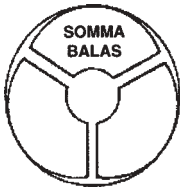


All Balas products are manufactured by Somma Tool Co. to the same demanding standards that have made the Balas name synonymous with quality.

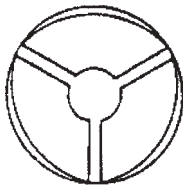
Features include:

- Cam grinding of all Collets to prevent sticking and for tighter gripping of the bar stock.
- All Collets and Pads manufactured for maximum concentricity.
- High quality alloy steels plus scientific heat treating gives greater resilience and longer life.

All Somma/Balas collets for automatic screw machines are cam ground by a process Balas pioneered many years ago...see illustrations below. The tremendous success of cam grinding with a cloverleaf shape has resulted in this process being adopted by most manufacturers of collets...even the "cloverleaf" name is now generally accepted terminology.



Cam ground collets always bear at the center of the taper.

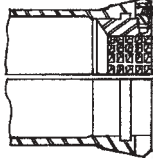


Round ground collets bear on the edges of the collet segments.

Cloverleaf cam ground collets provide a means of handling stock size variation and collet wear that cannot be done with a round ground collet or one with flat ground reliefs at the saw slots.

When you use Somma/Balas cam ground collets, you get these seven advantages:

1. No sticking in the chuck head when operating with undersized stock.
2. Faster opening.
3. Tight gripping.
4. Reduced chatter.
5. Less tendency to push stock back.
6. Chucking mechanism closes easier and with less strain.
7. Less breakage.



MARTIN MASTER COLLETS

Developed by Balas to reduce change over time of collet pads.

- Pads can be changed without removing master from spindle.
- Pads held in place securely by expanding lugs.
- Pads available to full machine capacity.



MODEL "A" MASTER PUSHERS

Developed by Balas to simplify changing of pusher pads.

- No pins or screws are used.
- No small parts to become loose through vibration. Pads are engaged within the master and cannot rotate.
- Pads are held firmly to absorb rotating thrust.
- Pads can be changed quickly and easily.
- Pads are heat-treated to hardness exceeding that of the body.
- Body is tempered to high spring tension.
- Thread ends are toughened, yet a high degree of resiliency is maintained throughout remainder of body.



DIAL ADJUSTABLE MASTER PUSHERS

Developed by Balas for longest running time.

- Tension is adjustable to suit job - instead of fixed as with conventional pushers.
- Carbide pads maintain tension because wear is practically non-existent.
- Carbide pads eliminate galling and marking of stock.
- Saves downtime that would be required for changing pushers, because they last so long.
- Outperforms other pushers - run almost indefinitely.

ORDERING INSTRUCTIONS

When Ordering Collet Pads and Pusher Pads Use Following Computer Format:

Balas No.	Bar Size	Bar Shape	Serrated	Material
---	---	---	---	---

Round = R	Y = Yes	Steel = S
Hex = H	N = Smooth	Carbide = C
Square = S		Bronze = B

EXAMPLES OF COMPUTER ORDERING NUMBER FOR COLLET PADS AND PUSHER PADS

2200-1-1/2RYS = 1-1/2 Round Serrated Steel
2200 Collet Pad

5005-1-3/4HNS = 1-3/4 Hex Smooth Steel
5005 Pusher Pad

ALL OTHER ITEMS SPECIFY "BALAS NO."

NOW AVAILABLE FROM SOMMA -

RELEASING MASTER PUSHERS & PADS FOR SCRATCH FREE FEEDING OF BAR STOCK.



These Master Pushers are designed for positive pushing in the forward direction with a very free return. The freedom of the return stroke results in long pad life and freedom from scratch marks on the stock.

They also eliminate the need to chamfer the bar end when loading new bar stock. When the bar end is pushed against the back of the pusher pads they spring open to allow easy loading.

Recommended for long run or long feed-out stock.

