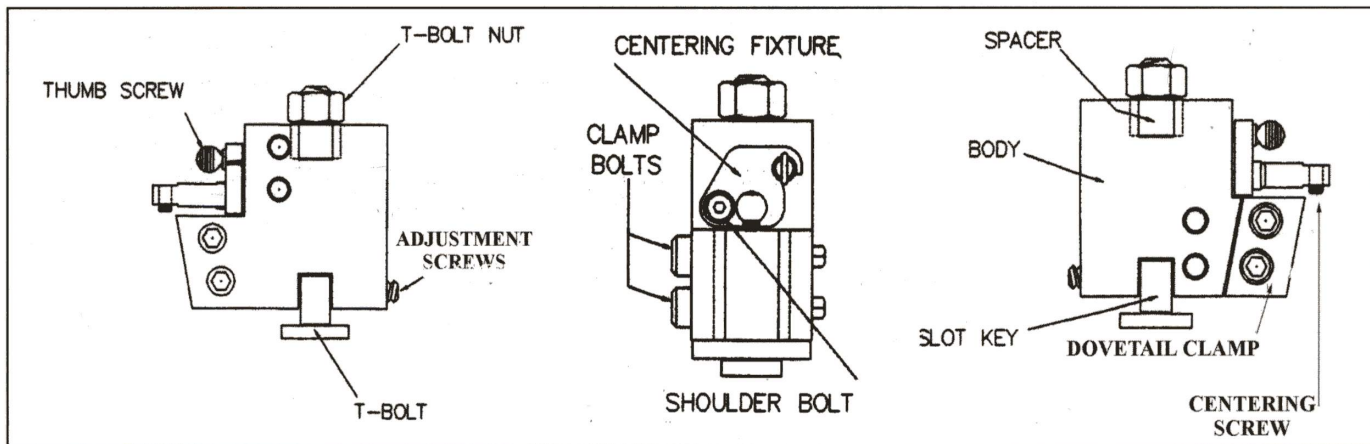
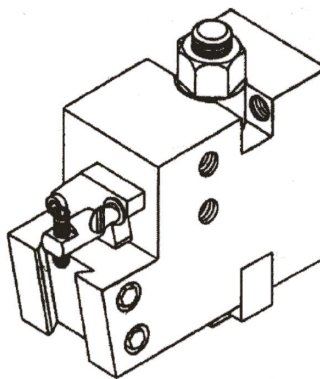
**To determine tool heights, subtract base radius of tool (smallest radius tools will cut part on) from normal tool height shown.

Replacement Parts

Body	0130001	0131001	0132001
Top Plate	0130002	0131002	0132002
Wedge Set (2 reqd.)	0130003	0131003	0132003
T-key	0130004	0131004	0132004
Top Screws (6 reqd.)	0130005	0131005	0132005
Side Screws (4 reqd.)	0130006	0131006	0132006
Bolts	0130008	0131008	0132008
Soft Plate	0130010	0131010	0132010

A TRULY UNIVERSAL BROWN AND SHARPE DOVETAIL FORM TOOL HOLDER

A dovetail form tool holder that has the ability to be used on both cross slides and in both spindle directions. Unlike the competition, this holders' clamps can be accessed from either side. To add to the unquestionable value of these holders, they all come equipped with a center line adjusting screw. And now, the first holders to offer the ability to use a recess tool with the use of an optional pusher.



DOVETAIL FORM TOOL HOLDER

Model	DDHU00	DDHU0	DDHU2
Ordering Number	0120000	0121000	0122000
D/T Tail Size	.714	.951	.951
<i>Replacement Parts</i>			
Body	0120001	0121001	0122001
Clamp	0120002	0121002	0122002
Clamp Bolts (2 Req'd.)	0120003	0121003	0122003
T bolt	0120004	0121004	0122004
Centering Fixture	0120005	0121005	0122005
D/T Key	0120010	0121010	0122010
Spacer	0120011	0121011	0122011
Thumb Screw	0120012	0121012	0122012
Wrench	0120015	0121015	0122015

**CENTERING
GAGE
INCLUDED**

**SWIVEL
TAPER
ADJUSTMENT**

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SELECTING THE PROPER HIGH SPEED STEEL

BACKGROUND

Ever since the beginning of the 20th century, high speed steels have been one of the primary materials used in the manufacturing of cutting tools for the metalworking industry. Over the years, the popularity of various grades has shifted to technological advances. Early high speed steels were primarily of the tungsten variety. But during World War II, with tungsten scarce, molybdenum types were successfully developed to produce comparable results as obtained with tungsten. Since then, molybdenum types have gained popularity to the point where most high speed steel tools made today use the molybdenum steels.

