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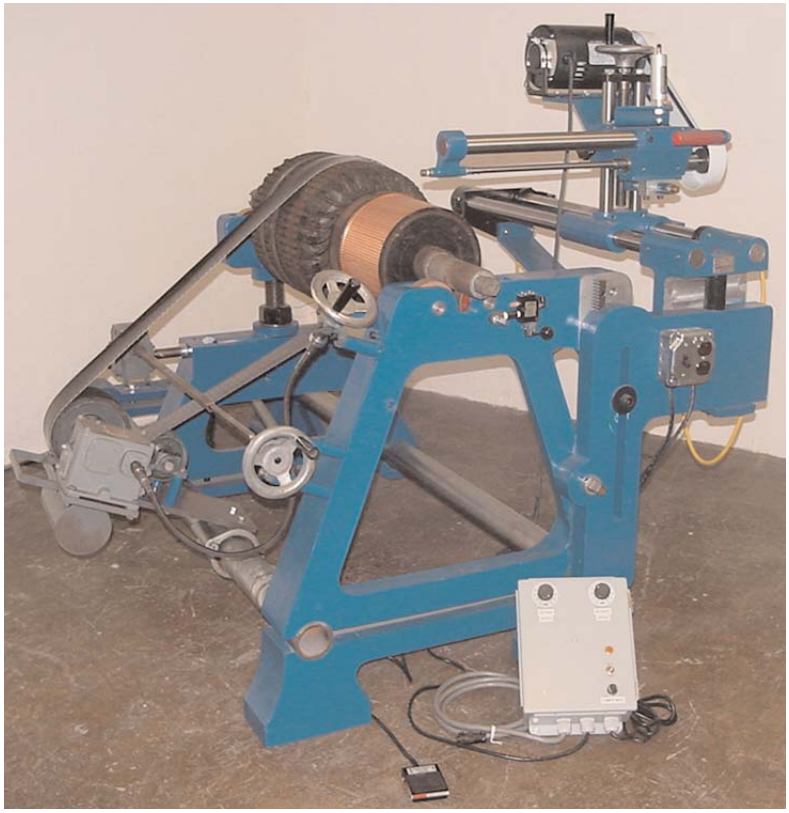
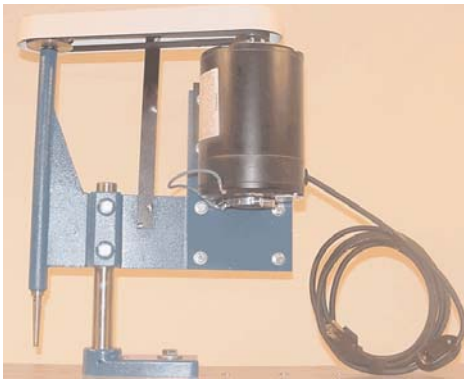
MARTINDALE

Commutator Undercutters

- Hand Held Models
- Floor Models
- Bench Models
- Lathe Models





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MARTINDALE

Over 90 Years of Service.

Martindale Electric Co. started in the electric motor maintenance tool manufacturing business in 1913. From the start, we put emphasis on quality materials and workmanship — and on dedicated customer service.

Martindale specializes in the manufacture of equipment and supplies for the electric motor repairman. The products on the following pages are the result of continuous testing and research in an effort to help the motor maintenance industry minimize the costs of maintaining electric motors and generators.

The catalog following is devoted to our complete line of undercutters ranging from the Close-Cut, which is the smallest portable undercutter, to the industrial Model HA-2, which will handle commutators up to 44” diameter and 10,000 lbs. In between is the versatile “Mica-Miller” in three differently powered models, with three interchangeable heads; three bench models; and others. Three of these fifteen undercutters are flexible-shaft driven, five are air-driven, and the rest are electric motor driven either directly or by a belt. In this selection is an undercutter for every need. All are available for prompt shipment.

UNDERCUTTERS CONTENTS

Martindale Close-Cut Undercutter

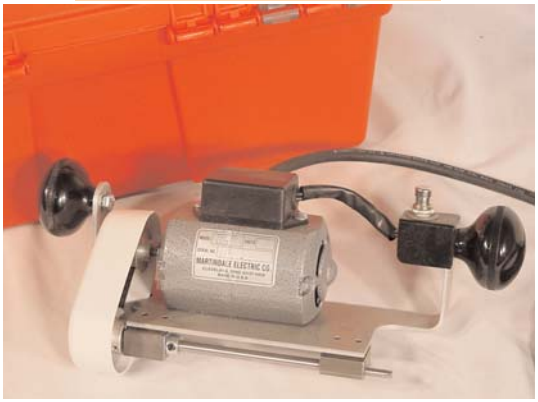
The Close-Cut Undercutter was specially designed to finish off a mica slot when it is necessary to cut within 1/8" of a riser.

This unit has a straight solid shaft and needle bearings, both front and rear, for smoother operation.

While this small machine can be used for undercutting the full length of smaller commutator slots, one of the more substantial Martindale Undercutters should be used on larger commutators for most of the cut and the Close-Cut used for the remaining end against the riser.

Though we hesitate to recommend carbide saws in any hand-held undercutter, we have had success with them in this smaller unit.

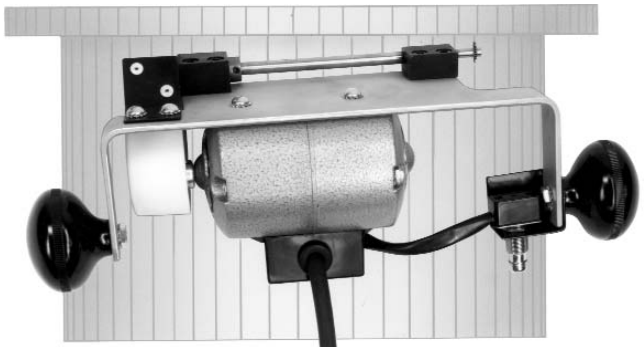
For undercutting right up to the riser



Design of the Close-Cut allows ample clearance between the undercutter and the commutator surface on even the largest commutators.

Features:

- Cuts 1/16" deep with 3/8" diameter saw.
- Cuts 3/32" deep with 7/16" diameter saw.
- Cuts full depth to within 1/8" of riser.
- Saw spindle speed 6,000 r.p.m.
- Weighs only 3-3/4 lbs.
- 1/15 h.p. A.C.-D.C. ball bearing motor.



This view (looking down on the commutator) shows plenty of clearance is also available between the undercutter and the riser.

	Catalog Number
Close-Cut Undercutter, 115 V., 50/60 Hz. complete with Carrying Case	CCUCA
Close-Cut Undercutter, 230 V., 50/60 Hz. complete with Carrying Case	CCUCB

Saws are available in High-Speed Steel or Carbide as shown in table below:

Saws			
High-Speed Steel	O.D.	I.D.	**Catalog Number**
32-HS Saws	3/8"	1/8"	HSMS32___
12-HS Saws	7/16"	1/8"	HSMS12___
Tungsten-Carbide	O.D.	I.D.	**Catalog Number**
32-TC Saws	3/8"	1/8"	TUNS32___
12-TC Saws	7/16"	1/8"	TUNS12___

For further specifications see pages 14 and 15.

Net wt. 4-1/2 lbs., Shipping wt. 11 lbs., with case.

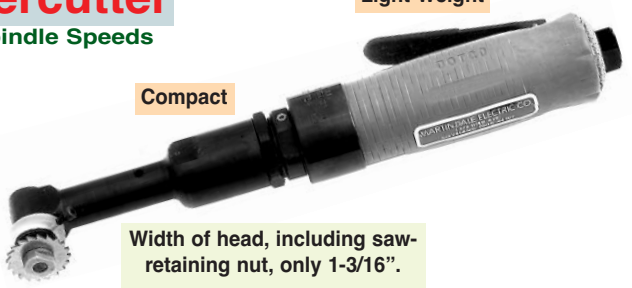
Stocked in the following thicknesses: .010", .015", .018", .020", .023", .025", .028", .030", .032", .035", .038", .040", .043", .045".

Kut-Kwik Undercutter

Three Models — 3 Saw Spindle Speeds

Light-Weight

Compact



Width of head, including saw-retaining nut, only 1-3/16".

Kut-Kwik is a very small *light-duty* air-driven undercutter designed for reaching into limited spaces where other undercutters cannot be used. It is not meant for the heavier duty and more continuous service of our other portable undercutters.

There are now 3 versions of the Kut-Kwik Undercutter available to accommodate the various needs of our customers.

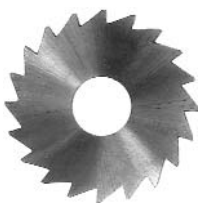
- Model KK32: 4,000 RPM version has gained increased popularity since it was introduced. It is still the most popular and practical unit for use with high speed steel saws and V-Cutters.
- Model KK50: 5,300 RPM version is recommended for use with tungsten carbide saws. It should be noted that because of the brittle nature of carbide, these saws are more susceptible to breakage and should only be used by more skilled operators. The higher price of carbide can normally be justified by the shorter time required to complete a job because of the higher operating speeds and less down-time required to replace cutters.
- Model KK180: 20,000 RPM version is intended for use with diamond coated undercutting wheels. Extremely fast undercutting is made possible by this high speed tool which will more than justify the higher priced diamond wheels. Again, this tool is only recommended for use by more skilled operators.

Model	RPM	H.P.	Length	Wt.	Catalog Number
KK32	4,000	.3	9-1/2"	1-1/2#	KTKW032
KK50	5,300	.3	9-1/2"	1-1/2#	KTKW050
KK180	20,000	.9	11-1/2"	2-1/2#	KTKW180

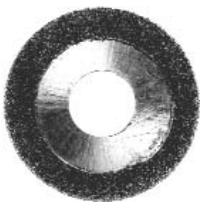
Net Weight 2-1/2 lbs., Shipping Weight 4 lbs.

Saws For use with Model KK32 or KK50			
High-Speed Steel	O.D.	I.D.	**Catalog Number**
65-HS Saws	3/4"	5/16"	HSMS65___
75-HS Saws	7/8"	5/16"	HSMS75___
Tungsten-Carbide	O.D.	I.D.	**Catalog Number**
65-TC Saws	3/4"	5/16"	TUNS65___
75-TC Saws	7/8"	5/16"	TUNS75___

For further specifications see pages 14 and 15.