Machine Type	Spindle Capacity	Master Pusher#	Pusher Pads			
			Round#	Max Rnd. Cap.	Hex#	Max Hex Cap.
Acme	7/16"	4600	*5600R	5/16"	*5600H	1/4"
	9/16"	4601	*5601R	7/16"	*5601H	3/8"
	5/8"	4603	*5603R	1/2"	*5603H	13/32"
	3/4"	4604	*5604R	19/32"	*5604H	1/2"
	1"	4606	*5606R	25/32"	*5606H	21/32"
	1-1/4"	4608	*5608R	1"	*5608H	27/32"
	1-5/8"	4609	*5609R	1-1/4"	*5609H	1-3/32"
	2"	4612	*5612R	1-1/2"	*5612H	1-5/16"
	2-1/4"	4614	*5614R	1-3/4"	*5614H	1-17/32"
	2-5/8"	4617	*5617R	2"	*5617H	1-3/4"
3-1/2"	4618	*5618R	2-1/2"	*5618H	2-3/16"	
Cone	9/16"	4602	*5601R	7/16"	*5601H	3/8"
	7/8"	4605	*5605R	11/16"	*5605H	19/32"
	1"	4607	*5607R	25/32"	*5607H	21/32"
	1-1/4"	4608	*5608R	1"	*5608H	27/32"
	1-5/8"	4610	*5610R	1-1/4"	*5610H	1-3/32"
	2"	4613	*5612R	1-1/2"	*5612H	1-5/16"
	2-1/4"	4615	*5614R	1-3/4"	*5614H	1-17/32"
	2-5/8"	4617	*5617R	2"	*5617H	1-3/4"
	3-1/2"	4619	*5618R	2-1/2"	*5618H	2-3/16"
	New Britain	1"	4607	*5607R	25/32"	*5607H
1-1/4"		4608	*5608R	1"	*5608H	27/32"
1-5/8"		4610	*5610R	1-1/4"	*5610H	1-3/32"
1-3/4"		4611	*5610R	1-1/4"	*5610H	1-3/32"
2-1/4"		4616	*5614R	1-3/4"	*5614H	1-17/32"
2-5/8"		4617	*5617R	2"	*5617H	1-3/4"
Wickman	1"	4607	*5607R	25/32"	*5607H	21/32"

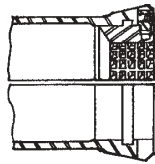
- Scratch-free work.
- Much longer wear-free pad life.
- Uniform work length - no drawing -back of stock.
- Constant tension at any spindle speed.
- Easily adjustable tension.
- No special tools required.
- Reduced wear on feed slide and drum cans.
- No duplicating of pads - hardened tool steel pads are applicable for all classes of work.

Note: Please specify tolerance of bar stock diameter when ordering pusher pads to insure proper fit.

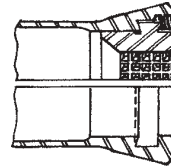
Minimum stock capacity - 1/16" round, 1/8" hex.

These pushers are not compatible with the New Cone screw machines that have a hydraulic feed system.

MARTIN MASTER COLLETS AND PADS



"CB" MASTER COLLETS AND PADS



Machine Size and Model	MARTIN MASTER COLLETS AND PADS				
	MASTER Balas Number	PADS Balas Number	CAPACITY		
			Round	Hex.	Sq.
9/16" RA & R-6, RAN-6	—	—	—	—	—
1" RA & R-4 RA & R-6, RAS-6	1475	2002	1"	7/8	11/16
1-1/4" RA & R-6 RB-8, G & GA-4	1101-1	2003G	1-1/4	1-1/16	7/8
1-5/8" RA, RAS & R-4 RB, RA, & R-6 RB & RA-8, GA-4	1128	2019	1-5/8	1-3/8	1-1/8
2" RA, RAS & R-4 RB, RAS, RA & R-6	1408	2041	1-15/16	1-5/8	1-5/16
2-5/8" RB, RA & R-6 RB, RA-8, M	1064	2010	2-5/8	2-3/16	1-13/16
3-1/2" RB & RA-4	—	—	—	—	—
3-1/2" RB & RA-6, M	1256NB	2011	3-1/2	3"	2-7/16

Machine Size and Model	"CB" MASTER COLLETS AND PADS				
	MASTER Balas Number	PADS Balas Number	CAPACITY		
			Round	Hex	Sq.
1094-B	2239		9/16	7/16	3/8
7075	C2027		1"	7/8	23/32
7101-B	2473		1-1/4	1-1/16	7/8
7247	2128		1-5/8	1-13/32	1-9/64
7108	2103		2"	1-11/16	1-3/8
7064CB	C2010		2-5/8	2-1/4	1-27/32
7326	2159		3-1/4	2-13/16	2-5/16
CB-7256	C2011		3-1/2	3-1/16	2-1/2

Collet pads are available with round, round serrated, hexagon or square holes in .001" increments, fractional or metric sizes.

