HPC/Scotsman
Model 747XU

Tubular Duplicode™

Tubular Key Code and Duplicating Machine
Introduction

Congratulations

You have become the owner of the most modern tubular key cutting machine available today. This HPC/Scotsman Tubular Key Cutting Machine provides you with the following features:

- **Compactness:** The small physical size and light-weight construction allows for easy storage, requires minimum bench space, and makes it ideal for shop or mobile service.

- **Simplicity:** The HPC/Scotsman Tubular Key Machine offers fast, easy operation, whether duplicating, or cutting to code. The simplicity of the machine also assures you of many years of profitable, accurate key cutting, with a minimum of required maintenance.

- **Universality:** HPC/Scotsman Model #747XU will cut all cuts on the 3 sizes of the most popular tubular keys (indicated below), plus the Fort (GEM) “thick walled” key.

- **Durability:** Every part of the machine is designed and manufactured to provide extended life, giving added trouble-free service. Each machine is unconditionally guaranteed by the manufacturer for 90 days. (Remember to fill out and return the warranty card which is provided with this machine).

- **Accuracy:** The HPC/Scotsman Tubular Key Machine is a precision machine which has been properly adjusted before leaving the factory. The adjustment of the machine assures you fast, accurate key cutting capabilities. All parts of the machine are manufactured to the highest quality standards, insuring you more years of accurate operation.

☞ **IMPORTANT!**
Unplug your machine prior to doing any maintenance on it.

Definitions of Terms

- **Tubular Keys:** Also known as “Ace Type Keys” or “Round Keys”. The tubular key is designed to actuate locks which are constructed with the pin tumblers arranged in a circular fashion. The key is constructed with a cylindrical body designed to enter the keyway of such a lock. Various cuts which appear on the circumference of this key allow the pin tumblers of the lock to be depressed to the proper depth thereby meeting a common shearline, and allowing the lock to turn. Proper arrangement and depth of these cuts is critical in order for the lock to be actuated smoothly and efficiently.

- **“Standard” Tubular Keys:** This is the most common of the tubular key family. The outside diameter is .375"/9.53mm. Use the HPC/Scotsman 137 (steel) or 137B (brass) key blanks.

- **“Small” Tubular Keys:** Less common than the standard size, this key measures .365"/.927mm in outside diameter. Use the HPC/Scotsman 137SB key blanks.
“Oversize” Tubular Keys: This key is often referred to as the “UL” or “Certified” key and measures .400”/10.16mm in diameter. The lock which this key actuates is UL Rated and is designed with either 10 or 11 pin tumblers. Seven of the pin tumblers are actually sleeves around other pins. These sleeves are usually located around the pins in positions 2-4-6 or 1-3-5-7, but could be around and of the 7 pins. The secondary cuts (described below) are responsible for depressing these sleeves to proper depth, thereby meeting the common shearline of the pins. The purpose of this lock is to complicate manipulation by picking.

Primary Cuts: Those cuts most commonly found equally spaced around the circumference of a tubular key. These cuts normally do not penetrate the wall of the key completely. The depth of these cuts is determined by the length of the corresponding pin within the lock. Under the normal conditions these are the only type of cuts which are contained on either the small or standard tubular keys. Explanation of a cut which might penetrate the wall of the key is covered under “Secondary Cuts”.

Secondary Cuts: These cuts are often referred to as “cuts-within-cuts”, most commonly found on the “oversize” keys. The secondary cuts will be found to penetrate completely through the wall of the key. Typical location and purpose of these cuts is explained under “Oversize Tubular Keys” above.

Dead Pin Cuts: These are cuts occasionally found between two “primary cuts” on a standard size tubular key. The lock in which such a key is used has a “dead pin”. This pin is designed to hamper in the event of manipulation by picking, or an unauthorized key tries to enter. The depth of the dead pin cut is normally not critical but must be of sufficient depth to allow the key to enter the keyway to maximum depth.

Duplication: This is the act of directly transferring or tracing cuts as they exist on an original key to a blank key, thereby manufacturing an exact copy. This process is used when the original key is known to actuate the lock smoothly and efficiently. If the original key is in error, or there is a question as to its accuracy, it should be decoded and a precision key cut by code using the code cutting capability of the 747X or 747XU.