Diamond Coated Undercutting Wheels For use with Model KK180			
O.D.	I.D.	**Thicknesses**	**Catalog Number**
3/4"	5/16"	.020, .030, .040"	DIAW3 (add thickness)
7/8"	5/16"	.020, .025, .030, .035, .040, .045, .050, .055, .060, .065"	DIAW7 (add thickness)



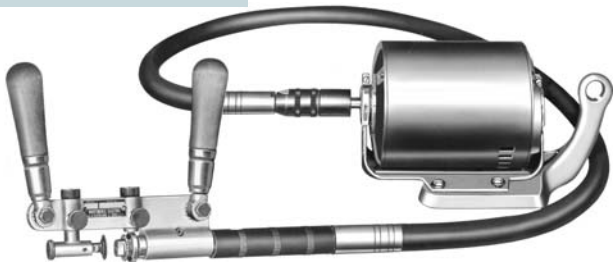
Imperial Undercutter

The Imperial Undercutter is an efficient machine where a good, sturdy undercutter is desired for portable and shop use. Its cast-bronze head is heavy enough to keep the saw from "bouncing". Available in electric or air-powered models.

Features:

- ☛ Undercuts small, medium, or large commutators.
- ☛ Undercuts rapidly and without vibration. Ball bearing spindle.
- ☛ Has either flexible shaft or air motor drive.
- ☛ Direct drive: Flexible Shaft Model = 2850/3450 r.p.m.
  Air Motor Model = 2000 r.p.m.
- ☛ Uses either "V" Cutters for "V" slots or Saws for "U" slots.
- ☛ Cuts full depth to within 7/16" of riser.
- ☛ Simple easy adjustments. Slot guide and depth gauge adjusted by sensitive screws, then locked in position.

FLEXIBLE SHAFT MODEL



The Flexible Shaft Model is powered by a 1/3 h.p., 2,850/3,450 r.p.m. motor and a 3/8" diam., 5 ft. long flexible shaft (No. 16), as pictured above. It can also be furnished with a ball-bearing swivel connection for attaching to any motor with 1/2", 5/8", 10mm. or 14mm. armature shaft.

We recommend, however, that it be purchased complete with motor. The motor is mounted on a special base which enables it to be suspended to permit the shaft to take its natural curve. This also takes some of the weight off the operator's hands.

	Catalog Number
Imperial Undercutter with motor as pictured above;	
115 V., 50/60 Hz.	IMPU100A
230 V., 50/60 Hz.	IMPU100B
Imperial Undercutter with flexible shaft and Ball Bearing Swivel Connection for use with your motor;	
with 1/2" motor connection	IMPU10112
with 5/8" motor connection	IMPU10158
with 10 mm. motor connection	IMPU10110MM
with 14 mm. motor connection	IMPU10114MM
No. 16 Core (Replacement for flexible shaft)	MFLXD90
No. 16 Sheath (Replacement for flexible shaft)	MFLXD61
No. 2 Steel Carrying Case for electric Imperial	CASE102

Net Wt. with motor, 27 lbs.; without motor, 7 lbs.

AIR MOTOR MODEL

The Air Motor Model is powerful, compact, and lightweight. It is operated with one hand on the left handle and the other hand around the air motor on the air control valve. This air model operates on 90 to 120 lbs. air pressure and develops .6 h.p. at 90 lbs. The saw spindle speed (full load) is 2,000 r.p.m.

A ten-foot air hose complete with end connections, including a quick-connector at the motor end, is available at extra cost.

Also available and highly recommended is the Automatic Air Filter-Lubricator listed in the Price List below. It keeps the air motor adequately lubricated at all times.

	Catalog Number
Imperial Undercutter with Air Motor	IMPU102
Automatic Air Filter-Lubricator	FILL01
Air Hose, 10 ft. long complete with quick connector	AIRH10
No. 1 Steel Carrying Case for air motor Imperial	CASE101

Net Wt. 4 lbs., Shipping Wt. 6 lbs.

High Speed Steel Saws and V-Cutters

(See page 14 for Saw and Cutter specifications)

For Small and Medium Commutators:	O.D.	I.D.	Catalog Number
No. 3-HS Saws	7/8"	9/32"	HSMS3___
No. 3-VHS Cutters	7/8"	9/32"	HSMSV3___
For Large Commutators:			
No. 4-HS Saws	1"	9/32"	HSMS4___
No. 4-VHS Cutters	1"	9/32"	HSMSV4___

Martindale Universal Undercutter

Features:

- ☛ Undercuts any size commutator. Excellent for small commutators.
- ☛ Uses either V-Cutters for "V" slots or Saws for "U" slots.
- ☛ Direct drive: Flexible Shaft = 1/3 h.p. motor; 2850/3450 r.p.m.
- ☛ Drive Shaft is extremely flexible and light, though sturdy (No. 14 Core and Sheath; 1/4" diam. x 3 ft. long)

The Universal Undercutter is similar to the Imperial Undercutter shown above. This unit uses only a 1/2" diameter saw and comes with two slot guides.

Equipped with Depth Gauge and 2 slot Guides. The angled slot guide is for use on commutators up to 7" diameter. The 1/2" diameter saws allow cutting to within 1/4" of riser.

	Catalog Number
Universal Undercutter with motor as pictured at left;	
115 V., 50/60 Hz.	UNVU100A
230 V., 50/60 Hz.	UNVU100B
Universal Undercutter with flexible shaft and Ball Bearing Swivel Connection for use with your motor;	
with 1/2" motor connection	UNVU10112
with 5/8" motor connection	UNVU10158
with 10 mm. motor connection	UNVU10110MM
with 14 mm. motor connection	UNVU10114MM
No. 14 Core (Replacement for flexible shaft	MFLXD75
No. 14 Sheath (Replacement for flexible shaft)	MFLXD54
No. D-363 Reducer	MFLXD363
No. 2 Steel Carrying Case for electric Imperial	CASE102

Net Wt. with motor, 24 lbs.; without motor, 3-1/2 lbs.

High Speed Steel Saws and V-Cutters

(See page 14 for Saw and Cutter specifications)

	O.D.	I.D.	Catalog Number
No. 16-HS Saws	1/2"	3/16"	HSMS16___
No. 17-VHS Cutters	1/2"	3/16"	HSMSV17___

Morgan Advanced Materials

Air-Driven Mica-Miller

The Air-Driven Mica-Miller is leightweight, rugged, and powerful tool that is very popular. This undercutter is available in two models for use with High-Speed Steel or Tungsten-Carbide saw blades.

The 5,800 R.P.M. model, for use with solid carbide saw blades, is great for prolonged use on larger commutators. Less stopping to change blades saves you time and money.

Uses the three interchangeable heads described below.

Full load saw spindle speeds at 90 lbs. air pressure are as follows:

At 90 lbs. air pressure, Air Motor, for H.S.S. Saws develops .6 h.p. and for Tungsten-Carbide Saws develops .75 h.p. Overall length 14-1/4".

If you do not already have an automatic oiler in your air-line, be sure to include one in your order (see pg. 29 for description) as oil is essential in the operation of an air motor.

Air-Driven Mica-Miller:	*For Use with H.S.S. Saws* RPM	Catalog Number	*For Use with Tungsten-Carbide Saws* RPM	Catalog Number
With "Small" Head, 5/16" arbor	2,500	M-MU201	*** See Note	*** See Note
With "Standard" Head, 5/16" or 7mm. arbor	2,000	M-MU202 or (7M)	5,800	M-MU202C or (7M)
With "Heavy-Duty" Head, 3/8" arbor	1,350	M-MU203	5,150	M-MU203C
	Net Weight: Shipping Weight:	3-1/2 lbs. 6 lbs.	Net Weight: Shipping Weight:	3-1/2 lbs. 6 lbs.
Extra Interchangeable Heads:				
Small, 5/16" arbor		M-MU01		M-MU01
Standard, 5/16" arbor		M-MU02		M-MU02
Standard, 7mm. arbor		M-MU027M		M-MU027M
Heavy-Duty, 3/8" arbor		M-MU03		M-MU03
Air Hose, 10 ft. long; complete with quick connector		AIRH10		AIRH10
Automatic Air Filter-Lubricator		FILL01		FILL01
Steel Carrying Case, No. 1; for Air-Driven Mica-Miller		CASE101		CASE101

***

Not recommended for use with small head at this speed.

The table at right lists at least 2 diameters of saws and cutters for each of the three interchangeable Mica-Miller heads.

H.S.S. Saws ("U" slot) are stocked in the following thicknesses (thousandths of an inch): **15, 18, 20, 23, 25, 26, 28, 30, 32, 35, 38, 40, 43, 45, 50, 53, 55, 58, 60, 63, and 65**, and can be supplied in other thicknesses at a slight additional charge. (Standard metric thicknesses available.)

Tungsten-Carbide Saws ("U" slot) are available from **.010" to .065"** thickness.

H.S.S. V-cutters ("V" slots) are all **.045"** thick and are stocked with **40°, 50°, and 60°**, angles between cutting edges.

Tungsten-Carbide V-Cutters ("V" slots) are available from **.030" to .065"** thickness and are available with **40°, 50°, and 60°**, angles between cutting edges.

40°, cutters are generally used for thin mica, 50° for medium mica, and 60° for thick mica.

