



## ***HV-3 BENCH-TYPE UNDERCUTTER INSTRUCTIONS***

### **INITIAL ASSEMBLY:**

Turn the vertical adjustment hand wheel (30-30) over and tighten the set screw. Remove the carriage stop screw with modified Black Tee Know from the end of the roller slide and install the carriage assembly (30-2 etc) by inserting the carriage roller bearings into the notches of the slides. Replace the stop screw with Knob. Three countersunk holes are provided for screwing the base to a bench.

### **FOR SLOTTING HORIZONTAL COMMUTATORS:**

Fasten the end of the operating handle (30-18) to the base of the carriage (30-2). Position handle between dowel pins and thread bolt through spacer (30-21) into carriage base (30-2).

### **FOR SLOTTING VERTICAL COMMUTATORS:**

Fasten the end of the operating handle (30-18) to the bottom of the carriage lifting arm (30-15).

### **CHANGING SAW SPINDLES:**

To remove the spindle, first, remove the pulley guard (30-28). Loosen the two hollow head set screws in the motor support bracket (30-3) that hold the spindle in position. Loosen the tension on the drive belt and slip off the belt. Slide out the spindle housing along with the pulley. When inserting the other spindle, push it through from the pulley side with the flats in line with the set screw. Insert the spindle until the flats are under the set screws.

### **ALIGNMENT:**

Fasten a 6" rule or other thin metal straight edge to the saw spindle in place of a saw (between saw retaining screw and spindle end) with the end of the rule hanging down several inches. Align the edge of the rule with the point of the center support and tighten the saw spindle in this position with the 2 set screws.



#### SPINDLE SPEEDS:

When using Carbide Saws, the large pulley would be on the motor and the small pulley on the spindle.

When using High Speed Steel Saws, the large pulley should be on the saw spindle and the small pulley on the motor.

#### OPERATION:

##### FOR HORIZONTAL COMMUTATORS

Put a saw of the desired thickness on the saw spindle. Mount an armature on the V-supports or centers. Place a bubble level (a combination square head works fine for horizontal or vertical commutators) on the base plate dovetail, and match the setting on the commutator by adjusting the front or rear height adjusting knobs (30-7). If the V-supports are used, keep them in as close to the armature as possible to prevent fore or aft movement of the armature, but not so close as to bind and prevent rotation for indexing. Retract or remove the centers to prevent damage to the armature. Each V-support has a vertical adjustment of 1" for bearings or shafts of different diameters. One of the centers is spring-loaded to make mounting of several armatures of the same size easier. The spring loaded center may be locked in position for heavier work.

Using the operating handle, push the carriage back until the saw is positioned to cut as close to the riser as desired. Loosen the thumbscrew and set the stop rod to limit the carriage travel.

With the saw at riser end of the commutator, turn the motor on and lower the saw into the mica strip to the desired cutting depth using the hand wheel (30-30) on the vertical adjusting screw. The arbor is lowered by turning the hand wheel counter-clockwise: (.050 to each revolution.) (loosen the screw with T-Knob on the motor support before adjusting the vertical screw, and tighten it after adjustment.)

Start the cut at the back of the commutator and pull the saw toward you at an even rate until the slot is cut the entire length. At the end of the slot, lift up slightly on the operating handle to raise the saw up out of the slot, above the level of the commutator and return the saw arbor back to the riser. Index the commutator to center the saw on the next mica strip, lower the handle slowly to let the saw enter the mica and pull the saw through this second strip, etc. Lifting the saw out of the cut when returning the saw arbor back to the riser end for the next cut lengthens the saw life and reduces the chance for accidental damage to the commutator.

##### FOR VERTICAL COMMUTATORS:

Mount the armature in the same manner as for the horizontal commutators.

Fasten the end of the operating handle (30-18) to the bottom of the bottom end of the car-



riage lifting arm (30-15) as explained above under Initial Assembly .

Push the motor carriage toward the commutator until the saw is within about 1/8" of the face of the commutator and set the carriage stop with the screw with T-Knob. Adjust the motor carriage position with the vertical adjustment handwheel (30-30) until the saw is near the armature shaft end of the commutator. Lock the carriage to the vertical adjusting screw (30-11) by means of the thumbscrew on the motor support.