Decoding: The act of determining the longitudinal depth of a cut defined as that distance from the end of the key blank to the bottom of the cut. Normally each depth would be assigned a code of 1 through 8. A standard depth increment for most tubular lock manufacturers is .016 of an inch. Therefore a code depth of 1 would have a depth of .016”. A code depth of 2 would be .032”, and so on to a depth of code 8 which would be .128” deep. ONE IMPORTANT EXCEPTION TO THIS RULE is those locks manufactured by Ilco/Unican or those locks known as Dyna-Lok, which have code depth increments of .025 of an inch. Since the 747XU uses a standard of .016” depth increments, keys for the locks mentioned are most effectively duplicated rather than cut-to-code.

Cutting to Code: This is the act of cutting a key without the use of an original key. This method of cutting a tubular key can become necessary when: (a) there is no original key (see page 58 for Methods of Obtaining a Code); or (b) there is a possibility that the original key is inaccurate. If this is the case, the original key should be decoded and cut to code as explained on pages 27-47 of this manual.

Right and Left Cut Keys: These terms refer to a rotation of cuts which are occasionally required on Tubular Keys (usually found on standard size keys only). Some locks are manufactured with the pin tumbler locations rotated 1/2 space right or left of normal position. When referring to a right cut key, the cuts are found to be rotated 1/2 space counterclockwise. Left cut keys have a rotation 1/2 space clockwise. See page 41.

NOTE: Other manufacturers have attempted to copy the unique Scotsman design, but failed to give equal quality for the modest cost of these machines. See page 110 for a description of other models of tubular key machines and key blanks now available by HPC/Scotsman.
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Expect Quality...
Demand HPC.
1.0

PARTS DESIGNATION
Motor: 120VAC/60 cycle or 240VAC/50 cycle
(2 amp 1/15hp) (.8 amp 1/13hp)

Weight: 7 lbs./3.2 kg.

Machine Size: 16” W x 4” D x 4 1/2” H
40cm W x 10cm D x 11.5cm H
2.0

Duplication
Select proper extension to use. (Machine is assembled with standard No. 2).

**NOTE:** Place key over extensions; the proper size will be the largest extension on which the key will fit.
Note: the most popular key blank sizes.
To remove and change extensions, use wrench provided.

**Hint:** use screw to pull extension into place. Use proper size key blank to *rock* extension when removing. *Never* use vise grips, hammer or pliers to remove or install the extensions, as this may cause damage.
Turn elevation knob to match number of extension used.

<table>
<thead>
<tr>
<th>Extension No.</th>
<th>Elevation Knob No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Small Bore</td>
<td>1</td>
</tr>
<tr>
<td>2- Standard</td>
<td>2</td>
</tr>
<tr>
<td>3- UL- Cut Within Cut</td>
<td>3A Primary, 3B Secondary</td>
</tr>
<tr>
<td>4- Fort Thick Wall</td>
<td>2</td>
</tr>
</tbody>
</table>
Set decoder to “D” for duplicating.
Verify that the original key with cuts enters fully into depth stop.

**NOTE:** an HPC tubular pick, with the feelers in “picked” position, can be used to “duplicate” a key.
If the cuts on the original key do not fit smoothly under the stop pin, the stop pin is too low. If the key will insert past the stop pin, the stop pin is too high. To adjust the stop pin, push in and rotate key so a cut lines up with the stop pin, then...
Loosen the cinch stud and position the stop pin to smoothly enter the cut on key, then tighten cinch stud.
Insert blank into collet and leave sticking out approximately 3/8” (.375”/9.6mm). Then lightly but, firmly *hand tighten* collet nut.

**NOTE:** Do not overtighten as key needs to move during indexing to allow for proper seating of key.
Turn cutter to “flute down” position, so one flute on the cutter is positioned straight up and down.
With machine switched “off”, push shaft with key to be duplicated *firmly and fully* into stop to properly “index” the blank.

**Note:** The key should recess slightly into the collet when properly indexed.  
**Note:** Cutter should just barely scrape key when turned by hand. You may wish to index key in (3) or more positions. If key face is not flat, accuracy will be compromised.
Slowly release shaft and allow key to come all the way back to rest position.
Re-tighten collet nut.
Close cover to engage safety switch, then turn on machine.
Using a *slow, steady* movement, push the original key to engage cutter and extend all the way to fully engage the stop pin on each cut. Slowly release the shaft, and rotate to next cut until all cuts are made.

