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Key Machine Report

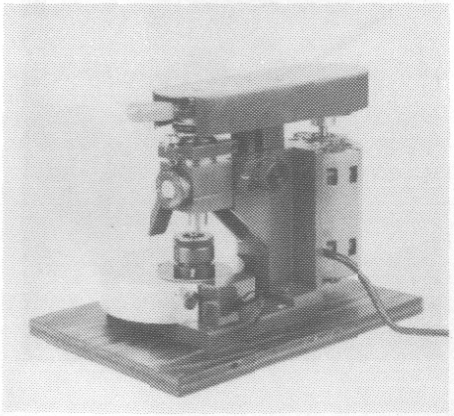
TKM-100 tubular key machine

Framon Mfg. Co. Inc. has just introduced a new concept in cutting tubular keys. It incorporates all the necessary functions to make any tubular key used in today's market. The new TKM-100 cuts vertical depths from .000" to .180" in any position around the circumference of any diameter key. It produces standard cuts, master cuts, ward cuts, and cut-within-cuts. Furnished with a dial depth gauge, it enables the operator to read the depths on any existing key so that accurate duplicates can be cut on the machine.

The main objectives to be accomplished in creating this new tubular key machine were accuracy, speed, and simplicity. This meant a departure from all previous designs of tubular key machines. The first change needed, therefore, was to avoid using collets for each diameter blank.

After a great deal of experimental design and engineering, Framon developed a remarkable universal chuck. This unique holding device accepts any diameter blank with such firmness that it resists over 100 lbs. of downward pressure. The blank will not move while being cut since only eight lbs of downward pressure is ever required to make a cut with the TKM-100.

The chuck is mounted in a turntable which has positive stops in three positions; load position, height setting position, and cutting position. The chuck rotates within the turntable to allow proper indexing around the circumference of the



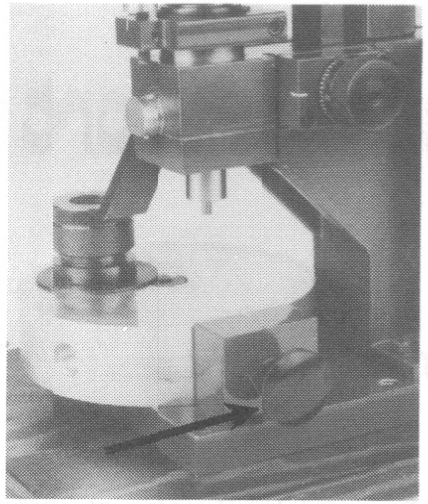


Figure 1. Plunger knob

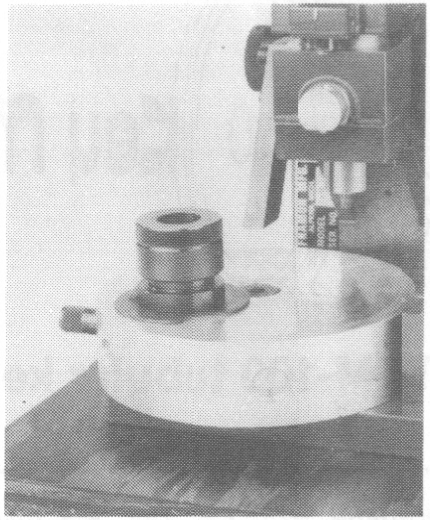


Figure 2. Turntable in load position

key. Depth cams are applied to the spindle housing to provide stops at the proper depth according to various manufacturers measurements. The spindle head is adjustable for accurate side depth penetration for different diameter keys and different side depth for master cuts and cuts-within-cuts. The result of this unusual combination of features is that adjustments for both vertical depths and side depths can be made in increments of .001". Precision is assured because all measurements are taken from the face end of the blank, not the inaccurately swagged base of the tube or the bow of the key.

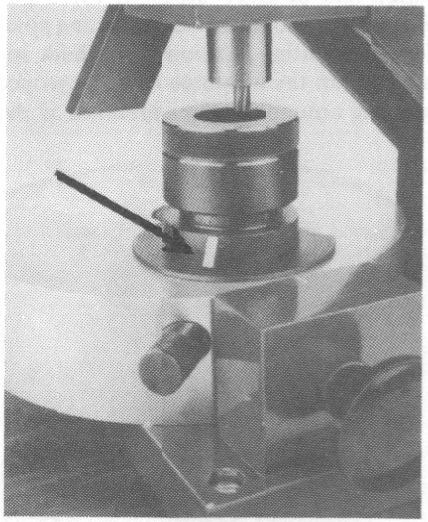


Figure 3. Guide pin

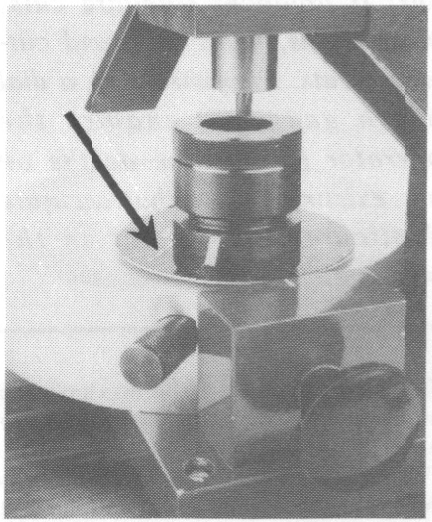


Figure 4. Spacing plate aligned with guide pin

As an example, here's how the TKM-100 would be used to cut a standard tubular key for an Ace lock with a combination of 3246323 and master cuts in the third and fourth position of 2 and 4 respectively.

To load machine, release plunger knob on right by pulling knob outward (see pointer on Figure 1). This frees the turntable. Rotate turntable to load position (Figure 2) where plunger will automatically lock table in place (the turntable will be locked in place at each position by plunger). Loosen the chuck lock knob and rotate chuck so that the guide pin (Figure 3) at base of chuck is visible, then tighten lock knob firmly. Place correct manufacturer's spacing plate over chuck and be sure that the slot in plate (Figure 4) engages the guide pin.

To open chuck, turn counterclockwise so that the jaws open and insert key, bow down. The key guide, or "wing" of the blank (Figure 5) must be aligned to spacing plate slot and guide pin. You will feel spring pressure against the key. Push key down as far as it will go and tighten chuck (Figure 6).

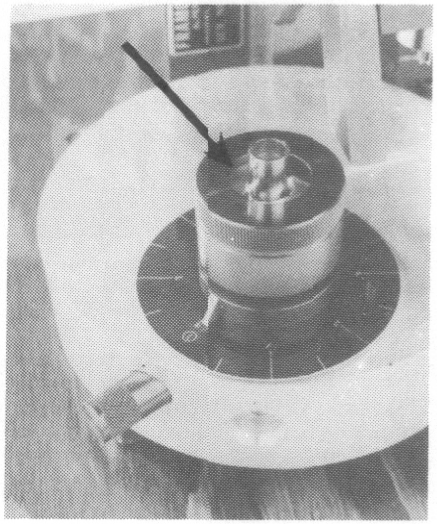


Figure 5. Key guide aligned with chuck guide

Release turntable lock knob and rotate until it locks in setting position (Figure 7). At this point, the key should be directly below the setting shoe. Loosen chuck and the key will spring up so that its face will press against the shoe (Figure 8). Tighten