Next, with the saw at the top of the commutator, turn the motor on, and, by making small adjustments on the horizontal carriage stop, feed the saw into the mica strip to the desired depth and set the horizontal carriage stop at this point. Slowly lower the operating handle until the saw has cut the full length of the mica strip. A slight pull on the operating handle will remove the saw from the slot and the operating handle can be raised up until the saw has cleared the commutator. Index the commutator to line up the saw with the next mica strip, push the operating handle forward (with the saw still clear of the commutator) and then lower the saw through this second strip, etc.

#### **MAINTENANCE:**

The bearings in the saw spindle housing are lubricated when assembled and do not require periodic maintenance.

Tracks on which carriage ball bearings travel both vertically and horizontally, should be kept wiped clean and lightly oiled.

Occasional lubrication of other various points such as the vertical adjusting screw, bearing etc., is sufficient.

#### **DRIVE BELT TENSIONING:**

The spindle drive motor is mounted on 4 studs - (1/4-20 x 1-1/2"). Each of these studs carries 3 nuts and 2 washers. The outermost nuts and washers on each stud are moved in or out evenly, to tighten or loosen the drive belt tension. When the belt tension is correct the nuts and washers are securely tightened against the motor.

#### **RETRO FITTING OF THE BELT TENSIONING ADJUSTMENT:**

If the machine does not have the belt tensioning adjustment studs fitted, it is simply a matter of removing the 4 x 1/4-20 cap head screws and replacing them with the 4 x 1/4-20x1-1/2" studs, locked in place by the single 1/4-20 jam nuts.



## SAWS and CUTTERS — HIGH-SPEED Steel or CARBIDE

Two ball bearing spindles are available, with 1/8" or 3/16" arbors. The machine is equipped with one spindle only; additional spindle 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.

### SAWS ("U"-Slot)

Saws stocked in these thicknesses:

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

(Other thicknesses available at extra cost.)

<u>Type</u>	<u>O.D.</u>	<u>Hole</u>	<u>No. Teeth</u>
9-1/2HS	5/16"	1/8"	16
32-HS	3/8"	1/8"	18
33-HS	3/8"	3/16"	18
12-HS	7/16"	1/8"	18
42-HS	1/2"	1/8"	18
16-HS	1/2"	3/16"	18
13-HS	11/16"	3/16"	28

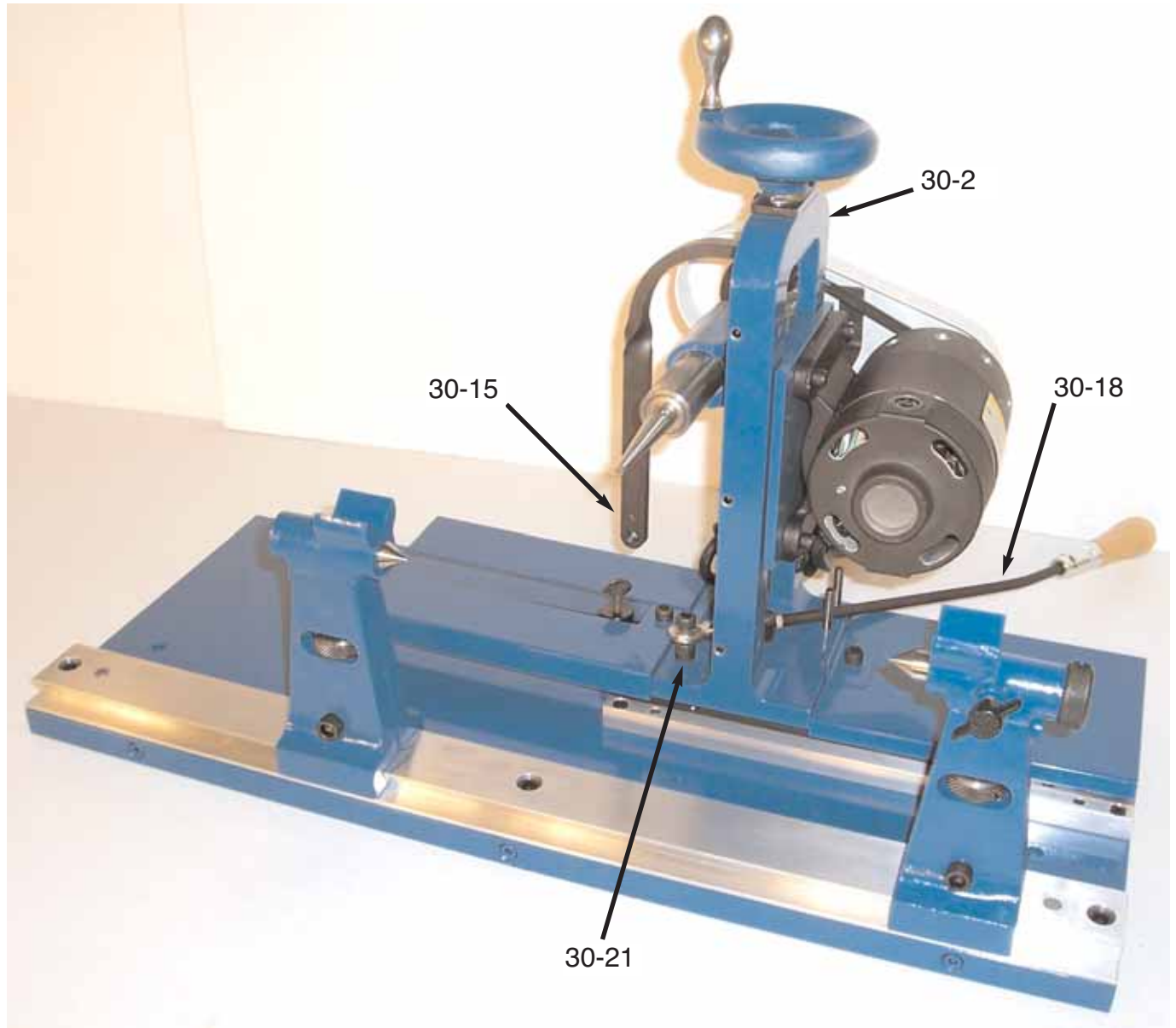
### V-CUTTERS ("V"-Slot)

