



# SOLUTIONS FOR BETTER PERFORMING TOOLS

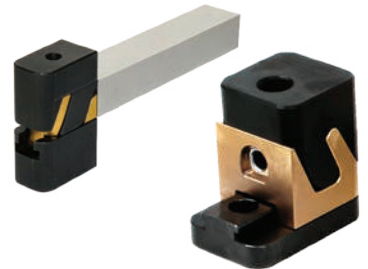
CATALOG VERSION 13  
RECENTLY ADDED PRODUCTS:



More Pin and Sleeve Options  
Section A



Monitoring Remotely  
Section F



Expanded CamActions  
Section G



High Temp Tool Options  
Section F



New Bar Lock Sizes  
Section C



Toolroom Items  
Section M

Customer Service  
1-800-269-6653 | 1-847-487-1000

[www.procomps.com](http://www.procomps.com)

**PROGRESSIVE**  
COMPONENTS

# ABOUT PROGRESSIVE...

Progressive Components offers advanced solutions for unmatched tooling performance, with product lines consisting of standard and proprietary mold components, mold monitoring devices and software, and innovations for improving mold maintenance.

This Progressive Catalog version 13 includes the widest scope of offerings in our company's history:

- New components for cleanroom molding, stainless items, and new Black Nitride options.
- Off-the-shelf Standard Components and an increased range of Mold-Ready Components.
- Alignment Locks for large multi-plate tools, and small interlocks for mounting in cavity inserts.
- Standard Lifters, CamActions, and Plate Sequencing devices to simplify mold building and maintenance.
- Toolroom Supplies and Software that help to advance asset tracking and mold maintenance.

Together, this collection of advantages delivers convenience for the mold builder and unmatched tooling performance for molders and OEMs, with availability through direct distribution and authorized dealers throughout the world.

## Progressive Components Worldwide Locations

### Europe

P: (44)-0-1928-240660  
F: (44)-0-1928-750280  
sales.eu@procomps.com

### North & South America

P: 800-269-6653  
F: 800-462-6653  
sales@procomps.com

Illinois • California  
South Carolina

### Asia

P: (65)-6753-3212  
F: (65)-6753-4489  
sales.asia@procomps.com

## OUR COMMITMENT:

The team at Progressive continuously strives to be the leading supplier to the tooling industry. With a foundation in the mold business, we feel a responsibility to provide continued excellence.

Therefore, every customer should always expect the following:

- Products that meet expectations for quality, value, and performance.
- Prompt resolution of any order issue.
- Prompt response to billing questions and account status.
- Orders that are traced at no additional charge.
- Knowledgeable and helpful Customer Service and Technical Support staff.

If there is any way in which we can serve your needs better, we want to hear about it. Feel free to contact anyone on the Progressive Team using the contact information provided above.

We appreciate your support and will work to further earn your business.



Glenn Starkey  
President

glenn.starkey@procomps.com

Don Starkey  
Chairman

don.starkey@procomps.com

## Progressive Components Headquarters

235 Industrial Drive  
Wauconda, Illinois 60084

### Customer Service

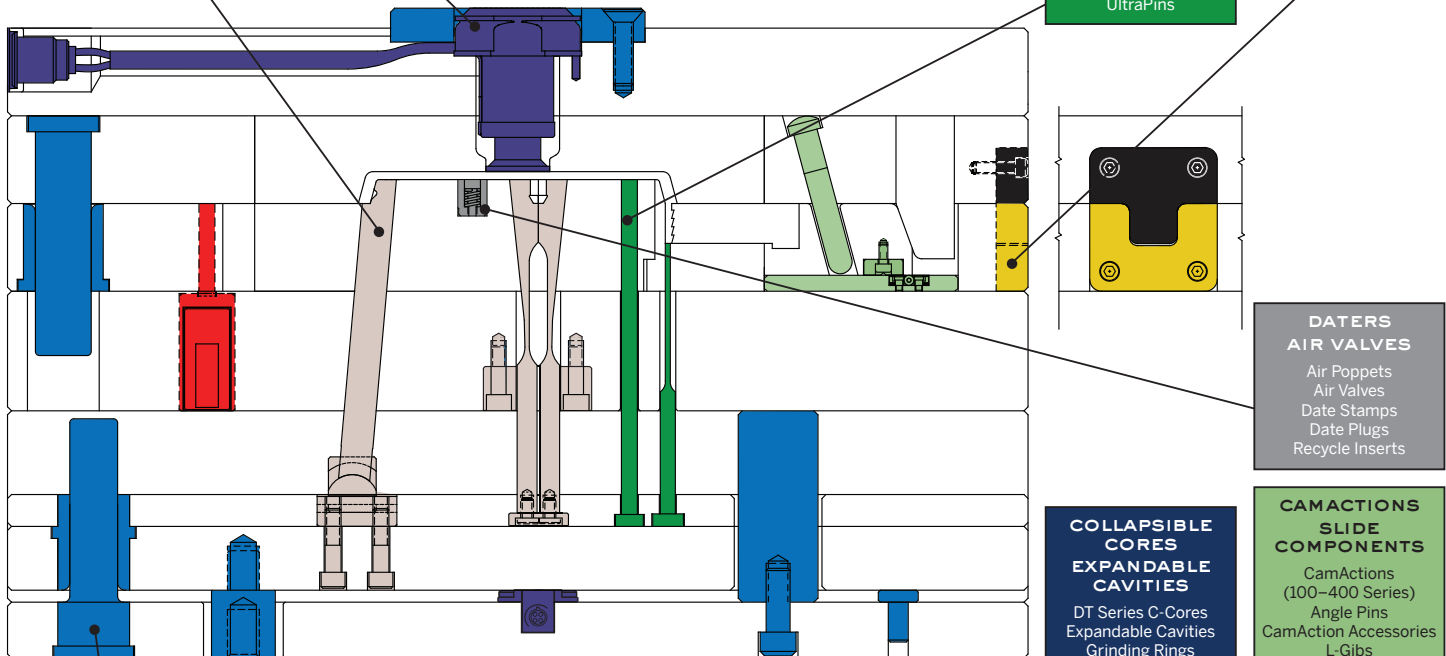
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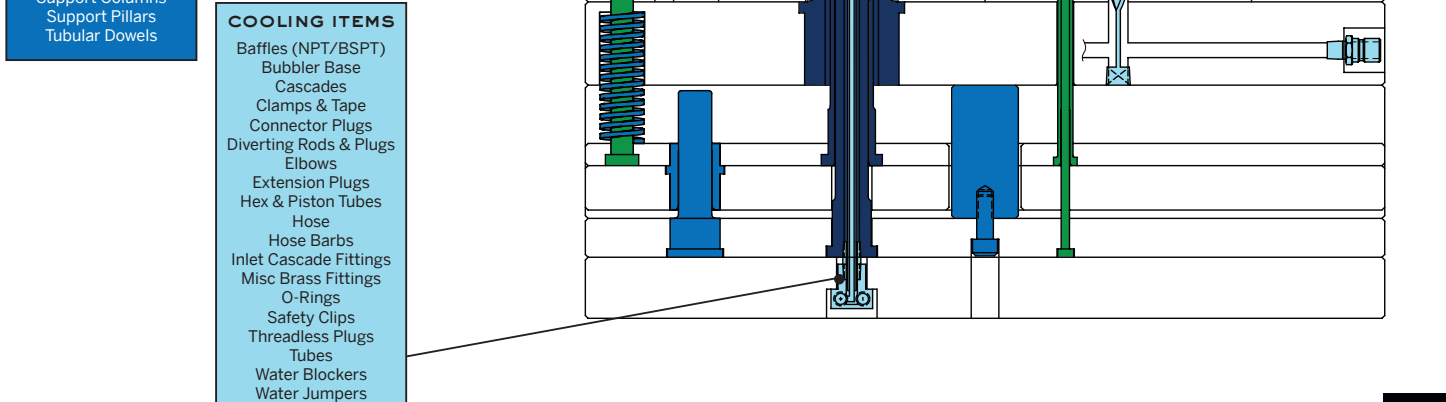
**PROGRESSIVE**  
C O M P O N E N T S



- LIFTERS UNDERCUT RELEASE**
  - FlexiCores
  - Guides & Keys
  - Lifter Blades
  - Lifter Cores
  - ModuLifters
  - Spherical Bushings
  - UniLifters
  - Versa-Lifters
- ELECTRICAL COMPONENTS**
  - Cables
  - Cavity Pressure
  - Hot Sprue Bushings
  - KO Switches
  - Recessed Connectors
  - Switches
  - Thermocouples
  - Wire Channels
- RAPID TOOLING INSERTS**
  - Clamps
  - Frames
  - Inserts
  - RTI Pins & Bushings
  - RTI Support Pillars
  - T-Handles
- TOOLROOM INNOVATIONS**
  - Mold Light Bar
  - Nozzles
  - Nozzle Caddy
  - Rhino Foot
  - Rhino Toes
  - Status Tags
  - Synthetic Mold Grease
  - Toolroom Bench
- MOLD MONITORING**
  - Asset Tags & Plates
  - CounterView
  - CVe Live
  - CVe Monitor
  - CVe OnDemand
  - Insulator Block
  - Insulator Bracket
  - MoldTrax
  - ProFile System
  - System Cooling
  - System Cooling Test Rig
- EJECTOR PINS CORE PINS SLEEVES**
  - Blade Ejectors
  - Core Pins & Retainers
  - Ejector Pins
  - Ejector Sleeves
  - DIN Pins/Sleeves/Blades
  - Return Pins
  - Sleeve Extensions & Blanks
  - Thin Wall Sleeves
  - TI Pins
  - UltraPins
- ALIGNMENT LOCKS**
  - Bar Locks & Guides
  - Cavity Interlocks
  - Guide Locks
  - Needle Bearing Locks
  - Shuttle Mold Locks
  - Side Locks
  - Taper Locks
  - Top Locks
  - X-Series Locks



- MOLD BASE COMPONENTS**
  - Extended Sprues
  - Front Loading Pins
  - Guided Ej Bushings
  - Guided Ejector Pins
  - Guided Support Pillars
  - Leader Pins
  - Locating Rings
  - Mold Straps
  - PKO Extensions
  - Puller Pins & Bushings
  - Springs
  - Sprue Bushings
  - Stop Pins
  - Shoulder Bushings
  - Straight Bushings
  - Stripper Bolts & Bushings
  - Support Columns
  - Support Pillars
  - Tubular Dowels
- PLATE SEQUENCE CONTROL**
  - Friction Pullers
  - Plate Locks
  - Roller Pullers
  - StackKit
- COLLAPSIBLE CORES EXPANDABLE CAVITIES**
  - DT Series C-Cores
  - Expandable Cavities
  - Grinding Rings
  - MiniCores
  - Retention Sleeves
  - RT Series C-Cores
- CAMACTIONS SLIDE COMPONENTS**
  - CamActions (100-400 Series)
  - Angle Pins
  - CamAction Accessories
  - L-Gibs
  - SRT Slide Retainers
  - Urethane Retainers
  - Wear Plates