**FORT • GEM®**

**CHICAGO • ACE®**

NOTE: Most popular manufacturers spacing rotation.
Duplicating Secondary Cuts

If key has secondary cuts, you must turn Elevation Knob to setting “3B”.

Loosen cinch stud and position stop pin to smoothly, enter secondary cut on key then tighten cinch stud.

NOTE: No need to reset on Fort thick walled keys.
Loosen collet and re-index key (as detailed on pages 16-20).
Using a slow steady movement, push the original key to engage cutter and extend all the way to fully engage the stop pin on each secondary cut. Slowly release the shaft, and rotate to next secondary cut, until all cuts are made.
When done duplicating all cuts, turn off machine and lift cover.
Remove keys, and deburr the duplicate key, as needed.
3.0

Cutting by Code
Install the No. 2 extension. Set the Elevation Knob to the proper number of the key you will cut.

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Bore</td>
<td>1</td>
</tr>
<tr>
<td>Standard</td>
<td>2</td>
</tr>
<tr>
<td>UL- Cut Within Cut</td>
<td>3A-Primary/3B-Secondary</td>
</tr>
<tr>
<td>Fort Thick Wall</td>
<td>2</td>
</tr>
</tbody>
</table>
Place Position Knob (No. 25-07) on end of shaft.
Loosen cinch stud so that Position Knob key enters below and clear of depth stop pin.
Turn decoder knob to “0” position.
Insert blank to be cut into collet and leave sticking out approximately 3/8” (.375”/9.6mm). Then lightly, but firmly *hand tighten* collet nut.

**NOTE:** Do not overtighten as key needs to move during indexing to allow for proper seating of key.
Turn cutter to “flute down” position, (so one flute on the cutter is positioned straight up and down).
With machine switched “off”, push shaft with position knob *firmly and fully* into stop to properly index the key blank.

**Note:** The key blank should recess slightly into the collet when properly indexed.

**Note:** Position Knob key should not engage stop pin, but rather use the decoder “0” position as an internal stop to gauge key.
Note: Cutter should just barely scrape key when turned by hand. You may wish to index key in 3 or more positions. If key face is not flat, accuracy will be compromised.
Re-tighten collet nut.
Close cover to engage safety switch and turn machine on.
NOTE: Most popular manufacturers’ spacing rotation.

Turn decoder to first depth dimension, for the key you are cutting.
The 747XU is set to handle (16) standard rotation positions. This means that any 22-1/2° or 45° increments will be controlled by the machine to ensure spacing will be accurate.

**NOTE:** If you wish to disengage this function, turn position guide counterclockwise (as shown above) until it stops, and cuts may be made in other than standard positions.
These positions are delineated by the numbers 1-7 on the Position Knob (45° increments); and at half-way between each number (22-1/2° increments).
**Note:** 8-cut keys and 7-pin left or right offset keys require interpolation of the Position Knob.

On right offset the cuts are positioned at the half-way mark, starting **before 1** (as pictured above). On left offset the cuts are positioned at the half-way mark, starting **after 1** (not shown).

**Hint:** Think of right offset as before 1, and left offset as below 1.
Push in and turn Position Knob to first space position for the key you are cutting.
Using a *slow, steady movement*, engage cutter and push all the way in to fully engage internal decoder stop face.
Slowly release shaft after completing each cut.
Note: Be sure you are using correct spacing rotation.

Turn decoder to next depth.
Push in and rotate to second space position. Continue this procedure until all cuts are complete.
After all cuts have been made, turn machine off and lift cover. Remove key, and deburr as needed.
Expect Quality...
Demand HPC.
4.0

**Decoding a Key**
HPC’s TKPD-1 covers 8 depths. Depths 1 through 7 are regular depths; number 8 is for pin-within-a-pin. This tool is for use with standard, large, left hand, right hand, and UL (pin-within-a-pin) tubular keys.

INSTRUCTIONS:

1. Read the key when the key is facing you. See Figs. 1 & 2. Keep the corners sharp for accurate readings.

2. Take a depth reading at the corner. See Fig. 3.

NOTE: the TKPD-1 is made of stainless steel; do not wire brush the gauge.

