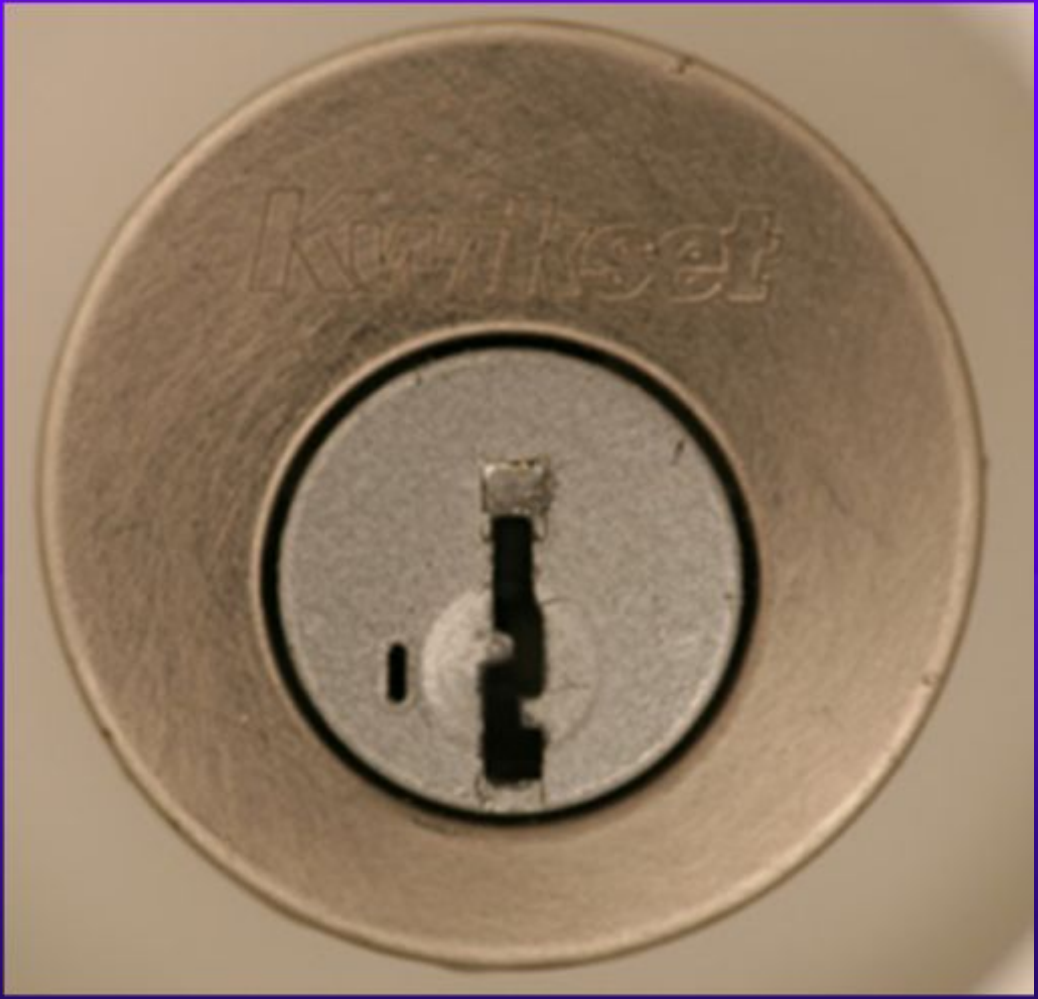
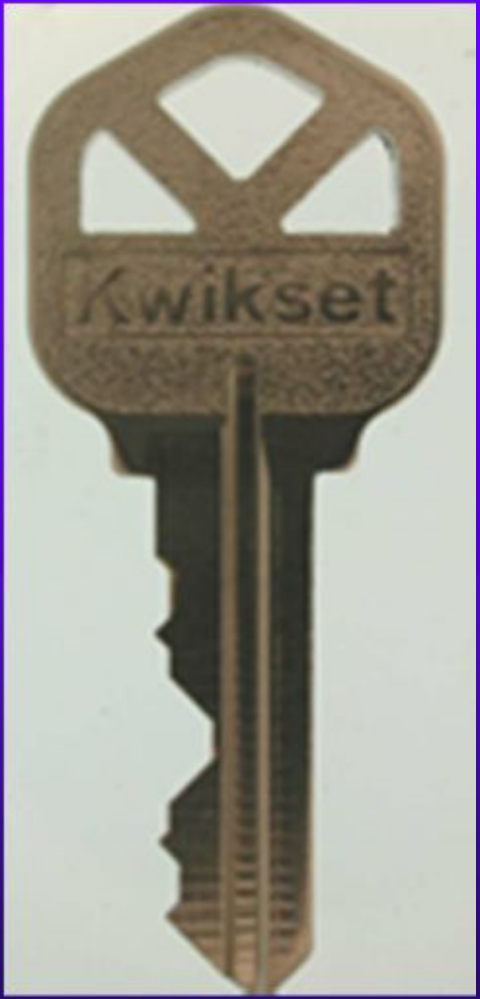
A FAILURE OF IMAGINATION: Kwikset Smartkey® and Insecurity Engineering

ONE OF THE MOST SECURE and INSECURE LOCKS IN AMERICA

KWIKSET SMARTKEY





#1: IS SMARTKEY SECURE? Brian: 06/25/2013 1105 A.M.

#2: IS SMARTKEY SECURE? Satima: 06/24/2013 4:26 P.M.

KWIKSET TECH SUPPORT
SATIMA 06/24/2013
4:26 P.M.

#3: IS SMARTKEY SECURE? Raymond: 06/25/2013 3:58 P.M.

KWIKSET TECH SUPPORT
RAYMOND 06/25/2013
3:58 P.M.

KWIKSET LOCKS

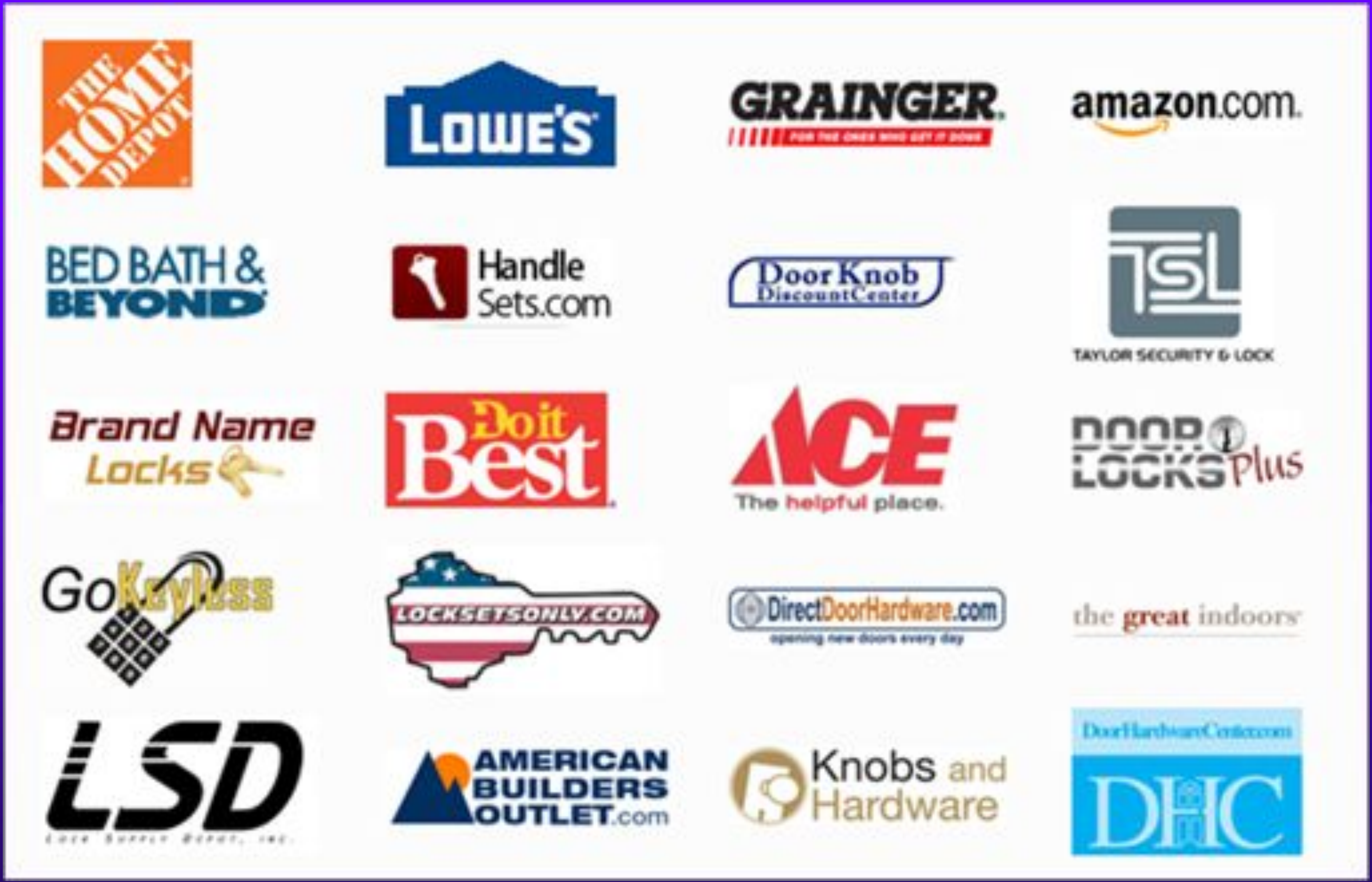
A Spectrum Brands Company

- ♦ MILLIONS IN USE IN AMERICA AND CANADA
- ♦ HOMES, APARTMENTS, BUSINESSES
- ♦ INEXPENSIVE: COST: $20-$30
- ♦ MODELS:
  - – Pin tumbler, 5 and 6 pin
  - – Smartkey, 5 pin
  - – Deadbolts
  - – Electronic + override

ONE OF THE MOST POPULAR LOCKS IN U.S.