	Type	O.D.	Hole	Catalog Number H.S.S.	Catalog Number Carbide
For "Small" Head	Saws	23/32"	5/16"	HSMS14___	*** See Above
	Cutters	23/32"	5/16"	HSMSV15___	*** See Above
	Saws	3/4"	5/16"	HSMS65___	*** See Above
	Cutters	3/4"	5/16"	HSMSV65___	*** See Above
For "Standard" Head	Saws	7/8"	5/16"	HSMS75___	TUNS75___
	Cutters	7/8"	5/16"	HSMSV75___	TUNSV75___
	Saws	1"	5/16"	HSMS85___	TUNS85___
	Cutters	1"	5/16"	HSMSV85___	TUNSV85___
	Saws	25 mm	7 mm	HSMM25___	
	Cutters	25 mm	7 mm	HSMMV25___	
For "Heavy-Duty" Head	Saws	1-1/8"	3/8"	HSMS96___	TUNS96___
	Cutters	1-1/8"	3/8"	HSMSV96___	TUNSV96___
	Saws	1-1/4"	3/8"	HSMS106___	TUNS106___
	Cutters	1-1/4"	3/8"	HSMSV106__	TUNSV106__

Steel Carrying Cases

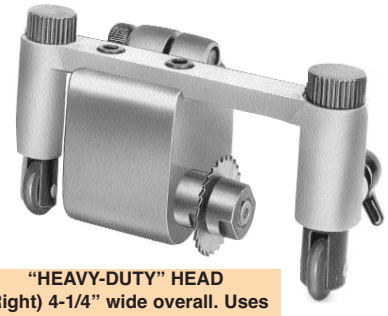
Heavy gauge steel carrying cases to protect your Model K, Air-Driven or Flex-Drive Mica-Miller, extra heads, saws and cutters, accessories, etc., are available.

Three Interchangeable Heads

For all Air & Electric Mica-Millers

"SMALL" HEAD (Below) Only 1-7/8" wide (less Slot-Guide). Uses 23/32" or 3/4" diameter x 5/16" hole Saws or "V" cutters.

"STANDARD" HEAD (Left) 2-1/4" wide (less Slot-Guide). Available for use with 7/8" or 1" diameter x 5/16" hole, or 25 mm. diameter x 7 mm. hole Saws or "V" cutters.



"HEAVY-DUTY" HEAD (Right) 4-1/4" wide overall. Uses 1-1/8" or 1-1/4" diameter x 3/8" hole Saws or "V" cutters.

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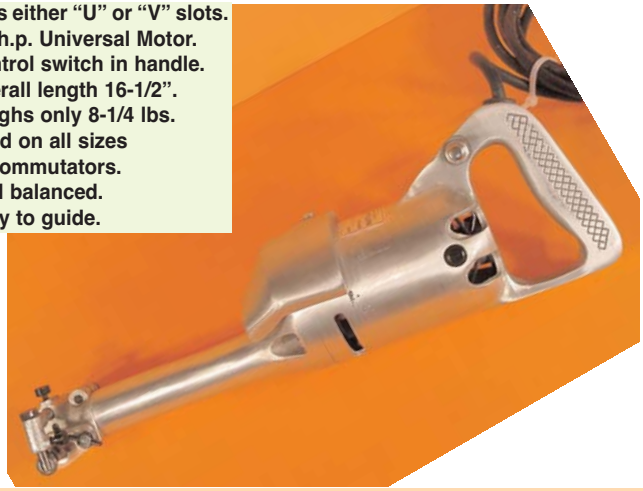
Model K Mica-Miller

Powerful, Light-Weight, Easy To Use

Cuts either "U" or "V" slots.
1/5 h.p. Universal Motor.
Control switch in handle.
Overall length 16-1/2".
Weighs only 8-1/4 lbs.
Used on all sizes of commutators.
Well balanced.
Easy to guide.



The model K Mica-Miller is an excellent all-around Undercutter for industrial plants or repair shops, as it can be used in the shop or taken to the job, and can be operated on either A.C. or D.C. from any lighting circuit.

Three interchangeable heads (see bottom of page 6) make the Model K most versatile. Saws or "V" cutters from 23/32" to 1-1/4" diameter can be used to undercut commutators of virtually any size.

Full load saw spindle speeds are as follows:

With "Small" Head . . . . . .3500 r.p.m.
With "Standard" Head . . . . . .2800 r.p.m.
With "Heavy-Duty" Head . . . . . .1850 r.p.m.

The slot guide provided on the two smaller heads is positioned by two sensitive screw adjustments. It may be swung out of the way when changing saws. Many operators find the model K so easy to use they remove the guide entirely.

	Catalog Number	
Model K Mica-Miller:	115 V., 60 Hz.	230 V. 50/60 Hz.
With "Small" Head, 5/16" arbor	M-MU101A	M-MU101B
With "Standard" Head, 5/16" arbor	M-MU102A	M-MU102B
With "Standard" Head, 7 mm. arbor	M-MU1027MA	M-MU1027MB
With "Heavy-Duty" Head, 3/8" arbor	M-MU103A	M-MU103B

Extra Interchangeable Heads only:	Catalog Number
"Small", 5/16" arbor	M-MU01
"Standard", 5/16" arbor	M-MU02
"Standard", 7 mm. arbor	M-MU027M
"Heavy-Duty", 3/8" arbor	M-MU03
Steel Carrying Case, No. 1; for Model K Mica-Miller	CASE101

Net Weight 8 lbs., Shipping Weight 11 lbs.
For Saws and Cutters, See Page 6 or 14.

Flex-Drive Mica-Miller

Flex-Drive Mica-Miller should be hung overhead by means of its suspension ring, thus lessening operator fatigue and flexible shaft strain.

The flexible shaft (No. 16; 3/8" diam., 5 ft. long) of the Flex-Drive Mica-Miller is strong yet very flexible and transmits full power smoothly, without chatter or vibration.

The three interchangeable heads described above are available for this undercutter. The head mounts on a long slender drive shaft housing making the machine particularly valuable in close quarters as the head is the widest part of the undercutter.

Full load saw spindle speeds are as follows:

With "Small" Head . . . . . .3700/4300 r.p.m.
With "Standard" Head . . . .2850/3450 r.p.m.
With "Heavy-Duty" Head . .1700/2300 r.p.m.

Net Weight with motor 25 lbs., without motor 7 lbs.
Shipping Weight with motor 27 lbs., without motor 9 lbs.

	Catalog Number	
Flex-Drive Mica-Miller:	115 V., 60 Hz.	230 V., 60 Hz.
With "Small" Head and 5/16" arbor	M-MU301A	M-MU301B
With "Standard" Head and 5/16" or (7mm.) arbor	M-MU302A or (7M)	M-MU302B or (7M)
With "Heavy-Duty" Head and 3/8" arbor	M-MU303A	M-MU303B

Flex-Drive Mica-Miller with Flexible Shaft and Swivel Connection for use with your motor:		Catalog Number
With "Small" Head and 5/16" arbor	and 1/2" diam. Motor Connection	M-MU40112
	and 5/8" diam. Motor Connection	M-MU40158
	and 10mm. diam. Motor Connection	M-MU40110MM
	and 14mm. diam. Motor Connection	M-MU40114MM
With "Standard" Head and 5/16" or (7mm. arbor)	and 1/2" diam. Motor Connection	M-MU40212 or (7M)
	and 5/8" diam. Motor Connection	M-MU40258 or (7M)
	and 10mm. diam. Motor Connection	M-MU40210MM or (7M)
	and 14mm. diam. Motor Connection	M-MU40214MM or (7M)
With "Heavy-Duty" Head and 3/8" arbor	and 1/2" diam. Motor Connection	M-MU40312
	and 5/8" diam. Motor Connection	M-MU40358
	and 10mm. diam. Motor Connection	M-MU40310MM
	and 14mm. diam. Motor Connection	M-MU40314MM

Extra Interchangeable Heads	See pg. 6
No. 16 Core (5 ft.) (replacement for flexible shaft)	MFLXD90
No. 16 Sheath (replacement for flexible shaft)	MFLXD61
Steel Carrying Case, No. 2; for Flex-Drive Mica-Miller	CASE102

Martindale Lathe-Type Undercutter

The Lathe-Type Undercutter can be quickly attached in place of the tool post on any lathe. It can be mounted directly on the cross slide, or on the slide carriage which is then mounted on the cross slide.

The Slide Carriage is lever operated and is much faster than using the lathe carriage. Travel is 11" on the Model 110, 15-1/2" on the Model 110L15 and 21" on the Model 110L21, with adjustable stops at both ends. A skewed bar adjustment is provided at the right end.

Both horizontal and vertical commutators can be undercut. As undercutting is done from the side of the commutator the saw or V-cutter is set level with the lathe centers.

Undercutter is powered by a 1/3 h.p. motor and uses high-speed steel or tungsten-carbide Saws or V-cutters.

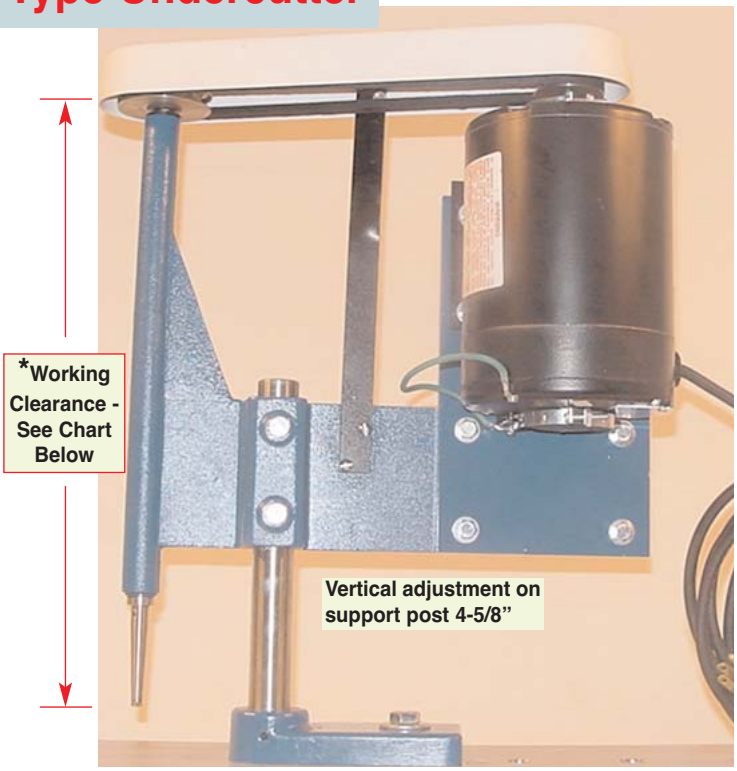
A spring between hardened washers under the pulley allows the spindle to move ("float") up or down and follow an existing slot that is being re-cut. If a fixed spindle is desired, the spring can be removed and the pulley turned over.

TWO SPINDLES ARE FURNISHED: one for 7/8" x 5/16" saws which turns at 2400 r.p.m., and one for 1/2" x 3/16" saws which turns at 5400 r.p.m. and cuts closer to the riser.