"A" MASTER PUSHERS AND PADS



CAGE TYPE PUSHERS



Machine Size and Model	CAGE Balas Number	MASTER Balas Number	STEEL PADS			CARBIDE PADS		
			PADS Balas Number	CAPACITY		Balas Number	CAPACITY	
			Balas Number	Round	Hex	Sq.	Round	
7/16" RA-6	6041	4041	5002	25/64	11/32	9/32	5002C	11/32
9/16" RA & R-6 RAN-6	6094	4020	5076	1/2	7/16	11/32	5076C	15/32
5/8" RN-6	6049	4160	5076	1/2	7/16	11/32		
3/4" RA-8	6096	4182	5014	23/32	5/8	1/2	5014C	11/16
1" RA & R-4 RA & R-6 RAS-6	6127	4159	5016	15/16	13/16	21/32	5016C	27/32
1-1/4" RA & R-6 RB-8 G & GA-4	6101	4101-A	5013	1-3/16	1"	13/16	5013C	1-1/8
1-5/8" RA, RAS & R-4, RB, RA & R-6 RB & RA-8, GA-4	6128	4076	5015	1-1/2	1-3/16	1-1/16	5015C	1-3/8
2" RA, RAS & R-4 RB, RAS, RA & R-6	6108	4108	5029	1-7/8	1-5/8	1-3/16		
2-5/8" RB, RA & R-6, RB, RA-8, M	6064	4064	5005	2-9/16	2-3/16	1-13/16		
3-1/2" 2B & RA-4 RB & RA-6, M	6256	4256-A	5006	3-7/32	2-3/4	2-1/4		

Carbide pusher pads are available with round, hexagon or square holes 1/8" to capacity in .001" increments, fractional or metric sizes.

Steel pusher pads are available with round, hexagon or square holes in .001" increments, fractional or metric sizes.

DIAL ADJUSTABLE MASTER PUSHERS AND CARBIDE PADS

Machine Size and Model	Pusher Pad Capacity Round	PUSHERS	CARBIDE PADS
		Balas Number	Balas Number
7/16" RA	11/32	14000	5002C
9/16" R & RA	15/32	14040	5076C
5/8" RA-6	15/32	14670	5076C
1" R, RA, RAS	27/32	14020	5016C
1-1/4" R & RA & G	1"	14590	5089C
1-5/8" R, RA, G, GA	1-5/16	14030	5023C



Carbide pusher pads are available with round, hexagon or square holes 1/8" to capacity in .001" increments, fractional or metric sizes.

SOMMA'S EXCLUSIVE DIAL ADJUSTABLE MASTER PUSHERS WITH CARBIDE PADS

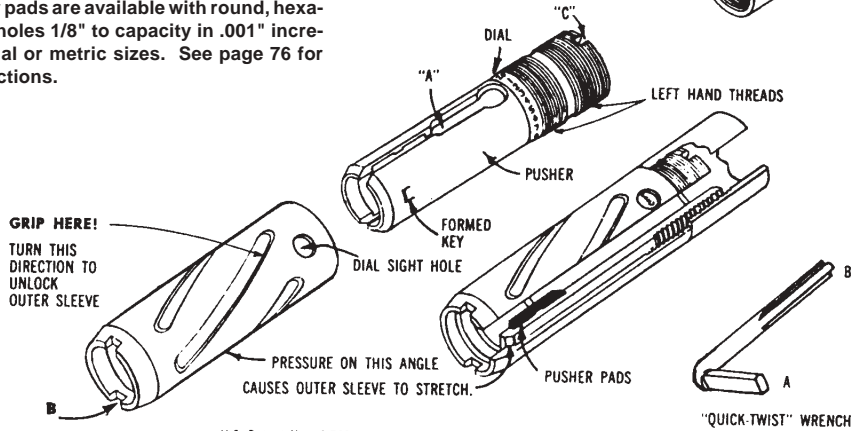
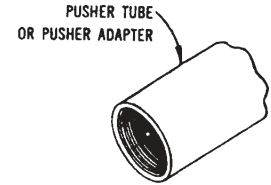
THE UNCHALLENGED CHOICE OF DAVENPORT OPERATORS!

OUTPERFORMS EVERY OTHER TYPE PUSHER!
INCREASES PRODUCTIVITY OF DAVENPORTS!

- Tension is infinitely adjustable to suit type and size material
- Does not mar stock
- Does not slip
- Tension does not change
- Carbide pads outlast steel at least 10 to 1
- Saves labor and downtime required for frequent changing of steel pads

* NOTE: The proper dial adjustable for the O.S. 3/4" capacity Davenport is #14550. The 14340 is a 9/16" capacity Davenport dial adjustable master with an adapter on it to fit the O.S. machine.