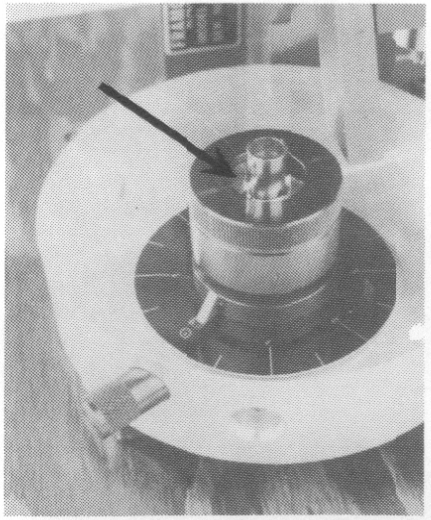


Figure 6. Collet holding key in load position

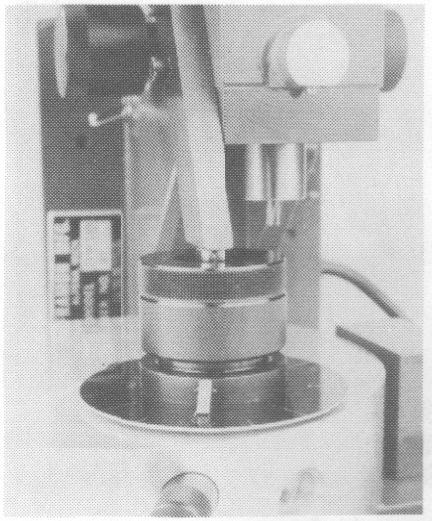


Figure 7. Key aligned under setting shoe

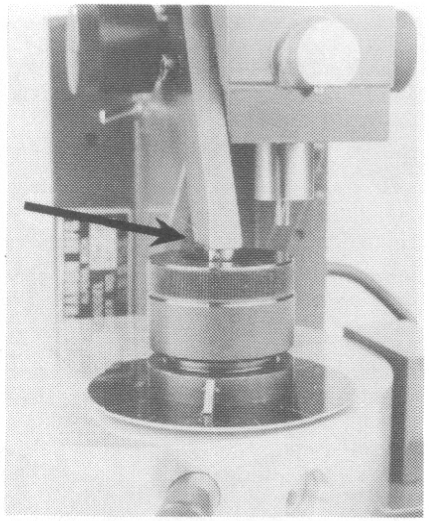


Figure 8. Key against setting shoe

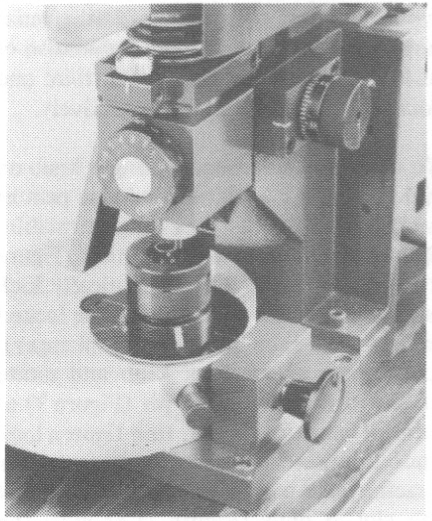


Figure 9. Turntable in cutting position

chuck firmly with finger pressure (IMPORTANT! Do not use pliers or any kind of gripping tool).

Release plunger once again and rotate turntable to cutting position (Figure 9).

Loosen chuck locking knob just enough so that the chuck can be rotated by hand. Chuck and spacing plate can now be turned to position #1 opposite pointer which is located above plunger knob (Figure 10).

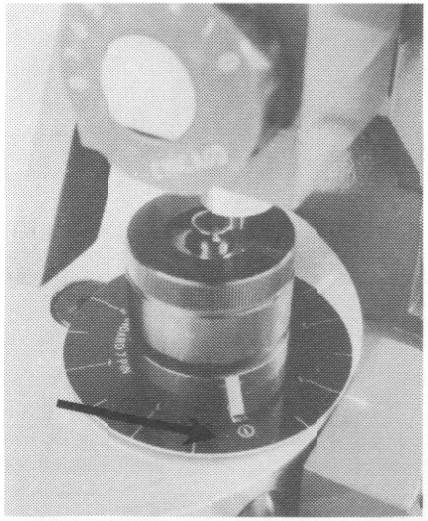


Figure 10. Spacing plate aligned in #1 spacing position

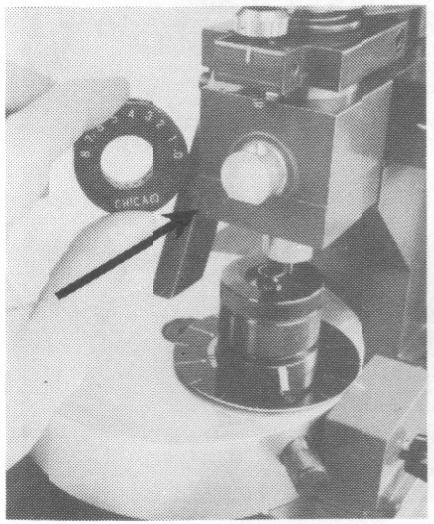


Figure 11. Chicago cam and cam hub

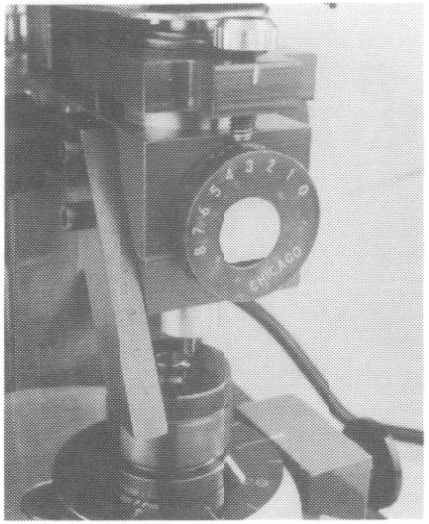


Figure 12. Cam set at #3 depth position

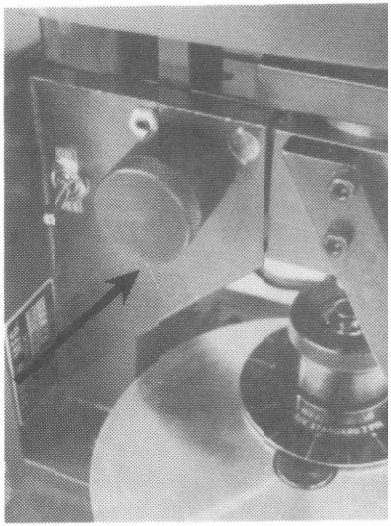


Figure 13. Spindle locking knob

Depth setting

Select appropriate cam for Chicago Ace lock (Figure 11) and press onto hub at front of spindle housing (Figure 11). Rotate cam so # 3 depth shows directly below spindle stop (Figure 12). Cam is now in position and automatically held in place by detent ball built into hub.

Side space setting

Loosen spindle locking knob on *left* of spindle housing (Figure 13). This side spacing knob on right side (Figure 14) to move spindle housing to correct position for cutting side depth. Push side spacing knob forward (toward front of machine) as far as it will go. S

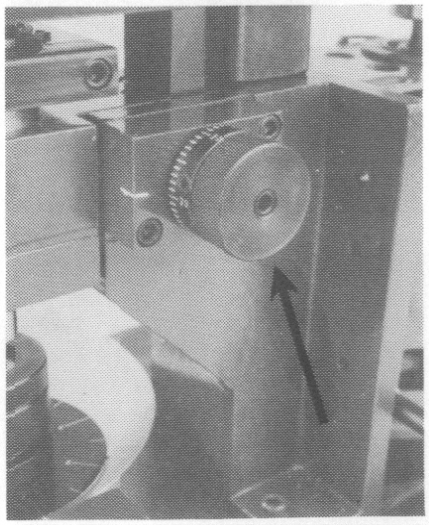


Figure 14. Side spacing knob

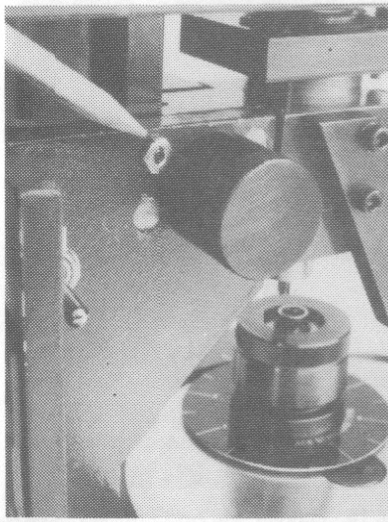


Figure 15. Spindle housing stop scre

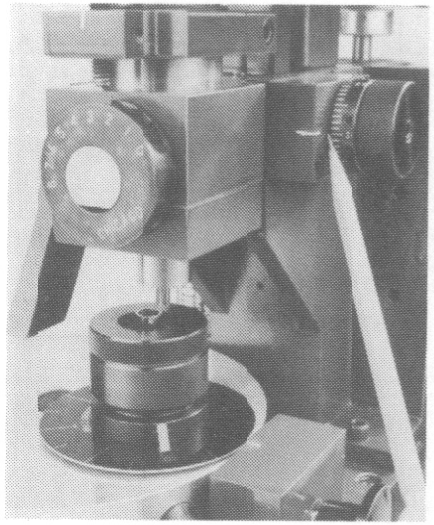


Figure 16. Side depth setting for Ace standard keys

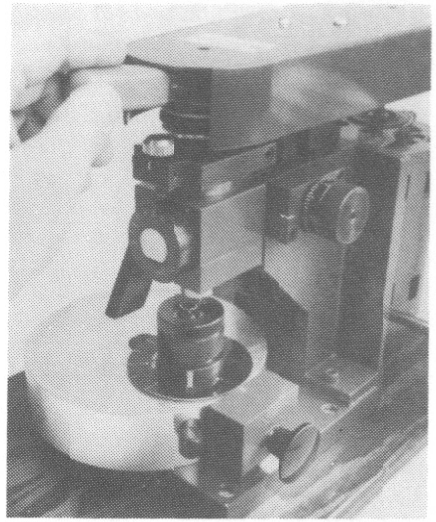


Figure 17. Making first cut, #1 space, #3 depth

housing will stop against stop screw at left side of spindle housing (Figure 15).