To change spindles remove both pulleys — slide out one spindle and slide in the other. Put the 1-3/4" pulley on the 3/16" spindle, or the 2-1/2" pulley on the 5/16" spindle. The other pulley goes on the motor.

Saws & V-Cutters			High-Speed Steel		Tungsten Carbide	
O.D.	I.D.	Type	Part No.	Catalog Number	Part No.	Catalog Number
1/2"	3/16"	Saw	16-HS	HSMS16__	16-TC	TUNS16__
1/2"	3/16"	V-Cutter	17-VHS	HSMSV17_	17-VTC	TUNSV17_
7/8"	5/16"	Saw	75-HS	HSMS75__	75-TC	TUNS75__
7/8"	5/16"	V-Cutter	75-VHS	HSMSV75_	75-VTC	TUNSV75_

For further specifications see pages 14 and 15.



There are two versions of the Lathe-Type Undercutter available, depending on the amount of clearance needed to clear larger diameter risers.

***Working Clearance**, measured from the saw / cutter up to the lower edge of the belt guard is shown on the chart below.

Description Undercutters	Spindle Size	*Working Clearance	Catalog Number
Lathe-Type Undercutter only with Both Spindles, for attaching directly to lathe; (A)=115V., (B)=230V.; 60 Hz.	3/16"	10-1/2"	LTHU101(A) or (B)
	5/16"	8-1/2"	
Lathe-Type Undercutter only with Both **Extended** Spindles, for attaching directly to lathe; (A)=115V., (B)=230V.; 60 Hz.	3/16"	17-3/4"	LTHU105(A) or (B)
	5/16"	15-3/4"	

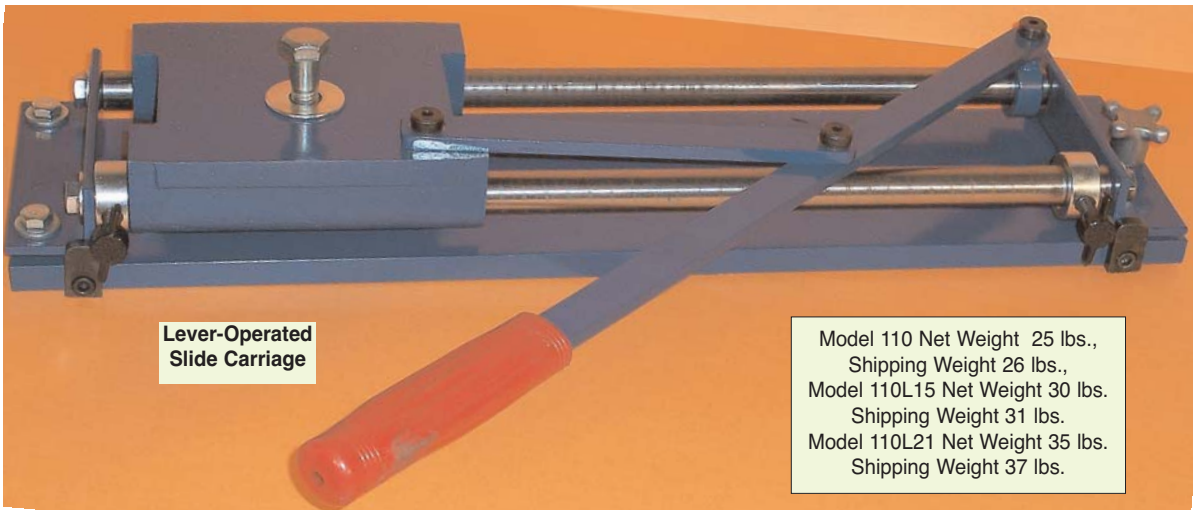
Model 101 Net Weight 28 lbs., Shipping Weight 36 lbs.,
Model 105 Net Weight 30 lbs. Shipping Weight 39 lbs.

Martindale Lathe-Type Undercutter Slide Carriage

— Speeds up production

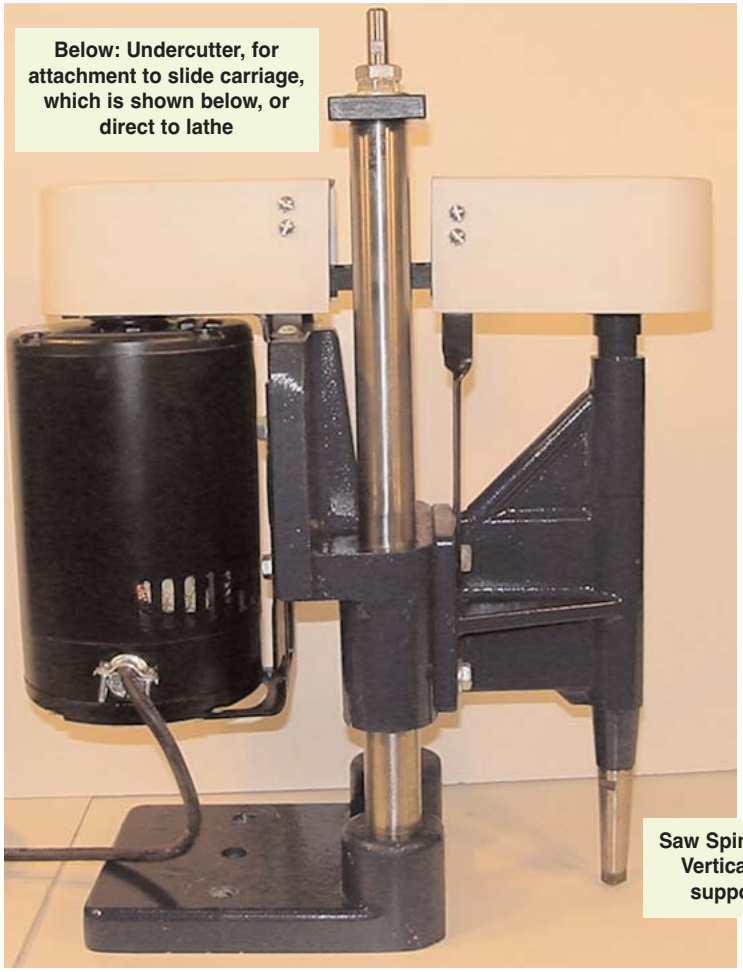
— Faster and easier to operate than any lathe traverse controls

Description Slide Carriages	Slide Carriage Stroke Length	Slide O.A.L.	Catalog Number
Slide Carriage, 11" Max. Slide Travel	11"	21"	LTHU110
Slide Carriage, 15-1/2" Max. Slide Travel	15-1/2"	26"	LTHU110L15
Slide Carriage, 21" Max. Slide Travel	21"	31"	LTHU110L21



Model 110 Net Weight 25 lbs., Shipping Weight 26 lbs.,
Model 110L15 Net Weight 30 lbs. Shipping Weight 31 lbs.
Model 110L21 Net Weight 35 lbs. Shipping Weight 37 lbs.

Martindale Super Lathe-Type Undercutter



Below: Undercutter, for attachment to slide carriage, which is shown below, or direct to lathe

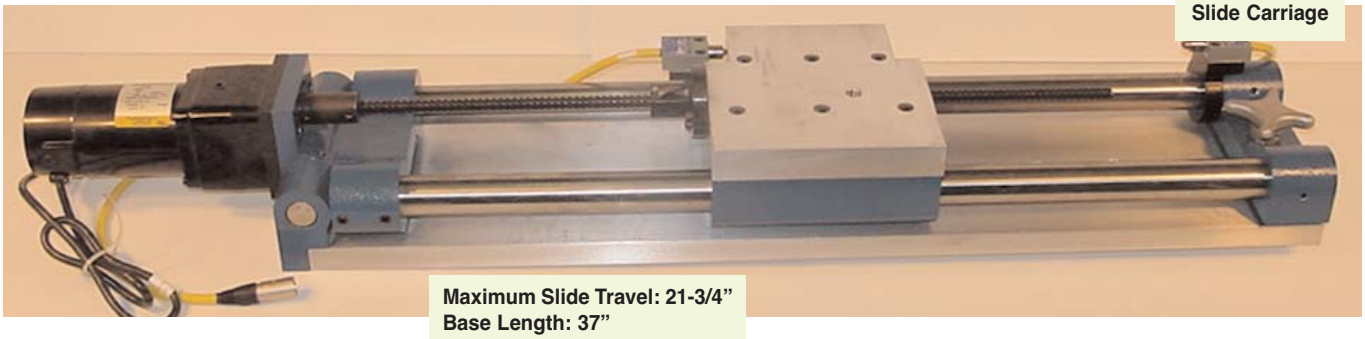
This undercutter is for handling large armatures in a lathe. It can be mounted directly on the lathe or on the Slide Carriage which bolts to the lathe cross-slide. The motor is 3/4 h.p. With gear-belt drive it has enough power and rigidity to use 7/8" O.D. x 5/16" I.D. Tungsten-Carbide Saws at 4600 r.p.m. By interchanging pulleys it will also use 7/8" O.D. x 5/16" I.D. High-Speed Steel Saws at 2600 r.p.m.

An alternate spindle assembly is available with a 3/8" arbor to use 1-1/8 O.D. x 3/8" I.D. Saws in either Tungsten Carbide or High Speed Steel. It is longer and can be used with two saws to cut two slots at each pass with commutator bars up to 1/2" wide (User furnishes spacers to fit commutators being undercut). Both spindle assemblies include the heavy and rigid spindle housing which bolts to the motor mount.

The heavy-duty Slide Carriage runs on a variable speed, electric motor-driven screw drive complete with foot switch. Speeds are adjustable in both directions. The stroke is adjustable at both ends up to 21-3/4". It slides on "oilite" bushings on 1-1/2" hardened steel rods. A skewed bar adjustment is provided at the left end of the slide.