- ♦ MILLIONS SOLD EVERY YEAR
  - – COMMON KEYWAY: WEISER, BALDWIN
- ♦ FOR MORE THAN FIFTY YEARS
- ♦ DIVERSE PRODUCT LINE
  - – Deadbolts
  - – Rim
  - – Lever handle
  - – Electronic

KWIKSET DISTRIBUTION


THE HOME DEPOT
LOWE'S
GRAINGER. FOR THE ONES WHO GET IT DONE
amazon.com.
BED BATH & BEYOND
Handle Sets.com
Door Knob Discount Center
TSL TAYLOR SECURITY & LOCK
Brand Name Locks
Do it Best
ACE The helpful place.
DOOR LOCKS Plus
GoKeyless
LOCKSETSONLY.COM
DirectDoorHardware.com opening new doors every day
the great indoors
LSD LOCK SUPPLY DEPOT, INC.
AMERICAN BUILDERS OUTLET.com
Knobs and Hardware
DoorHardwareCenter.com DHC

WIDE PRODUCT LINE

HOMES, APARTMENTS, BUSINESS, COMMERCIAL

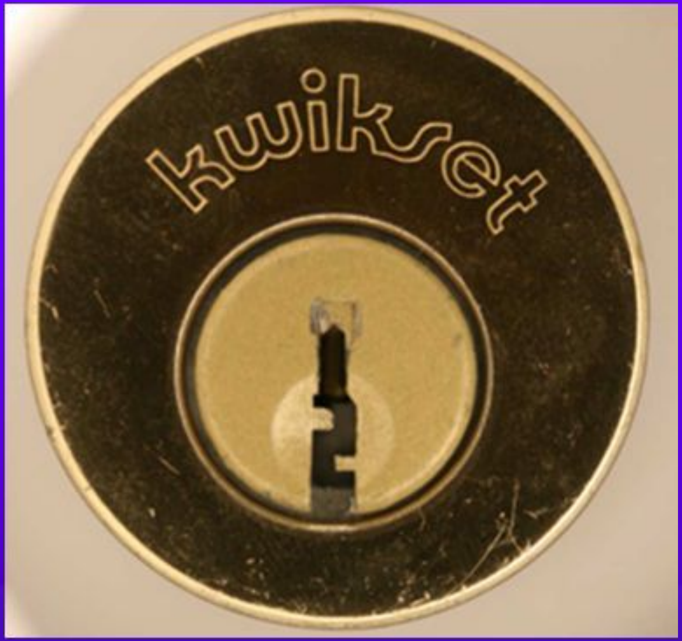
KWIKSET, WEISER, BALDWIN: The Basics

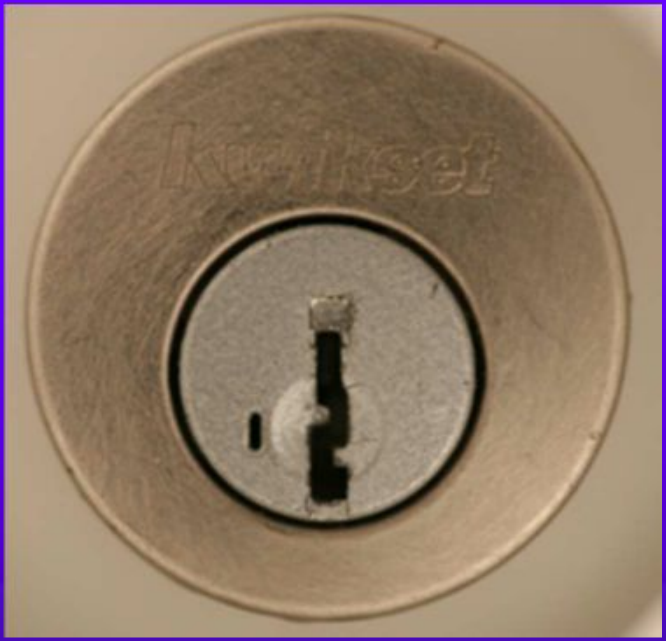
- PIN TUMBLER AND SMARTKEY
- 5 or 6 PIN CONVENTIONAL CYLINDERS
  - Many configurations
- 5 PIN SMARTKEY PROGRAMMABLE
- COMMON KEYWAYS, NO SECURITY
- NO DUPLICATION PROTECTION
- NOT HIGH SECURITY
- MAINLY RESIDENTIAL AND APARTMENTS

KWIKSET HISTORY

- ♦ ORIGINAL PIN TUMBLER DESIGN
  - – Rim cylinder
  - – Deadbolt
  - – Key-in-knob design
- ♦ EASILY COMPROMISED
- ♦ MOST POPULAR UNTIL 2008
  - – Smartkey introduced to Canada and U.S.

PIN TUMBLER v. SMARTKEY

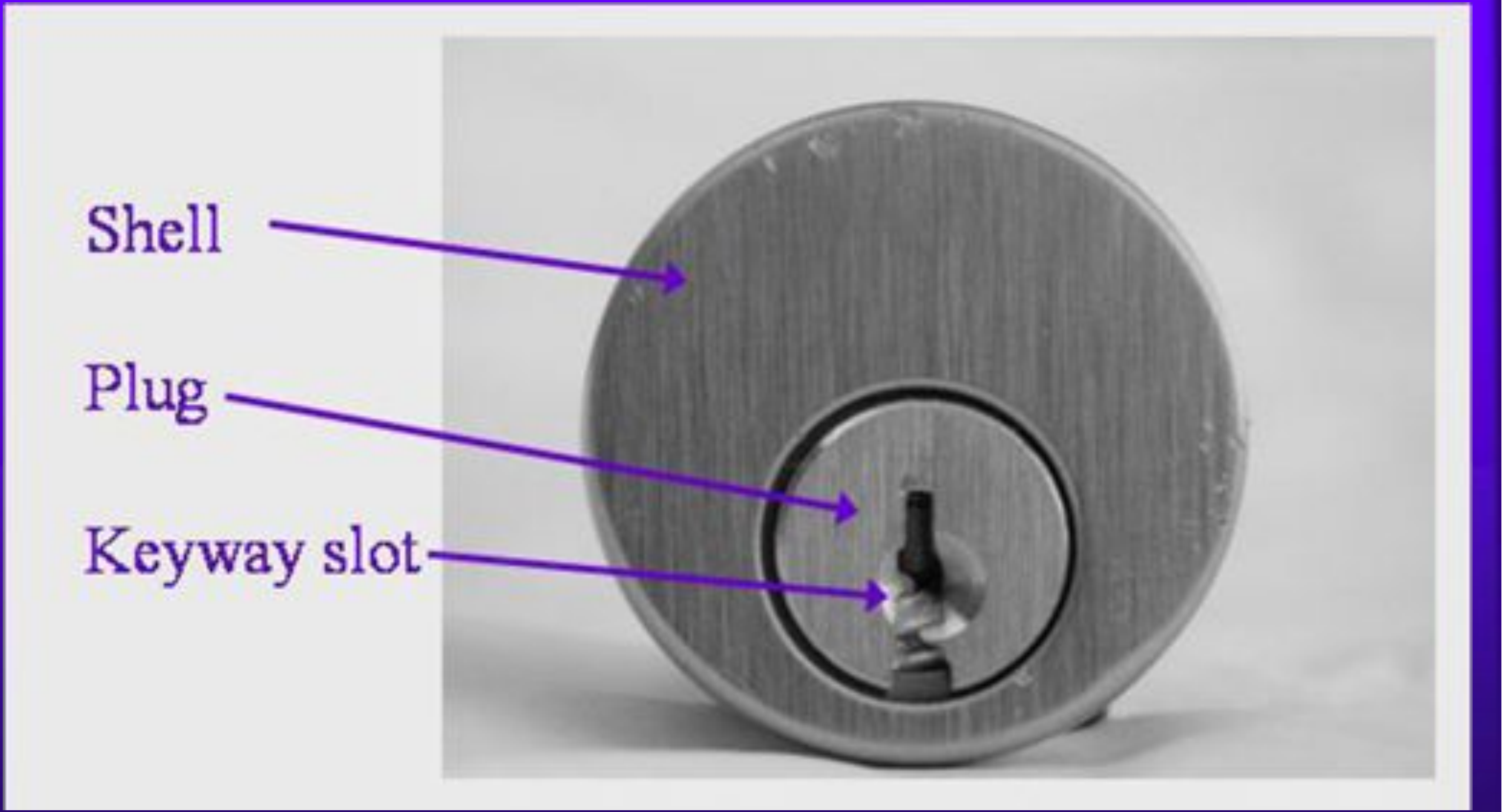




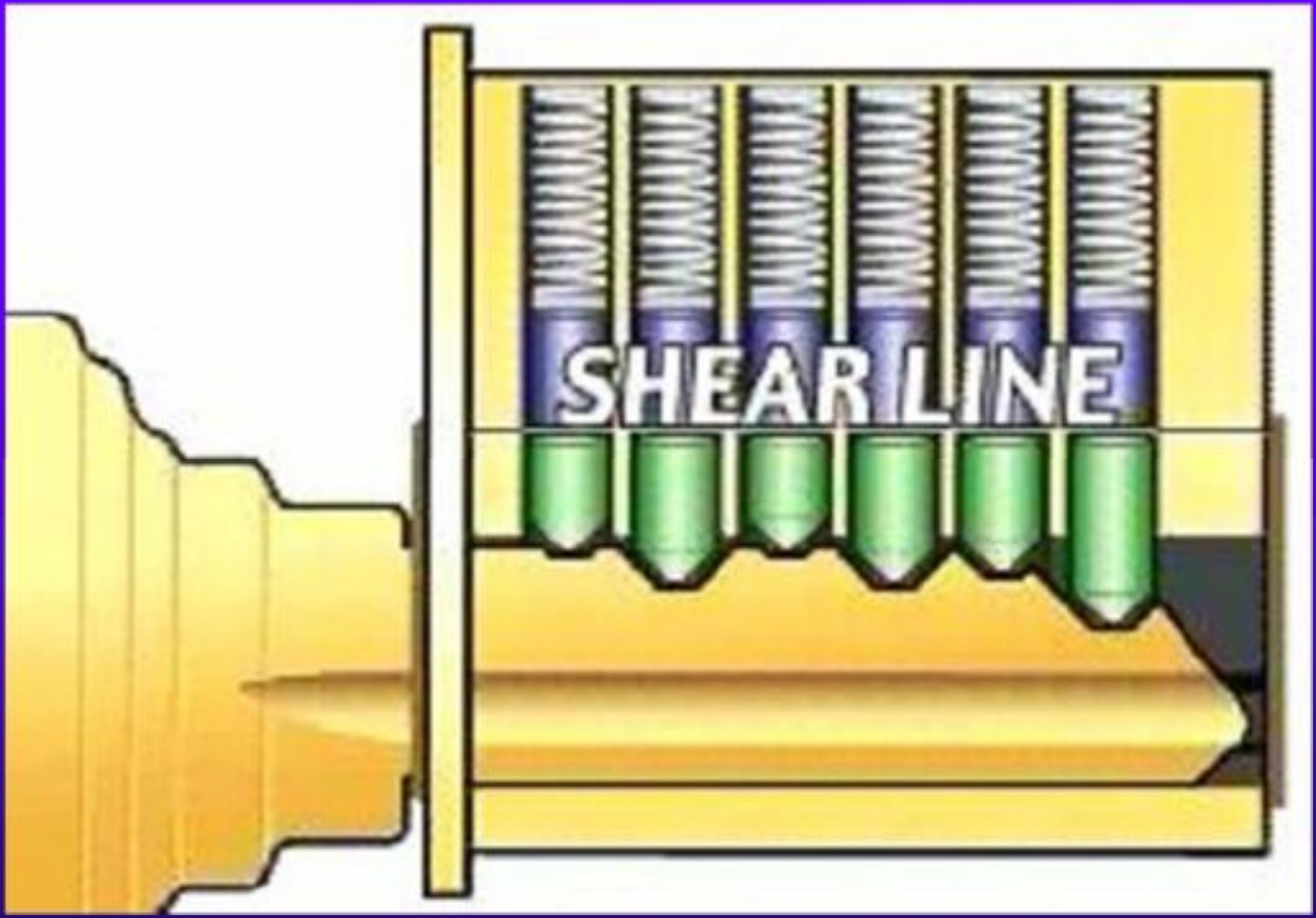
PIN TUMBLER DESIGN

- NOT SECURE
- Easy to pick
- Easy to bump
- Easy to impression
- Easy to mechanically bypass
- Can be master keyed
- Easy to determine the Top Level MK
- Limited number of combinations