Rotate knob slowly in opposite direction (toward motor) until the numeral 30 is lined up with indicator mark on pointer (Figure 16). Tighten spindle lock knob on left. Spindle is now in proper position to cut Ace standard side depths.

Cutting key

Turn on machine and slowly push down handle (Figure 17) as far as it will go. Release handle so that spindle will retract to upper position.

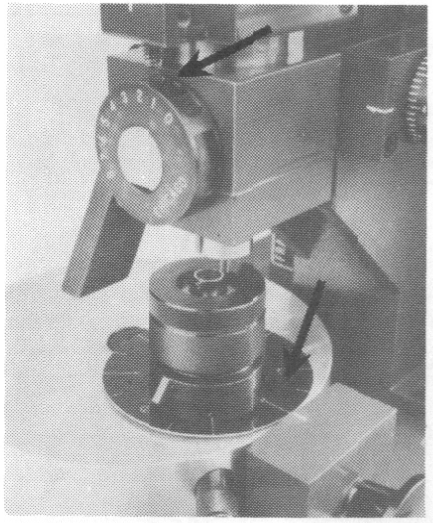


Figure 18. Making second cut, #2 space, #2 depth

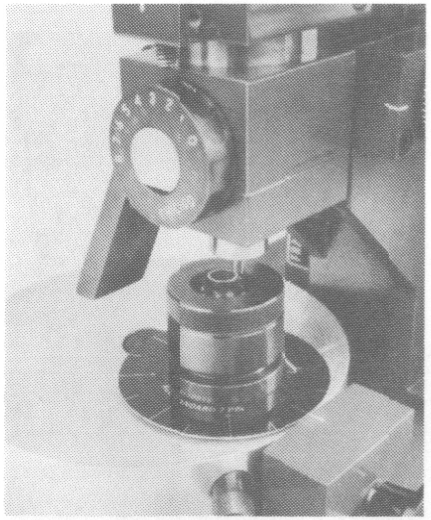


Figure 19. Final cut, #7 space, #3 depth

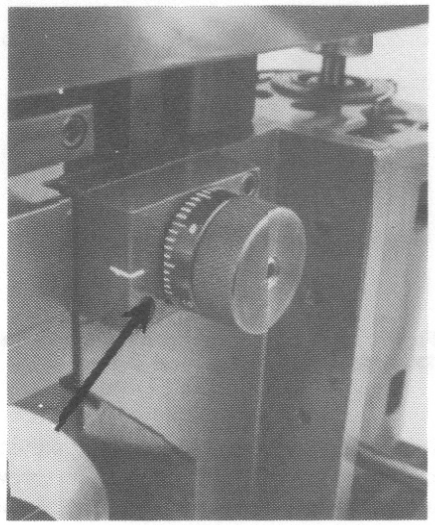


Figure 20. Proper side depth for master cuts, Ace standard

To make second cut, rotate chuck to second space position on spacing plate (Figure 18). Rotate depth cam to # 2 setting and depress spindle. Continue this procedure until all cuts are made. Figure 19 shows final cut in seventh position. Loosen spindle lock knob and rotate side spacing knob forward (toward front of machine) so a setting of .005" is at side space indicator (Figure 20). Tighten spindle lock knob. Set depth cam at # 2 depth and make cut. Rotate chuck and spacing plate to # 4 spacing position, set depth cam at # 4 depth, and make final cut (Figure 21). Key is now complete. *Turn off machine at this point.*

Release turntable plunger and rotate turntable to load position. Tighten chuck lock knob, loosen chuck, and completed key will pop out of chuck.

The above procedure is used on all tubular keys except for slight variations explained in the instruction manual. The average seven pin key can be cut in less than 30 seconds when the proper combination is known. Figures 22 and 23 show finished key. The Framon TKM-100 is

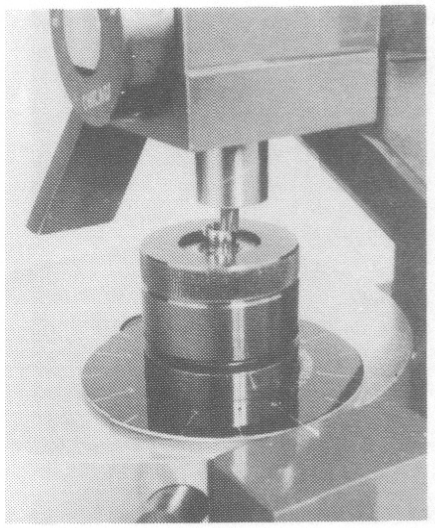


Figure 21. Final master cut

complete with spacing plates and can (Figure 24) for all size keys and a prec sion dial depth indicator (Figure 25) fo decoding keys is also included.

Adjustments

Adjustments for both depth and space ca be made in micrometer adjustments o .001". Depth adjustments are made b

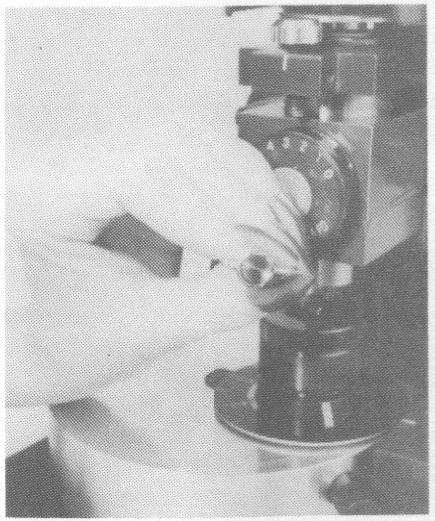


Figure 22. Completed key, end view

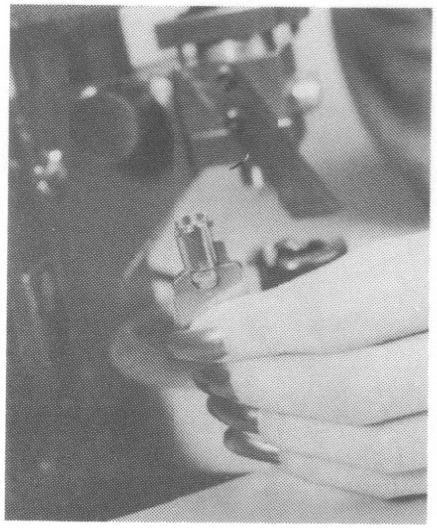


Figure23. Completed key, side view

first releasing the locking arm below the graduated knob on the depth stop, then by rotating the knob to whatever correction is required and re-tightening the

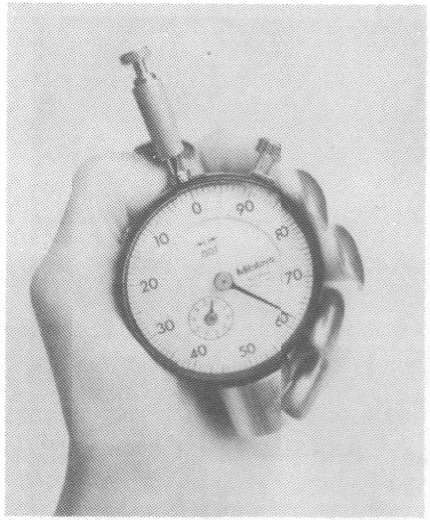


Figure 25. Depth indicator for decoding keys, also included with TKM-100

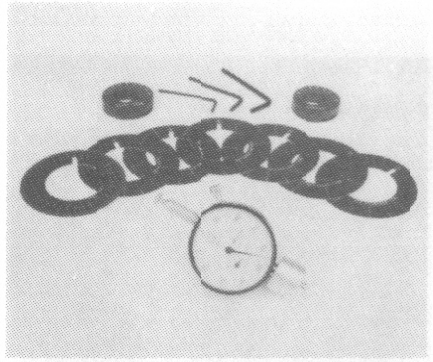


Figure 24. Cams and spacing plates for TKM-100 included with machine

locking arm (Figure 26). Spacing adjustments are made by releasing the set screw and rotating the graduated sleeve on the side spacing knob (Figure 20).