Saw Spindle length 12-3/4"
Vertical adjustment on support posts 4-5/8"

Electric Motor-Driven Screw Drive Slide Carriage



Maximum Slide Travel: 21-3/4"
Base Length: 37"
Overall Length: 47-1/2"

Super Lathe Type Undercutter:	complete with Slide Carriage: Catalog Number	for attaching directly to lathe (less slide carriage): Catalog Number
115 V., 50/60 Hz., with 5/16" Spindle	LTHU200A5	LTHU201A5
115 V., 50/60 Hz., with 3/8" Spindle	LTHU200A3	LTHU201A3
230 V., 50/60 Hz., with 5/16" Spindle	LTHU200B5	LTHU201B5
230 V., 50/60 Hz., with 3/8" Spindle	LTHU200B3	LTHU201B3
Extra 5/16" Spindle Assembly		LTHU445
Extra 3/8" Spindle Assembly		LTHU443
Carriage, Slide Only, (A) = 115V., (B) = 230V.		LTHU210(A) or (B)

Net Weight complete unit 189 lbs., without Slide Carriage 62 lbs.,
Shipping Weight complete unit 303 lbs., without Slide Carriage 83 lbs.

Saws and V-Cutters			
High-Speed Steel	O.D.	I.D.	Catalog Number
75-HS Saws	7/8"	5/16"	HSMS75___
75-VHS Cutters	7/8"	5/16"	HSMSV75___
96-HS Saws	1-1/8"	3/8"	HSMS96___
96-VHS Cutters	1-1/8"	3/8"	HSMSV96___
Tungsten-Carbide	O.D.	I.D.	Catalog Number
75-TC Saws	7/8"	5/16"	TUNS75___
75-VTC Cutters	7/8"	5/16"	TUNSV75___
96-TC Saws	1-1/8"	3/8"	TUNS96___
96-VTC Cutters	1-1/8"	3/8"	TUNSV96___

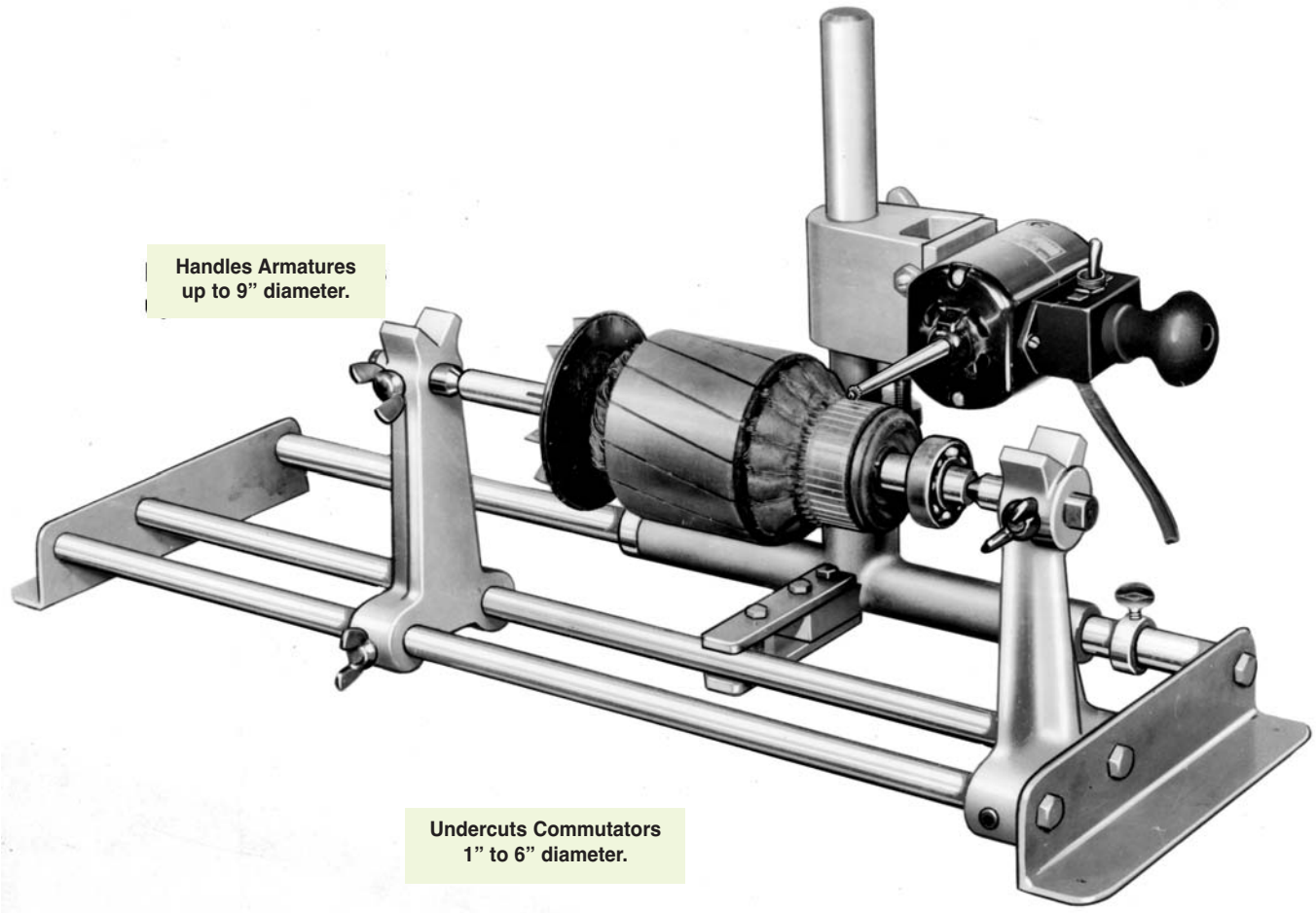
For further specifications see pages 14 and 15.

Utility Undercutter

The Utility Undercutter, as its name implies, is a low-cost machine designed for the repair shop that handles a wide variety of armatures — from the smallest up to 9" diameter. Bearings, fans, etc., need not be removed from the armature.

Its frame and spindle are built sufficiently rigid to permit use of Tungsten-Carbide as well as High-Speed Steel saws. Saws used (listed below) all have 1/8" hole. The smallest, No. 10-HS or 10-TC, (1/4" O.D.) cuts .025" deep.

The sturdy 1/12 h.p. motor is "universal" (A.C.-D.C.) with full-load speed of 5,000 r.p.m. The motor mount is spring-loaded to lift the saw from the slot at the end of the cut; a fine screw adjustment allows accurate setting for depth of cut. Centers are adjustable and can be removed if desired. Saw travel is controlled in both directions by adjustable stops.



Handles Armatures up to 9" diameter.

Undercuts Commutators 1" to 6" diameter.

Utility Undercutter: **Catalog Number**

115 V., 50/60 Hz. . . . . UTLUA

230 V., 50/60 Hz. . . . . UTLUB

Net Weight 21 lbs., Shipping Weight 23 lbs.

Saws			
High-Speed Steel	O.D.	I.D.	**Catalog Number**
10-HS Saws	1/4"	1/8"	HSMS10___
9-HS Saws	9/32"	1/8"	HSMS9___
9-1/2-HS Saws	5/16"	1/8"	HSMS9.5___
32-HS Saws	3/8"	1/8"	HSMS32___
Tungsten-Carbide	O.D.	I.D.	**Catalog Number**
10-TC Saws	1/4"	1/8"	TUNS10___
9-1/2-TC Saws	5/16"	1/8"	TUNS9.5___
32-TC Saws	3/8"	1/8"	TUNS32___

For further specifications see pages 14 and 15.

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Bench-Type Undercutter Model HV-3

Uses either High-Speed Steel or Tungsten-Carbide Saws and V-Cutters. To change operation from High-Speed Steel to Carbide, or vice-versa, it is necessary only to reverse pulleys (to change spindle speed).

Handles a wider variety of armature sizes and shaft lengths than any similar machine being manufactured.

This outstanding undercutter is designed to handle the large volume production undercutting of the motor manufacturer, as well as the wide variety of undercutting requirements encountered in the service shop.

Model HV-3 is precision built, rugged, fast, and accurate. Depth of cut is governed by a fine screw adjustment. When the saw is being returned to the riser for the next cut, it is lifted clear of the slot for indexing.

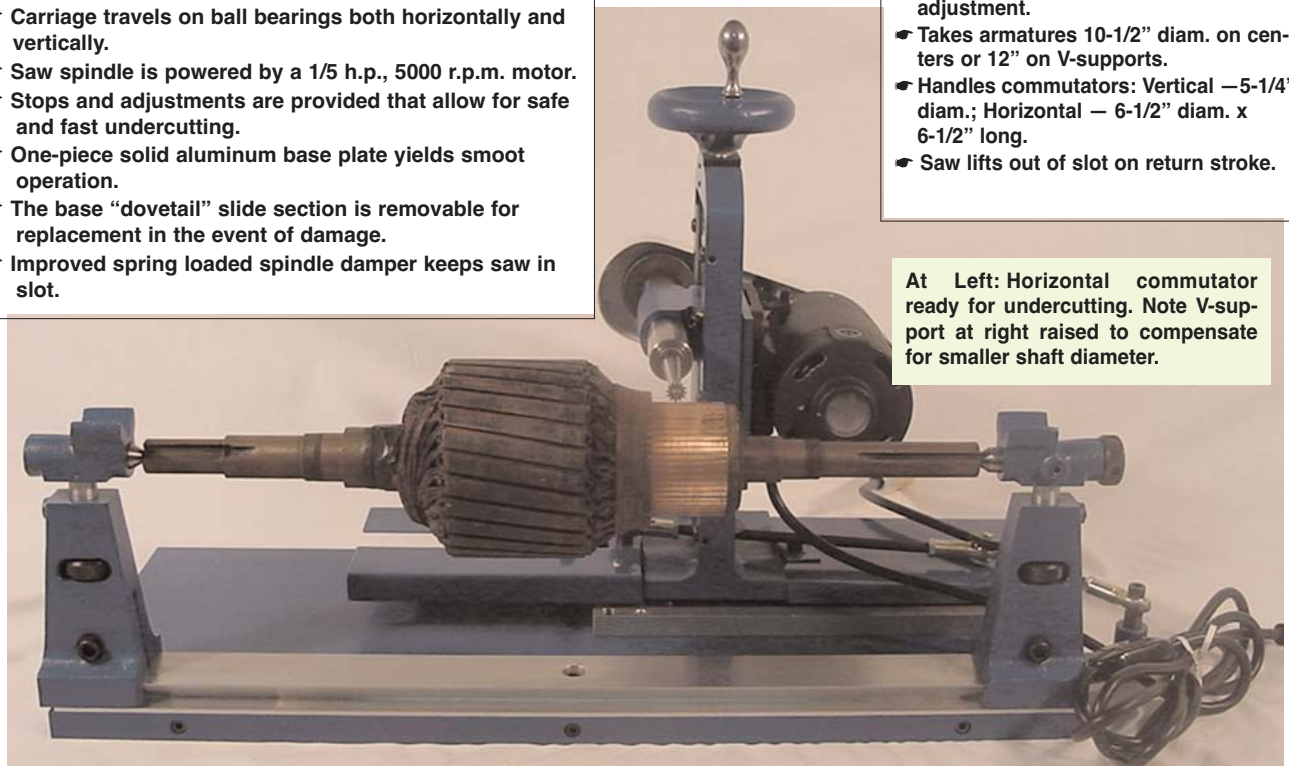
Two ball bearing spindles are available, with 1/8" or 3/16" arbors. The machine is equipped with one spindle only; the additional spindle is available at extra cost. For undercutting horizontal commutators only, the 1/8" spindle is recommended; with it the 1/8" hole saws listed below are used. When both horizontal and vertical commutators are to be undercut, the 3/16" spindle is used; with the 3/16" hole saws or V-cutters.