- COOLING ITEMS**
  - Baffles (NPT/BSPT)
  - Bubbler Base
  - Cascades
  - Clamps & Tape
  - Connector Plugs
  - Diverting Rods & Plugs
  - Elbows
  - Extension Plugs
  - Hex & Piston Tubes
  - Hose
  - Hose Barbs
  - Inlet Cascade Fittings
  - Misc Brass Fittings
  - O-Rings
  - Safety Clips
  - Threadless Plugs
  - Tubes
  - Water Blockers
  - Water Jumpers






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	<b>Catalog # Prefix</b>	Prefix: EP	Prefix: EP	Prefix: EPD
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<b>Ejector Pins: Straight JIS</b>	<b>Ejector Pins: Shoulder JIS</b>	<b>UltraPins: Straight</b>	<b>UltraPins: Shoulder</b>	<b>Blade Ejectors: Inch</b>
Prefix: EPJ	Prefix: EPJ	Prefix: EPL	Prefix: EPL	Prefix: BE
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Prefix: BE	Prefix: CP	Prefix: TI	Prefix: ES	Prefix: ESD
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<b>Thin Wall Sleeves</b>	<b>Sleeve Extensions</b>	<b>Core Pin Retainers</b>	<b>Return Pins</b>
Prefix: ESTW	Prefix: SXT	Prefix: CPR	Prefix: RP
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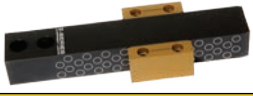
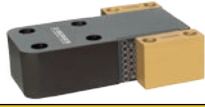


<b>MOLD BASE COMPONENTS</b>				
	<b>PKO Extensions</b>	<b>Locating Rings</b>	<b>Sprue Bushings</b>	<b>Extended Sprues</b>
	<b>Catalog # Prefix</b>	Prefix: PH, PKP	Prefix: LR	Prefix: SPR
<b>Catalog Page</b>	Page: B-1	Page: B-2	Page: B-3	Page: B-4






				
<b>Puller Pins &amp; Bushings</b>	<b>Leader Pins: Inch</b>	<b>Leader Pins: DIN</b>	<b>Leader Pins: Shoulder</b>	<b>Guided Ejector Pins</b>
Prefix: PP, PPB	Prefix: LP	Prefix: LPD	Prefix: SLP	Prefix: GEP, LP
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<b>Bushings: Shoulder</b>	<b>Bushings: Straight</b>	<b>Guided Ejector Bushings</b>	<b>Guided Ej. Bushings: QC</b>	<b>Front Load Pins &amp; Bushings</b>
Prefix: SAB, SHB, SGP, STL	Prefix: STB, STGP	Prefix: GEB, GGP.	Prefix: GQC	Prefix: FLPB
Page: B-10	Page: B-11	Page: B-12	Page: B-13	Page: B-14





				
<b>Guide Blocks</b>	<b>Support Pillars &amp; Columns</b>	<b>Guided Support Pillars</b>	<b>Urethane Springs</b>	<b>Springs</b>
Prefix: GBK	Prefix: SP, SPH	Prefix: GESP	Prefix: US	Prefix: MS, HS
Page: B-15	Page: B-16	Page: B-19	Page: B-20	Page: B-21






				
<b>Stripper Bolts</b>	<b>Stripper Bolt Bushings</b>	<b>Tubular Dowels</b>	<b>Stop Discs &amp; Pins</b>	<b>Mold Straps</b>
Prefix: SBLT	Prefix: SBB	Prefix: TD	Prefix: SD, STP	Prefix: MSTRP
Page: B-24	Page: B-25	Page: B-26	Page: B-27	Page: B-27





<b>ALIGNMENT LOCKS</b>				
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	Prefix: BLB & BLG	Prefix: BLN, BLG	Prefix: SL, SLM	Prefix: TL, TLM
<b>Catalog # Prefix</b>	Page: C-4	Page: C-7	Page: C-8	Page: C-9
<b>Catalog Page</b>				

				
<b>Guide Locks</b>	<b>X-Style Side Locks</b>	<b>Shuttle Mold Sets</b>	<b>Cavity Interlocks: Flat</b>	<b>Cavity Interlocks: Round</b>
Prefix: GL, GLM	Prefix: SLX	Suffix: -SF, -SM	Prefix: CF, CFM	Prefix: CRS, CRSM
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<b>Taper Locks &amp; Plates</b>	<b>Top Lock - 20MM Square</b>	<b>Needle Bearing Locks</b>	<b>Side Locks: Steel</b>	<b>Side Locks: Graphite</b>
Prefix: MTL, FTL, TLP	Prefix: TLM	Prefix: SLR, SLRM, TLR	Prefix: SLS, SLMS	Prefix: SLPM
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<b>DATERS AIR VALVES</b>				
	<b>Locking Series</b>	<b>Tapered Series</b>	<b>RF Series</b>	<b>20 Series</b>
	Prefix: DN, DTN	Prefix: DTPR	Prefix: DF	Prefix: DL
<b>Catalog # Prefix</b>	Page: D-1	Page: D-3	Page: D-4	Page: D-5
<b>Catalog Page</b>				






				
<b>D Series</b>	<b>CH Series</b>	<b>FD Series</b>	<b>Multi-Daters</b>	<b>Retro Plugs</b>
Prefix: DC, Suffix: -D	Prefix: DC	Prefix: DFD	Prefix: DMD	Prefix: DP
Page: D-5	Page: D-6	Page: D-7	Page: D-8	Page: D-9






			
<b>MicroDaters</b>	<b>LG Series</b>	<b>Recycle Inserts</b>	<b>Air Valves &amp; Poppets</b>
Prefix: MD	Prefix: DLB, DLS	Prefix: RI	Prefix: AV, APV
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<b>COOLING ITEMS</b>				
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	Prefix: PC	Prefix: SB, TB	Prefix: JBA	Prefix: RFB
<b>Catalog # Prefix</b>	Page: E-1	Page: E-2	Page: E-4	Page: E-5
<b>Catalog Page</b>				






				
<b>Cascade: Nipple Type</b>	<b>Cascade: High Flow</b>	<b>Cascade: Rear Load Nipple</b>	<b>Cascade: RL Quick Coupler</b>	<b>Cascade: Hex Key, Compact</b>
Prefix: NC	Prefix: HFC	Prefix: RLN	Prefix: RLQC	Prefix: HKC, CC
Page: E-6	Page: E-7	Page: E-8	Page: E-9	Page: E-10






				
<b>Cascade: Quick Coupler</b>	<b>Bubbler Base</b>	<b>Inlet Cascade</b>	<b>Metric Tubes: High Flow, Hex</b>	<b>Tubes: High Flow, Hex</b>
Prefix: QC	Prefix: BBL	Prefix: CF	Prefix: HFTM, HEXM, EHEXM	Prefix: HFT, HEXT
Page: E-11	Page: E-12	Page: E-13	Page: E-14	Page: E-15

				
<b>Tubes: Piston, Brass</b>	<b>O-Rings</b>	<b>Pipe Plugs</b>	<b>Extension Plugs</b>	<b>Connector Plugs</b>
Prefix: PT, T	Prefix: OR	Prefix: BR, ST, SS	Prefix: Numeral	Prefix: Numeral
Page: E-16	Page: E-17	Page: E-20	Page: E-21	Page: E-24

				
<b>Socket Connectors</b>	<b>Connector Plugs: Keyed</b>	<b>Socket Connectors: Keyed</b>	<b>Safety Clips</b>	<b>Adjustable Hex Nipples</b>
Prefix: SC	Prefix: Numeral, Suffix: -K	Prefix: SC, Suffix: -K	Prefix: SC	Prefix: APN
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<b>Hex Key Extension Pipes</b>	<b>Elbows: Hex Key</b>	<b>Pipe Nipples</b>	<b>Push-Lok Hose</b>	<b>Plugs: Water Blockers</b>
Prefix: HKEPN	Prefix: HK, HKEE, HKL	Prefix: BPN, GPN	Prefix: WJH	Prefix: WB
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<b>Plugs: Threadless</b>	<b>Diverting Rods &amp; Plugs</b>	<b>Water Jumpers</b>	<b>Water Jumpers: Swivel</b>	<b>Elbows: Hex, Extension</b>
Prefix: TWP, TAP, TDP	Prefix: D, DR	Prefix: WJ	Prefix: WJ	Prefix: HELS, HELB
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<b>Hose Barbs &amp; Splicers</b>	<b>Combination Hose Inserts</b>	<b>Cover Plugs, Clamps &amp; Tape</b>	<b>Tees &amp; Elbows</b>	<b>Reducers &amp; Couplings</b>
Prefix: MB, FB, HS	Prefix: Numeral	Prefix: CP, HC, TT	Prefix: T, MT, ELS, EL, ELA	Prefix: RB, MR, C, HN
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**MOLD MONITORING**



	<b>CVe Monitor</b>	<b>CVe OnDemand</b>	<b>CVe Live</b>	<b>Remote Validation Kit</b>
<b>Catalog # Prefix</b>	Prefix: CVe			
<b>Catalog Page</b>	Page: F-1	Page: F-3	Page: F-4	Page: F-4



<b>ProFile®</b>	<b>Asset Tags &amp; Plates</b>	<b>CounterView: S-Series</b>	<b>CounterView: R-Series</b>	<b>Insulator Blocks</b>
	Prefix: AMTG, CVTG	Prefix: CVPL, CVIN, CVPLHT	Prefix: CVR-A, CVR-B	Prefix: CV, CVMM, CVRA
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<b>System Cooling</b>	<b>System Cooling Test Rig</b>	<b>MoldTrax</b>
Prefix: SCM	Prefix: SCTR	
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**CAMACTIONS SLIDE COMPONENTS**



	<b>CamAction 100 Series</b>	<b>CamAction 200 Series</b>	<b>CamAction 250 Series</b>	<b>CamAction 300/350 Series</b>
<b>Catalog # Prefix</b>	Prefix: CA, CAMM	Prefix: CA, CAMM	Prefix: CA	Prefix: CA, CAMM
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<b>CamAction 400 Series</b>	<b>Slide Retainers</b>	<b>SRT Bases &amp; Bushings</b>	<b>Angle Pin</b>	<b>Slide Retainer: Urethane</b>
Prefix: CA	Prefix: SRT, SRTM	Prefix: SRTBA, SRTBU	Prefix: AP	Prefix: RET
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<b>Wear Plates</b>	<b>L-GIBS</b>
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Page: G-19	Page: G-20