The molybdenum high speed steels include a number of compositions. These range from the standard grades, such as M-2 and M-1 through the M-3's and M-4 with high carbon and high vanadium content to the super hard M-40 series. The tungsten high speed steels that have retained popularity over the years are T-5 and T-15.

In the last ten years, particle metallurgy techniques have added a new dimension to the high speed steel picture. Although there are a number of variations of this process, the basic procedure involves the compacting of millions of fine particles of steel that are even in size and uniform in carbide distribution into a bar of tool steel.

The result of this procedure produces bars of tool steel with uniform properties throughout. This not only means increased grindability and toughness over the conventional material, but also may contribute to greater tool life due to the uniform and fine carbide distribution.

Today, it is possible to obtain a powered metal equivalent for almost any of the previously mentioned high speed steels. The biggest impact to date though has been in the T-15 material. But before we get into that, we should review the four basic properties generally used to compare various high speed steels. These are:

- Red hardness
- Wear resistance
- Toughness
- Grindability

RED HARDNESS (R)

The retention of cutting edge strength at high operating temperatures is called red hardness. High cutting speeds produce heat buildup at the cutting edges of the tools, often reaching 1000° F. At these temperatures, insufficient hardness of a high speed steel will cause the cutting edges to deform, impairing cutting efficiency and requiring frequent resharpening.

WEAR RESISTANCE (W)

In any cutting application, the work material constantly rubs against the tool edges resulting in an abrasive action that causes wear and

impairment of cutting ability. Wear resistance is the relative ability to withstand such wear.

TOUGHNESS (T)

Toughness is generally known as the ability to withstand shock and avoid premature breakage to chipping of cutting edges.

GRINDABILITY (G)

Grindability is generally the last property reviewed in selecting of tool grade. However, the grindability of a material has a direct effect on the economics of tool manufacturing. Whether you make or buy your tools, grinding time is expensive.

INTERRELATIONS OF PROPERTIES

As a general rule, these properties are not independent of one another. In many cases, improved characteristics in one property may be at the expense of certain other properties. In particular, wear resistance and grindability are opposing characteristics and red hardness and toughness are opposing characteristics. For example, wear resistance of a material is often measured by observing the wheel wear on grinding the different high speed steels – a greater magnitude of wheel wear signifies higher wear resistance. In addition, hardness and toughness are opposites. Hardness often has to be compromised to avoid premature breakage or chipping of cutting edges. This will become more evident as we study the charts.

READING THE CHARTS

A great many high speed steels comparison charts have been published by various sources. Each of these seem to be different from the next. In order to be as objective as possible, we solicited and compiled technical information from the following companies:

Braeburn Alloy Steel Division
Crucible Specialty Metals Div.
Latrobe Steel
Teledyne Vasco

These charts represent a composite of this information and our 75+ years of experience with screw machine tooling. We think it is important to you to note the following about each of the steels shown:

M-2 (M)

M-2 is a general purpose high speed steel that is used in many applications. Our chart is organized using M-2 as our benchmark; for most comparisons of high speed steel start off with the question – "How does it compare to M-2?"

M-3-2

As you can see, M-3-2 has a higher red hardness and a lower toughness than M-2. In addition, M-3-2 has a higher relative wear

resistance and a lower grindability than M-2. What this means is if your M-2 tools cutting edges are burning out or wearing out and you are faced with frequent resharpenings, M-3-2 might solve your problem. We generally, though, would recommend M-42 as a solution for your problem. Here's why:

M-42 (R)

M-42 has a higher wear resistance and red hardness than M-3-2. It is almost as tough as M-3-2 and its grindability is better than M-3-2. Because of this, we have found that M-42 is preferred over M-3-2 in most cases. For this reason, M-42 tools and blanks are stocked while M-3-2 tools are not. Our designation for this material is "R", which refers to the fact that M-42 has the highest red hardness of any of the high speed steels generally used today.

CPM-20

CPM-20 is an alternative for M-42. It does everything as good as or better than M-42, and does not include hard-to-get cobalt. We substitute freely with M-42.