Features:

- **Model HV-3 undercuts horizontal and vertical commuta tors.**
- **Uses either High-Speed Steel or Carbide Saws and V-Cutters.**
- **Carriage travels on ball bearings both horizontally and vertically.**
- **Saw spindle is powered by a 1/5 h.p., 5000 r.p.m. motor.**
- **Stops and adjustments are provided that allow for safe and fast undercutting.**
- **One-piece solid aluminum base plate yields smoot operation.**
- **The base "dovetail" slide section is removable for replacement in the event of damage.**
- **Improved spring loaded spindle damper keeps saw in slot.**

Specifications:

- **20" between centers.**
- **Longer armatures on V-supports, which can be spread to 23" between inside edges, and have 1" vertical adjustment.**
- **Takes armatures 10-1/2" diam. on centers or 12" on V-supports.**
- **Handles commutators: Vertical —5-1/4" diam.; Horizontal — 6-1/2" diam. x 6-1/2" long.**
- **Saw lifts out of slot on return stroke.**



At Left: Horizontal commutator ready for undercutting. Note V-support at right raised to compensate for smaller shaft diameter.

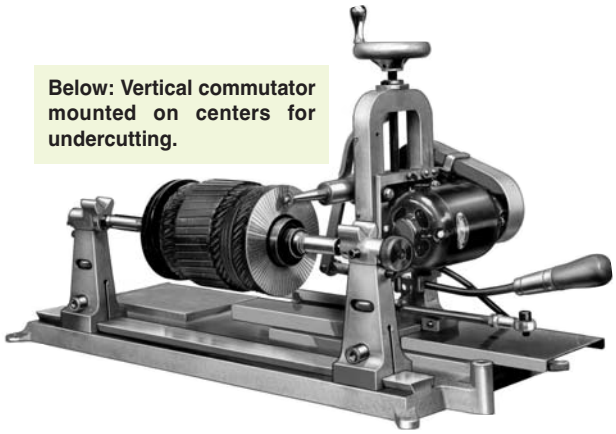
Model HV-3 Undercutter:	Catalog Number
115 V., 50/60 Hz. with 1/8" spindle	HV3UA1
115 V., 50/60 Hz. with 3/16" spindle	HV3UA3
230 V., 50/60 Hz. with 1/8" spindle	HV3UB1
230 V., 50/60 Hz. with 3/16" spindle	HV3UB3
Extra 1/8" Spindle Assembly	HV3U30918
Extra 3/16" Spindle Assembly	HV3U309316

Net Weight 50 lbs., Shipping Weight 56 lbs.

Saws and V-Cutters			
High-Speed Steel	O.D.	I.D.	**Catalog Number**
9-1/2-HS Saws	5/16"	1/8"	HSMS9.5___
32-HS Saws	3/8"	1/8"	HSMS32___
16-HS Saws	1/2"	3/16"	HSMS16___
17-VHS Cutters	1/2"	3/16"	HSMSV17__
13-HS Saws	11/16"	3/16"	HSMS13___
13-VHS Cutters	11/16"	3/16"	HSMSV13__
Tungsten-Carbide	O.D.	I.D.	**Catalog Number**
9-1/2-TC Saws	5/16"	1/8"	TUNS9.5___
32-TC Saws	3/8"	1/8"	TUNS32___
16-TC Saws	1/2"	3/16"	TUNS16___
17-VTC Cutters	1/2"	3/16"	TUNSV17__

For further specifications see pages 14 and 15.

Below: Vertical commutator mounted on centers for undercutting.

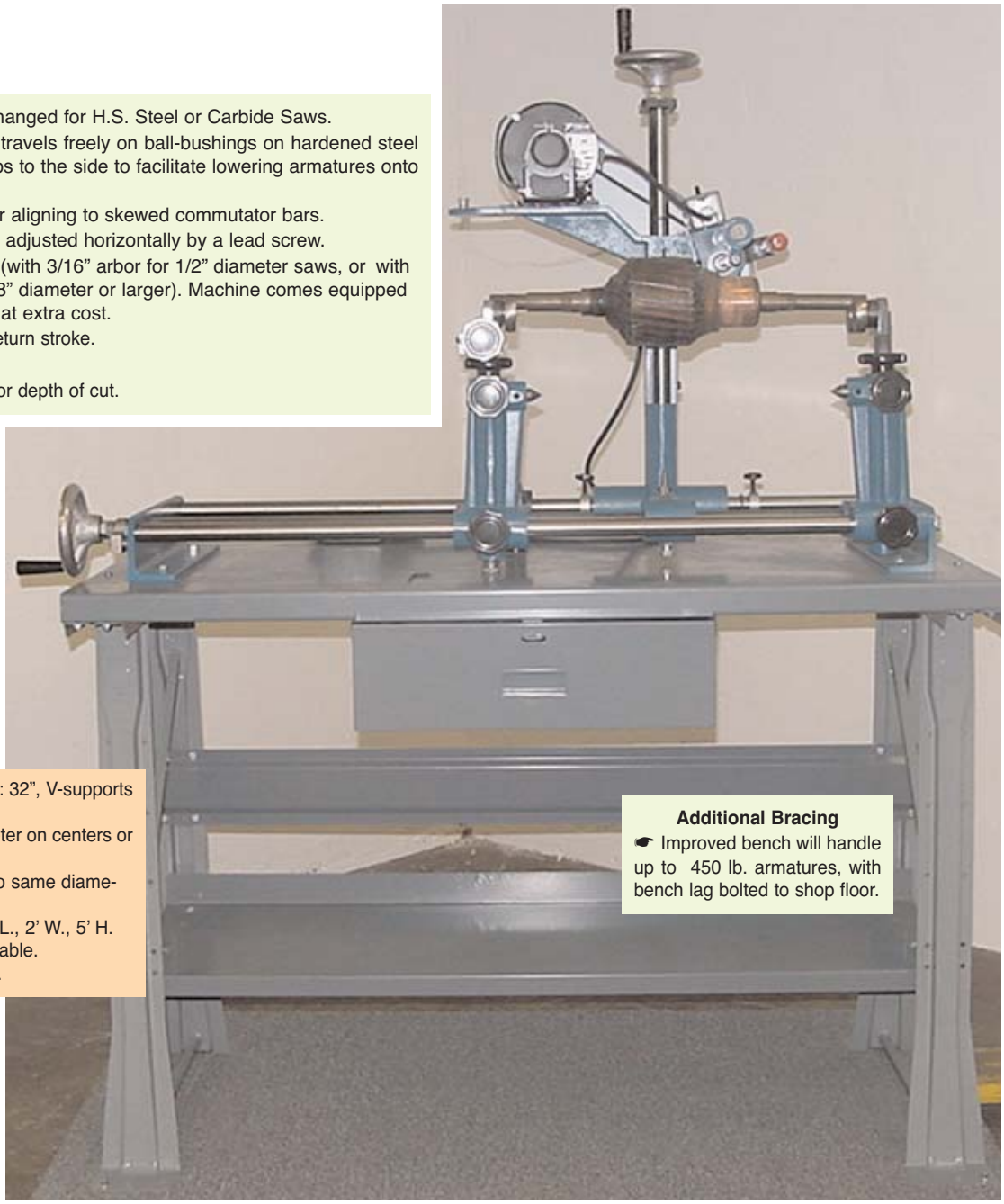


Heavy-Duty Bench-Type Undercutter Model H-9

Model H-9 uses either High-Speed Steel or Carbide Saws and V-cutters. This undercutter handles armatures from the small sizes up to 17" diameter and 450 lbs. This includes a range of sizes too large for Model HV-3 and not large enough to necessitate an undercutter as large as the HA-2.

Features:

- ☛ Spindle speed easily changed for H.S. Steel or Carbide Saws.
- ☛ Cutting Head Carriage travels freely on ball-bushings on hardened steel rods; entire Carriage tips to the side to facilitate lowering armatures onto the V-supports.
- ☛ Adjustment provided for aligning to skewed commutator bars.
- ☛ Rear Armature Support adjusted horizontally by a lead screw.
- ☛ Two spindles available (with 3/16" arbor for 1/2" diameter saws, or with 5/16" arbor for saws 7/8" diameter or larger). Machine comes equipped with one spindle; other at extra cost.
- ☛ Saw lifts out of slot on return stroke.
- ☛ "Stops" limit saw travel.
- ☛ Fine screw adjustment for depth of cut.



Additional Bracing

☛ Improved bench will handle up to 450 lb. armatures, with bench lag bolted to shop floor.

Specifications:

- Maximum between centers: 32", V-supports 35".
- Takes armatures 12" diameter on centers or 17" on V-supports.
- Handles commutators up to same diameters as armatures.
- Dimensions with bench: 4' L., 2' W., 5' H.
- V-supports vertically adjustable.
- Motor: 1/2 h.p., 3450 r.p.m.