**LIFTERS UNDERCUT RELEASE**






	<b>UniLifter System</b>	<b>Versa-Lifter System</b>	<b>Spherical Bushings</b>	<b>Lifter Guides</b>
<b>Catalog # Prefix</b>	Prefix: CB, UC, TG	Prefix: UGV, SGV, CBV	Prefix: LSB	Prefix: LG, LHK
<b>Catalog Page</b>	Page: H-1	Page: H-5	Page: H-7	Page: H-8



<b>ModuLifter System</b>	<b>FlexiCore System</b>	<b>Lifter Blades &amp; Cores</b>
Prefix: MLB, MLC, MLR, MLH	Prefix: FCA, FCR, FCDA	Prefix: LBA, LCA
Page: H-10	Page: H-16	Page: H-22



COLLAPSIBLE CORES EXPANDABLE CAVITIES				
	C-Cores: DT Series	DT Core Grinding Fixtures	DT Core Sub-10mm Series	C-Cores: RT Series
	<b>Catalog # Prefix</b>	Prefix: EXCAV	Prefix: DTG	Prefix: S10
<b>Catalog Page</b>	Page: I-1	Page: I-6	Page: I-7	Page: I-9




















	
RT Core Grinding Rings	Expandable Cavities
Prefix: RTGR	Prefix: EXCAV
Page: I-11	Page: I-12

PLATE SEQUENCE CONTROL				
	External Plate Locks	Internal Plate Locks	Friction Pullers	Roller Pullers
	<b>Catalog # Prefix</b>	Prefix: PLC, PLCM	Prefix: PLN	Prefix: FP
<b>Catalog Page</b>	Page: J-1	Page: J-5	Page: J-7	Page: J-8


StackIt System
Prefix: SK
Page: J-9

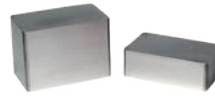
ELECTRICAL COMPONENTS				
	KO Switches	CamAction Switches	Plate Position Switch	Side Action Switch
	<b>Catalog # Prefix</b>	Prefix: SWKO	Prefix: SWCA	Prefix: SWPPS
<b>Catalog Page</b>	Page: K-1	Page: K-3	Page: K-4	Page: K-4

				
External Mount Switches	Thermocouples	Hot Sprue Bushings	Pressure Transducers	Patch Cables
Prefix: SWXM	Prefix: TC	Prefix: BX	Prefix: CPT	Prefix: ECCA
Page: K-5	Page: K-7	Page: K-8	Page: K-10	Page: K-12

		
Jumper Plugs	Recessed Connectors	Wire Channel Inserts
Prefix: ECJP	Prefix: ECRC	Prefix: WC
Page: K-12	Page: K-13	Page: K-13



**RAPID TOOLING INSERTS**



	Rapid Tooling Inserts	RTI: Complete	RTI Cavity & Core Inserts	RTI Frames
<b>Catalog # Prefix</b>	Prefix: RTS, RTL, RTT	Prefix: RTL P	Prefix: RCI, RCIA	Prefix: RTF
<b>Catalog Page</b>	Page: L-1	Page: L-14	Page: L-15	Page: L-16



RTI Pins & Bushings	Frame Sprue Bushing	Support Pillars	Straps	Frame Clamps
Prefix: RLP, RSB, RGEB	Prefix: RFS	Prefix: RSP	Prefix: MS	Prefix: RFC
Page: L-20	Page: L-21	Page: L-21	Page: L-22	Page: L-22

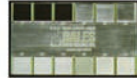


T-Handles
Prefix: T
Page: L-22

**TOOLROOM INNOVATIONS**



	Rhino Foot™	Rhino Toes™	Nozzles	Nozzle Caddie/Wrench
<b>Catalog # Prefix</b>	Prefix: RHF	Prefix: RHT	Prefix: NZFT	Prefix: NZLCAD, NZLWR
<b>Catalog Page</b>	Page: M-1	Page: M-1	Page: M-2	Page: M-3



Toolroom Bench	Status Tags	Mold Finish Guides	Mold Light Bar	Synthetic Grease
Prefix: TRB	Prefix: ST	Prefix: LIT	Prefix: MLB, MLBTF	Prefix: SYN
Page: M-4	Page: M-6	Page: M-7	Page: M-8	Page: M-8



# EJECTOR PINS CORE PINS, SLEEVES

## SECTION A



Ejector Pins: Straight Inch	Ejector Pins: Shoulder Inch	Ejector Pins: Straight DIN	Ejector Pins: Shoulder DIN
Prefix: EP	Prefix: EP	Prefix: EPD	Prefix: EPD
Page: A-2	Page: A-3	Page: A-4	Page: A-5



Ejector Pins: Straight JIS	Ejector Pins: Shoulder JIS	UltraPins: Straight	UltraPins: Shoulder
Prefix: EPJ	Prefix: EPJ	Prefix: EPL	Prefix: EPL
Page: A-6	Page: A-7	Page: A-8	Page: A-9



Blade Ejectors: Inch	Blade Ejectors: DIN	Core Pins	TI Pins
Prefix: BE	Prefix: BE	Prefix: CP	Prefix: TI
Page: A-10	Page: A-11	Page: A-12	Page: A-13



Ejector Sleeves: Inch	Ejector Sleeves: DIN	Thin Wall Sleeves	Sleeve Extensions
Prefix: TI	Prefix: ESD	Prefix: ESTW	Prefix: SXT
Page: A-15	Page: A-15	Page: A-16	Page: A-17



Core Pin Retainers	Return Pins
Prefix: CPR	Prefix: RP
Page: A-18	Page: A-19





# MOLD-READY COMPONENTS

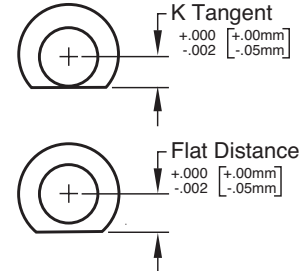
## KEYED PINS, SLEEVES, & BLADE EJECTORS

To order Pins, Sleeves, or Blades with the flat machined on the head tangent to the diameter, designate -K on the end of the catalog number. Ex: EP437L10-K or ES562L5-K.

To order Pins, Sleeves, or Blades with the flat machined on the head at a specific distance from the center of the pin, specify the catalog number and the specific distance after the "K" designation for the flat as shown below.

Examples:

- EP437L10-K.250 for a 7/16" diameter Ejector Pin with a flat 1/4" from center.
- EPD10L200-K6 for a 10mm diameter DIN pin with a flat 6mm from center.
- EPJ055L250-K4 for a 5.5mm diameter JIS pin with a flat 4mm from center.
- CPH125L6-K.094 for a 1/8" diameter Core Pin with a flat ground 3/32" from center.
- ES562L5-K.375 for a 9/16" ID Sleeve with a flat ground 3/8" from center.
- ESTW375L8-K.375 for a 3/8" ID Thin Wall Sleeve with a flat ground .375" from center.
- BE125-046L6.5-K.094 for an Ejector Blade (.046" thickness) with the flat 3/32" from center.

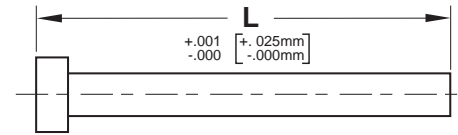
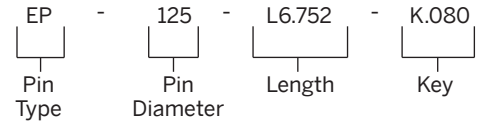


## CUT-TO-LENGTH PINS, SLEEVES, & BLADE EJECTORS

To order Pins, Sleeves, or Blades cut to your specified length,  $+0.001/-0.000$  ( $+0.025/-0.000\text{mm}$ ), with or without keyed heads, specify the length required after the standard catalog numbers.

Examples:

- EP437L6.25-K.250 for a 7/16" diameter pin x 6.25" long with a flat 1/4" from center
- EPD10L225.5 for a 10mm diameter x 225.5mm long DIN pin
- ES562L5.75 for a 9/16" ID Sleeve cut to 5.75" long
- CPH125L5.25 for a 1/8" Core Pin cut to 5.25" long
- BE125-046L4.250-K for an Ejector Blade (.046" thickness) cut to 4.250" with a key tangent to the 1/8" diameter.



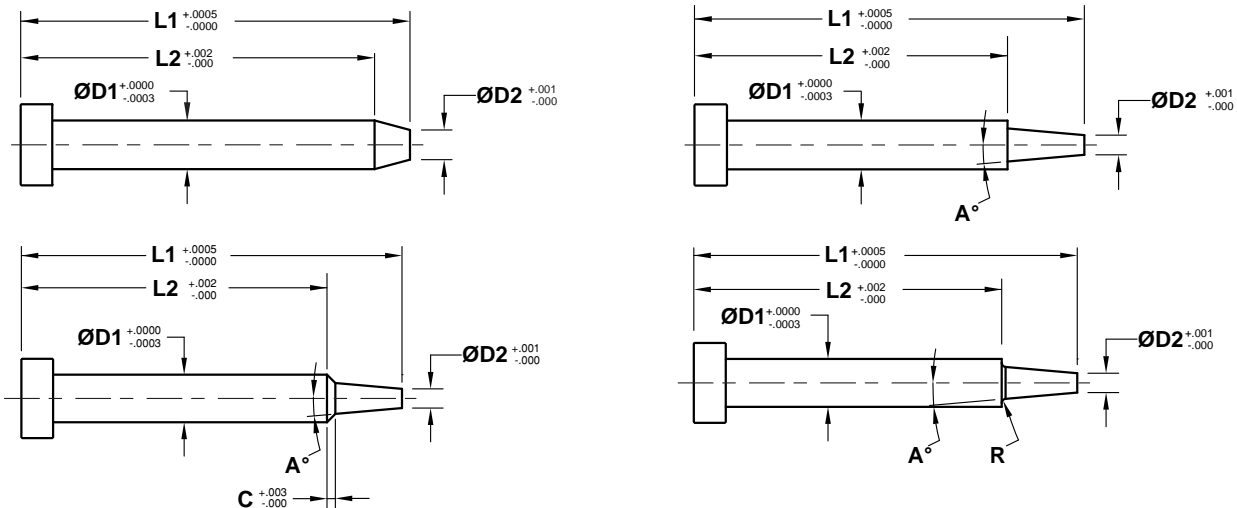
### Additional Services Provided:

- Laser engraving of detail or model numbers can be provided on the heads.
- Ejector Pins and Sleeves can be ordered with Black Nitriding treatment for better performance. To order, specify -BN at the end of the catalog number, including any special modifications to lengths or keys as noted previously.