T-15 PM (W)

T-15 has always been a good alternative to M-2 when additional wear resistance and red hardness are required. The chief problem with conventional T-15 has been that it is very difficult to grind and is relatively brittle. T-15 PM has solved that problem. As mentioned before, T-15 PM has the same components as conventional T-15, but it is manufactured in such a way that uniform carbide distribution and even particle size is obtained. The difference between conventional T-15 and T-15 PM is dramatic:

- 1.) T-15 PM grinds far easier than conventional T-15 from form grinding and resharpening tools.
- 2.) T-15 PM is much tougher than conventional T-15. It can withstand shock and is not nearly as brittle as conventional T-15.
- 3.) T-15 PM still retains excellent high wear resistance and red hardness. In fact, we have designated T-15 PM as "W" because its wear resistance is superior to any of the materials shown.

Please note that we make all our T-15 tools and blanks out of PM material. We feel you should have the benefit of metallurgical breakthroughs today as they occur, not as we run out of our stock.

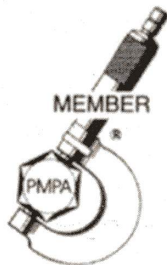
T-5

Over the years, T-5 has often been recommended as an alternative to M-2 because of its higher red hardness and higher wear resistance. However, we feel the use of T-5 will be only on a limited basis in the future.

CIRCULAR CUTOFF TOOL ENGINEERING DATA

HS 76 (U)

The most recent addition to our available materials. HS 76 offers even higher RED Hardness and wear resistance than T-15. Since this material is produced with the PM process, the grindability compares very closely to M-2. The tougher your part materials, the better HS 76 will perform. We suggest you try this on your next tough forming job.



A WORD ABOUT ROCKWELL HARDNESS

Lester Detterbeck Enterprises Ltd. has long been an advocate of proper Rockwell Hardness on Tool Steel. From our years of experience, and working with the High Speed Steel Manufacturer, we have developed what we feel are the optimal hardness ranges. The readings are checked on "C" scale and are as follows:

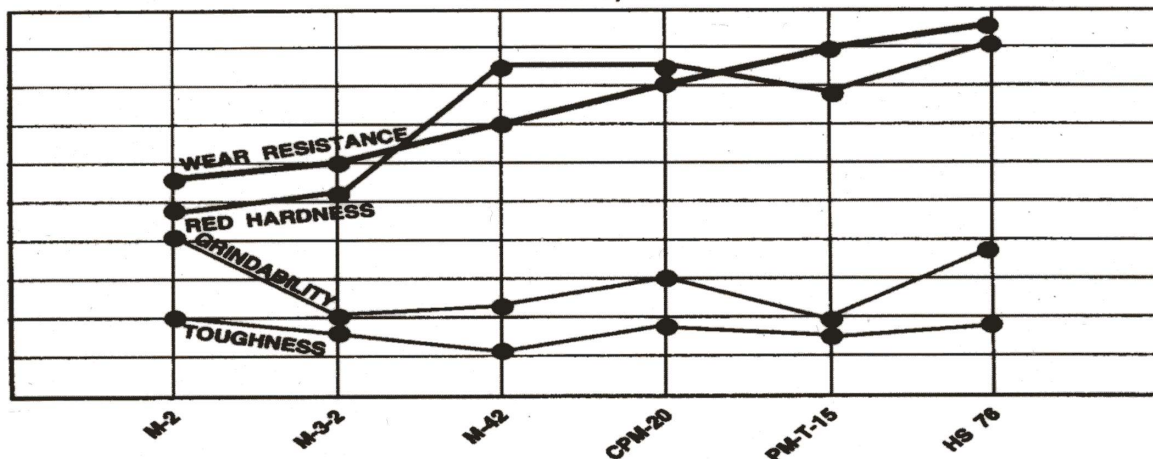
M-2.....63-65
CPM-20/M-42.....65-67
T-15 PM.....65-67
HS 76.....66-68

These Rockwell readings provide the best match of wear resistance, toughness, and Red Hardness for each given steel. Lower reading may improve grindability slightly, but at a major loss of tool life. Typically these "higher" Rockwell readings can only be achieved by Heat Treating in a Salt Bath Style Furnace. LDE uses only Salt Bath Heat Treat so we may provide you with the best possible blanks and tools.

IN SUMMARY

The selection of the proper high speed steel is very important. Your effort reviewing the chart provided on this page will represent time well spent. Your order of LDE blanks and tools of the proper material with the optimal Rockwell Hardness will represent money well spent. Our objective is your profitable machining.

*Titanium Nitrate Coating available on all Standard & Semi-standard Circular Tools.
Price on Request.*



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