

Calmark offers the Series 101, 103, 104, 105 Card Extractors for efficient extraction of Printed Circuit Board from connectors and the Series 107 and 108 Card Inserter-Extractor for efficient insertion and extraction of Printed Circuit Board in high density connector contact and multiple connector applications.

## FEATURES

- Lever action for safe easy card extraction
- Ample gripping and pushing surfaces for extracting and inserting card
- Available in colors for coding
- Generous area for hot stamp marking
- Exact replacement for other manufacturers

## MATERIALS

Series 101, 103, 104, 105 molded in 6/6 Nylon. All Series 107 plastic extractors are molded in Glass Filled (30%) 6/6 or Type 6 Nylon. See table for flammability ratings. UL94-V0 parts are self extinguishing to flame. May be used at 121°C (250°F) continuously. Resistant to alkalis, weak acids, and common solvents.

## ROLL PINS

- 2.38 (.094) dia x 6.35 (.250) long Series 101, 103, 104, 105, 107, 107-10, 107-20, 107-20-3, 107-70, 107-70-3
- 2.38 (.094) dia x 7.95 (.313) long Series 107-3, 107-10-3, 107-70-4
- 3.18 (.125) dia x 6.35 (.250) long Series 108
- 1.98 (.076) dia x 7.95 (.313) Series 107-30
- 2.38 (.094) dia x 12.7 (.500) long Series 107-40

## COLOR

Other colors available see Part number code. Series 101, 103, 104, 105 standard color is natural/white. Series 107 and 108 standard color is black. For standard colors, a color suffix is not necessary.

## HOT STAMPING

Hot stamp marking service is available. Please contact an Application Engineer with your requirements.

## SERIES P - PRE-STARTED ASSEMBLY PIN

Calmark offers any of our extractors and inserter-extractors with the option of Pre-Started Assembly Pin.

## FEATURES

- Faster and easier installation of extractor to PC card
- Eliminates need for special tools or equipment and set-up time
- Eliminates loss of loose assembly pins



Series 101 to 108 - Plastic Extractors

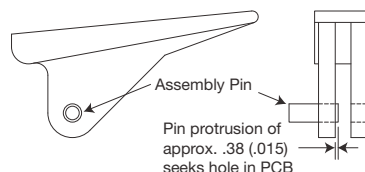
Series Part Number	Feature	Board Thickness	Standard Color	UL 94	Mechanical Advantage	Figures
101	E	1.6 (.063)	natural	V-2	3:1	1/A
V0101	E	1.6 (.063)	natural	V-0	3:1	1/A
103	E D	1.6 (.063)	natural	V-2	3:1	2/A
V0103	E	1.6 (.063)	natural	V-0	3:1	2/A
103-3	E D	2.4 (.093)	natural	V-2	3:1	2/A
V0103-3	E	2.4 (.093)	natural	V-0	3:1	2/A
104	E D	1.6 (.063)	natural	V-2	3:1	3/A
V0104	E	1.6 (.063)	natural	V-0	3:1	3/A
104-3	E D	2.4 (.093)	natural	V-2	3:1	3/A
V0104-3	E	2.4 (.093)	natural	V-0	3:1	3/A
105	E D	1.6 (.063)	natural	V-2	3:1	4/A or B
V0105	E	1.6 (.063)	natural	V-0	3:1	4/A or B
105-3	E D	2.4 (.093)	natural	V-2	3:1	4/A or B
V0105-3	E	2.4 (.093)	natural	V-0	3:1	4/A or B
107	I E D	1.6 (.063)	black	V-0	4.5:1	5/C
107-3	I E D	2.4 (.093)/3.2 (.125)	black	V-0	4.5:1	5/C
107-10	I E D	1.6 (.063)	black	V-0	3.3:1	6/C
107-10-3	I E D	2.4 (.093)	black	V-0	3.3:1	6/C
107-20	I E L	1.6 (.063)	black	V-2	4.5:1	7/D
V0107-20	I E L	1.6 (.063)	black	V-0	4.5:1	7/D
107-20-3	I E L	2.4 (.093)	black	V-0	4.5:1	7/D
V0107-20-3	I E L	2.4 (.093)	black	V-0	4.5:1	7/D
107-30	I E	1.6 (.063)	black	V-0	5.5:1	8/E
107-40	I E D	1.6 (.063)	black	V-0	4.5:1	9/C
107-40-3	I E	2.4 (.093)/2.4 (.125)	black	V-0	4.5:1	9/C
107-70	I E L	1.6 (.063)	black	V-0*	4.5:1	10/D
107-70-3	I E L	2.4 (.093)	black	V-0*	4.5:1	10/D
107-70-4	I E L	3.2 (.125)	black	V-0*	4.5:1	10/D
108	I E	1.6 (.063)	black	V-0	4.5:1	11/F