Machine components

All components shown, as well as information and instruction manual, are included in the purchase price. The Framon warrantee of repair or replacement, at no charge to the purchaser, is included with each machine.

Figure 26. Calibrated depth knob for readjusting depth if necessary

The Framon TKM-100 is a versatile and durable key machine which cuts very accurate tubular keys according to the predetermined manufacturers depth and cut positions. Included with the machine is a precision depth indicator used to determine cut depths, depth cams and spacing plates for pin tumbler tubular locks and cutting data for the various manufacturers tubular keys.

Please read all the following information and instructions thoroughly. This information will prove to be invaluable for the proper use of the TKM-100 tubular key machine.

Parts Description

Turntable Assembly - The turntable assembly consists of the turntable, stop block, chuck, and chuck lock pin.

The turntable is fastened to the base plate in such a manner as to allow movement to three positions necessary for cutting keys: load position, set position, and cutting position (Figs 3, 4 & 5). The outer perimeter of the turntable has detent holes that align with the spring loaded plunger in the stop block. This acts as a positive stop to hold the turntable in each of these positions.

The chuck consists of a chuck body, a chuck closer and a set of collets. The chuck is fixed in the turntable in such a manner as to allow the chuck to be rotated by hand for spacing positions around the key blank.

The chuck closer, when turned clockwise, forces both halves of the collet against the key blank for a solid four point grip. The two piece collet and the construction of the chuck allows this one chuck to hold almost all diameter key blanks.

The chuck lock pin prevents rotation of the chuck body when loading, unloading, and setting key

blanks. When the key is inserted in the collet, the chuck closer can be tightened without having the chuck rotate. This is done by hand pressure only (see cutting procedure for full instructions).

Spindle assembly - The spindle assembly consists of the spindle and attached cutter, spindle lever, and spindle housing.

The spindle travels in a vertical motion to make the actual cuts in the blank when the spindle lever is pushed in a downward motion. Spring pressure returns the spindle to its normal position when the lever is released.

The entire spindle housing is mounted on two steel guide rods and an adjusting screw. On the left side of this screw is a jam stop knob (Fig 2); on the right side is the spacing knob with a calibrated ring (Fig 1). The movement of the spindle housing allows lateral adjustment for side depth cutting of different diameter keys. The calibrated ring allows for proper setting as shown on charts provided for each manufacturer.

Spacing Plates - Seven spacing plates are provided with each machine. These plates cover almost all of the tubular keys used today.

1. Ace standard 7 pin - positions common 7 tumbler cuts.
2. Offset right 7 pin - positions Chicago offset right cuts.
3. Offset left 7 pin - positions Chicago offset left cuts.
4. National Keyset - positions National Keyset.
5. Ace Change-matic 8 pin - positions special Chicago Change-matic cuts.
6. Segal 8 pin - positions Segal.
7. Universal - 360° degree wheel to position cuts at other locations. This plate is graduated in 2° increments around the full 360° circumference of the plate. It can be used by first determining the spacing on the blank, then converting this spacing to the spacing on the universal plate.

The spacing plates are placed over the chuck with the notch set over the guide pin on the side of the chuck. The blank is then inserted in the chuck with the post aligned with the guide pin in the side of the chuck. These three components must be aligned for proper cutting.

Depth Cams - Depth cams are provided for most manufacturers. These cams are machined to a tolerance of plus or minus .001. The cam hub on the spindle housing has a detent ball and spring to hold cam in proper positions when indexing to required depth settings.

Cutters - The cutter furnished with the TEM-100 (Part TCA1001) is a solid carbide, six flute cutter. Cutters are end ground to a tolerance of .0005" and can be removed and replaced without any adjustment to the machine. If the cutter is removed, be sure to wipe off top end before replacing it. Allow cutter to bottom out firmly and tighten set screw.

Information Book - Included are a number of depth and space charts. Much of this information was gained from our own measurements and some from helpful locksmiths.

The depth and space charts give information in relation to each manufacturer. To cut keys properly, it is critical that manufacturer be known. The cuts of various keys chart on pgs 23 & 24 shows the depths each uses. You will note that the variation between the manufacturers depth in most cases are very slight on the shallower depths, but the variation in the deeper cuts are much greater.

Reading by eye will not show these differences. The depth indicator is supplied for determining exact depth of cuts, then determining what manufacturers chart should be used. When correct information is known, proper depth cams and spacing disc can be selected. Also note that some manufacturers use reverse reading for depth cuts.

Cutting depths and measurements are from the face of the blank toward the bow of the blank. Side depths are measured from the outer perimeter of the blank toward the center of the blank. Standard cuts normally do no break through the wall of the blank nor do ward cuts. Master cuts and cuts within cuts do break through the side vall.

Not all blanks are perfectly round. They may be out of round by as much as .012". As far as side depth clearance is concerned with these blanks, you may have to cut a little deeper to allov pins to enter the cuts.

The features described above allow the TKM-100 to cut any depth required in any position around the circumference of the blank. Depth cuts are controlled by the depth cams; spacing positions are controlled by the spacing plates; and side depth is controlled by the ability to move the spindle housing laterally in either direction. These three motions cover all the requirements needed to cut tubular keys.

Basic Operation

The chuck is mounted vertically on a three position turn table. The first position is the load position where the blank is inserted fully into the vise and temporarily tightened. The second position is the set position where the blank is released against the setting shoe and tightened to set the blank at the proper height for cutting. The final position is the cutting position.

The depths of cut are controlled by the proper depth cam which snaps on the hub and is then rotated to the desired depth setting.

The side depth of cut is adjusted by the side depth knob which positions the spindle and cutter. This adjustment is used when cutting different diameter key blanks, for cuts within cuts and master cuts.

The cutter is fed down into the end of the key blank by means of pressure on the spindle lever until the depth stop screw contacts the depth cam at the selected depth. The cutter moves back up after releasing the handle and the key and chuck may be rotated to the next position to make that cut.

The spacing position is set by rotating the chuck to the desired positions as marked on the spacing discs.

Decoding Keys

The depth indicator is supplied for decoding keys. You must determine cuts, size of key and manufacturer for proper key cutting.

There are three sizes of tubular keys: .365 dia, .375 dia. and .406 dia. Each diameter key needs a different side depth adjustment.

Set end of indicator tip in cut and push face of blank against hub on indicator. See page 13 for spaces around key. The reading on the dial will give you the depth of cut. You then use the chart on pgs 23 & 24 to convert to the number of the cut. Example: The indicator reads .046 on the first cut, this equals a #3 cut for Chicago. The second cut reads .031, this equals a #2 cut for Chicago. Continue taking readings in a counterclockwise direction until all cuts are read.

Unknown Lock Manufacturer

If the brand of lock is not known, measure the cuts (see decoding key) and then consult the foldout on cuts of various keys on pgs 23 & 24. Determine which manufacturers depth cam to use. Convert measurements to depth of cut. Then proceed to cut the key as explained above.

Cutting Procedure

The procedure used to cut a standard tubular key for an Ace lock with a combination of 3246323 and master cuts in the third and fourth position of 2 and 4 respectively. This is a standard size key.

1. Release the turntable by pulling the plunger knob outward (Part # TKMS051, Fig 7). Rotate the turntable to load position (Fig 3). The turntable will automatically be locked in place at each position by plunger.

Unlock the chuck body by pulling out the chuck lock pin (Part # TKSH005, Fig 7) approximately 3/16". You will feel resistance. This pin does not come completely out. Rotate the chuck body until the lock pin can be pushed into place. The chuck body will no longer rotate once the lock pin is engaged.