Model H-9 Undercutter, with extra pulley, belt, and bench and light:	Catalog Number
115 V., 50/60 Hz. with 3/16" spindle	H-9UA3
115 V., 50/60 Hz. with 5/16" spindle	H-9UA5
230 V., 50/60 Hz. with 3/16" spindle	H-9UB3
230 V., 50/60 Hz. with 5/16" spindle	H-9UB5
Extra 3/16" Spindle Assembly	H-9U42316
Extra 5/16" Spindle Assembly	H-9U42516
Dust Collector with 2 hoods, 115 V., 60 Hz.	DSCLCMBA
Dust Collector with 2 hoods, 230 V., 60 Hz.	DSCLCMBB

Net Weight 270 lbs., Shipping Weight 420 lbs.

Saws and V-Cutters			
High-Speed Steel	O.D.	I.D.	Catalog Number
16-HS Saws	1/2"	3/16"	HSMS16___
17-VHS Cutters	1/2"	3/16"	HSMSV17___
75-HS Saws	7/8"	5/16"	HSMS75___
75-VHS Cutters	7/8"	5/16"	HSMSV75___
85-HS Saws	1"	5/16"	HSMS85___
85-VHS Cutters	1"	5/16"	HSMSV85___
Tungsten-Carbide	O.D.	I.D.	Catalog Number
16-TC Saws	1/2"	3/16"	TUNS16___
17-VTC Cutters	1/2"	3/16"	TUNSV17___
75-TC Saws	7/8"	5/16"	TUNS75___
75-VTC Cutters	7/8"	5/16"	TUNSV75___
85-TC Saws	1"	5/16"	TUNS85___
85-VTC Cutters	1"	5/16"	TUNSV85___

For further specifications see pages 14 and 15.

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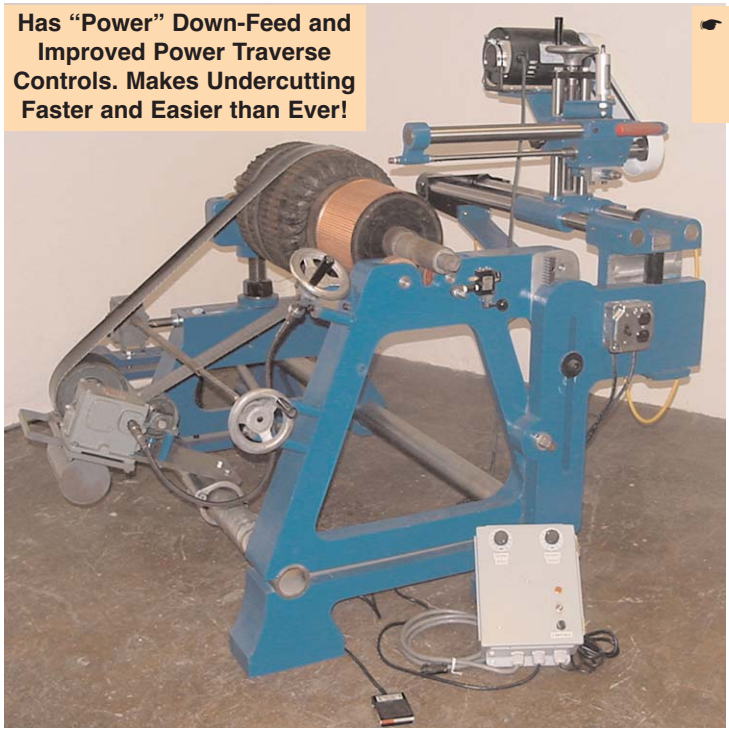
Martindale Industrial Undercutter Model HA-2

Has "Power" Down-Feed and Improved Power Traverse Controls. Makes Undercutting Faster and Easier than Ever!



☛ Power-Operated: Makes Undercutting Faster and Easier.
☛ Uses Tungsten-Carbide or High Speed Steel Saws.
☛ Heavy, Rigid Construction for Industrial Use.

Specifications:

Handles Armatures:
Up to 44" diameter (this will depend upon relative diameters of armature and commutators. Send us your requirement).
From 150 to 10,000 lbs.

Handles Commutators:
10" to 44" diameter.
Up to 21" length.

Base Length:
Up to 58" between roller supports. Additional length available at slightly higher cost.

Motor:
3/4 h.p.; 3450 r.p.m.
Extra pulley and belt are supplied to give spindle speeds of 3450 r.p.m. for High-Speed Steel Saws or V-Cutters, or 6900 r.p.m. for Tungsten-Carbide Saws or V-Cutters.

Air Supply:
About 90 lbs., controlled by pressure regulator with oiler and filter.

Saws and V-Cutters:
1/2", 7/8", or 1" O.D. Saws or V-Cutters. (See table below.)

Features:

☛Power Traverse — With Improved Electric Motor Variable Speed-Drive Control
An improved traverse system powered by an electric motor driven ball screw-drive, actuated by a foot pedal connected to a variable speed drive control. This system provides enhanced smooth vibration free undercutting with minimal maintenance requirements.

☛Power Down Feed — Hand-Valve Actuated
Holds the saw in the slot while cutting, lifts it from the slot while returning and indexing.

☛Magnifier Lamp —
Illuminates and magnifies work area for accurate and easy saw alignment.

☛Simple Indexing —
A hand wheel, connected by a flexible shaft to 100 to 1 speed reducer with a flat belt around the armature, combine to give quick positive indexing with no override or inertia problems. Belt segments of various lengths are furnished to fit any armature. Belt drive may be positioned anywhere along base.

☛Depth of Cut —
Fine adjustment is made with hand wheel on top of carriage. Rack and gear on frame are for major adjustments.

☛Supports —
Armatures shafts rest and rotate on 4 large phenolic rollers; assures no marking of shafts.

☛Adjustable Rear Support —
Vertically (on thrust bearing) for unequal shaft-sizes or tapered commutators. Sideways (on "Teflon" ways) from front of machine - for skewed bars. Length - rear support slides and locks into place to accommodate various armature lengths.

☛Carriage —
Slides on "Oilite" bushings over hardened steel rods. Adjustable stops at each end of stroke.

☛Saw Spindle —
1-1/2" hardened over-arm supports outer end of spindle. Two spindles available; one for 1/2" diameter saws (3/16" arbor hole) and the other for 7/8" and 1" diameter saws (5/16" arbor hole). Specify which one desired when ordering. An optional 2-position saw spindle block is available (at extra cost) which allows cutting up close to the riser in one position, and up close to a shoulder at the front of the commutator when in the other position.

Dust Collector removes mica dust quickly; comes with two hoods for use in a wide variety of dusty jobs.
Has paddle-wheel type fan driven by 1/3 h.p., 3450 r.p.m. motor. Plugs into outlet box on undercutter.
The Dust Collector is self-contained and easily portable to other locations where dust collection is desirable.

Model HA-2 Undercutter complete:	Catalog Number
115 V., 50/60 Hz., with 3/16" spindle	HA2UA3
115 V., 50/60 Hz., with 5/16" spindle	HA2UA5
230 V., 50/60 Hz., with 3/16" spindle	HA2UB3
230 V., 50/60 Hz., with 5/16" spindle	HA2UB5
Extra 3/16" Saw Spindle Assembly	HA2U43316
Extra 5/16" Saw Spindle Assembly	HA2U43516

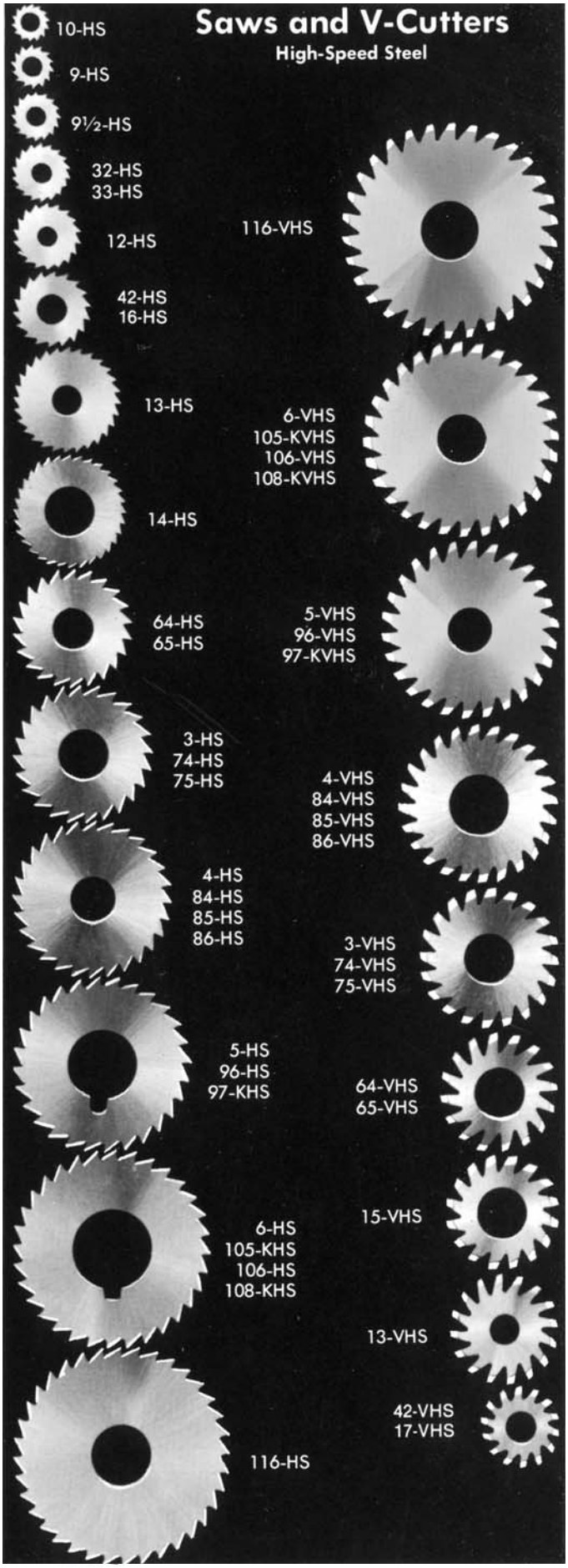
Net Weight 750 lbs., Shipping Weight 1,020 lbs.