They 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.

<u>Type</u>	<u>O.D.</u>	<u>Hole</u>	<u>No. Teeth</u>
42-VHS	1/2"	1/8"	14
17-VHS	1/2"	3/16"	14
13-VHS	11/16"	3/16"	16

# MARTINDALE

## *HV-3 Bench-Type Undercutter*



## *HV-3 Bench-Type Undercutter Parts*

Quantity	Description	Part No.
	<u>Undercutter</u>	
1	Base	HV3U301
1	Carriage	HV3U302
1	Motor Support	HV3U303
2	V-Block Support	HV3U304
2	V-Block	HV3U305
1	Short Center	HV3U306
2	Adjusting Knob	HV3U307
1	Center Knob	HV3U308
1	Spindle (Specify 1/8" or 3/16")	HV3U309 <small>(18 or 316)</small>
1	Spindle Housing	HV3U3010
1	Motor Support Adjusting Screw	HV3U3011
1	Adjusting Screw Plate	HV3U3012
2	Roller Slide	HV3U3013
1	Handle Guide	HV3U3014
1	Carriage Lifting Arm	HV3U3015
1	Rod with Handle	HV3U3018
1	Stud for Stop Rod	HV3U3019
1	Stop Rod	HV3U3020
1	Spacer	HV3U3021
1	Washer for Adjusting Screw	HV3U3022
1	Roller Rail L	HV3U3023L
1	Roller Rail R	HV3U3023R
2	Motor Support Guide Rail - Vertical	HV3U3024
1	Spindle Screw (specify 1/8" or 3/16")	HV3U3025 <small>(18 or 316)</small>
1	Front Shield	HV3U3026
1	Rear Shield	HV3U3027
1	Belt Guard with Brackets	HV3U3028
1	Hand Wheel	HV3U3030
1	Motor 115V. or 230V. w/ Cord & Switch	HV3U12656 <small>(A or B)</small>
1	Motor Pulley (1-1/2 x 3/8")	HV3UOS17
1	#1170 BELT	HV3U1170
4	Motor Spacer	
1	Spindle Pulley (2 x 3/8")	HV3UOS22
2	Spindle Bearing (77R6)	HV3U77R6
4	Vertical Guide Rail Bearing (77-R-4)	HV3U77R4
4	Carriage Bearing (#87008)	HV3U87008