Carbide pusher pads are available with round, hexagon or square holes 1/8" to capacity in .001" increments, fractional or metric sizes. See page 76 for ordering instructions.



U.S. Patent Nos. 2,752,161, 2,833,545, 2,836,425

DIAL ADJUSTABLE



DIAL ADJUSTABLE MASTER PUSHER

Machine & Capacity	MASTER ASSEMBLY	PARTS FOR MASTER ASSEMBLY			CARBIDE PADS		QUICK TWIST WRENCH
	Balas Number	Inner Sleeve	Outer Sleeve	Adapter	Balas Number	Capacity Round	Balas Number
Std. 9/16" Cap.	14270	14042	14041	14273	5076C	13/32"	8029-1-A
O.S. 3/4" Cap.	14550	14552	14551	14553	5087C	9/16"	8022-1-A
O.S. 3/4" Cap.	14340*	14042	14041	14341	5076C	15/32"	8029-1-A

B & S Pusher Number	Pusher Pad Capacity Round	PUSHERS	CARBIDE PADS
		Balas Number	Balas Number
#00	5/16	14100	5000C
#11	15/32	14140	5076C
#21A	9/16	14170	5087C
#22	3/4	14600	5055C
#22H	1"	14610	5089C
#22D	1-3/32	14620	5161C

DIAL ADJUSTABLE MASTER PUSHERS AND CARBIDE PADS FOR B&S MACHINES



Carbide pusher pads are available with round, hexagon or square holes 1/8" to capacity in .001" increments, fractional or metric sizes.

** Complete line of Chuck Nuts & Collet Sleeves available. **

WORK HOLDING



"A" MASTER PUSHERS AND PADS

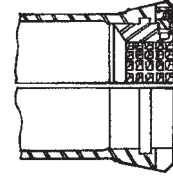
CAGE TYPE PUSHERS

Machine Size and Model	PUSHERS			CARBIDE PADS	
	Cage Balas Number	"A" Master Tension	"A" Master Balas Number	Balas Number	Capacity Round
Std. 1/2"-Model B Std. 1/2"-5/8"-Model	6072	Heavy	4072-H	5001C	1/2
		Medium	4072-M		
		Light	4072-L		
Oversize 3/4"-Cap	6074	Heavy	4074-H	5014C	11/16
		Medium	4074-M		
		Light	4074-L		

Carbide pusher pads are available with round, hexagon or square holes 1/8" to capacity in .001" increments, fractional or metric sizes.

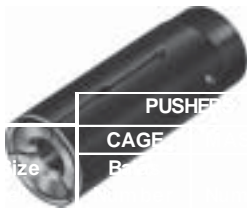
MARTIN MASTER COLLETS AND PADS

Machine Size and Model	MASTER		PADS		CAPACITY	
	Balas Number	Balas Number	Rd.	Hex.	Sq.	
7/8" (obsolete)	1055	2001	13/16	23/32	19/32	
1"-4 Vertical	1056	2002	1"	7/8	11/16	
1"-6 SW-SL-TS-TC	1140	2002	1"	7/8	11/16	
1-1/4"	1057	2003G	1-1/4	1-1/16	7/8	
1-1/2"	1058	2004	1-1/2	1-1/4	1-1/16	
1-5/8"	1237	2019	1-5/8	1-3/8	1-1/8	
1-7/8" (obsolete)	1059	2005	1-7/8	1-5/8	1-5/16	
2"	1061	2007	2"	1-11/16	1-3/8	
2-1/4"	1062	2008	2-1/4	1-15/16	1-9/16	
2-1/2"-2-5/8"	1064	2010	2-5/8	2-3/16	1-13/16	
3"	1063	2137	3"	2-9/16	2-1/8	
3-1/8"	1026	2137	3"	2-9/16	2-1/8	
3-1/4"	1054	2053	3-1/4	2-13/16	2-5/16	
3-1/2"	1065	2011	3-1/2	3"	2-7/16	

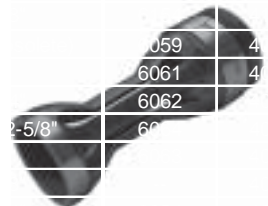


Collet pads are available with round, round serrated, hexagon or square holes in .001" increments, fractional or metric sizes.

"A" MASTER PUSHERS AND PADS



CAGE TYPE PUSHERS



Steel pusher pads are available with round, hexagon or square holes in .001" increments, fractional or metric sizes.