Dust Collector with 2 hoods, 115 V., 60 Hz.	DSCLCA
Dust Collector with 2 hoods, 230 V., 50 Hz.	DSCLCB

Net Weight 58 lbs., Shipping Weight 65 lbs.

Saws and V-Cutters			
High-Speed Steel	O.D.	I.D.	**Catalog Number**
16-HS Saws	1/2"	3/16"	HSMS16___
17-VHS Cutters	1/2"	3/16"	HSMSV17___
75-HS Saws	7/8"	5/16"	HSMS75___
75-VHS Cutters	7/8"	5/16"	HSMSV75___
85-HS Saws	1"	5/16"	HSMS85___
85-VHS Cutters	1"	5/16"	HSMSV85___
Tungsten-Carbide	O.D.	I.D.	**Catalog Number**
16-TC Saws	1/2"	3/16"	TUNS16___
17-VTC Cutters	1/2"	3/16"	TUNSV17___
75-TC Saws	7/8"	5/16"	TUNS75___
75-VTC Cutters	7/8"	5/16"	TUNSV75___
85-TC Saws	1"	5/16"	TUNS85___
85-VTC Cutters	1"	5/16"	TUNSV85___

For further specifications see pages 14 and 15.



Martindale Undercutting Saws

GENERAL

Martindale Undercutting Saws and V-Cutters are available in High-Speed Steel or Tungsten-Carbide. Both types are carefully designed as to tooth form, hollow grind, hardness, etc., and are manufactured to close tolerances in our own plant.

While used primarily for undercutting mica and slotting risers of commutators, Martindale Undercutting Saws and V-cutters are also used for cutting steel, aluminum, plastics, and other materials not requiring set teeth.

Undercutting differs from ordinary machining in that, instead of shearing, it is a combination of crushing, grinding, and conveying. Mica is very abrasive and varies in hardness, making necessary the very best design and production controls in the manufacture of undercutting saws.

HIGH-SPEED STEEL SAWS and V-CUTTERS

These can be used on either portable or stationary equipment with spindle speeds of 1,500 to 5,000 r.p.m.

(See Martindale Mica Undercutters for 16 Undercutters.)

SAWS ("U"-Slot)

Actual size illustrations at left; specifications below. Saws stocked in these thicknesses:

.015" .023" .028" .035" .043" .053" .060"
.018" .025" .030" .038" .045" .055" .063"
.020" .026" .032" .040" .050" .058" .065"

(Other thicknesses available at extra cost.)

Be sure to specify thicknesses.

Type Number	O.D.	Hole	No. Teeth	Catalog Number
10-HS	1/4"	1/8"	14	HSMS10
9-HS	9/32"	1/8"	14	HSMS9
9-1/2-HS	5/16"	1/8"	16	HSMS9.5
32-HS	3/8"	1/8"	18	HSMS32
33-HS	3/8"	3/16"	18	HSMS33
12-HS	7/16"	1/8"	18	HSMS12
42-HS	1/2"	1/8"	18	HSMS42
16-HS	1/2"	3/16"	18	HSMS16
13-HS	11/16"	3/16"	28	HSMS13
14-HS	23/32"	5/16"	32	HSMS14
64-HS	3/4"	1/4"	22	HSMS64
65-HS	3/4"	5/16"	22	HSMS65
74-HS	7/8"	1/4"	24	HSMS74
3-HS	7/8"	9/32"	24	HSMS3
75-HS	7/8"	5/16"	24	HSMS75
84-HS	1"	1/4"	28	HSMS84
4-HS	1"	9/32"	28	HSMS4
85-HS	1"	5/16"	28	HSMS85
86-HS	1"	3/8"	28	HSMS86
5-HS	1-1/8"	9/32"	28	HSMS5
96-HS	1-1/8"	3/8"	28	HSMS96
97-KHS	1-1/8"	7/16"	28	HSMS97K
6-HS	1-1/4"	9/32"	32	HSMS6
105-KHS	1-1/4"	5/16"	32	HSMS105K
106-HS	1-1/4"	3/8"	32	HSMS106
108-KHS	1-1/4"	1/2"	32	HSMS108K
116-HS	1-3/8"	3/8"	36	HSMS116

Metric Sizes
25 mm. O.D. x 7mm. I.D. Saws in stock, along with other metric sizes upon request.

V-CUTTERS ("V"-Slot)

Actual size illustrations at left; specifications below. These cutters are all .045" thick and stocked with 40°, 50°, and 60° angles between cutting edges. 40° V-cutters are for thin mica, 50° for medium mica, 60° for thick mica.

Be sure to specify angle 40°, 50°, or 60°.

Type Number	O.D.	Hole	No. Teeth	Catalog Number
42-VHS	1/2"	1/8"	12	HSMSV42
17-VHS	1/2"	3/16"	12	HSMSV17
13-VHS	11/16"	3/16"	14	HSMSV13
15-VHS	23/32"	5/16"	14	HSMSV15
64-VHS	3/4"	1/4"	14	HSMSV64
65-VHS	3/4"	5/16"	14	HSMSV65
74-VHS	7/8"	1/4"	18	HSMSV74
3-VHS	7/8"	9/32"	18	HSMSV3
75-VHS	7/8"	5/16"	18	HSMSV75
84-VHS	1"	1/4"	22	HSMSV84
4-VHS	1"	9/32"	22	HSMSV4
85-VHS	1"	5/16"	22	HSMSV85
86-VHS	1"	3/8"	22	HSMSV86
5-VHS	1-1/8"	9/32"	24	HSMSV5
96-VHS	1-1/8"	3/8"	24	HSMSV96
97-KVHS	1-1/8"	7/16"	24	HSMSV97K
6-VHS	1-1/4"	9/32"	24	HSMSV6
105-KVHS	1-1/4"	5/16"	24	HSMSV105K
106-VHS	1-1/4"	3/8"	24	HSMSV106
108-KVHS	1-1/4"	1/2"	24	HSMSV108K
116-VHS	1-3/8"	3/8"	26	HSMSV116

Metric Sizes
25 mm. O.D. x 7mm. I.D. V-Cutters in stock, along with other metric sizes upon request.

See "General" discussion of Undercutting Saws on page 14.

TUNGSTEN-CARBIDE SAWS and V-CUTTERS

These are extremely hard and brittle and are usually used on rigid stationary equipment. The teeth of both saws and V-cutters have a slight land to give strength to the cutting edge. Saws are hollow-ground for clearance, V-cutters have ample radial relief. When Carbide Saws are used on other equipment than our undercutters, steel supporting washers are recommended to reduce breakage. Spindle speeds may vary from 3,000 to 12,000 r.p.m., depending on Saw O.D.

See Undercutters for 9 Martindale Undercutters for use with these saws: Close-Cut, Kut-Kwik, Utility, Bench-Type Model HV-3, Lathe-Type and Super Lathe-Type, Heavy-Duty Bench-Type Model H-9, Industrial Model HA-2, and Model UL Lathe Mounted Automatic.

SAWS ("U"-Slot)

Actual size illustrations; specifications below. Thickness ranges as follows:

1/4" - 9/16" O.D. from .010" to .045" thick
5/8" - 1-3/8" O.D. from .010" to .065" thick

Be sure to specify thicknesses.

Type Number	O.D.	Hole	No. Teeth	Catalog Number
10-TC	1/4"	1/8"	12	TUNS10
9-1/2-TC	5/16"	1/8"	14	TUNS9.5
32-TC	3/8"	1/8"	14	TUNS32
33-TC	3/8"	3/16"	14	TUNS33
12-TC	7/16"	1/8"	14	TUNS12
42-TC	1/2"	1/8"	14	TUNS42
16-TC	1/2"	3/16"	14	TUNS16
18-TC	9/16"	1/4"	16	TUNS18
54-TC	5/8"	1/4"	16	TUNS54
64-TC	3/4"	1/4"	18	TUNS64
65-TC	3/4"	5/16"	18	TUNS65
75-TC	7/8"	5/16"	20	TUNS75
4-TC	1"	9/32"	20	TUNS4
84-TC	1"	1/4"	20	TUNS84
85-TC	1"	5/16"	20	TUNS85
86-TC	1"	3/8"	20	TUNS86
95-TC	1-1/8"	5/16"	22	TUNS95
96-TC	1-1/8"	3/8"	22	TUNS96
105-TC	1-1/4"	5/16"	24	TUNS105
106-TC	1-1/4"	3/8"	24	TUNS106
108-TC	1-1/4"	1/2"	24	TUNS108
116-TC	1-3/8"	3/8"	24	TUNS116

COMPOUND-LAND SAWS

The compound-land feature, sketched at right, is available on tungsten-carbide "U"-slot saws 9/16" O.D. and up (#18-TC thru #116-TC) at a 30% premium in price. Because of this feature, each tooth cuts only 50% of full slot width, resulting in better chip clearance, cooler operation and production increases of up to 60% over the square-toothed Saw. To order, add "CL" to Catalog Number. Minimum thickness .015".

V-CUTTERS ("V"-Slot)

Actual size illustrations; specifications below. Thickness ranges as follows:

1/2" O.D. from .030" to .045" thick
3/4" - 1-3/8" O.D. from .030" to .065" thick

Angles between cutting edges can be 40°, 50°, and 60°. 40° V-cutters are for thin mica, 50° for medium mica, 60° for thick mica.

Be sure to specify thicknesses and angle, 40°, 50° or 60°.

Type Number	O.D.	Hole	No. Teeth	Catalog Number
42-VTC	1/2"	1/8"	12	TUNSV42
17-VTC	1/2"	3/16"	12	TUNSV17
65-VTC	3/4"	5/16"	14	TUNSV65
75-VTC	7/8"	5/16"	16	TUNSV75
4-VTC	1"	9/32"	18	TUNSV4
85-VTC	1"	5/16"	18	TUNSV85
86-VTC	1"	3/8"	18	TUNSV86
95-VTC	1-1/8"	5/16"	20	TUNSV95
96-VTC	1-1/8"	3/8"	20	TUNSV96
105-VTC	1-1/4"	5/16"	22	TUNSV105
106-VTC	1-1/4"	3/8"	22	TUNSV106
116-VTC	1-3/8"	3/8"	22	TUNSV116

SPECIALS — Your inquiries are invited for sizes not listed on the H.S.S. or Tungsten-Carbide Saw Pages.