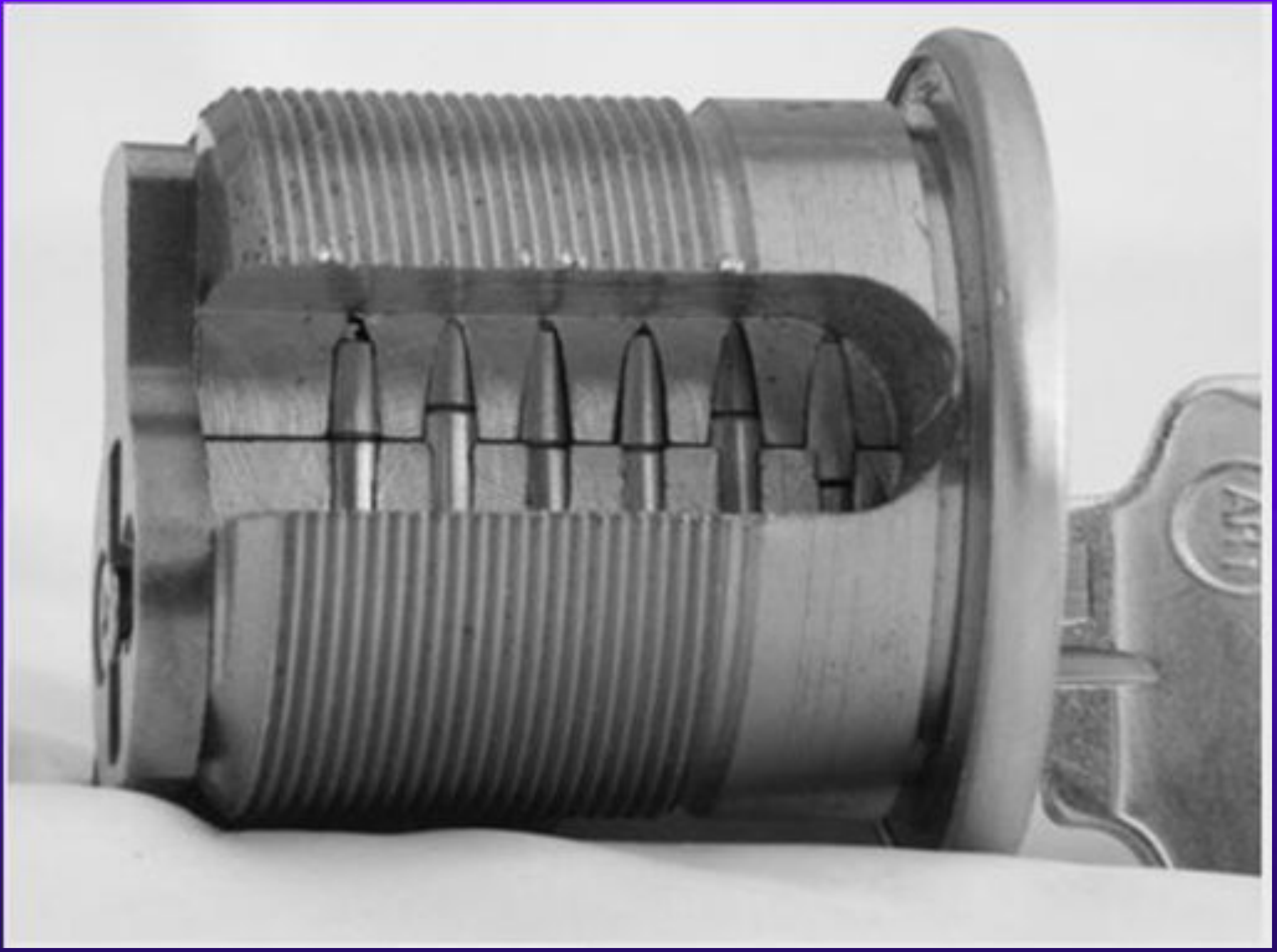
PIN TUMBLER DESIGN: How it works



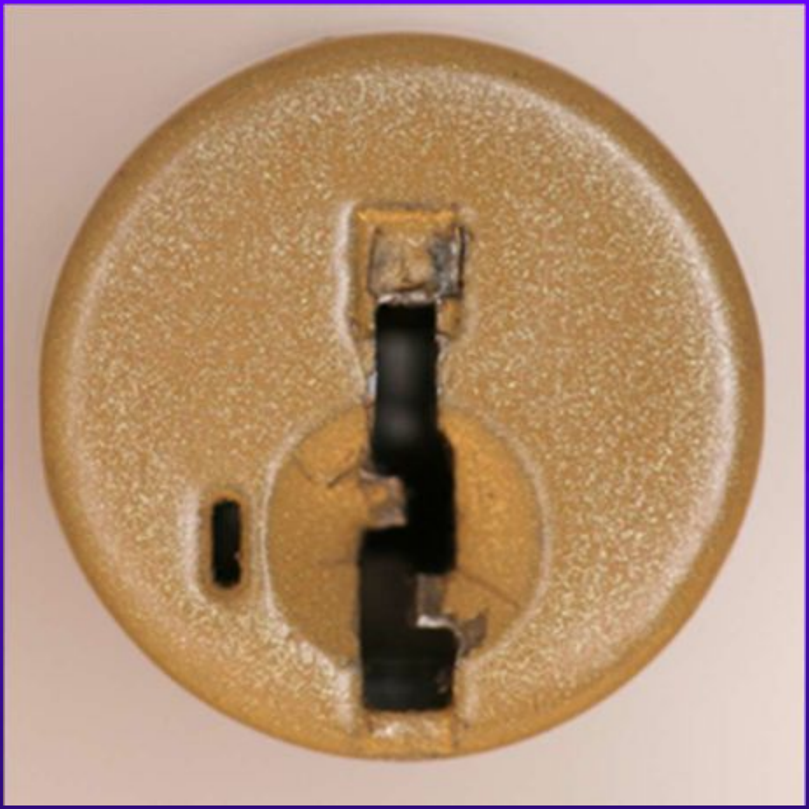
PIN STACKS = SECURITY: Plug can turn: pins at shearline



LOCKED:
PINS NOT AT SHEARLINE



KWIKSET SMARTKEY: Not a pin tumbler lock



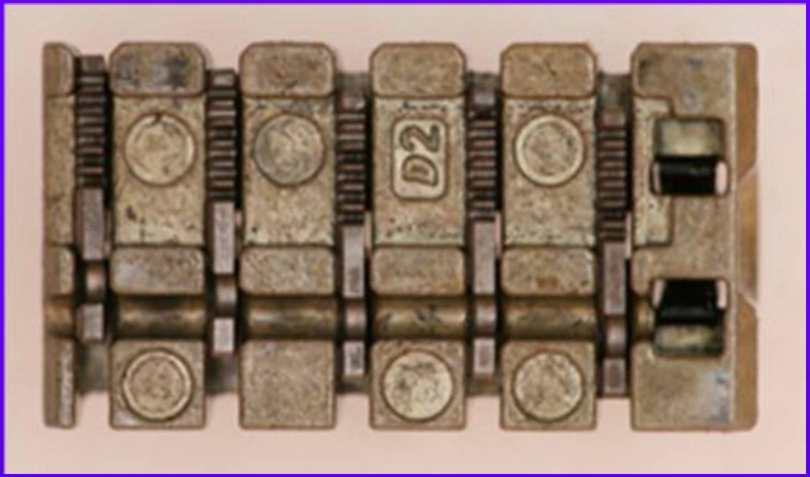
SMARTKEY ATTRIBUTES

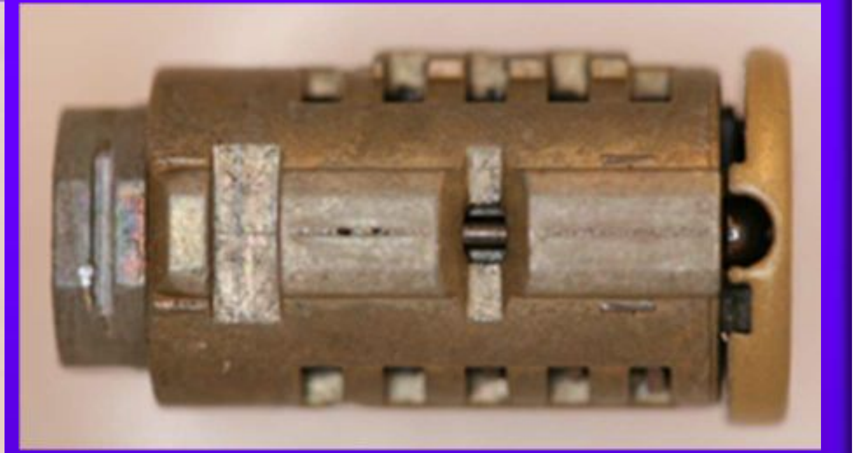
- 5 PIN ONLY 6 DEPTH INCREMENTS
- SINGLE SIDEBAR SECURITY
- EXTREMELY PICK RESISTANT UL437
- CANNOT BE BUMPED
- CANNOT BE IMPRESSIONED
- INSTANT PROGRAMMABILITY TO ANY KEY
- CANNOT BE MASTER KEYED

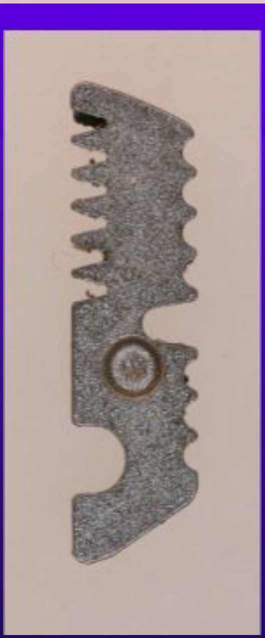
MORE ATTRIBUTES

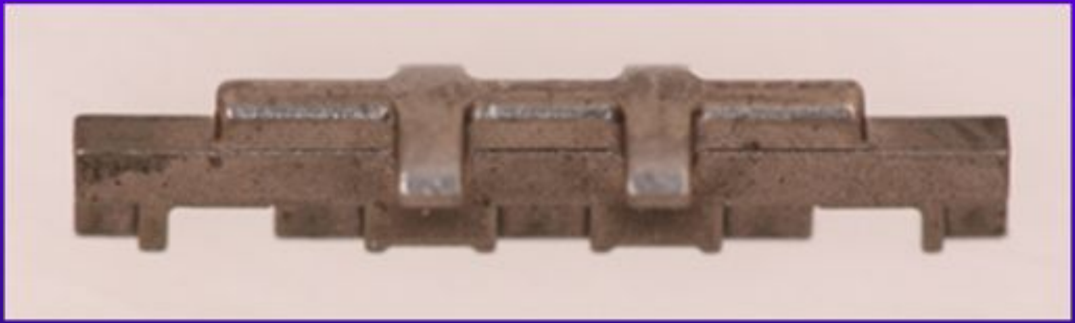
- ONE PRIMARY KEYWAY
- BHMA 156.5 GRADE 1 RATING
- UL 437 RATING
- SPECIAL "KEY CONTROL DEADBOLT' AS ALTERNATIVE TO MK SYSTEM