Feature: I = Inserter E = Extractor L = Latching D = meets DSCC 83023

For Pre-start pin feature, add "P" prefix to part number

\*Main handle portion is UL-94V0, but latch is UL94-V2

For colors other than the standard color, use one of the following suffixes: BLK, BRN, RED, ORG, YEL, GRN, BLU, PRP, GRY or WHT.



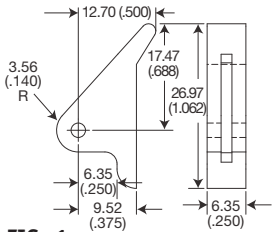


FIG. 1

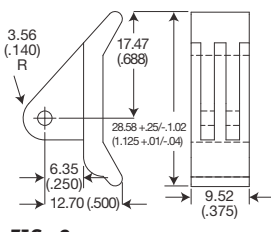


FIG. 2

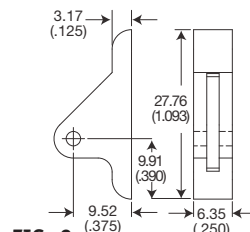


FIG. 3

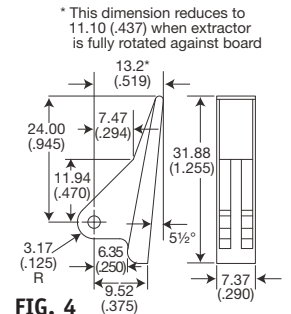


FIG. 4

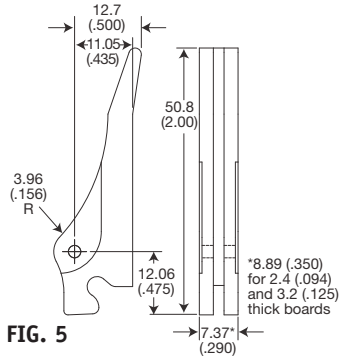


FIG. 5

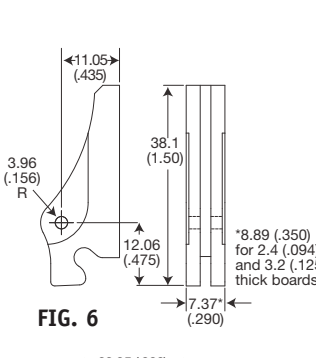


FIG. 6

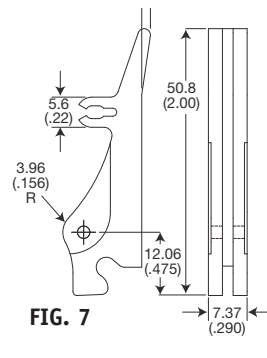


FIG. 7

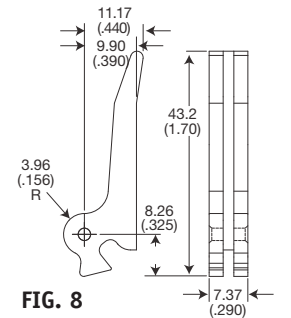


FIG. 8

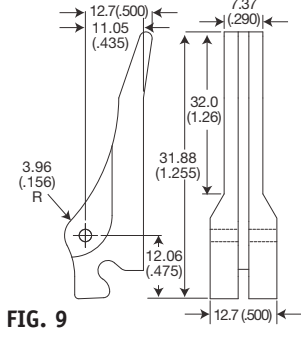


FIG. 9

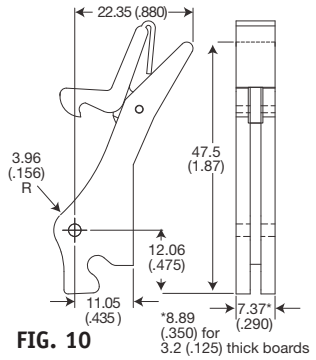


FIG. 10

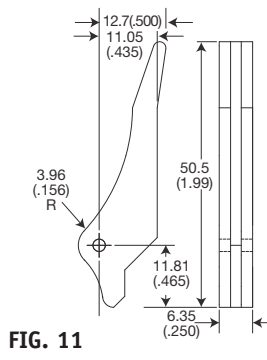


FIG. 11

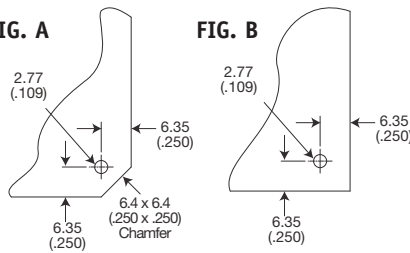
Units: mm (in)  
Unless specified otherwise,  
.xx = ± .25, .x = ± .5  
(.xxx = ± .010, .xx = ± .02)

## APPLICATION DATA

Two inserter or inserter-extractors are recommended per printed circuit board taller than 127 (5) in height.