Contact Customer Service for a quotation.



## FINISHED CORE PINS



Templates can be found in section X and online at [www.procomps.com](http://www.procomps.com). Or, email your drawing to [tech@procomps.com](mailto:tech@procomps.com) for competitive pricing and delivery.

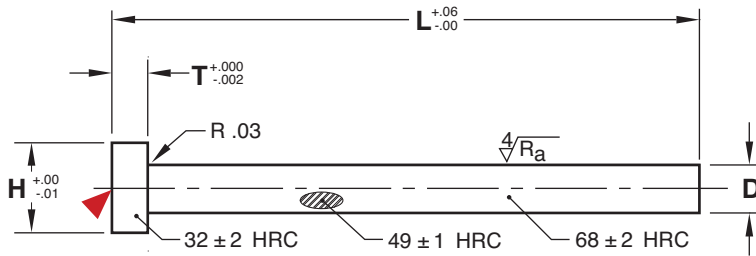
# EJECTOR PINS

## THROUGH-HARD PINS: STRAIGHT - INCH STANDARD



**D Tolerances**

Ø3/64 - Ø7/16	-.0004 -.0007
Ø15/32 and Up	-.0004 -.0009



**M** H-13 **H** Core: 48-50 HRC, Surface: 66-70 HRC

▶ CAD insertion point

D Nominal Pin Diameter	H	T	L=6"		L=10"		L=14"		L=18"		L=25"		L=39"		L=50"	
			D Standard	D Standard	D .005 Oversize	D Standard	D .005 Oversize	D Standard	D .005 Oversize	D Standard	D .005 Oversize	D Standard	D .005 Oversize	D Standard	D Standard	
1/32	.25	.125	EP031L6	—	—	—	—	—	—	—	—	—	—	—	—	—
3/64	.25	.125	EP047L6	—	—	—	—	—	—	—	—	—	—	—	—	—
1/16	.25	.125	EP062L6	EP062L10	—	—	—	—	—	—	—	—	—	—	—	—
5/64	.25	.125	EP078L6	EP078L10	—	—	—	—	—	—	—	—	—	—	—	—
3/32	.25	.125	EP094L6	EP094L10	—	—	—	—	—	—	—	—	—	—	—	—
7/64	.25	.125	EP109L6	EP109L10	—	—	—	—	—	—	—	—	—	—	—	—
1/8	.25	.125	EP125L6	EP125L10	EP130L10	EP125L14	EP130L14	EP125L18	—	EP125L25	—	—	—	—	—	—
9/64	.25	.125	—	EP141L10	—	EP141L14	EP146L14	—	—	—	—	—	—	—	—	—
5/32	.28	.156	EP156L6	EP156L10	EP161L10	EP156L14	EP161L14	EP156L18	—	EP156L25	—	—	—	—	—	—
11/64	.34	.187	—	EP172L10	—	EP172L14	EP177L14	—	—	—	—	—	—	—	—	—
3/16	.37	.187	EP187L6	EP187L10	EP192L10	EP187L14	EP192L14	EP187L18	—	EP187L25	—	—	EP187L39	EP187L50	—	—
13/64	.37	.187	—	EP203L10	—	EP203L14	EP208L14	—	—	—	—	—	—	—	—	—
7/32	.40	.187	EP219L6	EP219L10	EP224L10	EP219L14	EP224L14	—	—	EP219L25	—	—	—	—	—	—
15/64	.40	.187	—	EP234L10	—	EP234L14	EP239L14	—	—	—	—	—	—	—	—	—
1/4	.43	.187	EP250L6	EP250L10	EP255L10	EP250L14	EP255L14	EP250L18	EP255L18	EP250L25	—	—	EP250L39	EP250L50	—	—
17/64	.43	.250	—	EP266L10	—	EP266L14	EP271L14	—	—	EP266L25	—	—	—	—	—	—
9/32	.43	.250	EP281L6	EP281L10	EP286L10	EP281L14	EP286L14	EP281L18	EP286L18	EP281L25	—	—	—	—	—	—
19/64	.50	.250	—	EP297L10	—	EP297L14	EP302L14	—	—	—	—	—	—	—	—	—
5/16	.50	.250	EP312L6	EP312L10	EP317L10	EP312L14	EP317L14	EP312L18	EP317L18	EP312L25	EP317L25	EP312L39	EP312L50	—	—	—
21/64	.56	.250	—	EP328L10	—	EP328L14	EP333L14	—	—	EP328L25	—	—	—	—	—	—
11/32	.56	.250	EP344L6	EP344L10	EP349L10	EP344L14	EP349L14	—	—	EP344L25	—	—	—	—	—	—
23/64	.62	.250	—	EP359L10	—	EP359L14	EP364L14	—	—	—	—	—	—	—	—	—
3/8	.62	.250	EP375L6	EP375L10	EP380L10	EP375L14	EP380L14	EP375L18	EP380L18	EP375L25	EP380L25	EP375L39	EP375L50	—	—	—
25/64	.62	.250	—	—	—	EP390L14	EP395L14	EP390L18	—	—	EP395L25	—	—	—	—	—
13/32	.68	.250	EP406L6	EP406L10	EP411L10	EP406L14	EP411L14	EP406L18	—	EP406L25	—	—	—	—	—	—
27/64	.68	.250	—	—	—	EP422L14	EP427L14	—	—	—	—	—	—	—	—	—
7/16	.68	.250	EP437L6	EP437L10	EP442L10	EP437L14	EP442L14	EP437L18	—	EP437L25	—	—	EP437L39	EP437L50	—	—
29/64	.68	.250	—	—	—	EP453L14	EP458L14	—	—	—	—	—	—	—	—	—
15/32	.75	.250	—	EP469L10	EP474L10	—	EP474L14	EP469L18	—	EP469L25	—	—	—	—	—	—
31/64	.75	.250	—	—	—	EP484L14	EP489L14	—	—	—	—	—	—	—	—	—
1/2	.75	.250	EP500L6	EP500L10	EP505L10	EP500L14	EP505L14	EP500L18	—	EP500L25	EP505L25	EP500L39	EP500L50	—	—	—
17/32	.75	.250	—	—	—	EP531L14	EP536L14	—	—	EP531L25	—	—	—	—	—	—
9/16	.81	.250	EP562L6	EP562L10	—	EP562L14	—	EP562L18	—	EP562L25	—	—	EP562L39	EP562L50	—	—
5/8	.87	.250	EP625L6	EP625L10	—	EP625L14	—	EP625L18	—	EP625L25	—	—	EP625L39	EP625L50	—	—
11/16	.93	.250	—	EP687L10	—	—	—	EP687L18	—	EP687L25	—	—	—	—	—	—
3/4	1.00	.250	EP750L6	EP750L10	—	EP750L14	—	EP750L18	—	EP750L25	—	—	EP750L39	EP750L50	—	—
7/8	1.12	.250	—	EP875L10	—	EP875L14	—	EP875L18	—	EP875L25	—	—	EP875L39	EP875L50	—	—
1	1.25	.250	EP1000L6	EP1000L10	—	EP1000L14	—	EP1000L18	—	EP1000L25	—	—	EP1000L39	EP1000L50	—	—

To order pins with the keys tangent to the diameter, add "-K" to the end of the catalog number.  
 For Ejector Pins cut-to-length, with non-tangent keys, or Black Nitride, refer to page A-1.

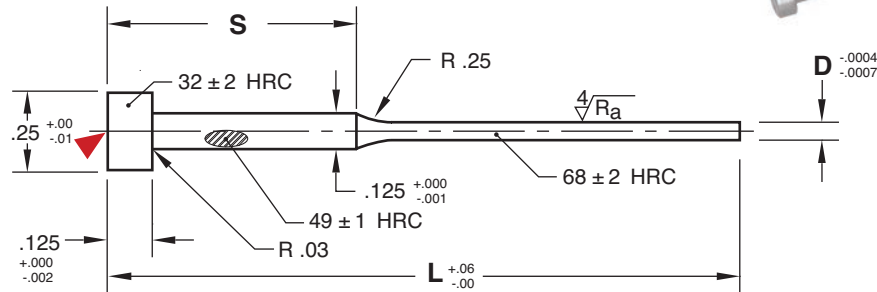






# EJECTOR PINS

## SHOULDER PINS: INCH STANDARD



**M** H-13 **H** Core: 48-50 HRC, Surface: 66-70 HRC

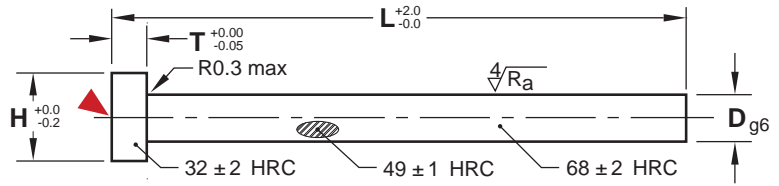
CAD insertion point

D Nominal Pin Diameter	S Shoulder Length	L=6"		L=10"		L=14"	
		D Standard	D .005 Oversize	D Standard	D .005 Oversize	D Standard	D .005 Oversize
1/32	1/2	EP031L6-05	EP036L6-05	—	—	—	—
	2	EP031L6-20	—	EP031L10-20	EP036L10-20	—	—
	3	EP031L6-30	—	—	—	—	—
	4	EP031L6-40	—	—	—	—	—
3/64	1/2	EP047L6-05	—	EP047L10-05	EP052L10-05	—	—
	2	EP047L6-20	—	EP047L10-20	EP052L10-20	EP047L14-20	—
	3	—	—	EP047L10-30	—	—	—
	4	—	—	EP047L10-40	EP052L10-40	EP047L14-40	EP052L14-40
1/16	1/2	EP062L6-05	—	EP062L10-05	EP067L10-05	—	—
	2	EP062L6-20	—	EP062L10-20	EP067L10-20	EP062L14-20	—
	3	—	—	EP062L10-30	—	—	—
	4	—	—	EP062L10-40	EP067L10-40	EP062L14-40	EP067L14-40
5/64	1/2	EP078L6-05	—	EP078L10-05	EP083L10-05	—	—
	2	EP078L6-20	—	EP078L10-20	EP083L10-20	EP078L14-20	—
	3	—	—	EP078L10-30	—	—	—
	4	—	—	EP078L10-40	EP083L10-40	EP078L14-40	EP083L14-40
3/32	1/2	EP094L6-05	—	EP094L10-05	EP099L10-05	—	—
	2	EP094L6-20	—	EP094L10-20	EP099L10-20	EP094L14-20	—
	3	—	—	EP094L10-30	—	—	—
	4	—	—	EP094L10-40	EP099L10-40	EP094L14-40	EP099L14-40
7/64	1/2	EP109L6-05	—	EP109L10-05	EP114L10-05	—	—
	2	EP109L6-20	—	EP109L10-20	EP114L10-20	EP109L14-20	—
	3	—	—	EP109L10-30	—	—	—
	4	—	—	EP109L10-40	EP114L10-40	EP109L14-40	EP114L14-40

To order pins with the keys tangent to the shoulder diameter, add "-K" to the end of the catalog number. For Ejector Pins cut-to-length, with non-tangent keys, or Black Nitride, refer to page A-1.