Manufacturer depths are per Chicago Ace®. See chart below.

<table>
<thead>
<tr>
<th>Chicago Ace®</th>
<th>Fort Lock Gem®/Apex®</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>.016</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>.032</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>.048</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>.064</td>
</tr>
<tr>
<td>5</td>
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<td>.080</td>
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<tr>
<td>6</td>
<td>5</td>
<td>.096</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>.112</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>.128</td>
</tr>
</tbody>
</table>
5.0 REPLACEMENT CUTTER
Switch to “off” and unplug the machine. Before removing dull cutter, verify the setup is still accurate using (2) blank keys.

**NOTE:** Do **not** remove keys.

- Refer to duplication section for specifics on indexing.
Using the wrench provided...
Loosen cutter set screw.
Remove dull cutter and replace with new cutter (Part No. 22-01). Then, lightly but firmly tighten set screw.

**NOTE:** Do not overtighten as cutter needs to move during indexing to allow for proper calibration.
Push key firmly inward to full depth stop. This will move cutter to correct position.

**NOTE:** Cutter should just barely scrape key blank when turned by hand.
Tighten final set screw.
visit us online at:
www.hpcworld.com
6.0
CUTTER ADJUSTMENT
WEB THICKNESS
.004" (10mm) to
.007" (.007mm) TYPICAL

DIM. X ON A
STANDARD KEY:
.320" (8.13mm) to
.326" (8.28mm)

Cut sample key and check distance across cuts (Dim. X) using dial caliper. If outside of range, proceed as follows...
Switch “off” and unplug the machine. Remove bottom cover and note adjustment screws and motor mounting bolt.
Loosen motor mounting bolt 1/4 turn.
If Dim. X is less than .320” (8.13mm):

Move cutter up and increase web thickness by turning both adjustment screws clockwise.

Note: a 1/8 clockwise turn will increase web thickness by approximately .005” (.127mm) and increase Dim. X by approximately .010” (.254mm).
If Dim. X is greater than .326” (8.28mm):

Move cutter down and decrease web thickness by turning **BOTH** adjustment screws counterclockwise.

**NOTE:** a 1/8 counterclockwise turn will decrease web thickness by approximately .005” (.127mm) and decrease Dim. X by approximately .010” (.254mm).
Retighten motor mounting bolt. Replace bottom cover after final adjustment is complete.
Cut key, and check Dim. “X”.

**Note:** To minimize waste of key blanks during adjustment, try to start with cutter being too high. This enables you to cut and recut keys until proper adjustment is obtained.
7.0

CUTTER ALIGNMENT
Switch “off” and unplug the machine. Using the wrench provided...
Loosen and remove cutter.
Loosen and remove alignment pin.
Replace cutter with alignment pin.
Load (2) blank keys.
CORRECT ALIGNMENT:

Alignment Pin    Key Tang

Push shaft to engage pin and check to see if the pin is centered on tang. If it is not centered, proceed as follows...
Switch “off” and unplug the machine. Remove bottom cover to expose adjustment screws and motor mounting bolt.
Loosen motor mounting bolt 1/4 turn.
**INCORRECT ALIGNMENT:**

If Pin is off in a *downward* position:

Turn bottom screw counterclockwise 1/4 turn, and turn top screw clockwise 1/4 turn.

**Note:** If pin is off in an upward position, see next page.
 INCORRECT ALIGNMENT:

Pin too far up.

If Pin is off in a upward position:

Turn bottom screw clockwise 1/4 turn, and turn top screw counterclockwise 1/4 turn.
Retighten the motor mounting bolt, and check alignment. If the alignment is correct, replace bottom cover. If alignment is not correct, repeat proceeding steps as necessary.
Note: Be sure to check web thickness. You may need to readjust after alignment is complete.
Expect Quality...
Demand HPC.
9.0
Preventive Maintenance, Warranty, and Service Center Information
LUBRICATION, PREVENTIVE MAINTENANCE, REPAIRS and WARRANTY