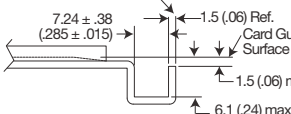
FIG. A

FIG. B



Provides insertion and extraction travel of 8.9 (.35) min.

Nominal position of card edge when seated in connector. The Inserter-Extractor will allow 1.3 (.05) overtravel for tolerance take-up.



Detail of Actuating Surfaces  
Required on Top and Bottom Guide Plates

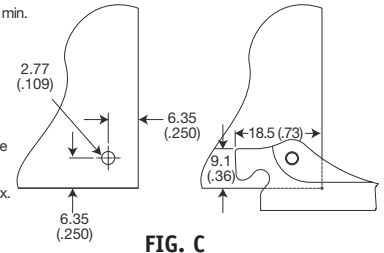
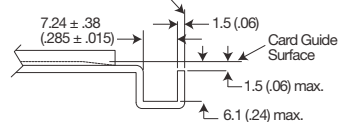


FIG. C

Provides insertion and extraction travel of 8.9 (.35) min.

Nominal position of card edge when seated in connector. The Inserter-Extractor will allow 1.3 (.05) overtravel for tolerance take-up.



Detail of Actuating Surfaces  
Required on Top and Bottom Guide Plates

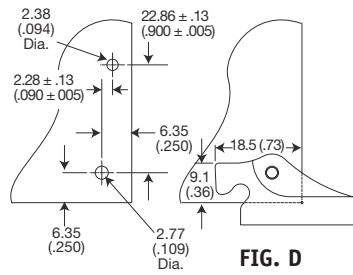
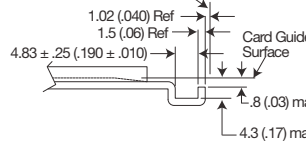


FIG. D

Provides insertion and extraction travel of 8.9 (.35) min.

Nominal position of card edge when seated in connector. The Inserter-Extractor will allow .8 (.03) overtravel for tolerance take-up.



Detail of Actuating Surfaces  
Required on Top and Bottom Guide Plates

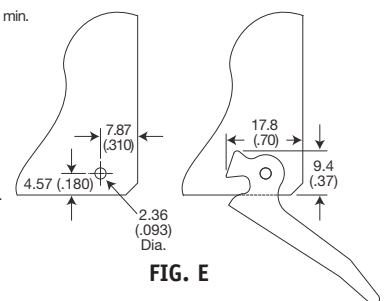


FIG. E

Provides insertion and extraction travel of 8.9 (.35) min.