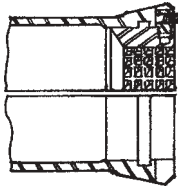
DIAL ADJUSTABLE MASTER PUSHERS AND CARBIDE PADS

Machine Model and Size	Pads Capacity Round	PUSHERS	CARBIDE PADS
		Balas Number	Balas Number
9/16" T.K. & Q.E.	15/32	14270	5076C
1"6 Spindle	27/32	14290	5016C
1-1/2"	1-3/32	14640	5161C
1-5/8"	1-5/16	14330	5023C

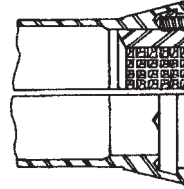


Carbide pusher pads are available with round, hexagon or square holes 1/8" to capacity in .001" increments, fractional or metric sizes.

MARTIN MASTER COLLETS AND PADS



NEW BRITAIN MASTER COLLETS AND PADS



Machine Size and Model	MARTIN MASTER COLLETS					N.B. MASTER COLLETS				
	MASTERS	PADS	CAPACITY			MASTERS	PADS	CAPACITY		
	Balas Number	Balas Number	Round	Hex.	Sq.	Balas Number	Balas Number	Round	Hex.	Sq.
1" #40, 51, 60 226, 263, 608	1140	2002	1"	7/8	11/16	7140	2140	1"	13/16	5/8
1-1/4" #601, 52	1101-1	2003G	1-1/4	1-1/16	7/8	—	—	—	—	—
1-5/8" #415, 656, 41, 42 61, 62	1154	2019	1-5/8	1-3/8	1-1/8	7154 7154CB	2154 2128	1-5/8 1-5/8	1-3/8 1-13/32	1-1/8 1-9/64
2" #41, 42, 61	1150B	2041	1-15/16	1-5/8	1-5/16	—	—	—	—	—
2-1/4" #415, 656, 41, 42 61, 62	1148	2029D	2-1/8	1-27/32	1-1/2	7148	2148	2-1/16	1-3/4	1-7/16
2-5/8" #42, 126, 826, 626	1149	2010D	2-9/16	2-3/16	1-13/16	7149	2149	2-5/8	2-1/4	1-7/8
3-1/2" #126 635	1256NB	2011	3-1/2	3"	2-7/16	CB7256NB	C2011	3-1/2	3-1/16	2-1/2

Collet pads are available with round, round serrated, hexagon or square holes in .001" increments, fractional or metric sizes.

"A" MASTER PUSHERS AND PADS



CAGE TYPE PUSHERS



Machine Size	PUSHERS		STEEL PADS				CARBIDE PADS	
	CAGE	"A" MASTER	CAPACITY			Balas Number	Capacity Round	
	Balas Number	Balas Number	Balas Number	Rnd.	Hex.			Sq.
1"	6140	4140	5016	15/16	13/16	21/32	5016C	27/32
1-1/4"	6101	4101-A	5013	1-3/16	1"	13/16	5013C	1-3/16
1-5/8"	6154	4154	5015	1-1/2	1-3/16	1-1/16	5015C	1-3/8
2"	6150	4150	5018A	1-15/16	1-11/16	1-3/8	Carbide pusher pads are available with round, hexagon or square holes 1/8" to capacity in .001" increments, fractional or metric sizes.	
2-1/4"	6148	4148	5010	2-1/8	1-27/32	1-1/2		
2-5/8"	*6149/6064	4064	5005	2-9/16	2-3/16	1-13/16		
3-1/2"	6256	4256-A	5006	3-7/32	2-3/4	2-1/4		

*Use Part # 6064 for Model #126 and #826 New Britain

*Use Part #6149 for Model #42 New Britain

Steel pusher pads are available with round, hexagon or square holes in .001" increments, fractional or metric sizes.

DIAL ADJUSTABLE MASTER PUSHERS AND CARBIDE PADS FOR NEW BRITAIN GRIDLEY AUTOMATICS

Machine Size and Model	Pad Capacity Round	MASTER	CARBIDE PADS
		Balas Number	Balas Number
1" #40 #51 #60 #172 #226	3/4	14580	5055C
1-1/4" #601 #52	1"	14590	5089C
1-5/8" #41 #42 #61 #206 #415 #656	1-5/16	14330	5023C



Carbide pusher pads are available with round, hexagon or square holes 1/8" to capacity in .001" increments, fractional or metric sizes.

Collet pads are available with round, round serrated, hexagon or square holes in .001" increments, fractional or metric sizes.