2. Place correct manufacturers' spacing plate over chuck. Be sure that the slot in plate engages the guide pin.

3. To open chuck, turn counterclockwise so that the jaws open and insert key, bow down. The key guide, or post, of the blank must be aligned to spacing plate slot and guide pin. You will feel spring pressure against the key. Push key down as far as it will go and tighten chuck.

4. Release turntable plunger knob and rotate until it locks in set position (Fig 4). At this point, the key should be directly below the setting shoe. Loosen chuck and the key will spring up so that its face will press against the shoe. Tighten chuck firmly with finger pressure only (IMPORTANT!! Do not use pliers or any kind of gripping tool).

5. Release the plunger knob once again and rotate turntable to cutting position (Fig 5). Pull out chuck locking pin so that the chuck can be rotated by hand. Chuck and spacing plate can now be turned to position #1 opposite pointer (white line on stop block) which is located above plunger knob.

6. Select appropriate cam for Chicago Ace lock and press onto hub at front of spindle housing. Rotate cam so #3 depth shows directly below spindle stop (Part # TKSH022, Fig 7). Cam is now in position, automatically held by detent ball built into hub.

7. Loosen jam stop knob on <u>left</u> side of spindle housing (Fig 6). This frees side spacing knob on right side (Part #TKSH037, Fig 1). Rotate side spacing knob counterclockwise as far as it will go. The spindle housing will stop against the stop screw. Rotate side spacing knob slowly clockwise until the numeral 30 is lined up with indicator mark on bearing keeper block. Tighten jam stop knob on left. This is the correct position for cutting side depth for Ace.

8. To make first cut, turn on machine. Hold chuck so it doesn't rotate while cut is being made. Slowly push down spindle lever (Fig 1) as far as it will go. Release handle so that spindle will retract to upper position.

To make second cut, rotate chuck to second space position on spacing plate. Rotate depth cam to #2 setting and depress spindle.

Continue this procedure until all cuts are made.

9. Cut master cuts. Loosen jam stop knob and rotate side spacing knob counterclockwise so a setting of .005" is at side space indicator. Tighten jam stop knob. Rotate chuck and spacing plate to the #3 spacing position. Set depth cam at #2 depth and make cut. Rotate chuck and spacing plate to #4 spacing position, set depth cam at #4 depth, and make final cut. Key is now complete. Turn off machine at this point.

10. Release plunger knob and rotate turntable to load position (Fig 3). Rotate the chuck body until the lock pin can be pushed into place. Loosen chuck, and completed key will pop out of chuck.

The above procedure is used on all tubular keys. The average sever pin key can be cut in less than 30 seconds when the proper combination is known.

Adjustments

Depth Adjustment - If the machine is not cutting proper depths, adjustmerts can be made by the following procedure. Example: Cut is .004" too deep. Loosen set screw on right side of spindle stop (Fig 1), turn adjustment knob two marks (calibrations on adjustment knob are .002" apart) clockwise and tighten set screw. Turning the adjustment knob clockwise makes cuts shallover, turning knob counterclockwise makes cuts deeper.

Side Depth Adjustment - Side depth adjustments should be made with an 1137 blank. Side depth setting for Ace keys (standard cut) is .030" on side space knob. After this setting is made, a cut should be made on each side of the key (space 1 and space 5). Do not remove key from chuck. Swing turntable to load position and measure across the inside of both cuts. Dial calipers are ideal for measuring across keys. This measurement should be .325". See chart on Page 15 of manual for measurements of various keys.

If measurement is wrong, for example, your reading is .330", your key is .005 off. Turn side depth adjustment knob counterclockwise .0025" (.0025 x 2 sides of key = .005).

Make two additional cuts in the #2 and #6 spacing position. If key is reading proper side depths, tighten jam stop knob on left side of machine. Loosen set screw on calibrated ring and turn to .030". Tighten set screw and adjustment is complete.

By using this method, the machine can be readjusted using only one key blank. No adjustments are needed for spacing around the perimeter of the key. This spacing is controlled by the graduations on the spacing plates.

Indicator - If indicator needs adjustment, simply use any flat piece of metal (six inch steel rule is ideal). Push post upward with rule and hold against hub. Pointer should be on "0". If not, loosen thumb screw for dial, rotate dial face until pointer is aligned with "0". Tighten thumb screw.

Lubrication

Turntable - The turntable can be taken off by removing the shoulder bolt (Part #TKMS405) and lifting turntable off of the base plate. Wipe base plate and bottom of turntable clean and lubricate with light grease.

Chuck - The inside of the chuck can be cleaned by first removing the turntable (see turntable in instructions above). Remove small, internal snap

ring (Part #TKTR003, Fig 9) and all internal parts (plunger, spring, and washer) will fall out. Clean all parts, remove chips, and replace in reverse order. A little light oil on plunger will insure smooth operation.

If chuck must be removed from the turntable, remove large snap ring (Part #TKTR001) and entire chuck unit can be lifted out of turntable. Clean and lubricate with light grease and reassemble.

A little oil on the cam hub (Fig 7) is the only other lubrication needed.

Note: When lubricating any parts, excess oil and grease only tend to gum up and collect dirt. Wipe off all excess lubrication before using machine.

Warranty

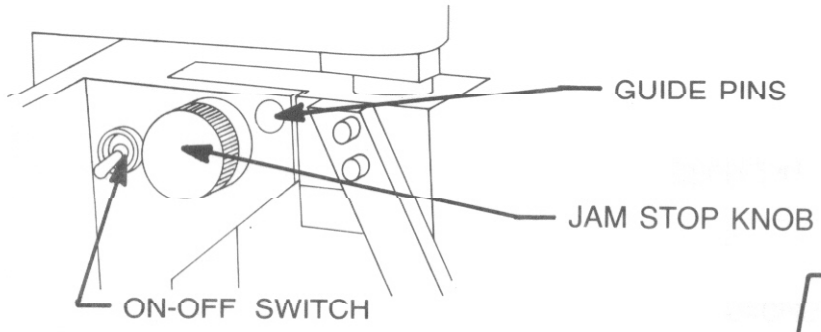
The Framon TKM-10C carries the same warranty as other Framon products. We will repair or replace any product found to be defective as to workmanship or material. This warranty is in effect for a period of one year from the date of purchase. The purchaser must inform Framon Mfg. Co. by telephone or letter and obtain permission before returning any machine. We will not accept any product returned without prior permission.

This warrantee does not cover cutters. We feel our cutters are among the finest in use today, but we have no control over their use. This warranty is valid only to the original purchaser.

Parts List

Part #	Description
TKA1001	Carbide Cutter
TKBA001	Spindle Bearing
TKBA002	Lever Bearing
TKMS002	Conical Spring
TKMS051	Plunger Knob
TKMS301	Guard
TKMS406	Shoulder Bolt
TKMS407	Yoke Rivet
TKMS409	Wavy Washer
TKMS601	Lever Handle
TKMS751	Wood Base
TKMS801	Woodruff Key
TKSC004	10-32 x 3/16 Screw
TKSC005	10-32 x 3/4 SHC Screw
TKSC006	5/16-24 x 3/4 Machine Screw
TKSC009	1/4-20 x 1 SHC Screw
TKSC012	Washer
TKSH001	Base Plate
TKSH002	Turntable
TKSH003	Turntable Block
TKSH005	Chuck Lock Pin
TKSH006	Cam
TKSH014	Chuck Body
TKSH016	Chuck Closer
TKSH017	Collet
TKSH018	Bushing Shield
TKSH019	Chuck Retainer
TKSH020	Chuck Plunger
TKSH022	Spindle Stop
TKSH023	Pulley
TKSH024	Cap Washer
TKSH025	Adjustment Knob
TKSH026	Spindle Support Casting
TKSH028	Spindle Housing
TKSH029	Spring Washer
TKSH030	Spring Block

TKSH031	Spindle Lever
TKSH033	Spindle Lever Support
TKSH034	Key Stop Arm
TKSH035	Guide Pin
TKSH036	Side Depth Adj Screw
TKSH037	Side Spacing Knob
TKSH038	Calibrated Ring
TKSH040	Jam Stop Inob
TKSH041	Bearing Keeper Block
TKTR001	Large Snap Ring - Chuck Body
TKTR003	Small Snap Ring - Chuck Body
F2MS001	Compression Spring
F2MT002	115v Motor
F3MT002	12v Motor
F2MT008	Toggle Switch