Nominal position of card edge when seated in connector.

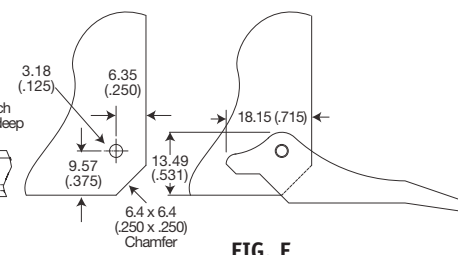
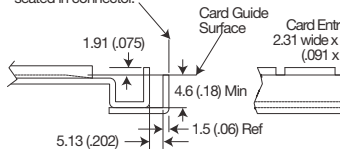


FIG. F

Units: mm (in)  
Unless specified otherwise,  
.xx = ± .25, .x = ± .5  
(.xxx = ± .010, .xx = ± .02)

Calmark offers the Series 107 Aluminum Inserter-Extractor for safe and easy insertion and extraction of printed circuit boards in the most severe applications. This product series offer a wide range of inserter-extractor with varying features from mechanical advantage ratios, color, board thickness, etc. If you don't see one here that meets your requirements, please contact our Applications Engineers with your specification.

## FEATURES

- "Ultra strong" lever action design overcomes insertion and extraction forces of highest possible limits
- Widths from 7.37 (.290) to 7.92 (.312) for printed circuit boards ranging from 1.6 (.063) to 3.2 (.125) thick
- Actuates from a simple "U" channel form
- Mounting detail on card retrofits other industry standards
- Available in black anodize or clear chemical film
- Generous area for identification markings
- Strong and Ultra-strong lever action overcome high insertion and extraction forces
- 107-73 and 107-75 offers a positive locking feature

## MATERIALS/FINISH

### EXTRACTOR

Aluminum alloy 6061-T6. Black anodize per Mil-A-8625, Type II Cl. 2. or Clear chemical film per Mil-5541 Cl 3 for a conductive finish. Other anodize colors or a gold chemical film also available. Please contact an Application Engineer with your requirements.

### ROLL PIN

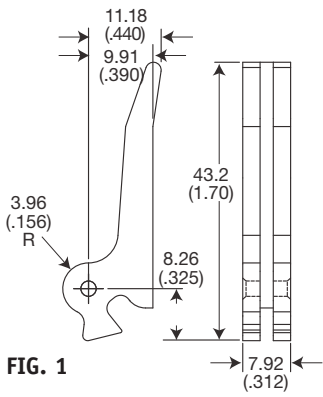
Stainless steel, 2.38 (.094) x 6.35 (.250) [except all Series 107-35 use 7.95 (.313) long]. Roll pins are furnished with each inserter-extractor. [Series 107-73 and 107-75, two roll pins]



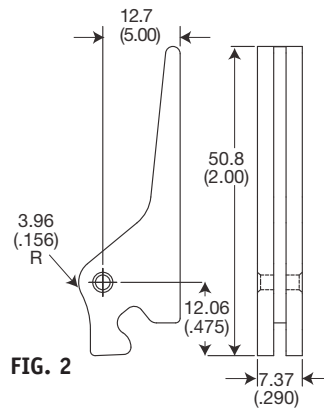
Series 107-50 - Inserter/Extractor (Aluminum)