# EJECTOR PINS

## STRAIGHT PINS: DIN STANDARD



**M** 1.2344 (H-13) **H** Core: 48-50 HRC, Surface: 66-70 HRC

CAD insertion point

D Pin Diameter	H	T	L=125MM	L=160MM	L=200MM	L=250MM	L=400MM	L=630MM	L=1000MM
1.2	3	1.5	EPD012L125	EPD012L160	—	—	—	—	—
1.5	3	1.5	EPD015L125	EPD015L160	EPD015L200	EPD015L250	—	—	—
1.6	3	1.5	EPD016L125	—	EPD016L200	EPD016L250	—	—	—
1.7	3	1.5	EPD017L125	—	EPD017L200	EPD017L250	—	—	—
1.8	3	1.5	EPD018L125	—	EPD018L200	EPD018L250	—	—	—
2	4	2	EPD02L125	EPD02L160	EPD02L200	EPD02L250	EPD02L400	—	—
2.2	4	2	EPD022L125	EPD022L160	EPD022L200	EPD022L250	EPD022L400	—	—
2.5	5	2	EPD025L125	EPD025L160	EPD025L200	EPD025L250	EPD025L400	—	—
2.7	5	2	—	EPD027L160	—	EPD027L250	EPD027L400	—	—
3	6	3	EPD03L125	EPD03L160	EPD03L200	EPD03L250	EPD03L400	EPD03L630	—
3.2	6	3	EPD032L125	EPD032L160	EPD032L200	EPD032L250	EPD032L400	—	—
3.5	7	3	EPD035L125	EPD035L160	EPD035L200	EPD035L250	EPD035L400	—	—
3.7	7	3	—	EPD037L160	—	EPD037L250	EPD037L400	—	—
4	8	3	EPD04L125	EPD04L160	EPD04L200	EPD04L250	EPD04L400	EPD04L630	—
4.1	8	3	—	EPD041L160	—	EPD041L250	EPD041L400	—	—
4.2	8	3	EPD042L125	EPD042L160	EPD042L200	EPD042L250	EPD042L400	—	—
4.5	8	3	EPD045L125	EPD045L160	EPD045L200	EPD045L250	EPD045L400	—	—
4.7	8	3	EPD047L125	EPD047L160	EPD047L200	EPD047L250	EPD047L400	—	—
5	10	3	EPD05L125	EPD05L160	EPD05L200	EPD05L250	EPD05L400	EPD05L630	EPD05L1000
5.2	10	3	EPD052L125	EPD052L160	EPD052L200	EPD052L250	EPD052L400	EPD052L630	—
5.5	10	3	EPD055L125	EPD055L160	EPD055L200	EPD055L250	EPD055L400	—	—
6	12	5	EPD06L125	EPD06L160	EPD06L200	EPD06L250	EPD06L400	EPD06L630	EPD06L1000
6.1	12	5	—	EPD061L160	—	EPD061L250	EPD061L400	—	—
6.2	12	5	EPD062L125	EPD062L160	EPD062L200	EPD062L250	EPD062L400	EPD062L630	—
6.5	12	5	EPD065L125	EPD065L160	EPD065L200	EPD065L250	EPD065L400	—	—
7	12	5	EPD07L125	EPD07L160	EPD07L200	EPD07L250	EPD07L400	EPD07L630	EPD07L1000
7.5	12	5	—	EPD075L160	—	EPD075L250	EPD075L400	—	—
8	14	5	EPD08L125	EPD08L160	EPD08L200	EPD08L250	EPD08L400	EPD08L630	EPD08L1000
8.2	14	5	EPD082L125	EPD082L160	EPD082L200	EPD082L250	EPD082L400	EPD082L630	—
8.5	14	5	EPD085L125	EPD085L160	EPD085L200	EPD085L250	EPD085L400	—	—
9	14	5	EPD09L125	EPD09L160	EPD09L200	EPD09L250	EPD09L400	—	—
9.5	14	5	—	EPD095L160	—	EPD095L250	EPD095L400	—	—
10	16	5	EPD10L125	EPD10L160	EPD10L200	EPD10L250	EPD10L400	EPD10L630	EPD10L1000
10.2	16	5	EPD102L125	EPD102L160	EPD102L200	EPD102L250	EPD102L400	—	—
10.5	16	5	EPD105L125	EPD105L160	EPD105L200	EPD105L250	EPD105L400	—	—
11	16	5	EPD11L125	EPD11L160	EPD11L200	EPD11L250	EPD11L400	—	—
12	18	7	EPD12L125	EPD12L160	EPD12L200	EPD12L250	EPD12L400	EPD12L630	EPD12L1000
12.2	18	7	EPD122L125	EPD122L160	EPD122L200	EPD122L250	EPD122L400	—	—
12.5	18	7	EPD125L125	EPD125L160	EPD125L200	EPD125L250	EPD125L400	—	—
14	22	7	EPD14L125	EPD14L160	EPD14L200	EPD14L250	EPD14L400	EPD14L630	—
16	22	7	EPD16L125	EPD16L160	EPD16L200	EPD16L250	EPD16L400	EPD16L630	—
16.2	22	7	—	—	—	EPD162L250	EPD162L400	EPD162L630	—
18	24	7	—	EPD18L160	EPD18L200	EPD18L250	EPD18L400	EPD18L630	—
20	26	8	—	EPD20L160	EPD20L200	EPD20L250	EPD20L400	EPD20L630	EPD20L1000
25	32	10	—	EPD25L160	EPD25L200	EPD25L250	EPD25L400	EPD25L630	EPD25L1000
32	40	10	—	EPD32L160	EPD32L200	EPD32L250	EPD32L400	EPD32L630	EPD32L1000

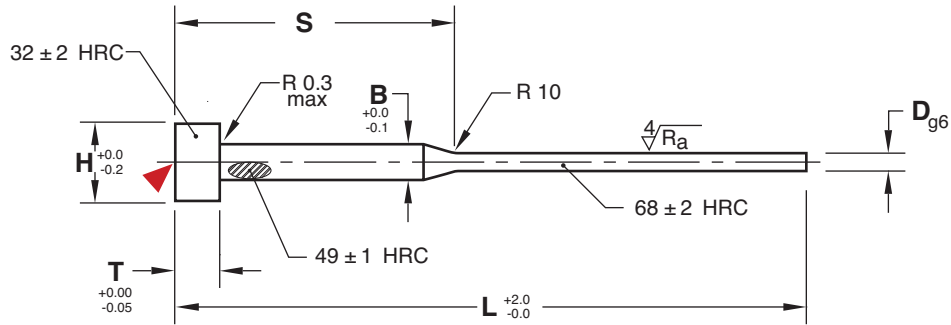
To order pins with the keys tangent to the diameter, add "-K" to the end of the catalog number.  
 For Ejector Pins cut-to-length, with non-tangent keys, or Black Nitride, refer to page A-1.





# EJECTOR PINS

## SHOULDER PINS: DIN STANDARD



**M** 1.2344 (H-13) **H** Core: 48-50 HRC, Surface: 66-70 HRC

CAD insertion point

D Nominal Diameter	B	H	T	L=125MM S=50MM	L=160MM S=75MM	L=200MM S=75MM
0.8	2	4	2	EPD008X2L125-50	EPD008X2L160-75	—
0.9	2	4	2	EPD009X2L125-50	EPD009X2L160-75	—
1	2	4	2	EPD01X2L125-50	EPD01X2L160-75	EPD01X2L200-75
1.1	2	4	2	EPD011X2L125-50	EPD011X2L160-75	—
1.2	2	4	2	EPD012X2L125-50	EPD012X2L160-75	—
1.3	2	4	2	EPD013X2L125-50	EPD013X2L160-75	EPD013X2L200-75
1.4	2	4	2	EPD014X2L125-50	EPD014X2L160-75	—
1.5	3	6	3	EPD015X3L125-50	EPD015X3L160-75	EPD015X3L200-75
1.6	3	6	3	EPD016X3L125-50	EPD016X3L160-75	EPD016X3L200-75
1.7	3	6	3	—	EPD017X3L160-75	EPD017X3L200-75
1.8	3	6	3	EPD018X3L125-50	EPD018X3L160-75	EPD018X3L200-75
2	3	6	3	EPD02X3L125-50	EPD02X3L160-75	EPD02X3L200-75
2.2	3	6	3	—	EPD022X3L160-75	EPD022X3L200-75
2.5	3	6	3	EPD025X3L125-50	EPD025X3L160-75	EPD025X3L200-75



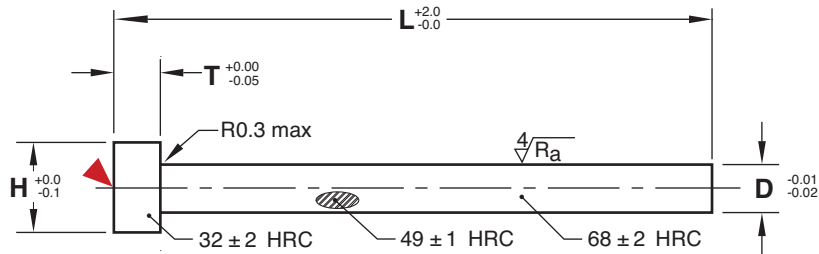
To order pins with the keys tangent to the shoulder diameter, add "-K" to the end of the catalog number. For Ejector Pins cut-to-length, with non-tangent keys, or Black Nitride, refer to page A-1.