VIEW IN DIRECTION OF ARROW "A"

Figure 2

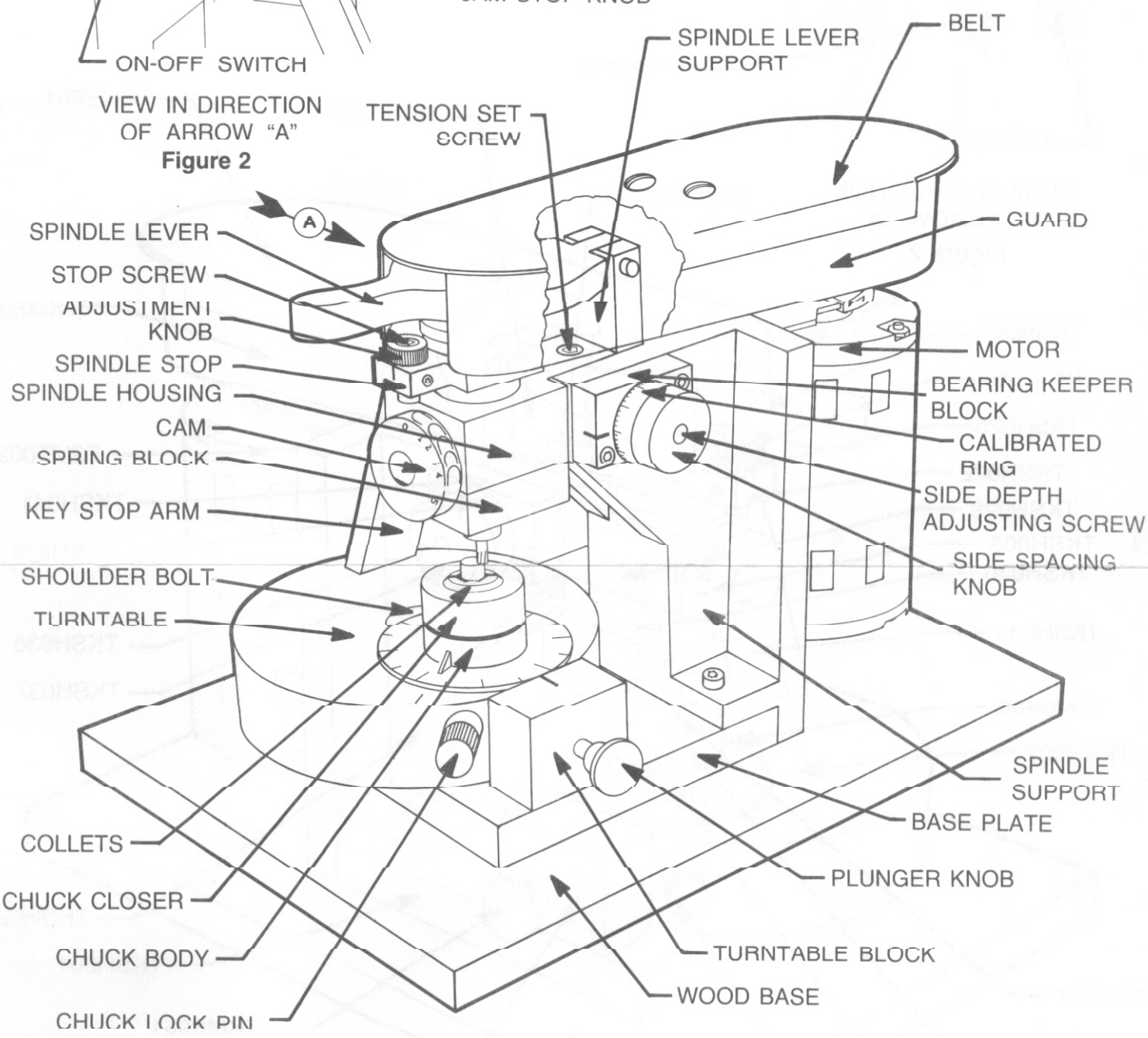
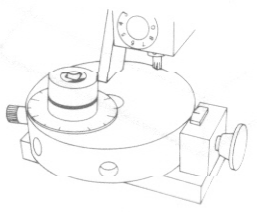
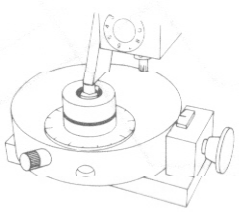


Figure 1



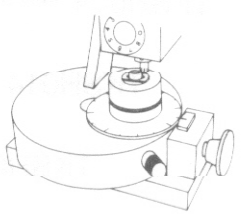
LOAD POSITION

Figure 3



SET POSITION

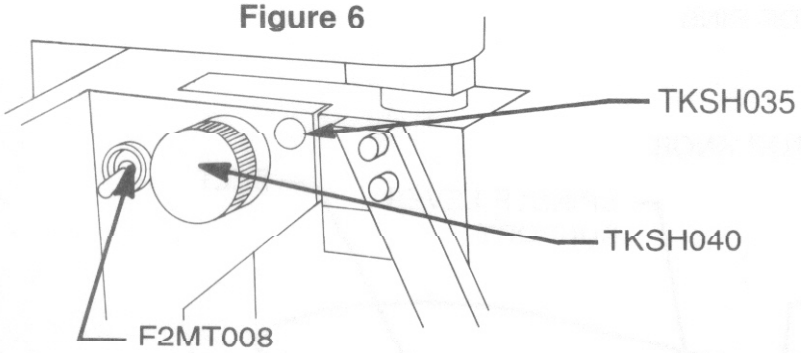
Figure 4



CUTTING POSITION

Figure 5

Figure 6



VIEW IN DIRECTION
OF ARROW "A"