SMARTKEY DESIGN

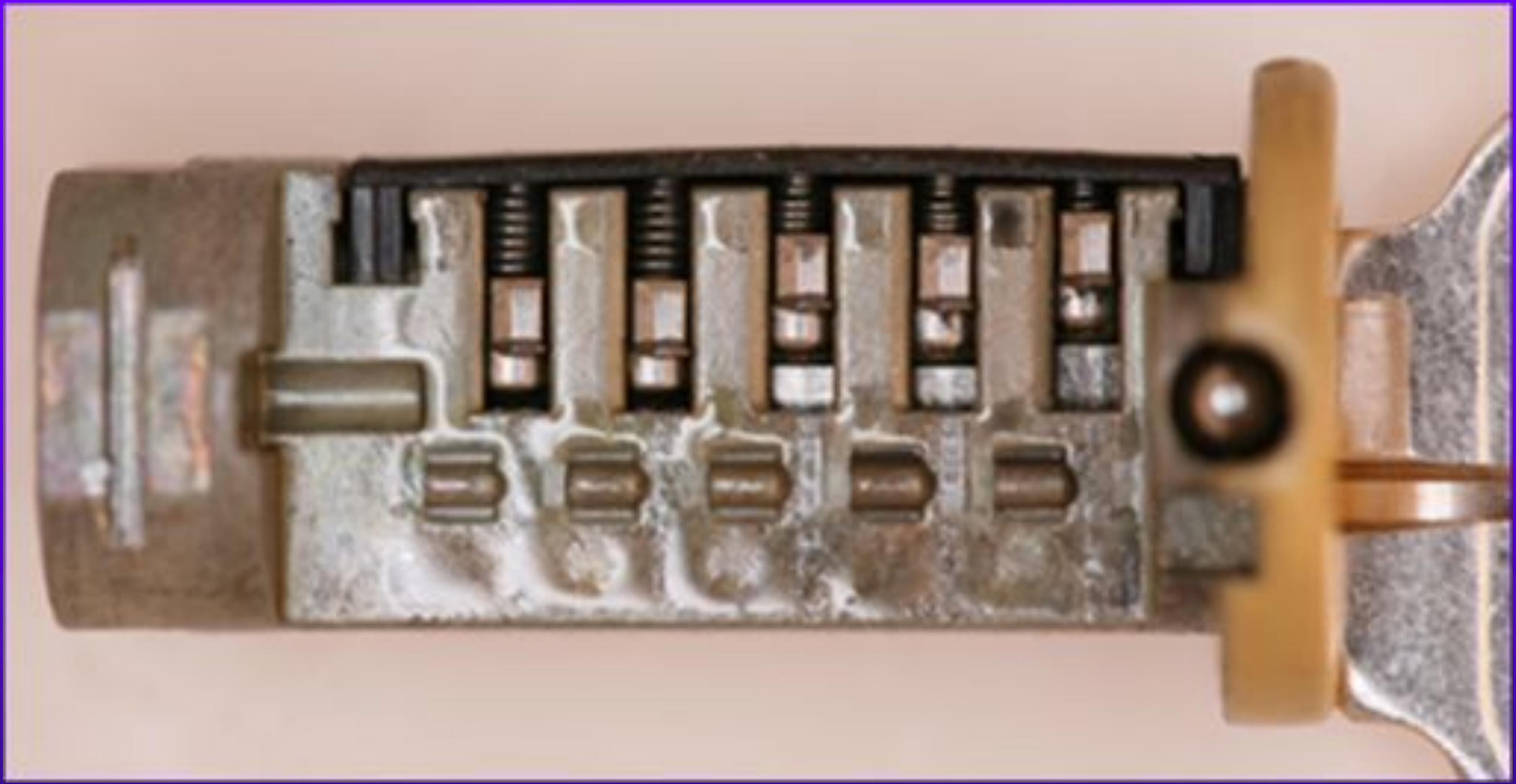




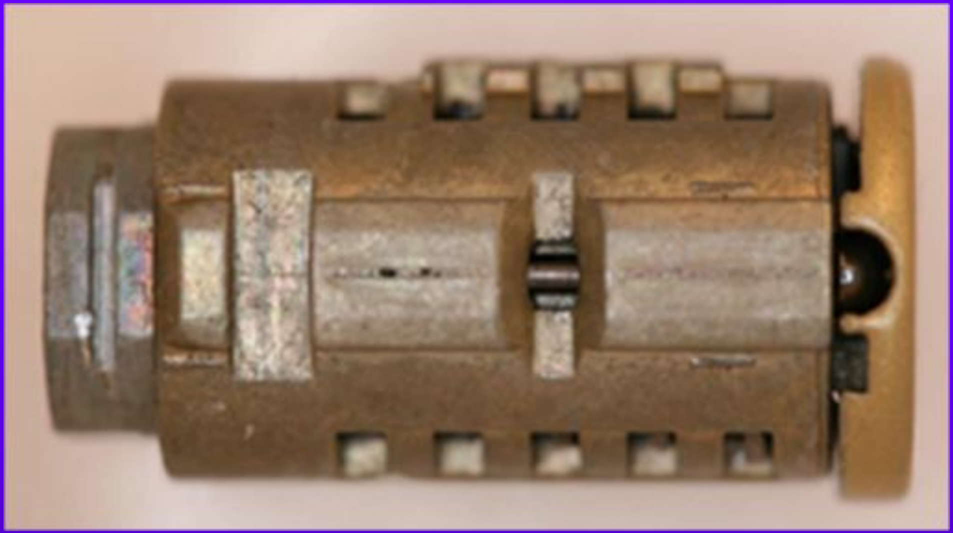


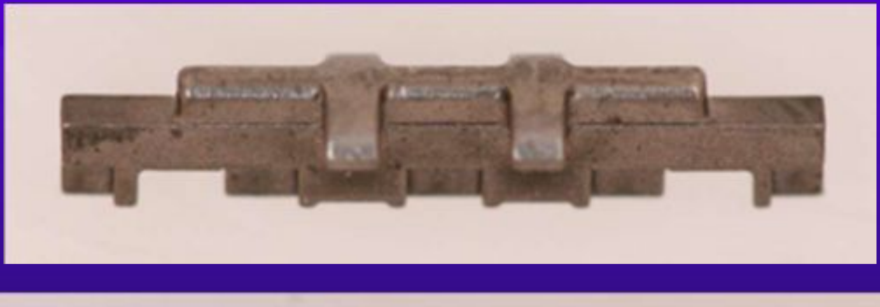


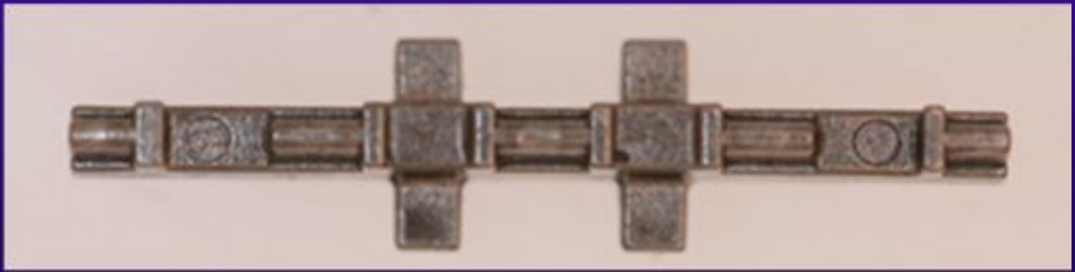
PROGRAMMABLE SLIDERS



SIDEBAR =SMARTKEY SECURITY

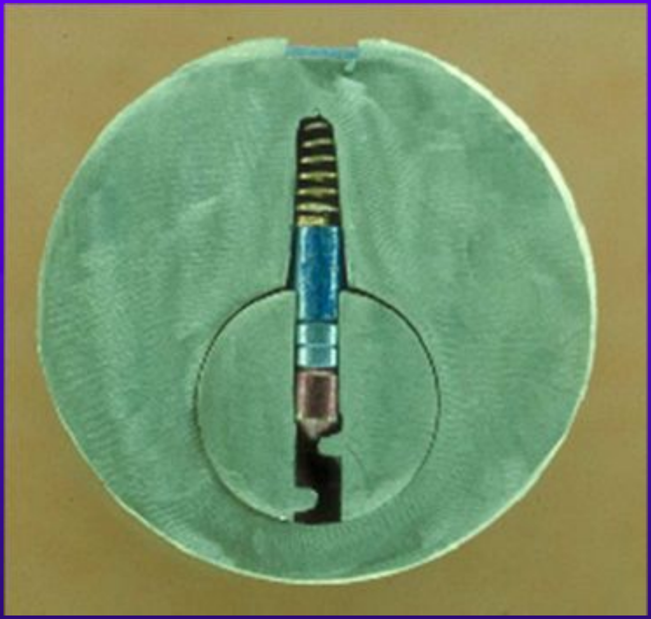


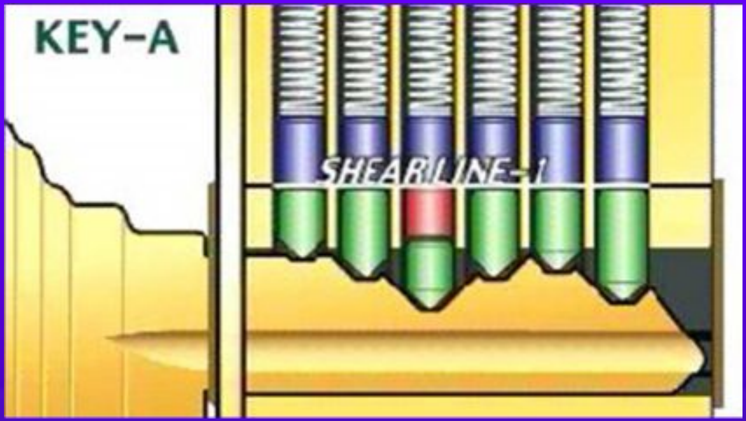


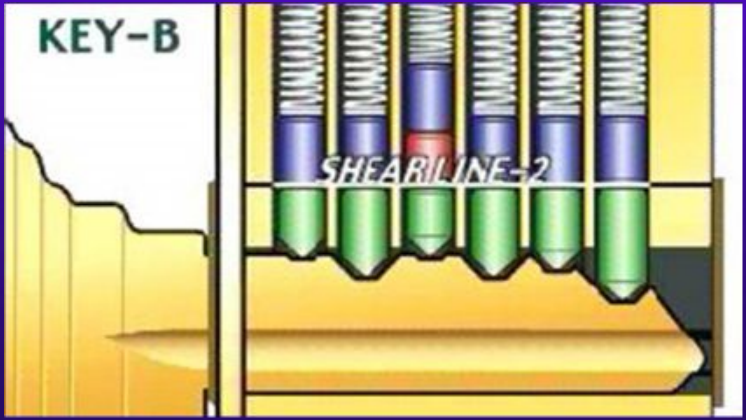


MASTER KEY SYSTEMS: Pin Tumbler v. Smartkey

- CONVENTIONAL MK SYSTEMS







CONVENTIONAL MK SYSTEM ATTRIBUTES

- ONE KEY OPENS MANY LOCKS
  - Only bottom pin and master pin per chamber
- DIFFERENT LEVELS OF KEYING
  - Can reduce number of change keys
- EXPENSIVE TO REKEY OR ADD KEYS
  - Must disassemble cylinder to rekey
- CROSS KEYING BETWEEN LOCKS AND SYSTEMS