1 -MOTOR - The motor is equipped with sealed bearings that require no lubrication.
2 -BEARINGS AND SLIDING SURFACES - These are to be given a light coat of grease at least every 6 months.
3 -EXPOSED STEEL SURFACES - All remaining exposed steel shafts, cutter, etc., should be sprayed with WD-40 or equivalent light oil at least every 6 months. Wipe off any excess.
4 -CLEANING - Remove all brass chips, dirt and grit from the surface of your machine daily, with a soft bristle brush. Take particular care in keeping the key vise jaw area clean and free of all residue build-up.
5 -WARRANTY - The 747XU Tubular Key Cutting Machine is fully warranted for 90 days from the date of purchase, against factory defects in material and workmanship. Mail the Warranty Card to us immediately, to validate your warranty. Should your machine require factory repairs, it should be packed securely, along with a letter describing the problem in detail, and returned to the factory.

During the 90 day warranty period, you will be billed for handling and shipping only. Neither HPC, Inc. nor our distributors have “loaner machines” available.
HPC SERVICE CENTER

If the need should arise, please note the following in order to assure you, our customer, of prompt service on your key machine repair:

1. The HPC Service Center answers questions involving key machines and related parts Monday through Friday from 8:00 am to 4:30 pm Central time. Please call 800-323-3295.

2. REPAIRS - The preventive maintenance and recalibration of space and depth, as fully outlined in this manual are the only repairs or adjustments suggested be done by the user. Every effort has been made to thoroughly field test every machine for both permanent shop and service truck installations. Internal operating mechanisms, while extremely simple in function and design, are factory repairable only. Additional repair charges may be incurred by attempting to fix these type of repairs yourself.

3. Parts for repairing any HPC key machine can be purchased directly through the Service Center by calling our toll-free number: 1-800-323-3295. When ordering any parts over the phone, please have a list of the part numbers and descriptions ready to expedite the ordering process. A parts listing and an exploded view drawing is included in this manual. If the parts are needed urgently, express processing is available at an additional charge.

4. If you need to send an HPC key machine in for repair, call the HPC Service Center to obtain a Work Order number. This number should be marked on the outside of the carton. Pack the machine securely in a box strong enough to prevent damage during shipping. Also be sure that your machine is equipped with an HPC cutter when it is sent in for repairs. Include a letter explaining exactly what type of problem you are having and any other work you may want done on the machine. Make sure your address and phone number are on the letter as well as the name of someone we can contact if the need arises while repairing your machine. Our shipping address is:

HPC, Inc.
Attn. Service Center
3999 N. 25th Avenue
Schiller Park, IL 60176 USA

5. Payment for parts and repair is by C.O.D., prepayment with order, or Visa/Mastercard credit cards. If you wish to have your HPC distributor billed for the cost of repairs, they will have to call in with approval of the billing and a purchase order number for the work being done, before the machine is repaired. Unless otherwise specified, key machines that are not under warranty will be shipped C.O.D. via UPS after the repairs have been made.

6. If you wish for the service department to call you with an estimate for repair of your machine, please specify this request in writing.

7. If while inspecting your machine our service department discovers additional problems not listed in your note, a service technician will call you with this information and the estimated charges to repair.

8. If no request is made for HPC to call with a repair estimate, but the cost is expected to exceed $250.00 or 25% of the cost of a new machine, you will be contacted with this information.

9. You will be called if the C.O.D. amount will exceed $250.00.

10. If after informing you of the repair estimate it becomes apparent that the cost will be higher, you will receive a call informing you of the additional charges before any additional work is done.

11. We are sorry, but neither HPC, Inc. nor our distributors have “loaner machines” available.
9.0 Preventive Maintenance, Warranty, and Service Center Information
LUBRICATION, PREVENTIVE MAINTENANCE, REPAIRS and WARRANTY

1. **MOTOR** - The motor is equipped with sealed bearings that require no lubrication.
2. **BEARINGS AND SLIDING SURFACES** - These are to be given a light coat of grease at least every 6 months.
3. **EXPOSED STEEL SURFACES** - All remaining exposed steel shafts, cutter, etc., should be sprayed with WD-40 or equivalent light oil at least every 6 months. Wipe off any excess.
4. **CLEANING** - Remove all brass chips, dirt and grit from the surface of your machine daily, with a soft bristle brush. Take particular care in keeping the key vise jaw area clean and free of all residue build-up.
5. **WARRANTY** - The 747XU Tubular Key Cutting Machine is fully warranted for 90 days from the date of purchase, against factory defects in material and workmanship. Mail the Warranty Card to us immediately, to validate your warranty. Should your machine require factory repairs, it should be packed securely, along with a letter describing the problem in detail, and returned to the factory.