## STANDARD TOLERANCES

NOMINAL DIAMETER (MM)		SHAFT TOLERANCE	
Over	To	g6	
0	3	-.002	-.008
3	6	-.004	-.012
6	10	-.005	-.014
10	18	-.006	-.017
18	30	-.007	-.020
30	50	-.009	-.025

# EJECTOR PINS

## STRAIGHT PINS: JIS STANDARD



**M** SKD61 (H-13) **H** Core: 48-50 HRC, Surface: 66-70 HRC

CAD insertion point

D Pin Diam.	H	T	L=100MM	L=150MM	L=200MM	L=250MM	L=300MM	L=400MM	L=500MM	L=600MM	L=650MM
1	4	4	EPJ01L100	EPJ01L150	EPJ01L200	—	—	—	—	—	—
1.5	4	4	EPJ015L100	EPJ015L150	EPJ015L200	EPJ015L250	—	—	—	—	—
2	5	4	EPJ02L100	EPJ02L150	EPJ02L200	EPJ02L250	—	—	—	—	—
2.5	6	4	EPJ025L100	EPJ025L150	EPJ025L200	EPJ025L250	—	—	—	—	—
3	6	4	EPJ03L100	EPJ03L150	EPJ03L200	EPJ03L250	—	—	—	—	—
3.5	7	4	EPJ035L100	EPJ035L150	EPJ035L200	EPJ035L250	—	—	—	—	—
4	8	6	—	—	EPJ04L200	EPJ04L250	EPJ04L300	EPJ04L400	—	—	—
4.5	8	6	—	—	EPJ045L200	EPJ045L250	EPJ045L300	EPJ045L400	—	—	—
5	9	6	—	—	EPJ05L200	EPJ05L250	EPJ05L300	EPJ05L400	—	—	—
5.5	10	6	—	—	EPJ055L200	EPJ055L250	EPJ055L300	EPJ055L400	—	—	—
6	10	6	—	—	EPJ06L200	EPJ06L250	EPJ06L300	EPJ06L400	EPJ06L500	—	—
7	11	6	—	—	—	EPJ07L250	EPJ07L300	EPJ07L400	EPJ07L500	—	—
8	13	8	—	—	—	—	—	EPJ08L400	EPJ08L500	EPJ08L600	—
10	15	8	—	—	—	—	—	EPJ10L400	EPJ10L500	EPJ10L600	—
12	17	8	—	—	—	—	—	—	EPJ12L500	EPJ12L600	EPJ12L650
14	19	8	—	—	—	—	—	—	EPJ14L500	—	—
15	19	8	—	—	—	—	—	—	EPJ15L500	—	—
16	21	8	—	—	—	—	—	—	EPJ16L500	—	—
18	23	8	—	—	—	—	—	—	EPJ18L500	—	—
20	25	8	—	—	—	—	—	—	EPJ20L500	—	—

To order pins with the keys tangent to the diameter, add “-K” to the end of the catalog number.

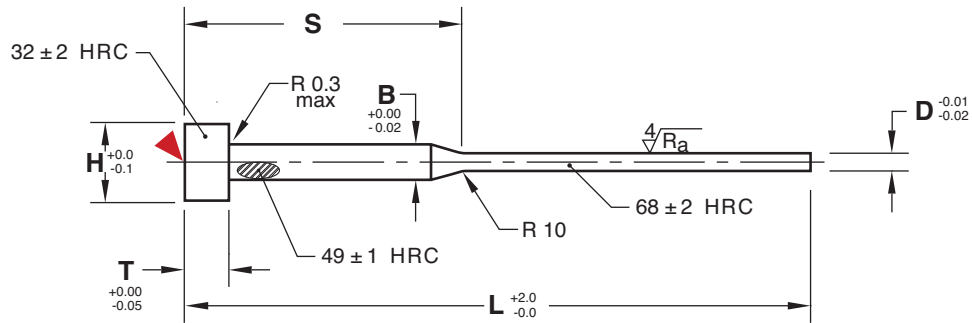
For Ejector Pins cut-to-length, with non-tangent keys, or Black Nitride, refer to page A-1.





# EJECTOR PINS

## SHOULDER PINS: JIS STANDARD



**M** SKD61 (H-13) **H** Core: 48-50 HRC, Surface: 66-70 HRC

▶ CAD insertion point

D Nominal Diameter	B	H	T	L=150MM		L=200MM	
				S=50MM	S=70MM	S=70MM	S=100MM
1	2.5	5	4	EPJ01X25L150-50	—	—	EPJ01X25L200-100
	3	6	4	EPJ01X3L150-50	—	EPJ01X3L200-70	EPJ01X3L200-100
1.2	2.5	5	4	EPJ012X25L150-50	—	—	EPJ012X25L200-100
	3	6	4	EPJ012X3L150-50	—	EPJ012X3L200-70	EPJ012X3L200-100
1.5	2.5	5	4	EPJ015X25L150-50	—	—	EPJ015X25L200-100
	3	6	4	EPJ015X3L150-50	—	EPJ015X3L200-70	EPJ015X3L200-100
	4	8	6	EPJ015X4L150-50	—	—	EPJ015X4L200-100
2	3	6	4	EPJ02X3L150-50	—	EPJ02X3L200-70	EPJ02X3L200-100
	4	8	6	—	EPJ02X4L150-70	—	EPJ02X4L200-100
2.5	3	6	4	EPJ025X3L150-50	—	EPJ025X3L200-70	EPJ025X3L200-100
	4	8	6	—	EPJ025X4L150-70	—	EPJ025X4L200-100
3	4	8	6	—	EPJ03X4L150-70	—	EPJ03X4L200-100
	5	9	6	—	—	—	EPJ03X5L200-100

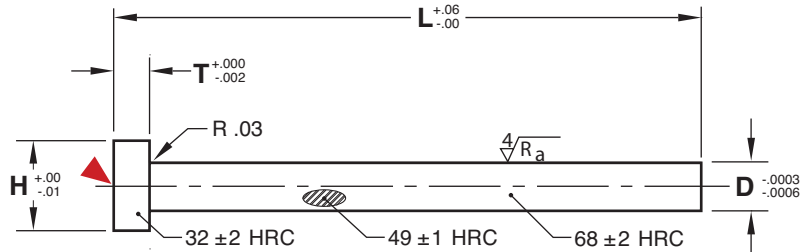
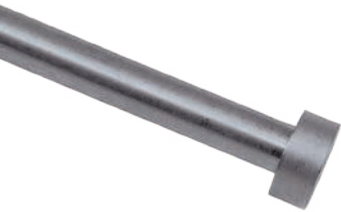


To order pins with the keys tangent to the shoulder diameter, add “-K” to the end of the catalog number. For Ejector Pins cut-to-length, with non-tangent keys, or Black Nitride, refer to page A-1.



# ULTRAPINS®

## TREATED STRAIGHT PINS



**M** H-13   **H** Core: 48-50 HRC, Surface: 66-70 HRC   **M** Chrome Plated: .00005-.00007" Thick   CAD insertion point

Nominal Diameter	D Actual Diameter	H	T	L=6" D Standard	L=10" D Standard	L=14" D Standard	D Actual Oversized Pin Diam.	L=10" D .005 Oversize
1/16	.0622 .0619	.25	.125	—	EPL062L10	—	—	—
5/64	.0778 .0775	.25	.125	—	EPL078L10	—	—	—
3/32	.0934 .0931	.25	.125	—	EPL094L10	—	—	—
1/8	.1247 .1244	.25	.125	EPL125L6	EPL125L10	EPL125L14	.1297 .1294	EPL130L10
5/32	.1560 .1557	.28	.156	EPL156L6	EPL156L10	—	.1610 .1607	EPL161L10
3/16	.1872 .1869	.37	.187	EPL187L6	EPL187L10	EPL187L14	.1922 .1919	EPL192L10
7/32	.2185 .2182	.40	.187	EPL219L6	EPL219L10	—	.2235 .2232	EPL224L10
1/4	.2497 .2494	.43	.187	EPL250L6	EPL250L10	EPL250L14	.2547 .2544	EPL255L10
5/16	.3122 .3119	.50	.250	EPL312L6	EPL312L10	EPL312L14	—	—
3/8	.3747 .3744	.62	.250	EPL375L6	EPL375L10	EPL375L14	—	—
7/16	.4372 .4369	.69	.250	EPL437L6	EPL437L10	EPL437L14	—	—
1/2	.4997 .4994	.75	.250	—	EPL500L10	EPL500L14	—	—

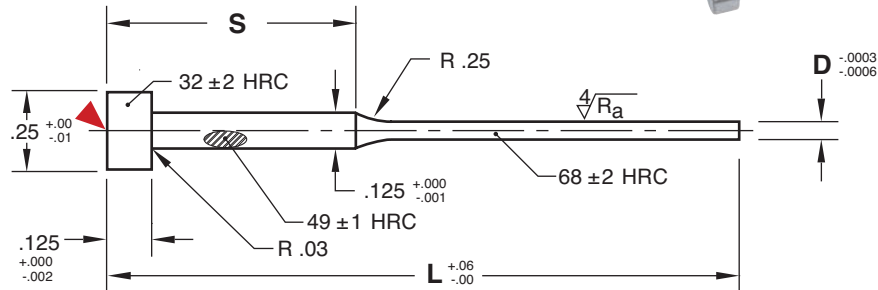
To order pins with the keys tangent to the diameter, add "-K" to the end of the catalog number.  
For Ultra Pins cut-to-length or with non-tangent keys, refer to page A-1.

### Application Guidelines:

- Maximum operating temperature: 660° F (350° C).
- Not recommended for Die Cast or PVC molding.
- Contact Customer Service for availability on other diameters and lengths not shown.