Series	Feature	Board Thickness	Standard Color	Mechanical Advantage	Figures
107-35	I E	1.6 (.063)	black	5.5:1	1/A
C107-35	I E	1.6 (.063)	clear	5.5:1	1/A
107-35-3	I E	2.4 (.093)	black	5.5:1	1/A
C107-35-3	I E	2.4 (.093)	clear	5.5:1	1/A
107-35-4	I E	3.2 (.125)	black	5.5:1	1/A
C107-35-4	I E	3.2 (.125)	clear	5.5:1	1/A
107-50	I E	1.6 (.063)	black	4.5:1	2/B
C107-50	I E	1.6 (.063)	clear	4.5:1	2/B
107-50-3	I E	2.4 (.093)	black	4.5:1	2/B
C107-50-3	I E	2.4 (.093)	clear	4.5:1	2/B
107-50-4	I E	3.2 (.125)	black	4.5:1	2/B
C107-50-4	I E	3.2 (.125)	clear	4.5:1	2/B
107-51	I E	1.6 (.063)	black	3.3:1	3/B
C107-51	I E	1.6 (.063)	clear	3.3:1	3/B
107-51-3	I E	2.4 (.093)	black	3.3:1	3/B
C107-51-3	I E	2.4 (.093)	clear	3.3:1	3/B
107-51-4	I E	3.2 (.125)	black	3.3:1	3/B
C107-51-4	I E	3.2 (.125)	clear	3.3:1	3/B
107-55	I E	1.6 (.063)	black	8:1	4/B
C107-55	I E	1.6 (.063)	clear	8:1	4/B
107-55-3	I E	2.4 (.093)	black	8:1	4/B
C107-55-3	I E	2.4 (.093)	clear	8:1	4/B
107-55-4	I E	3.2 (.125)	black	8:1	4/B
C107-55-4	I E	3.2 (.125)	clear	8:1	4/B
107-73	I E L	1.6 (.063)	black	4.2:1	5/C
C107-73	I E L	1.6 (.063)	clear	4.2:1	5/C
107-73-3	I E L	2.4 (.093)	black	4.2:1	5/C
C107-73-3	I E L	2.4 (.093)	clear	4.2:1	5/C
107-73-4	I E L	3.2 (.125)	black	4.2:1	5/C
C107-73-4	I E L	3.2 (.125)	clear	4.2:1	5/C
107-75	I E L	1.6 (.063)	black	7:1	6/C
C107-75	I E L	1.6 (.063)	clear	7:1	6/C
107-75-3	I E L	2.4 (.093)	black	7:1	6/C
C107-75-3	I E L	2.4 (.093)	clear	7:1	6/C
107-75-4	I E L	3.2 (.125)	black	7:1	6/C
C107-75-4	I E L	3.2 (.125)	clear	7:1	6/C

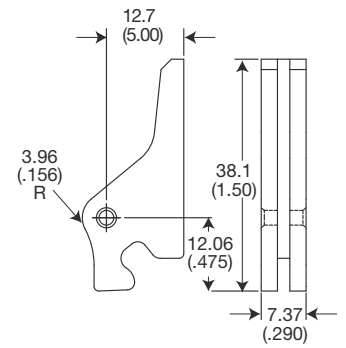
Feature: I = Inserter E = Extractor L = Latching  
For Pre-start pin feature, add "P" prefix to part number