MK SYSTEM SECURITY

- ♦ INHERENT INSECURITY
- ♦ MUST HAVE AT LEAST TWO SECURITY LAYERS
- ♦ EASIER TO COMPROMISE ENTIRE SYSTEM
  - – Multiple shear lines
  - – Unintended key combinations will open lock
  - – Easier to pick, bump, impression, decode
  - – Extrapolation of TMK

KWIKSET KEY CONTROL: The Alternative to Master Keying

- ♦ TWO INDEPENDENT CORES
- ♦ TWO SEPARATE AND DISTINCT KEYS
  - – Supposed to maintain security of key blanks
  - – Control key only from factory
- ♦ INSTANTLY REPROGRAMMABLE
- ♦ NO CROSS KEYING OR INCIDENTAL MASTER KEYS
- ♦ NOT A REAL MK SYSTEM
- ♦ ONLY ONE LEVEL OF KEYING

KWIKSET "KEY CONTROL" Positive Attributes

- NO LOCKSMITH REQUIRED
- 46,656 THEORETICAL COMBINATIONS
- GOOD FOR FACILITIES THAT NEED ONE MK LEVEL ONLY
- GREAT FOR CONSTRUCTION MK
- NO DISASSEMBLY OF CYLINDERS
- TWO INDEPENDENT SHEAR LINES WITH NO INTERACTION LIKE CONVENTIONAL SYSTEMS

KWIKSET “KEY CONTROL” More positive attributes

- ♦ INSTANT ABILITY TO REPROGRAM
- ♦ TWO SEPARATE KEYWAYS
- ♦ CANNOT DERIVE CONTROL KEY FROM CHANGE KEY
- ♦ LIKE CORBIN “MASTER SLEEVE” SYSTEM 75 YEARS AGO, INHERENTLY MORE SECURE
- ♦ LITTLE CHANCE OF ONE SYSTEM OPENING ANOTHER

KWIKSET “CONTROL KEY” The Bad

- ♦ NO WARRANTY FOR COMMERCIAL
- ♦ NOT FOR COMPLEX OR COMMERCIAL SYSTEMS
- ♦ CAN BE COMPROMISED IN 15 SECONDS
- ♦ EASY TO DECODE CONTROL KEY
- ♦ EASY TO REPLICATE CONTROL KEY
- ♦ NO PATENT PROTECTION ON KEYS

SECURITY:
YOU GET WHAT YOU PAY FOR

- DO YOU EXPECT A $20-$30 LOCK TO PROVIDE ANY SECURITY?
  - Some buyers cannot afford higher security
  - What is the minimum they are entitled to?
- KWIKSET KNOWS THESE LOCKS HAVE SERIOUS VULNERABILITIES
- DOES THE PUBLIC HAVE A RIGHT TO KNOW HOW EASY TO OPEN?
  - Should there be warnings on packaging?

KWIKSET SMARTKEY: INSECURITY ENGINEERING

- ♦ MILLIONS OF PEOPLE AND FACILITIES AT POTENTIAL RISK
  - – **COVERT ENTRY**
  - – **FORCED ENTRY**
- ♦ KWIKSET “Highest grade of residential security available.”
  - – True but misleading
  - – Open in less than thirty seconds

FALSE SENSE OF SECURITY

- BHMA GRADE 1 RATING
- “Highest grade of residential security”
- UL 437 PICKING RATING
- VIRTUALLY BUMP PROOF
- USERS ARE NOT AWARE OF RISKS
- LOCKS CAN BE OPENED IN SECONDS
- FAILURE TO DISCLOSE VULNERABILITIES

KWIKSET ADVERTISING and MISREPRESENTAIONS

- FALSE OR MISLEADING STATEMENTS BY TECH SUPPORT AND SALES
- 8 SEPARATE INTERVIEWS:
  - "Cannot be opened except by drilling"
  - "No maintenance problems"
  - "Video on YouTube not true: lock was tampered with"
  - "No way can be opened with a screwdriver"
  - "The problem has been dealt with"

SMARTKEY DESIGN ISSUES

- SIDEBAR SHOULD PROVIDE MORE SECURITY THAN PIN TUMBLER LOCK
- ONLY ONE LAYER OF SECURITY
- SMALL FRAGILE SLIDERS
- PROGRAMMING PROBLEMS
- LOW TOLERANCE, LIMITED DIFFERS
  - 243 Key combinations
  - All the same blank
- CAST METAL EASILY COMPROMISED

MORE DESIGN ISSUES

- ♦ PLUG DESIGN CAN BE WARPED
- ♦ SLIDER DESIGN
- ♦ ABLE TO DECODE THE SLIDERS
- ♦ SLIDERS EASILY JAMMED
- ♦ TAILPIECE DESIGN AND ACCESS
- ♦ NO KEY DETENT FOR PROGRAMMING

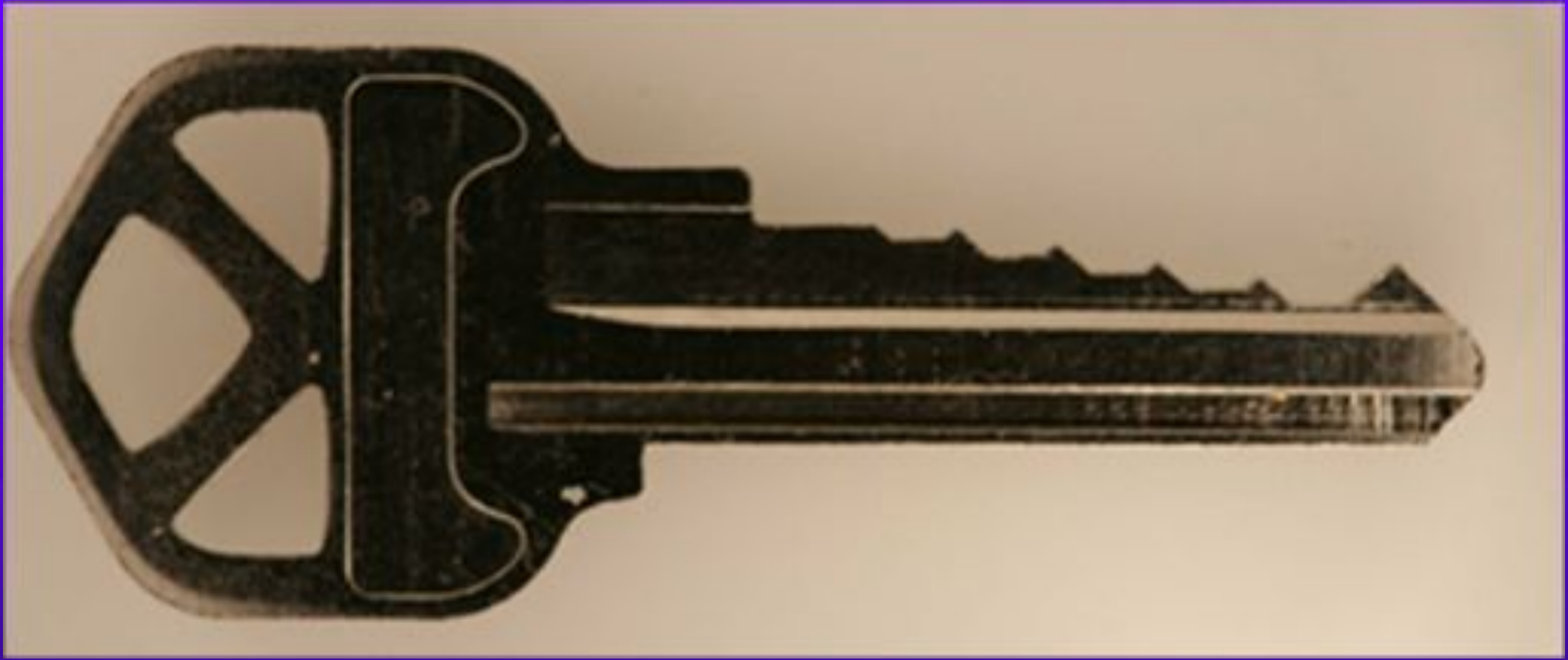
SMARTKEY: METHODS OF DEFEAT

- TRYOUT KEYS
- TAILPIECE, WIRE THROUGH KEYWAY
- VISUALLY READ SLIDER POSITION
- TORQUE THE PLUG AND OPEN
- REPLICATING CONTROL KEY
- DECODING OF THE MASTER KEY

TRYOUT KEYS

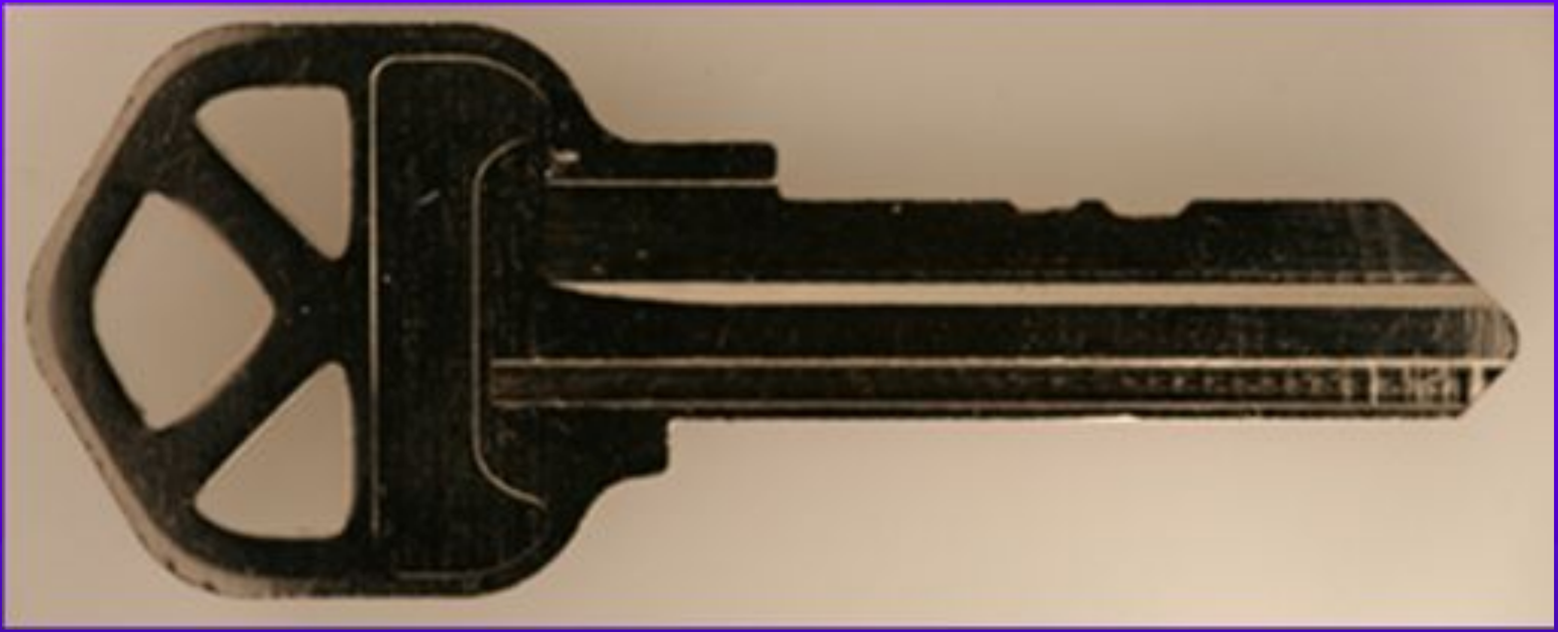
- ♦ BITTING = 6 DEPTHS @.023”
- ♦ 5 SLIDERS
- ♦ UNIVERSE OF KEYS = 3 to 5th = 243
- ♦ #1.5 =DEPTHS 1-2
- ♦ #3.5 = DEPTHS 3-4
- ♦ #5.5 = DEPTHS 5-6