# ULTRAPINS® TREATED SHOULDER PINS



**M** H-13 **H** Core: 48-50 HRC, Surface: 66-70 HRC **M** Chrome Plated: .00005-.00007" Thick ▶ CAD insertion point

Nominal Diameter	D Actual Diameter	S Shoulder Length	L=6" D Standard	L=10" D Standard	D Actual Oversized Pin Diameter	L=10" .005 Oversize
1/32	.0310 .0307	1/2	EPL031L6-05	—	—	—
		2	EPL031L6-20	—	—	—
3/64	.0466 .0463	1/2	EPL047L6-05	—	.0516 .0513	EPL052L10-05
		2	EPL047L6-20	EPL047L10-20		EPL052L10-20
		3	-	EPL047L10-30	-	-
		4	-	EPL047L10-40	-	-
1/16	.0622 .0619	1/2	EPL062L6-05	—	.0672 .0669	EPL067L10-05
		2	EPL062L6-20	EPL062L10-20		EPL067L10-20
		3	-	EPL062L10-30	-	-
		4	-	EPL062L10-40	-	-
5/64	.0778 .0775	1/2	EPL078L6-05	—	.0828 .0825	EPL083L10-05
		2	EPL078L6-20	EPL078L10-20		EPL083L10-20
		3	-	EPL078L10-30	-	-
		4	-	EPL078L10-40	-	-
3/32	.0934 .0931	1/2	EPL094L6-05	—	.0985 .0982	EPL099L10-05
		2	EPL094L6-20	EPL094L10-20		EPL099L10-20
		3	-	EPL094L10-30	-	-
		4	-	EPL094L10-40	-	-
7/64	.1091 .1088	1/2	EPL109L6-05	—	.1141 .1138	EPL114L10-05
		2	EPL109L6-20	EPL109L10-20		EPL114L10-20

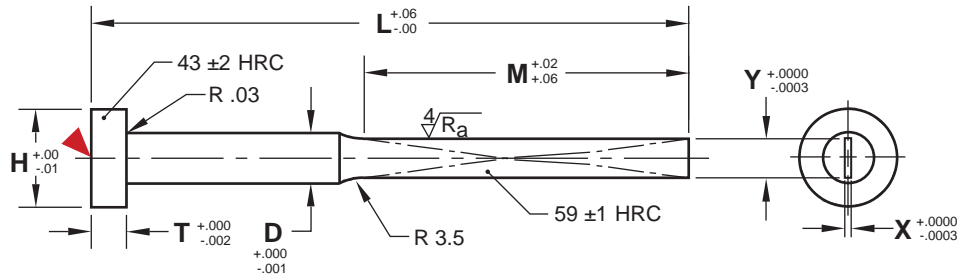
To order pins with the keys tangent to the shoulder diameter, add "-K" to the end of the catalog number. For Ultra Pins cut-to-length or with non-tangent keys refer to page A-1.

### Application Guidelines:

- Maximum operating temperature: 660° F (350° C).
- Not recommended for Die Cast or PVC molding.
- Contact Customer Service for availability of other diameters and lengths not shown.

# BLADE EJECTORS

## INCH STANDARD



**M** O-1 **H** 58-60 HRC

CAD insertion point

X	Y	D	H	T	L=6.5"	L=7.5"	L=10.5"
.0150	.0460	.062	.250	.125	BE062-015L6.5	BE062-015L7.5	—
.0150	.1000	.125	.250	.125	BE125-015L6.5	BE125-015L7.5	—
.0200	.0460	.062	.250	.125	BE062-020L6.5	BE062-020L7.5	—
.0200	.1000	.125	.250	.125	BE125-020L6.5	BE125-020L7.5	—
.0240	.1000	.125	.250	.125	BE125-024L6.5	BE125-024L7.5	—
.0240	.1400	.156	.281	.156	BE156-024L6.5	BE156-024L7.5	—
.0240	.1720	.187	.375	.187	BE187-024L6.5	BE187-024L7.5	—
.0320	.1000	.125	.250	.125	BE125-032L6.5	BE125-032L7.5	—
.0320	.1400	.156	.281	.156	BE156-032L6.5	BE156-032L7.5	—
.0320	.1720	.187	.375	.187	BE187-032L6.5	BE187-032L7.5	BE187-032L10.5
.0320	.2340	.250	.437	.187	BE250-032L6.5	BE250-032L7.5	BE250-032L10.5
.0320	.2960	.312	.500	.250	—	BE312-032L7.5	BE312-032L10.5
.0320	.3590	.375	.625	.250	—	BE375-032L7.5	BE375-032L10.5
.0460	.1000	.125	.250	.125	BE125-046L6.5	BE125-046L7.5	—
.0460	.1400	.156	.281	.156	BE156-046L6.5	BE156-046L7.5	—
.0460	.1720	.187	.375	.187	BE187-046L6.5	BE187-046L7.5	BE187-046L10.5
.0460	.2340	.250	.437	.187	BE250-046L6.5	BE250-046L7.5	BE250-046L10.5
.0460	.2960	.312	.500	.250	—	BE312-046L7.5	BE312-046L10.5
.0460	.3590	.375	.625	.250	—	BE375-046L7.5	BE375-046L10.5
.0620	.1720	.187	.375	.187	BE187-062L6.5	BE187-062L7.5	BE187-062L10.5
.0620	.2340	.250	.437	.187	BE250-062L6.5	BE250-062L7.5	BE250-062L10.5
.0620	.2960	.312	.500	.250	—	BE312-062L7.5	BE312-062L10.5
.0620	.3590	.375	.625	.250	—	BE375-062L7.5	BE375-062L10.5
.0780	.2960	.312	.500	.250	—	BE312-078L7.5	BE312-078L10.5
.0780	.3590	.375	.625	.250	—	BE375-078L7.5	BE375-078L10.5
.0780	.4840	.500	.750	.250	—	BE500-078L7.5	BE500-078L10.5
.0780	.5470	.562	.812	.250	—	BE562-078L7.5	BE562-078L10.5
.0780	.6090	.625	.875	.250	—	BE625-078L7.5	BE625-078L10.5
.0940	.4220	.437	.687	.250	—	BE437-094L7.5	BE437-094L10.5
.0940	.4840	.500	.750	.250	—	BE500-094L7.5	BE500-094L10.5
.0940	.5470	.562	.812	.250	—	BE562-094L7.5	BE562-094L10.5
.0940	.6090	.625	.875	.250	—	BE625-094L7.5	BE625-094L10.5
Blade Length <b>M</b>					M = 5"	M = 5"	M = 6"



To order Blade Ejectors with the keys tangent to the diameter, add "-K" to the end of the catalog number.

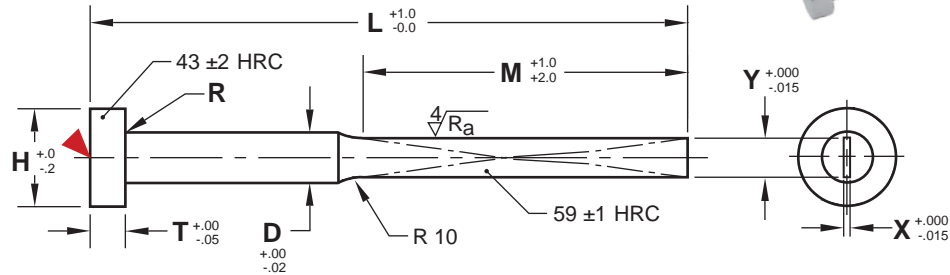
For Blades cut-to-length or with non-tangent keys, refer to page A-1.

Mold-ready Blade Ejectors can be quoted via the templates in section X.



# BLADE EJECTORS

## DIN STANDARD



**M** O-1 **H** 58-60 HRC

▶ CAD insertion point

X	Y	D	H	T	R	L= 60 MM	L= 80 MM	L= 100 MM	L= 125 MM	L= 160 MM	L= 200 MM	L= 250 MM	L= 315 MM	L= 400 MM
1.0	3.5	4	8	3	0.3	BE4-1.0L60	BE4-1.0L80	BE4-1.0L100	BE4-1.0L125	BE4-1.0L160	—	—	—	—
1.2	3.5	4	8	3	0.3	—	BE4-1.2L80	BE4-1.2L100	BE4-1.2L125	BE4-1.2L160	—	—	—	—
1.5	4.5	5	10	3	0.3	—	BE5-1.5L80	BE5-1.5L100	BE5-1.5L125	BE5-1.5L160	—	—	—	—
1.2	5.5	6	12	5	0.5	—	BE6-1.2L80	BE6-1.2L100	BE6-1.2L125	BE6-1.2L160	BE6-1.2L200	—	—	—
1.5	5.5	6	12	5	0.5	—	BE6-1.5L80	BE6-1.5L100	BE6-1.5L125	BE6-1.5L160	BE6-1.5L200	—	—	—
2.0	5.5	6	12	5	0.5	—	BE6-2.0L80	BE6-2.0L100	BE6-2.0L125	BE6-2.0L160	BE6-2.0L200	—	—	—
1.2	7.5	8	14	5	0.5	—	—	BE8-1.2L100	BE8-1.2L125	BE8-1.2L160	BE8-1.2L200	BE8-1.2L250	—	—
1.5	7.5	8	14	5	0.5	—	—	BE8-1.5L100	BE8-1.5L125	BE8-1.5L160	BE8-1.5L200	BE8-1.5L250	—	—
2.0	7.5	8	14	5	0.5	—	—	BE8-2.0L100	BE8-2.0L125	BE8-2.0L160	BE8-2.0L200	BE8-2.0L250	BE8-2.0L315	—
1.5	9.5	10	16	5	0.5	—	—	—	—	BE10-1.5L160	BE10-1.5L200	BE10-1.5L250	BE10-1.5L315	—
2.0	9.5	10	16	5	0.5	—	—	—	—	BE10-2.0L160	BE10-2.0L200	BE10-2.0L250	BE10-2.0L315	BE10-2.0L400
2.0	11.5	12	20	7	0.8	—	—	—	—	—	BE12-2.0L200	BE12-2.0L250	BE12-2.0L315	BE12-2.0L400
2.5	11.5	12	20	7	0.8	—	—	—	—	—	BE12-2.5L200	BE12-2.5L250	BE12-2.5L315	BE12-2.5L400
2.0	15.5	16	22	7	0.8	—	—	—	—	—	BE16-2.0L200	BE16-2.0L250	BE16-2.0L315	BE16-2.0L400
2.5	15.5	16	22	7	0.8	—	—	—	—	—	BE16-2.5L200	BE16-2.5L250	BE16-2.5L315	BE16-2.5L400
Blade Length M						M 30 mm	M 40 mm	M 50 mm	M 60 mm	M 80 mm	M 100 mm	M 125 mm	M 160 mm	M 200 mm



To order Blade Ejectors with the keys tangent to the diameter, add “-K” to the end of the catalog number.

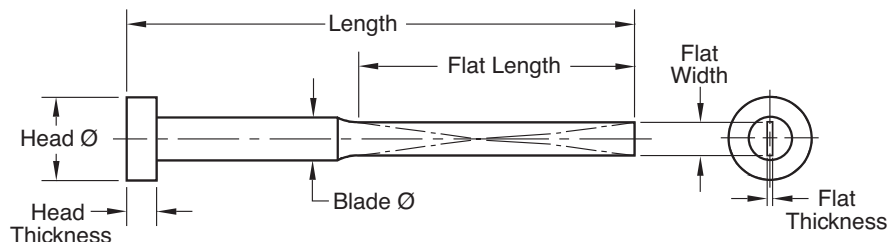
For Blades cut-to-length or with non-tangent keys, refer to page A-1.

Mold-ready Blade Ejectors can be quoted via the templates in section X.