MASTER COLLETS AND PADS

Machine Size	Model No.	MASTER COLLETS		PADS		
		Balas Number	W&S Reference No.	Balas Number	W&S Reference No.	Max. Capacity
No. 2MC	M-2600	7552	2609-1007	2552	2609	Rd. 1-1/4 Hex. 1-1/16 Sq. 7/8
	M-2650	—	2611-1001 Drawback			
No. 3 16" EC No. 2 No. 2EC	M-1200	7219	461-1002	2023	461	Rd. 1-1/2 Hex. 1-5/16 Sq. 1"
	M-4630		Pushout			
	M-2070	7267	462-1002			
	M-1330 M-2660	Drawback				
No. 3 (1-3/4")	M-1200 M-4630	7211	1369-1008 Spec.	2023	461	Rd. 1-1/2 Hex. 1-5/16 Sq. 1-1/16
No. 3 (1-3/4")	M-1200 M-4630	7220	1369-1003	2064	1129	Rd. 1-3/4 Hex. 1-1/2 Sq. 1-1/4
No. 4 (2")	M-4640	7215	1129-1002	2064	1129	Rd. 2" Hex. 1-3/4 Sq. 1-3/8
	M-2240 M-1420		1929-1021			
No. 4	M-4640	7224	1129-1016	2023	461	Rd. 1-1/2 Hex. 1-5/16 Sq. 1-1/16
	M-2240		1929-1039			
No. 5 1A (2-1/2")	M-2250	7229	471-1001	2049	471	Rd. 2-1/2 Hex. 2-3/16 Sq. 1-3/4
	M-3400 M-470		2199-1002			
No. 5 1A (2")	M-2250 M-3400	1249-1018	1249-1018	2064	1129	Rd. 2" Hex. 1-3/4 Sq. 1-3/8
No. 5 (2-1/2")	M-2250 M-1740	1249-1023	1249-1023	2049	471	Rd. 2-1/2 Hex. 2-3/16 Sq. 1-3/4
No. 5 (3")	M-4660	7339	4669-1001	2339	4669	Rd. 3" Hex. 2-5/8 Sq. 2-1/8
No. 5 (2-1/2")	M-4660	4-4669-1008	4669-1008	2049	471	Rd. 2-1/2 Hex. 2-3/16 Sq. 1-3/4
No. 5 (4-1/2")	M-2770 M-4670	2779-1001	2779-1001	2204	2779	Rd. 4-1/2 Hex. 3-7/8 Sq. 3-3/16
No. 5 (2-1/2")	M-2770 M-4670	2779-1031	2779-1031	2049	471	Rd. 2-1/2 Hex. 2-3/16 Sq. 1-3/4
No. 6OS	M-382 M-92	7232	387-1028	2085	185	Rd. 2" Hex. 1-11/16 Sq. 1-3/8
No. 5 2-1/4 No. 6NS	M-342 M-432 M-340	7233-1 7233	357-1003 357-1003 357-1008	2065	357 2066	Rd. 2-1/4 Hex. 1-15/16 Sq. 1-9/16

FOR WARNER & SWASEY AUTOMATICS

MARTIN MASTER COLLETS AND PADS

Machine Size	Model No.	MASTER COLLETS		PADS		
		Balas Number	W & S Reference No.	Balas Number	W & S Reference No.	Max. Capacity
0AB	M4415	1473	3300-1120	2003G	3300	Rd. 1-1/4 Hex. 1-1/16 Sq. 7/8
1AB	M3880	7200-1AB	2530 3897-1028	2200	2530	Rd. 2-1/4 Hex. 1-15/16 Sq. 1-19/32
2AB	M3925 M3380	1051B	3397-1112	2137	3397	Rd. 3" Hex. 2-9/16 Sq. 2-1/8
2AB	M3925 M3380	NOT MARTIN STYLE		2049	471	Rd. 2-1/2 Hex. 2-3/16 Sq. 1-3/4
		3397-1021	3397-1021			
3AB	M3995	1553	3999-1001	2047	3999	Rd. 4-1/2 Hex. 3-7/8 Sq. 3-9/16
3/4" Six Spindle	M3330	1472	3330	2001	3330	Rd. 13/16 Hex. 23/32 Sq. 19/32
1-1/4" Six Spindle	M3300	1473	3300-1120	2003G	3300	Rd. 1-1/4 Hex. 1-1/16 Sq. 7/8
1-3/4" Five Spindle	M2500	7199	2500-1120	2199	2500	Rd. 1-3/4 Hex. 1-17/32 Sq. 1-1/4
2-1/4" Five Spindle	M2530	7200-1AB	2530 1070	2200	2530	Rd. 2-1/4 Hex. 1-15/16 Sq. 1-19/32