DEPTH INCREMENTS AND TOLERANCE



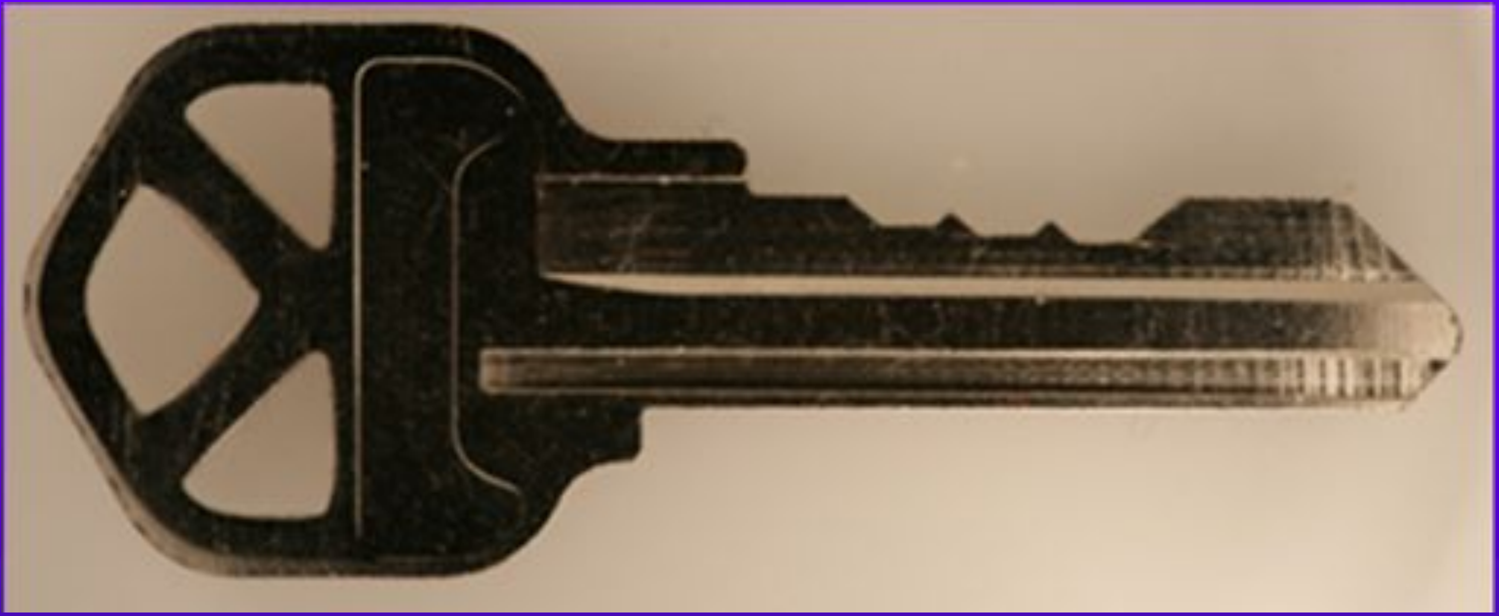
DEPTHS 1-2-3-4-5-6

DEPTH INCREMENTS 1-2



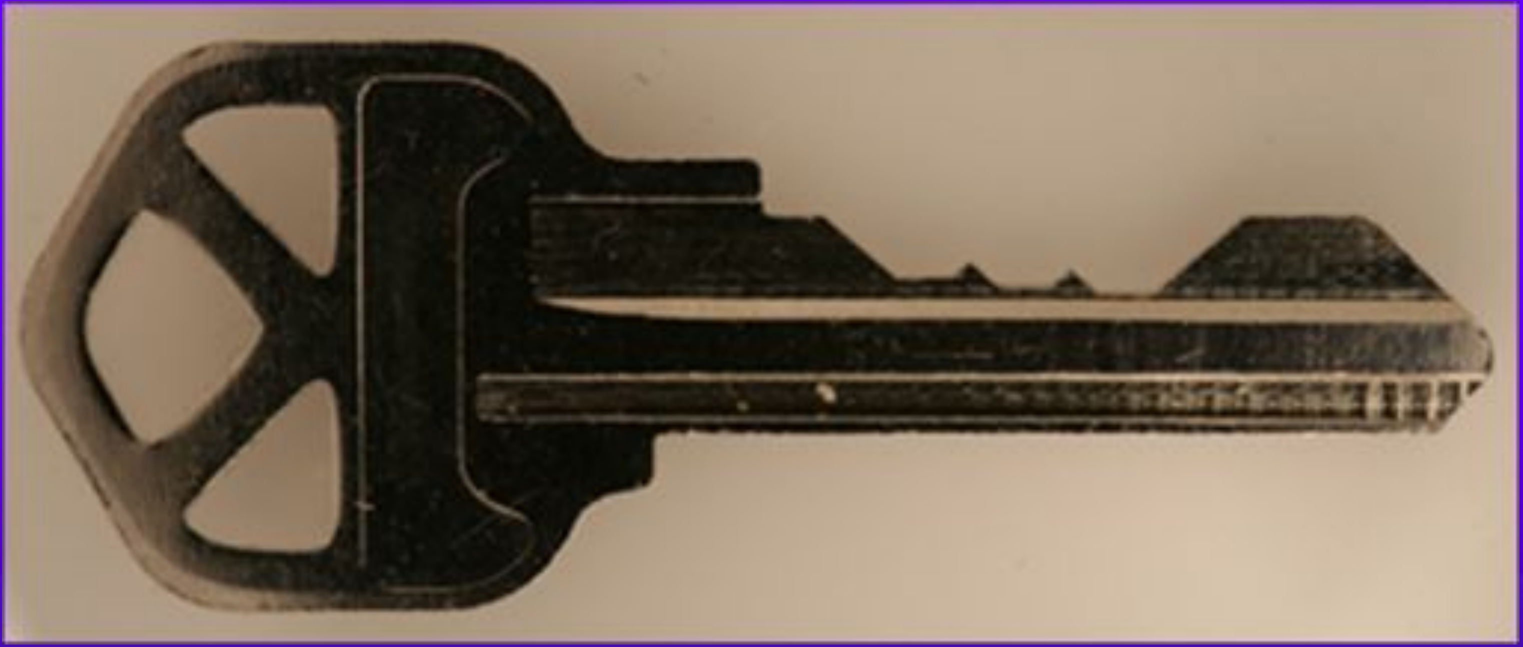
DEPTHS 1-2 = 1.5

DEPTH INCREMENTS 3-4



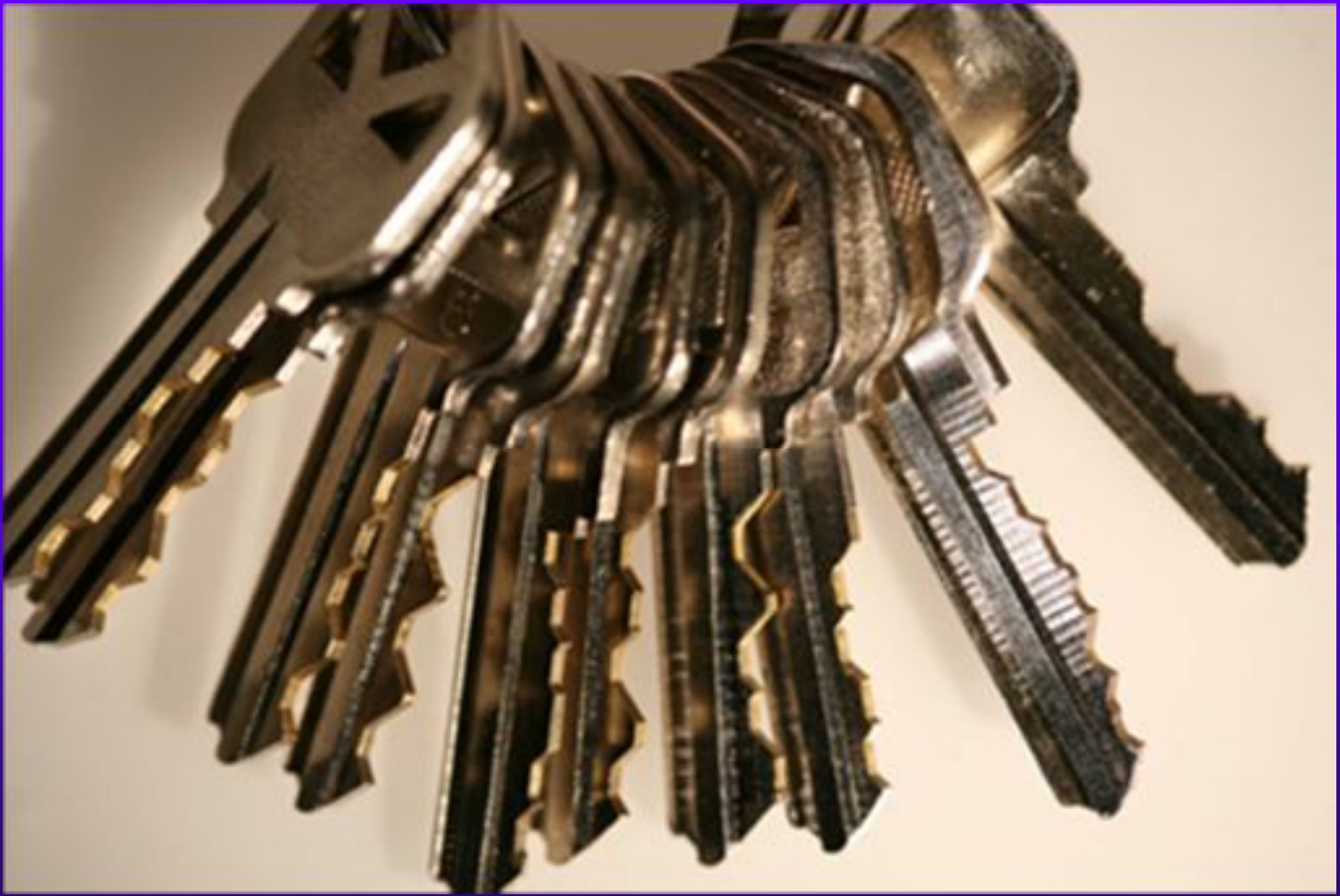
DEPTHS 3-4 = 3.5

DEPTH INCREMENTS 5-6



DEPTHS 5-6 =5.5

TRYOUT KEY SET

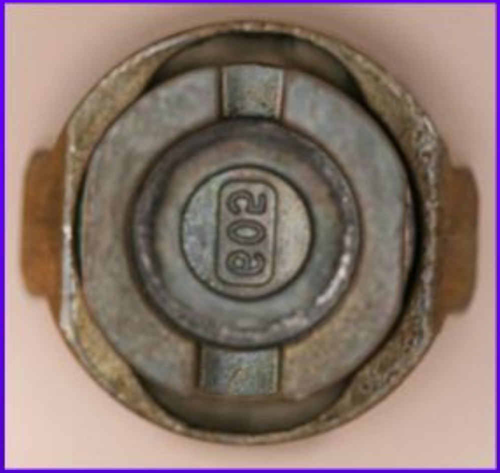


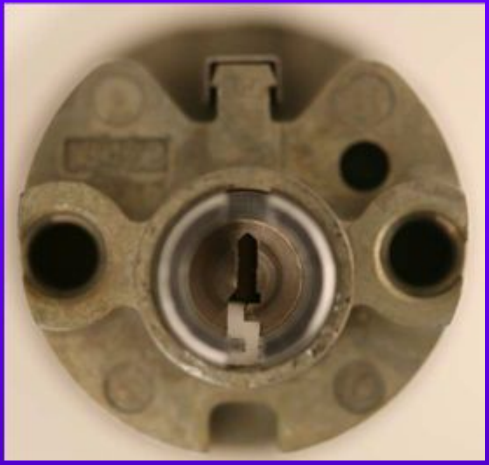
TAILPIECE DESIGN

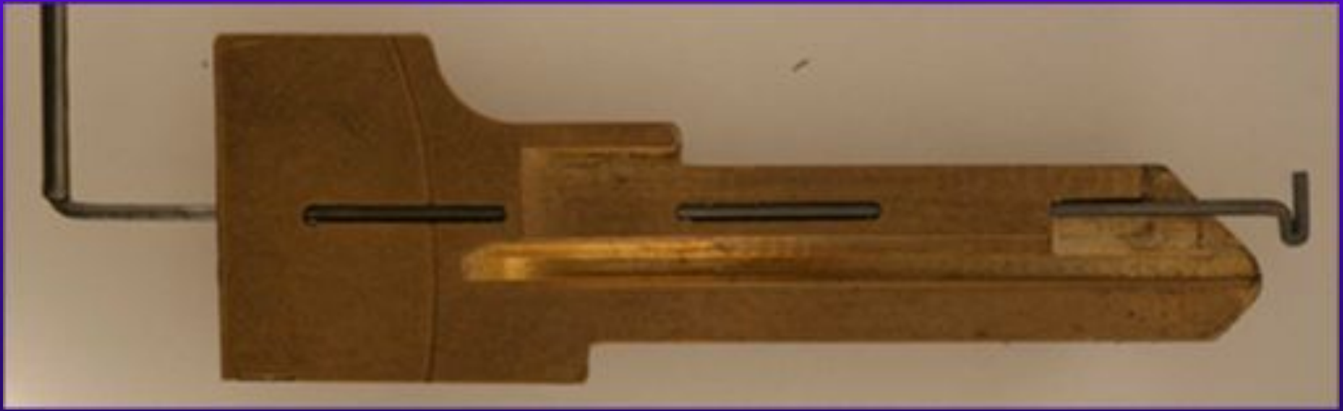
- ♦ SAME DESIGN FOR PIN TUMBLER AND SMARTKEY
- ♦ HOLLOW AND SOLID TELESCOPING
- ♦ PLUG CAP NOT SUFFICIENT
- ♦ ZIG ZAG WIRE THROUGH KEYWAY
  - – No trace
  - – No damage
  - – Less than 30 seconds

KEY-IN-KNOB ATTACK:

Tailpiece access

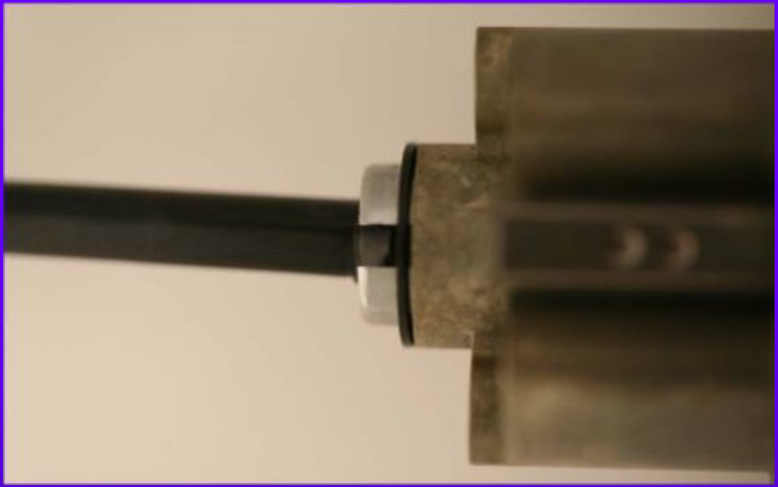


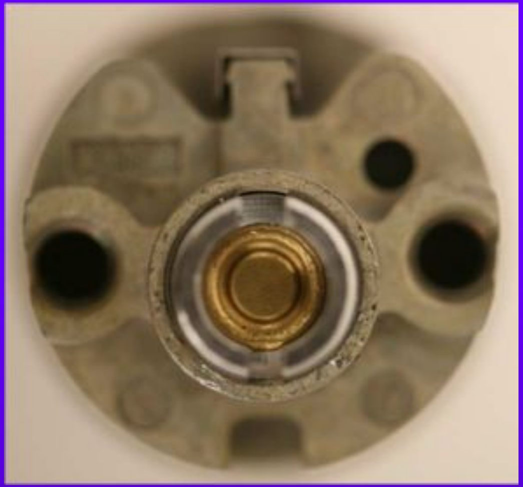




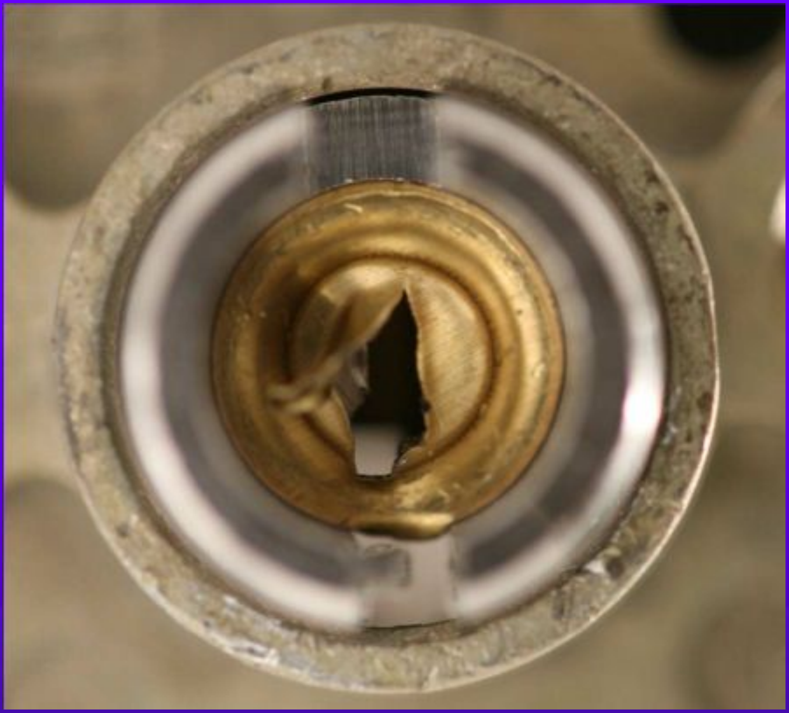
KEY-IN-KNOB ATTACK

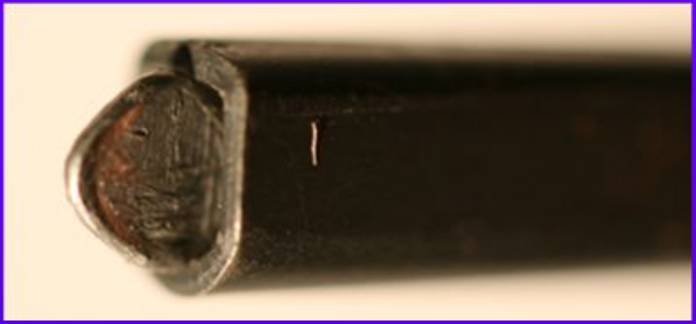
TAILPIECE AND WIRE

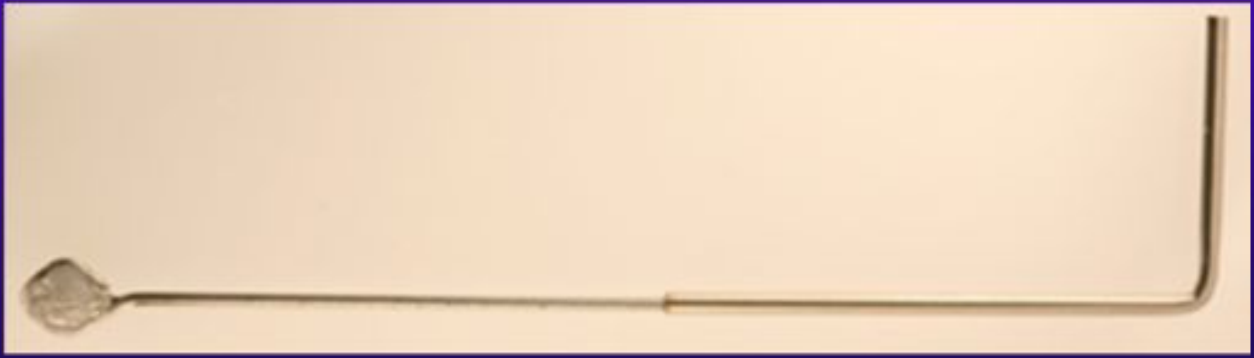




TAILPIECE ATTACK







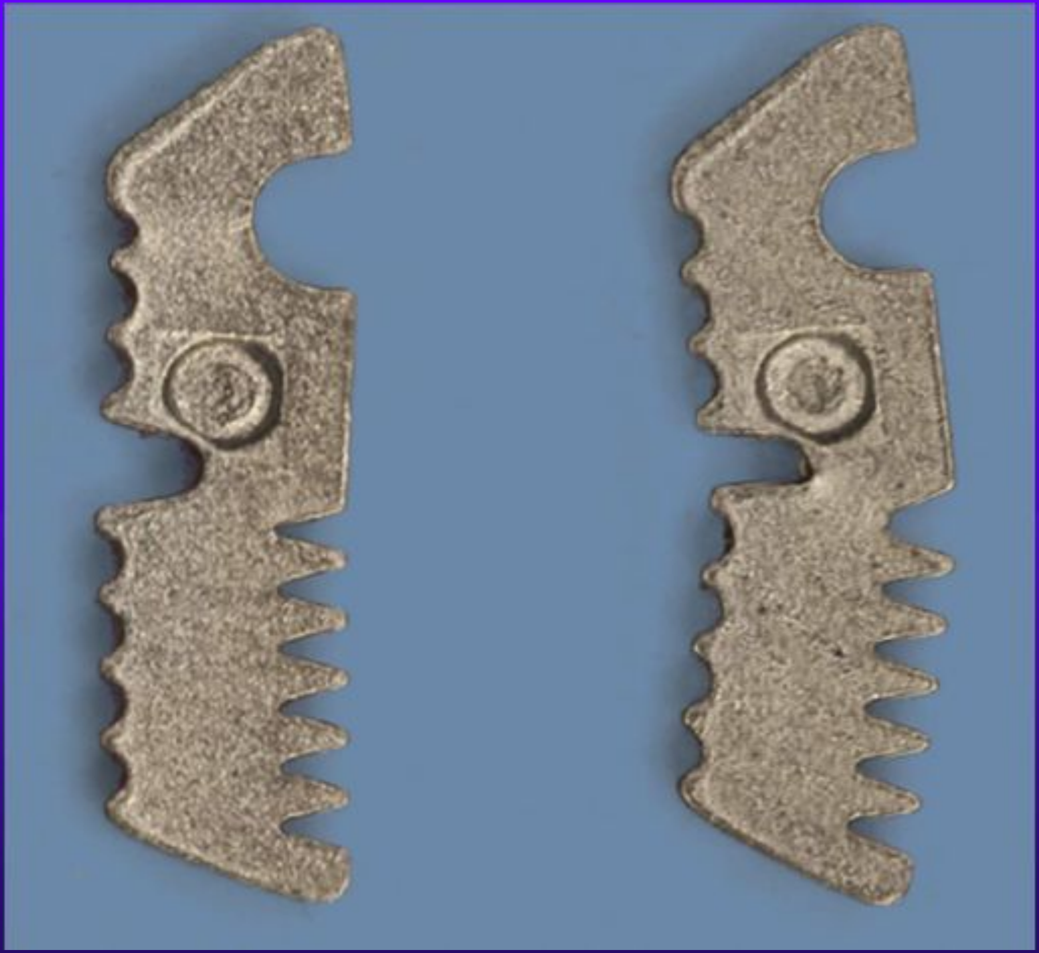
VISUAL DECODING SLIDERS

- SLIDER TO TUMBLER INTERFACE
- CAN DETERMINE POSITION OF SLIDER AND KEY CODE
- INSERT BORESCOPE OR MIRROR TO VIEW POSITION

TORQUE THE PLUG

- ♦ BELIEVE VIOLATES THE BHMA 156.5
- ♦ Formal complaint filed
- ♦ HOW THE LOCK CAN BE COMPROMISED: DESIGN ISSUES
  - – Warp sliders or keyway
  - – Application of 110 pound force inches
  - – Set sliders to specific position
  - – Apply torque with 4” screwdriver and wrench
  - – OPEN IN ABOUT FIFTEEN SECONDS

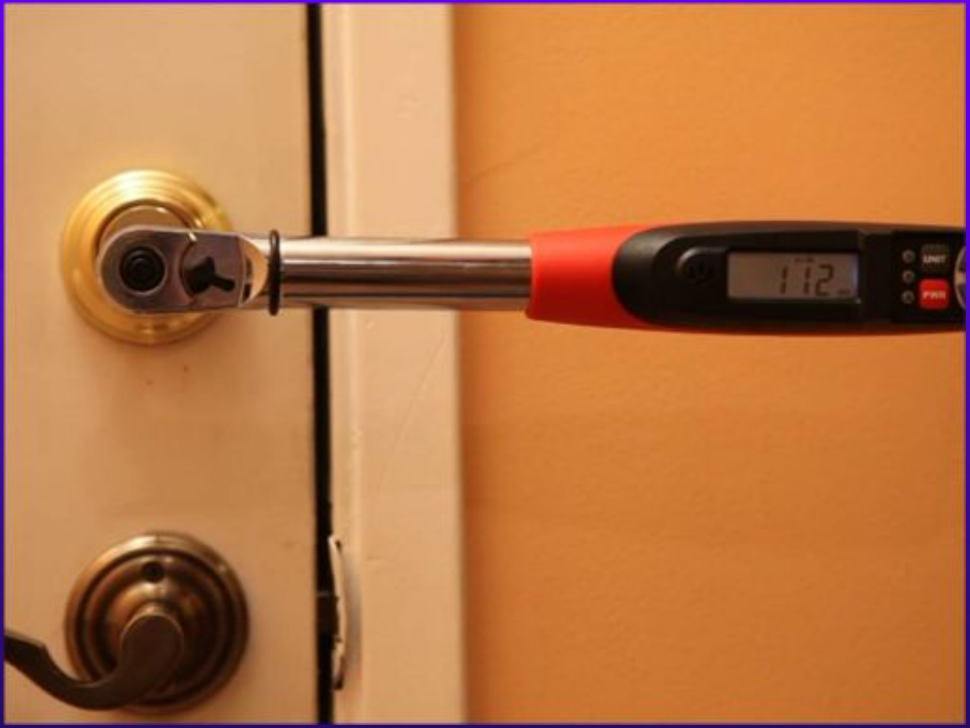
SLIDER DESIGN AND TORQUE ATTACK



TORQUE AND BHMA 156.5

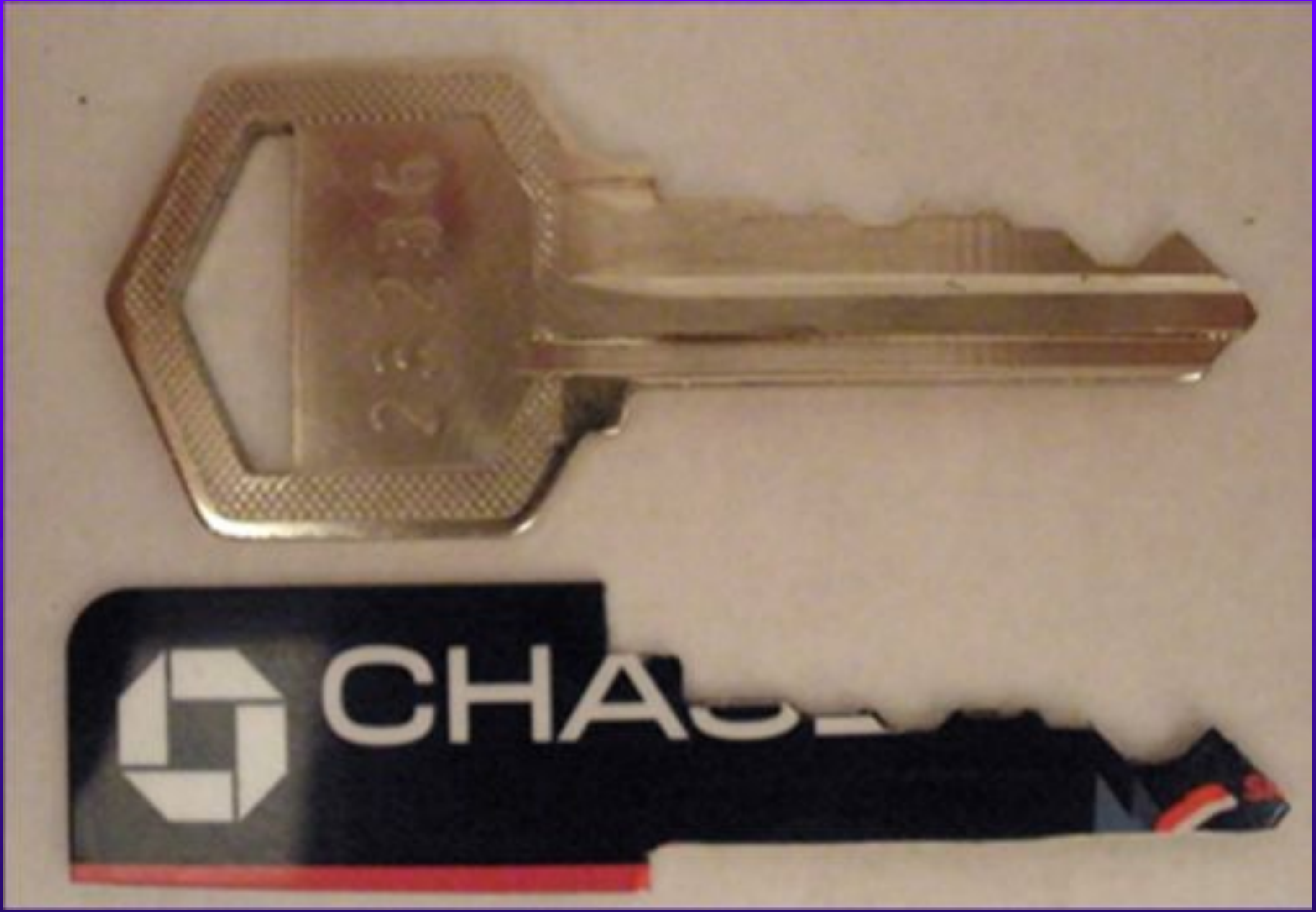
REQUIREMENT = 300 lbf-in

OPEN in 112 lbf-in