Figure 2

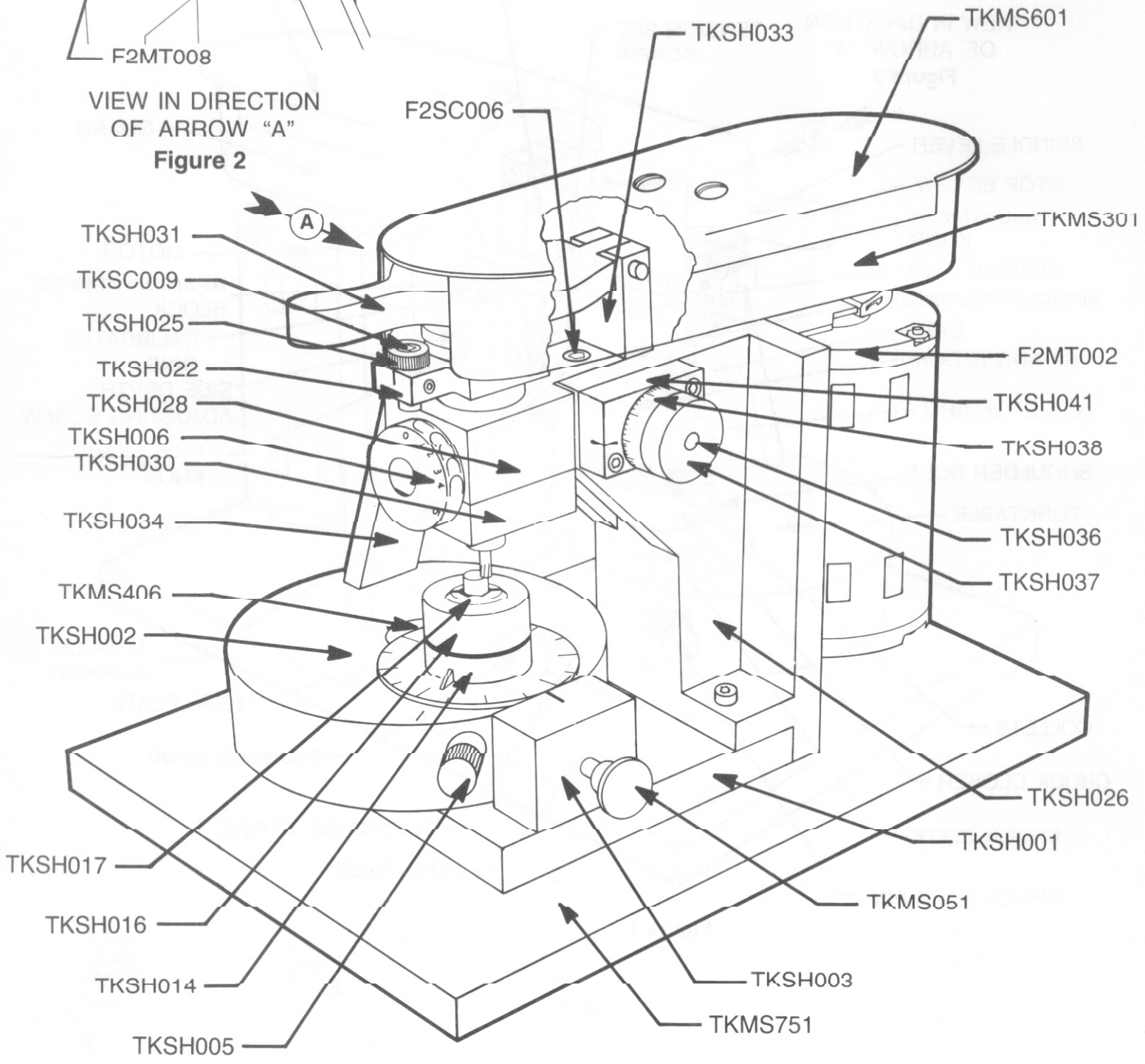


Figure 7

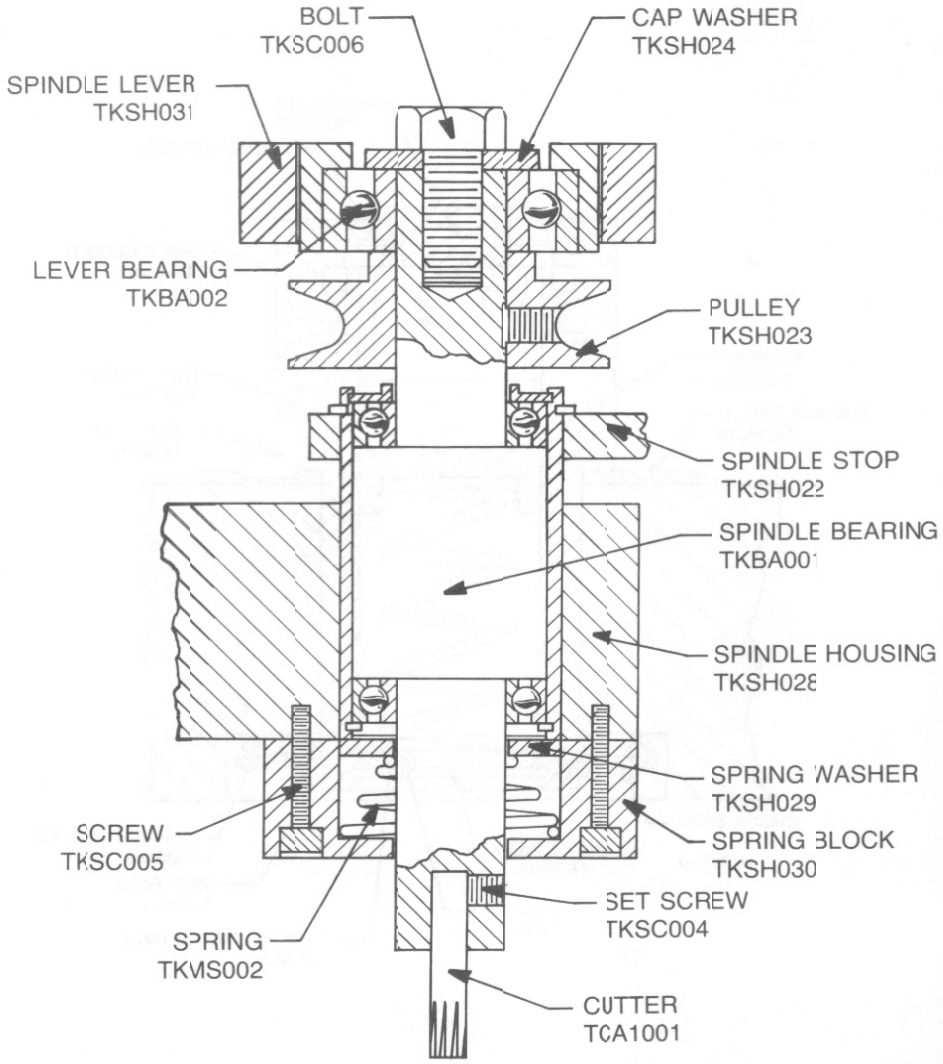

BOLT
TKSC006
CAP WASHER
TKSH024
SPINDLE LEVER
TKSH031
LEVER BEARING
TKBA002
PULLEY
TKSH023
SPINDLE STOP
TKSH022
SPINDLE BEARING
TKBA001
SPINDLE HOUSING
TKSH028
SPRING WASHER
TKSH029
SCREW
TKSC005
SPRING BLOCK
TKSH030
SET SCREW
TKSC004
SPRING
TKMS002
CUTTER
TCA1001

Figure 8

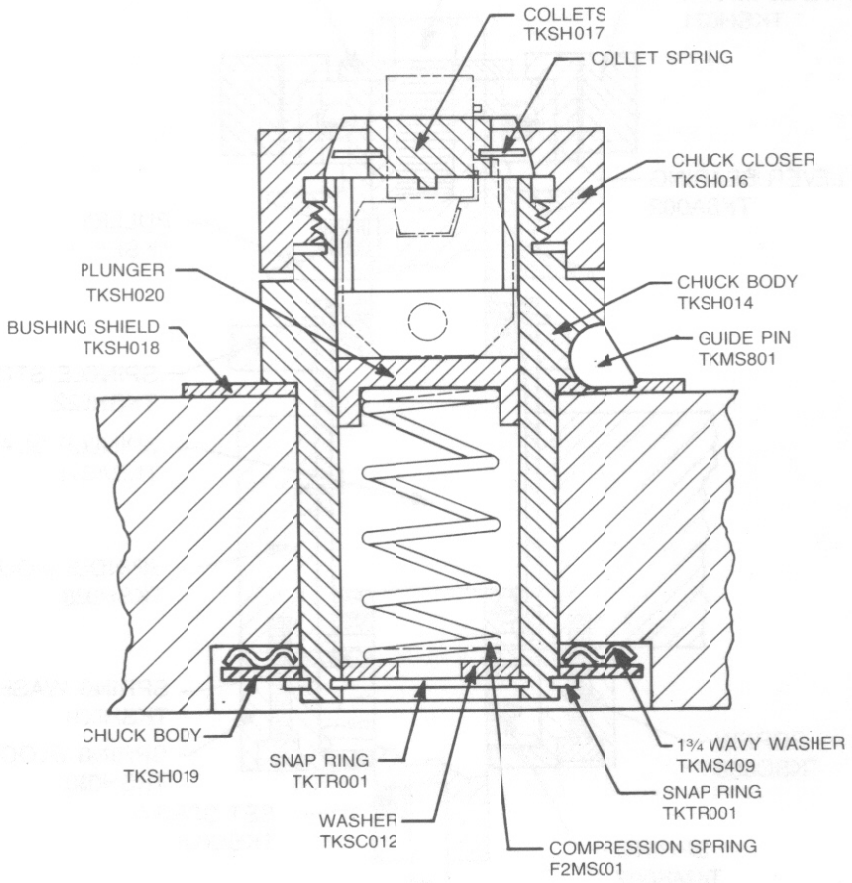
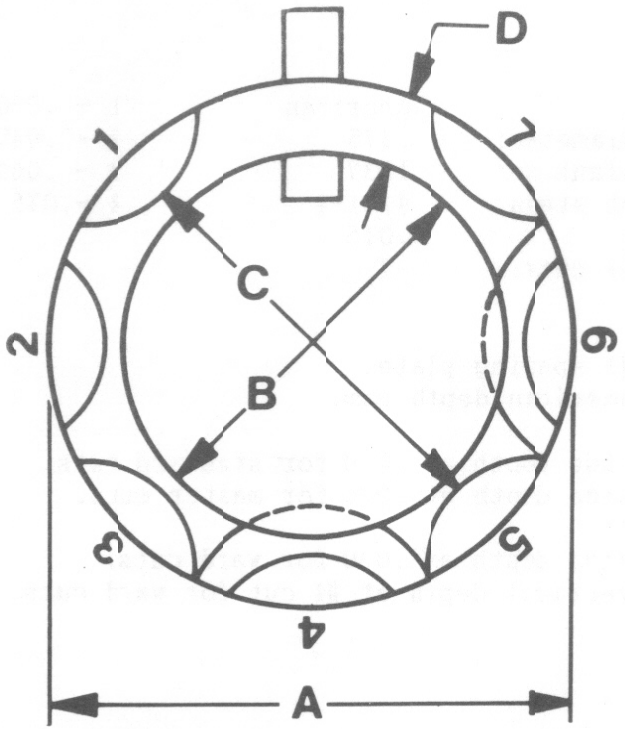