"A" MASTER PUSHERS AND PADS

Machine Size	Model No.	"A" MASTER PUSHER		PADS		
		Balas Number	W & S Reference No.	Balas Number	W&S Reference No.	Max. Capacity
0AB	M4415	4473	3300-1080	5102	3300	Rd. 1-1/4 Hex. 1-1/16 Sq. 7/8
1AB	M3880	4200	2530-1080	5200	2530	Rd. 2-1/8 Hex. 1-27/32 Sq. 1-1/2
2AB	M3925 M3380	4051	3398-1033	5069	3398	Rd. 2-13/16 Hex. 2-7/16 Sq. 1-31/32
3AB	M3995	4553	3998-1021	5026	3998	Rd. 4-7/16 Hex. 3-13/16 Sq. 3-3/8
3/4" Six Spindle	M3330	4472	3330-1130	5055	3330	Rd. 3/4 Hex. 11/16 Sq. 9/16
1-1/4" Six Spindle	M3300	4473	3300-1080	5102	3300	Rd. 1-1/4 Hex. 1-1/16 Sq. 7/8
1-3/4" Five Spindle	M2500	4199	2500-1130	5199	2500	Rd. 1-3/4 Hex. 1-17/32 Sq. 1-1/4
2-1/4" Five Spindle	M2530	4200	2530-1080	5200	2530	Rd. 2-1/8 Hex. 1-27/32 Sq. 1-1/2

Collet Pads and Steel pusher pads are available with round, hexagon or square holes in .001" increments, fractional or metric sizes.

DIAL ADJUSTABLE MASTER PUSHERS AND CARBIDE PADS

Carbide pusher pads are available with round, hexagon or square holes 1/8" to capacity in .001" increments, fractional or metric sizes.

Machine Size and Model	Pusher Pad Capacity Round	PUSHERS	CARBIDE PADS
		Balas No.	Balas No.
1-1/4"6-Spindle	1"	14650	5089C
1-3/4"5-Spindle	1-15/16"	14560	5023C

FOR WARNER & SWASEY N/C TURRET LATHES



Steel pusher pads are available with round, hexagon or square holes in .001" increments, fractional or metric sizes.

Collet pads are available with round, round serrated, hexagon or square holes in .001" increments, fractional or metric sizes.



MARTIN MASTER COLLETS AND PADS

"A" MASTER PUSHERS AND PADS (PULLERS)

Machine Size	Model No.	"A" MASTER PUSHERS		PADS		
		Balas Number	W & S Reference No.	Balas Number	W&S Reference No.	Max. Capacity
SC15 (3-1/2")	M4820	4065	4838-1200	5006	4838	Rd. 3"
SC15 (4-5/8")	M4820	4065	4838-1200	5006	4838	Rd. 3"
		4553	3998-1021	5026	3998	Rd. 4"
1SC	M5000	4200	2530-1080	5200	2530	Rd. 2-1/8"
2SC	M5040	4065	4838-1200	5006	4838	Rd. 3"
2SCL	M5080	4065	4838-1200	5006	4838	Rd. 3"
		4553	3998-1021	5026	3998	Rd. 4"

Machine Size	Model No.	MASTER COLLETS		PADS		
		Balas Number	W&S Reference No.	Balas Number	W&S Reference No.	Max. Capacity
SC15 (3-1/2")	M4820	1558	4836-1200	2010	4836	Rd. 2-5/8 Hex. 2-3/16 Sq. 1-13/16
SC15 (4-5/8")	M4820	1559	4826-1200	2157	4826	Rd. 4" Hex. 3-1/2 Sq. 2-7/8
1SC	M5000	1566	5014-10062"	2200	2530	Rd. 2-1/4 Hex. 1-15/16 Sq. 1-19/32
		1567	5034-10012-1/4"	2200	2530	Sq. 1-19/32
2SC	M5040	1569	5054-1003	2137	3397	Rd. 3" Hex. 2-9/16 Sq. 2-1/8
2SCL	M5080	1571	5094-1004	2016	5094	Rd. 4-1/2 Hex. 3-7/8 Sq. 3-3/16

Now Available!