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4 - CLEANING - Remove all brass chips, dirt and grit from the surface of your machine daily, with a soft bristle brush. Take particular care in keeping the key vise jaw area clean and free of all residue build-up.
5 - WARRANTY - The 747XU Tubular Key Cutting Machine is fully warranted for one year from the date of purchase, against factory defects in material and workmanship. Mail the Warranty Card to us immediately, to validate your warranty. Should your machine require factory repairs, it should be packed securely, along with a letter describing the problem in detail, and returned to the factory.

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2. REPAIRS - The preventive maintenance and recalibration of space and depth, as fully outlined in this manual are the only repairs or adjustments suggested be done by the user. Every effort has been made to thoroughly field test every machine for both permanent shop and service truck installations. Internal operating mechanisms, while extremely simple in function and design, are factory repairable only. Additional repair charges may be incurred by attempting to fix these type of repairs yourself.

3. Parts for repairing any HPC key machine can be purchased directly through the Service Center by calling our toll-free number: 1-800-323-3295. When ordering any parts over the phone, please have a list of the part numbers and descriptions ready to expedite the ordering process. A parts listing and an exploded view drawing is included in this manual. If the parts are needed urgently, express processing is available at an additional charge.

4. If you need to send an HPC key machine in for repair, call the HPC Service Center to obtain a Work Order number. This number should be marked on the outside of the carton. Pack the machine securely in a box strong enough to prevent damage during shipping. Also be sure that your machine is equipped with an HPC cutter when it is sent in for repairs. Include a letter explaining exactly what type of problem you are having and any other work you may want done on the machine. Make sure your address and phone number are on the letter as well as the name of someone we can contact if the need arises while repairing your machine. Our shipping address is:

   HPC, Inc.
   Attn. Service Center
   3999 N. 25th Avenue
   Schiller Park, IL  60176 USA

5. Payment for parts and repair is by C.O.D., prepayment with order, or Visa/Mastercard credit cards. If you wish to have your HPC distributor billed for the cost of repairs, they will have to call in with approval of the billing and a purchase order number for the work being done, before the machine is repaired. Unless otherwise specified, key machines that are not under warranty will be shipped C.O.D. via UPS after the repairs have been made.

6. If you wish for the service department to call you with an estimate for repair of your machine, please specify this request in writing.

7. If while inspecting your machine our service department discovers additional problems not listed in your note, a service technician will call you with this information and the estimated charges to repair.

8. If no request is made for HPC to call with a repair estimate, but the cost is expected to exceed $250.00 or 25% of the cost of a new machine, you will be contacted with this information.

9. You will be called if the C.O.D. amount will exceed $250.00.

10. If after informing you of the repair estimate it becomes apparent that the cost will be higher, you will receive a call informing you of the additional charges before any additional work is done.

11. We are sorry, but neither HPC, Inc. nor our distributors have “loaner machines” available.
HPC’s new Scotsman 747XU is a lightweight tubular key machine designed to cut all three sizes of tubular keys. The capability of the machine includes dead pin cuts, right and left hand cuts, eight-cuts and double cuts in any position. A unique aspect of the machine is that you can duplicate any key, even if it has non-standard depth increments! The positive decoding mechanism is the first of its kind. This same mechanism allows you to cut by code, leaving you no guesswork!

HPC’s new Scotsman 747E Econo is a basic no frills tubular key machine. It duplicates in any position or any depth. The Econo Duplicut™ provides an inexpensive standard size tubular key cutting solution.

HPC’s New Scotsman Tubular Key Blanks

#137 Steel
All Steel Construction with Nickel Plating (standard) .375 diameter

#137B Brass
Unplated Brass Body with Nickel Plated Steel Finish (standard) .375 diameter

#137P Brass
Unplated Brass Body with Nickel Plated Steel Finish (5 Pin) .394 diameter

#1375SB Brass
Unplated Small Bore Brass Body with Nickel Plated Steel Finish .363 diameter