Figure 9



Blank Number	Lock Mfgr	A	B	C	D
1137	All	.375	.312	.325	.0315
1137	Chicago Mas.	.400	.326	.340	.037
1137S	Chicago etc.	.365	.300	.305	.032
K1137	Fort Mas.	.375	.285	.300	.045

This chart is provided to check accuracy of cut keys and for measurements needed to readjust key machine when necessary. Blanks will vary slightly according to manufacturers tolerances. All adjustments should be set with an 1137 key blank with O.D. of .375 and I.D. of .312. Measurement across "C" should be .325 of less. When making side adjustments, renember that correction should be half the distance to be corrected. Side depths will work better if cut is slightly deeper than if cut is too shallow.

Mfgr:	American	1 - .030
Key diameter:	.375	2 - .045
Key blank No:	1137	3 - .060
No. of steps:	4, 1-4	4 -.075
Drop:	.015	
No. of cuts:	7	

Use #1 spacing plate.
Use American depth cam.

Set side depth at .030 for standard cuts.
Set side depth at .005 for master cuts.

Set side depth at .030 for ward cuts.
Set vertical depth at #4 cut for ward cuts.

Mfgr:	Chicago / Ace	0 - No Cut
Key diameter:	.375	1 - .0155
Key blank No:	1137	2 - .031
No. of steps:	9, 0-8	3 - .0465
Drop:	.0155	4 - .062
No. of cuts:	7	5 - .0775
		6 - .093
		7 - .1085
		8 - .124

Use #1 spacing plate.
Use Chicago depth cam.

Set side depth at .030 for standard cuts.
Set side depth at .005 for master cuts.

Set side depth at .030 for ward cuts.
Set vertical depth at #7 cut for ward cuts.

Mfgr:	Chicago - Mastered	0 - No Cut
Key diameter:	.403	1 - .0155
Key blank No:	1137A	2 - .031
No. of steps:	9, 0-8	3 - .0465
Drop:	.0155	4 - .062
No. of cuts:	7	5 - .0775
		6 - .093
		7 - .1085
		8 - .124

Use #1 spacing plate.
Use Chicago depth cam.

Set side depth at .040 for standard cuts.
Set side depth at .010 for master cuts.

Set side depth at .040 for ward cuts
Set vertical depth at #6 cut for ward cuts.

Mfgr:	Cop	0 - .125
Key diameter:	.375	1 - .100
Key blank No:	1137	2 - .075
No. of steps:	6, 0-5 See Note	3 - .050
Drop:	.025	4 - .025
No. of cuts:	7	5 - No Cut

Use #1 spacing plate.
Use Unican depth can.

Set side depth at .030 for standard cuts.
Set side depth at .005 for master cuts.

Set side depth at .030 for ward cuts.
Set vertical depth at #1 cut for ward cuts.

NOTE: Cop uses reverse reading for cut depths.

Mfgr:	Dominion	0 - .016
Key diameter:	.375	1 - .032
Key blank No:	1137	2 - .048
No. of steps:	8, 0-7	3 - .064
Drop:	.016	4 - .080
No. of cuts:	7	5 - .096
		6 - .112
		7 - .128

Use #1 spacing plate.
Use Dominion depth cam.

Set side depth at .030 for standard cuts.
Set side depth at .005 for master cuts.

Set side depth at .030 for ward cuts.
Set vertical depth at #6 cut for ward cuts.

Mfgr:	Dynalock	0 - .125
Key diameter:	.375	1 - .100
Key blank No:	1137	2 - .075
No. of steps:	6, 0-5 See Note	3 - .050
Drop:	.025	4 - .025
No. of cuts:	7	5 - No Cut

Use #1 spacing plate.
Use Dynalock depth cam.

Set side depth at .030 for standard cuts.
Set side depth at .005 for master cuts.

Set side depth at .030 for ward cuts.
Set vertical depth at #1 cut for ward cuts.

NOTE: Dynalock uses reverse reading for cut depths.

Mfgr:	Fort / Gem	0 - .017
Key diameter:	.375	1 - .033
Key blank No:	1137	2 - .048
No. of steps:	8, 0-7	3 - .064
Drop:	.015 to .017	4 - .079
No. of cuts:	7	5 - .095
		6 - .111
		7 - .126

Use #1 spacing plate.
Use Fort depth cam.

Set side depth at .030 for standard cuts.
Set side depth at .005 for master cuts.

Set side depth at .030 for ward cuts.
Set vertical depth at #6 cut for ward cuts.

Mfgr:	Taylor	0 - .125
Key diameter:	.375	1 - .100
Key blank No:	1137	2 - .075
No. of steps:	6, 0-5 See Note	3 - .050
Drop:	.025	4 - .025
No. of cuts:	7	5 - No Cut

Use #1 spacing plate.
Use Unican depth cam.

Set side depth at .030 for standard cuts.
Set side depth at .005 for master cuts.

Set side depth at .030 for ward cuts.
Set vertical depth at #1 cut for ward cuts.

NOTE: Taylor uses reverse reading for cut depths.

Mfgr:	Unican / Herculock	0 - .125
Key diameter:	.375	1 - .100
Key blank No:	1137	2 - .075
No. of steps:	6, 0-5 See Note	3 - .050
Drop:	.025	4 - .025
No. of cuts:	7	5 - No Cut

Use #1 spacing plate.
Use Unican depth cam.

Set side depth at .030 for standard cuts.
Set side depth at .005 for master cuts.

Set side depth at .030 for ward cuts.
Set vertical depth at #1 cut for ward cuts.

NOTE: Unican uses reverse reading for cut depths.

CUTS - VARIOUS KEYS

Code	Chicago	Greenwald	American	Fort	Dominion	Dynalock	Unican	Segal
0	(--)			-- - X		-- - 5	--	
1	.0155	.013		.017 - 0	.016 - 0			
2	.031		.030 - 1	.033 - 1	.032 - 1	.025 - 4	.025	.026
3	.0465	.043	.045 - 2	.048 - 2	.048 - 2	.050 - 3	.050	.046
4	.062		.060 - 3	.064 - 3	.064 - 3			.066
5	.0775	.074	.075 - 4	.079 - 4	.080 - 4	.075 - 2	.075	.086
6	.093			.095 - 5	.096 - 5	.100 - 1	(.100)	
7	.1085	.104		.111 - 6	.112 - 6			.106
8	(.124)			.126 - 7	.128 - 7	.125 - 0	(.125)	
Incr.	.0155	similar to Chicago	.015	.015 to .017	.016	.025	.025	.020

TUMBLER DATA

Code	Chicago	American	Fort	Dominion	Unican	Zipf	Lab	Segal
0	(.185)		.185 - x		.175			
1	.2025	.180	.202 - 0	.200 - 0	.200	.203	.204	
2	.218	.195	.218 - 1	.216 - 1		.218	.219	.220
3	.2335	.210	.233 - 2	.232 - 2	.225	.234	.234	.240
4	.249	.225	.249 - 3	.248 - 3	.250	.249	.249	
5	.2645		.264 - 4	.264 - 4		.265	.264	.260
6	.280		.280 - 5	.280 - 5	.275	.280	.279	.280
7	.2955		.296 - 6	.296 - 6		.295	.294	.300
8	(.311)		.311 - 7	.312 - 7				
Dia.	.078	.094	.078	.077	.079	.078	.077	.094
BSHG	.185	.151	.185	unk	.176	---	---	.188
DRVR	varies	.180	.201	.202	.175	.125	.125	.170
						.140	.141	
						.180	.180	

Greenwald: similar to Chicago; codes to GR8999 all odd, GR9000 starts even cuts.

Dynalock: appears like Unican; not verified.