**Warner & Swasey
Tooling & Repair Parts
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CHUCK JAWS & PADS FOR SADDLE TYPE TURRET LATHES

Machine Size	Model No.	MASTER CHUCK JAWS		JAW PADS		
		W & S Master Chuck Jaw Reference No.	Balas Number	W & S Reference No.	Balas Number	Capacity
2A (2-1/2")	M-492	493-1016	7105	493	2104	Rd. 2-1/2 Sq. 1-3/4 Hex. 2-1/8
1A (3")	M-3400 M-470	404-1008	7222	404	2096	Rd. 3-1/4 Sq. 2-3/8 Hex. 2-3/4
2A (3-1/2")	M-3470 M-510	404-1008	7222	404	2096	Rd. 3-1/4 Sq. 2-3/8 Hex. 2-3/4
2A (4-1/2") 3A (4-1/2")	M-3470 M-3500 M-1950	533-1008	7226	533	2226	Rd. 4-1/2 Sq. 3-3/16 Hex. 3-7/8
3A (6")	M-3500 M-1950	1959-7	7230	1959	2230	Rd. 6" Sq. 4-1/2 Hex. 5-3/16

SEE PAGE 135 FOR ORDERING INSTRUCTIONS

PUSHERS AND PADS FOR BAR FEED MECHANISMS ON TURRET LATHES

Machine Size	Model No.	"A" MASTER PUSHER		PADS	
		Balas Number	Balas Number	Max. Capacity	
No. 1 No. 1 No. 2 Hand No. 2 EC Hand	M-1270 M-2620 M-1330 M-2660	4009	5001	Rd. 35/64 Hex. 1/2 Sq. 13/32	
No. 2 Power No. 2 Power	M-1330 M-2660	4238-L 4238-M 4238-H	5055	Rd. 13/16 Hex. 23/32 Sq. 9/16	

Steel pusher pads are available with round, hexagon or square holes in .001" increments, fractional or metric sizes.

SEE PAGE 135 FOR ORDERING INSTRUCTIONS



STOCK DELIVERY

Keep extra sets in your toolroom for immediate use - Can be used over and over by boring out to larger sizes!!

SOFT MACHINABLE - 4150 STEEL

Install pad into master collet - Load into machine - insert pins Chuck down - Drill and finish bore - Remove pins!!
CENTER HOLE 5/16" DIAMETER.

EMERGENCY COLLET PADS

Machine Size	W & S Master Collet No.	Balas Master Collet No.	Balas Number
No. 3	461-1002	7219	2023E
No. 4	1129-1002	7215	2064E
No. 5-1A	471-1001	7229	2049E
No. 5-3"	4669-1001	7339	2339E
No. 5-4 1/2"	2779-1001	2779-1001	2204E
0AB	3300-1120	1473	2003E
1-1/4"	3300-1120	1473	2003E
Six Spindle			
1AB	3897-1028	7200-1AB	2200E
2-1/4"	2530-1070	7200-1AB	2200E
Five Spindle			
2AB	3397-1112	1051	2137E
2SCL	5094-1004	1571	2016E

SQUARE LUGS FOR MARTIN MASTER COLLET PADS

COMPLETE LUG AND SCREW SET	
BALAS NUMBER	SIZE OF LUG
8003	3/8 Sq.
8004-1	5/16 Sq.
8015-3	1/2 Sq.
8067	3/4 Sq.

SCREW PLUGS ONLY	
BALAS NUMBER	THREAD SIZE
8003-SCR	1/16 Pipe
8004-1-SCR	1/4/2028
8015-3-SCR	1/8 Pipe
8067-SCR	1/4 Pipe

"L" WRENCHES FOR "A" STYLE MASTER PUSHERS

Balas No.	8005-1	8006-1	8022-1	8022-2	8022-3	8029-1
Width of Wrench	.395/.400	.460/.465	.335/.340	.305/.310	.365/.370	.270/.275

"L" WRENCHES FOR DIAL ADJUSTABLE PUSHERS WITH KEY SHAPE END

Balas No.	8022-1-A	8029-1-A
Width of Wrench	.335/.340	.270/.275
Width of Key	1/8	1/8

NON-LOOSENING SCREWS FOR COLLET PADS

Balas Number	For Pad Nos.	Thread Size
SCR-2023	2023	5/16-24 x 5/16
SCR-2049	2049,2339	3/8-24 x 15/32
SCR-2064	2064,2552	5/16-24 x 13/32
SCR-2096	2096,2204,2226	5/16-18 x 9/16
SCR-2104	2104	5/16-18 x 3/8

SCREWS FOR "CB" MASTER COLLETS

Balas Number	Thread Size
9080-1	1/2-20 X 5/8
9080-2	3/8-24 X 9/16
9080-3	3/8-24 X 11/32
9080-4	5/16-24 X 11/32