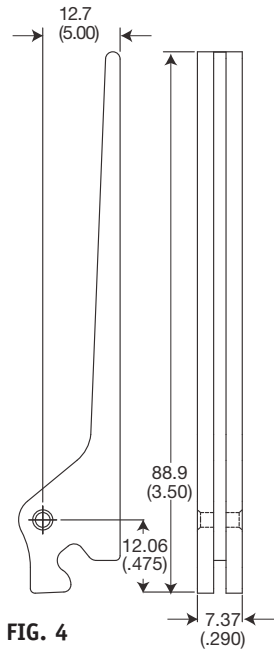
**FIG. 1**



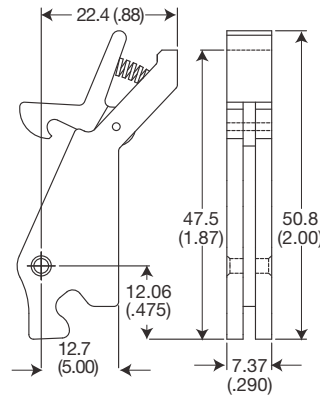
**FIG. 2**



**FIG. 3**

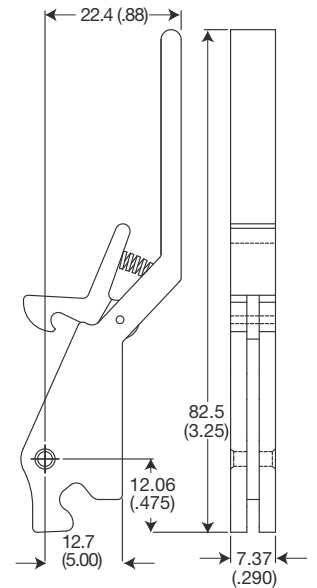


**FIG. 4**



**FIG. 5**

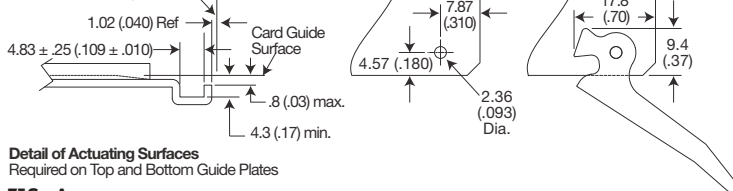
Units: mm (in)  
 Unless specified otherwise,  
 .xx = ± .25, x = ± .5  
 (.xxx = ± .010, .xx = ± .02)



**FIG. 6**

Provides insertion and extraction travel of 7.6 (.30) min.

Nominal position of card edge when seated in connector. The Inserter-Extractor will allow .76 (.03) overtravel for tolerance take-up.



**Detail of Actuating Surfaces**  
 Required on Top and Bottom Guide Plates

**FIG. A**

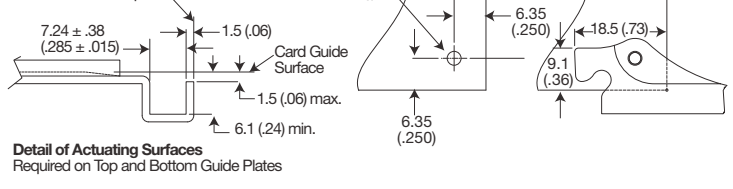
## APPLICATION DATA

Two inserter or inserter-extractors are recommended per printed circuit board taller than 127 (5) in height.

Units: mm (in)  
 Unless specified otherwise,  
 .xx = ± .25, x = ± .5  
 (.xxx = ± .010, .xx = ± .02)

Provides insertion and extraction travel of 8.9 (.35) min.

Nominal position of card edge when seated in connector. The Inserter-Extractor will allow 1.3 (.05) overtravel for tolerance take-up.

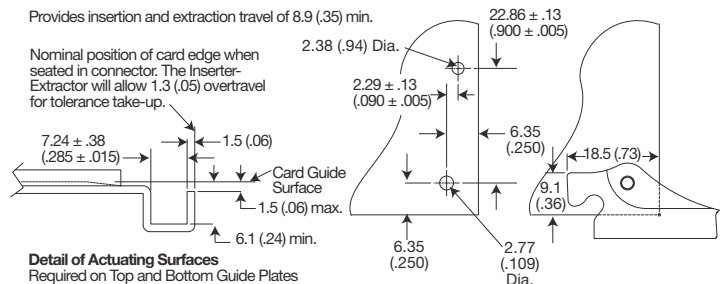


**Detail of Actuating Surfaces**  
 Required on Top and Bottom Guide Plates

**FIG. B**

Provides insertion and extraction travel of 8.9 (.35) min.

Nominal position of card edge when seated in connector. The Inserter-Extractor will allow 1.3 (.05) overtravel for tolerance take-up.



**Detail of Actuating Surfaces**  
 Required on Top and Bottom Guide Plates

**FIG. C**

Calmark offers the Series 109 narrow profile aluminum Card Extractor for safe and efficient extraction of Printed Circuit Board with limited available space. Single-side actuating foot design provides clearance for use on boards with "Card-Lok" clamping retainers. The Series 109 meets the requirements of DSCC 84191.