112 Pounds Force Inches = OPEN

KEY CONTROL: NONE



SMART KEY LOCKS AND KEY CONTROL

DECODING THE LOCK OR CONTROL KEY

- KEY CONTROL BLANK ONLY AVAILABLE FROM FACTORY
- NOT THE SAME AS CHANG KEY
- SPECIAL DECODER TO READ THE SLIDERS

MAKING THE CONTROL KEY

- SEPARATE KEYWAYS ARE NOT SUPPOSED TO BE INTERCHANGEABLE
- THE REPRESENTATION: CONTROL KEYS ARE SECURE

CHANGE KEYS AND CONTROL KEYS

SUMMARY: SMARTKEY INSECURITY

- ONE OF MOST POOPULAR AND INEXPENSIVE LOCKS IN US. AND CANADA
- CONSUMER FRIENDLY
- FILLS CERTAIN NEEDS
- SECURE AGAINST CERTAIN ATTACKS
  - Picking
  - Bumping

BURGLARS: THEY DON'T PICK LOCKS

- **PICK RESISTANT**
- **BUMP PROOF**
- **ALL OF THE SECURITY IS MEANINGLESS IF THE LOCK CAN BE OPENED IN 15 SECONDS**
- **PATENTS MEAN NOTHING**
- **BHMA RATINGS MEAN NOTHING**
- **COULD BE MADE SECURE**
- **YOU GET WHAT YOU PAY FOR**

A FAILURE OF IMAGINATION: INSECURITY ENGINEERING

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- mwtobias@security.org
- tbluzmanis@security.org
- www.security.org