## FEATURES

- Lever action provides mechanical advantage for efficient insertion and extraction of printed circuit board
- Meets requirements of DSCC 84191
- Narrow profile requires minimum board space
- Single-side actuating foot provides clearance for use with "Card-Lok" clamping retainers
- Strong aluminum or stainless material
- Available in colored finish for coding

## MATERIALS/FINISH

### EXTRACTOR

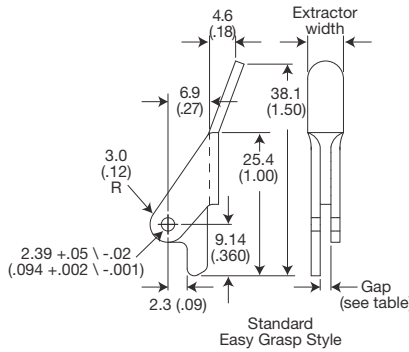
.063 thk. Aluminum Alloy, type 5052-H32 per QQ-A-250/8 Chem film or anodize finish (See part number code) or .063 thk. Stainless Steel, type 304 per ASTM-A666. Passivated per AMS-QQ-P-35

### ROLL PIN

Stainless Steel, 2.38 (.093) x 4.75 (.187) long. -3 and -4 versions use 6.35 (.250) long



Series 109 - Extractor (Card-Lok Compatible)

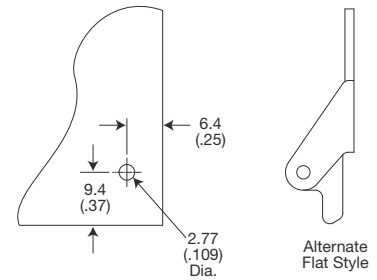


Board Thickness Dash No.	Board Thickness	Gap Dimension ± .013 (± .005)	Extractor Width Dimension
[blank]	1.6 (.063)	1.91 (.075)	6.4 (.25)
-3	2.3 (.094)	2.67 (.105)	6.4 (.25)
-4	3.2 (.125)	3.61 (.142)	7.4 (.29)

Units: mm (in)  
 Unless specified otherwise,  
 .xx = ± .25, .x = ± .5  
 (.xxx = ± .010, .xx = ± .02)

## APPLICATION DATA

Two (2) extractors are recommended per board. (One "L" and one "R" per printed circuit board). Provides extraction travel of 11.4 (.45) minimum, with a mechanical advantage of 4.5:1



Part Number Code	
Series 109 Extractor	_____
Prefix options	P F 109 CR -3 R -BLK -SED
Prestarted pin option	_____ P
Pin kitted with extractor	_____ [blank]
Flat Style Handle	_____ F
Easy Grasp Handle	_____ [blank]
Suffix options	
Material	
.063" thk. Aluminum Alloy 5052-H2	_____ [blank]
.063" thk. Stainless Steel Type 304	_____ CR
Board Thickness	
.063 (1.6)	_____ [blank]
.093 (2.4)	_____ -3
.125 (3.2)	_____ -4
Right or Left Handle	
Right (Shown)	_____ R
Left (Opposite)	_____ L
Finish	
Chem Film Gold	_____ [blank]
Or choose from finish table	
ESD silkscreen	_____ SED
No ESD silkscreen	_____ [blank]

## Part Number Code Example:

P109CR-4R-BLK-SED

Series 109 Extractor made from stainless steel with pre-start pin, made for .125 thick boards, anodized black with ESD silkscreen for a right handed extraction.

## FINISH TABLE

Code Letter	Finish
[blank]	Chemical Film Gold
-BLK	Black Anodize
-BRN	Brown Anodize
-RED	Red Anodize
-ORG	Orange Anodize
-YEL	Yellow Anodize
-BLU	Blue Anodize
-GRN	Green Anodize
-PRP	Purple Anodize
-CLR	Clear Anodize