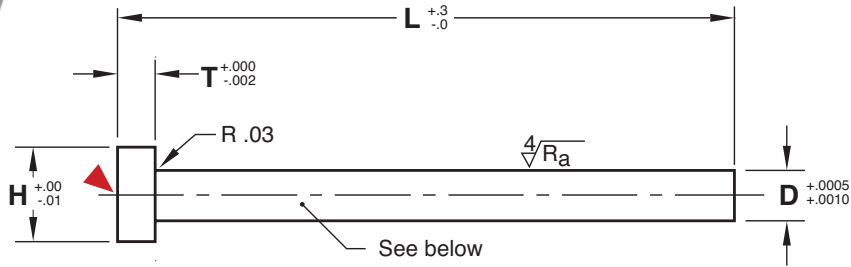
### JIS SPECIFICATION

MATERIAL: O-1

Contact Customer Service for the availability of JIS Blade Ejectors by specifying the information shown below:



# CORE PINS



**M** H-13 **H** 30-35 HRC

D Nominal Pin Dia.	H Head Dia.	T Head Thick.	L=3"	L=6"	L=10"	L=14"
3/32	.25	.125	CPS094L3	CPS094L6	CPS094L10	—
7/64	.25	.125	CPS109L3	CPS109L6	CPS109L10	—
1/8	.25	.125	CPS125L3	CPS125L6	CPS125L10	CPS125L14
9/64	.25	.125	CPS141L3	CPS141L6	CPS141L10	CPS141L14
5/32	.28	.156	CPS156L3	CPS156L6	CPS156L10	CPS156L14
11/64	.34	.187	CPS172L3	CPS172L6	CPS172L10	CPS172L14
3/16	.37	.187	CPS187L3	CPS187L6	CPS187L10	CPS187L14
13/64	.37	.187	CPS203L3	CPS203L6	CPS203L10	CPS203L14
7/32	.40	.187	CPS219L3	CPS219L6	CPS219L10	CPS219L14
15/64	.40	.187	—	CPS234L6	CPS234L10	—
1/4	.43	.187	CPS250L3	CPS250L6	CPS250L10	CPS250L14
9/32	.43	.250	CPS281L3	CPS281L6	CPS281L10	CPS281L14
5/16	.50	.250	CPS312L3	CPS312L6	CPS312L10	CPS312L14
11/32	.56	.250	CPS344L3	CPS344L6	CPS344L10	CPS344L14
3/8	.62	.250	CPS375L3	CPS375L6	CPS375L10	CPS375L14
13/32	.68	.250	CPS406L3	CPS406L6	CPS406L10	CPS406L14
7/16	.68	.250	CPS437L3	CPS437L6	CPS437L10	CPS437L14
15/32	.75	.250	CPS469L3	CPS469L6	CPS469L10	CPS469L14
1/2	.75	.250	CPS500L3	CPS500L6	CPS500L10	CPS500L14
17/32	.75	.250	—	CPS531L6	CPS531L10	—
9/16	.81	.250	—	CPS562L6	CPS562L10	CPS562L14
5/8	.87	.250	—	CPS625L6	CPS625L10	CPS625L14
11/16	.93	.250	—	CPS687L6	CPS687L10	CPS687L14
3/4	1.00	.250	—	CPS750L6	CPS750L10	CPS750L14
13/16	1.125	.250	—	CPS812L6	CPS812L10	CPS812L14
7/8	1.125	.250	—	CPS875L6	CPS875L10	CPS875L14
1	1.25	.250	—	CPS1000L6	CPS1000L10	CPS1000L14

**M** H-13 **H** 50-55 HRC

CAD insertion point

D Nominal Pin Dia.	H Head Dia.	T Head Thick.	L=3"	L=6"	L=10"	L=14"
3/32	.25	.125	CPH094L3	CPH094L6	CPH094L10	—
7/64	.25	.125	CPH109L3	CPH109L6	CPH109L10	—
1/8	.25	.125	CPH125L3	CPH125L6	CPH125L10	CPH125L14
9/64	.25	.125	CPH141L3	CPH141L6	CPH141L10	CPH141L14
5/32	.28	.156	CPH156L3	CPH156L6	CPH156L10	CPH156L14
11/64	.34	.187	CPH172L3	CPH172L6	CPH172L10	CPH172L14
3/16	.37	.187	CPH187L3	CPH187L6	CPH187L10	CPH187L14
13/64	.37	.187	CPH203L3	CPH203L6	CPH203L10	CPH203L14
7/32	.40	.187	CPH219L3	CPH219L6	CPH219L10	CPH219L14
15/64	.40	.187	—	CPH234L6	CPH234L10	—
1/4	.43	.187	CPH250L3	CPH250L6	CPH250L10	CPH250L14
9/32	.43	.250	CPH281L3	CPH281L6	CPH281L10	CPH281L14
5/16	.50	.250	CPH312L3	CPH312L6	CPH312L10	CPH312L14
11/32	.56	.250	CPH344L3	CPH344L6	CPH344L10	CPH344L14
3/8	.62	.250	CPH375L3	CPH375L6	CPH375L10	CPH375L14
13/32	.68	.250	CPH406L3	CPH406L6	CPH406L10	CPH406L14
7/16	.68	.250	CPH437L3	CPH437L6	CPH437L10	CPH437L14
15/32	.75	.250	CPH469L3	CPH469L6	CPH469L10	CPH469L14
1/2	.75	.250	CPH500L3	CPH500L6	CPH500L10	CPH500L14
17/32	.75	.250	—	CPH531L6	CPH531L10	—
9/16	.81	.250	—	CPH562L6	CPH562L10	CPH562L14
5/8	.87	.250	—	CPH625L6	CPH625L10	CPH625L14
11/16	.93	.250	—	CPH687L6	CPH687L10	CPH687L14
3/4	1.00	.250	—	CPH750L6	CPH750L10	CPH750L14
13/16	1.125	.250	—	CPH812L6	CPH812L10	CPH812L14
7/8	1.125	.250	—	CPH875L6	CPH875L10	CPH875L14
1	1.25	.250	—	CPH1000L6	CPH1000L10	CPH1000L14

Note: Heads are annealed on 6", 10" and 14" lengths

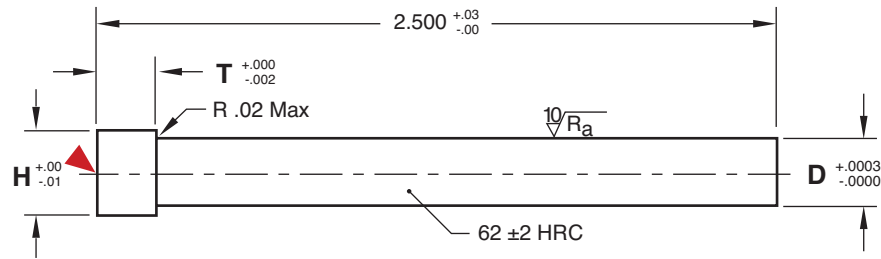
For mold-ready or keyed Core Pins, refer to page A-1 or the templates in section X.





# TI™ PINS

## THOUSANDTH INCREMENT PINS



**M** M-2 **H** 60-64 HRC ▶ CAD insertion point

D Decimal Pin Diameter	H Head Diameter	T Head Thickness
.060 - .062	.093	.125
.0625	.093	.125
.063 - .093	.156	.125
.0937	.156	.125
.094 - .124	.187	.125
.1250	.187	.125
.126 - .156	.218	.125
.1562	.218	.125
.157 - .187	.250	.125
.1875	.250	.125
.188 - .218	.281	.125
.2187	.281	.125
.219 - .249	.312	.125
.2500	.312	.125
.251 - .312	.437	.187
.3125	.437	.187
.313 - .320	.500	.187

For mold-ready detail, refer to the templates in section X.

### Features:

- Use of TI Pins allow for wire EDM'ing of the hole to the finish diameter, with no step machining required for the core pin.
- Unlike punches, TI Pin heads are precision ground to standard mold tolerances.

### To order:

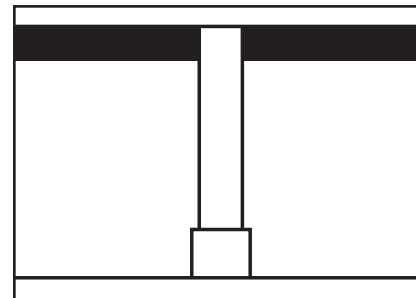
Specify the prefix TI- and the three place decimal of the pin required, followed by a "0" if not nominal:

Ex: .090 $\emptyset$  = TI-0900  
or  
.252 $\emptyset$  = TI-2520

If a nominal size, carry to a four place decimal as listed in the chart at left:

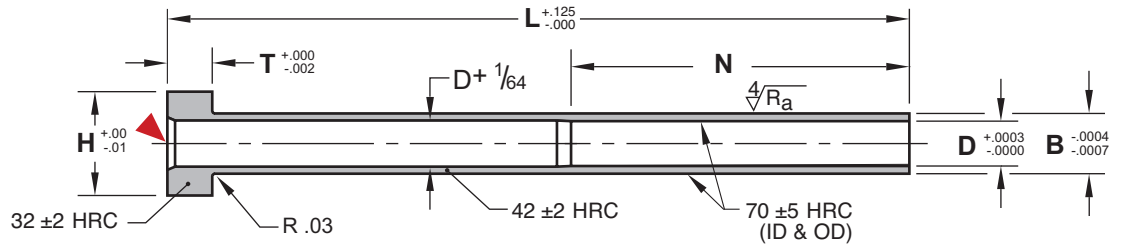
Ex. 5/32 $\emptyset$  nominal = TI-1562  
or  
3/32 $\emptyset$  = TI-0937

Contact Customer Service for availability of additional diameters or lengths.



# EJECTOR SLEEVES

## INCH STANDARD



### General Dimensions

N=1-7/8" for ES094 & ES125      T=.187" for ES094 thru ES156  
 N=2-3/8" for ES156 and larger      T=.250" for ES187 and larger

**M** H-13    **H** Core: 40-44 HRC, Surface: 65-75 HRC

D Nom. I.D.	B O.D.	H Head Dia.	L=3"	L=4"	L=5"	L=6"	L=7"	L=8"	L=9"	L=10"	L=11"	L=12"	L=13"	L=14"
3/32	.1875	.37	ES094L3	ES094L4	ES094L5	ES094L6	ES094L7	ES094L8	ES094L9	ES094L10	ES094L11	—	—	—
1/8	.2187	.40	ES125L3	ES125L4	ES125L5	ES125L6	ES125L7	ES125L8	ES125L9	ES125L10	ES125L11	—	—	—
5/32	.2500	.43	—	ES156L4	ES156L5	ES156L6	ES156L7	ES156L8	ES156L9	ES156L10	ES156L11	ES156L12	ES156L13	ES156L14
3/16	.3125	.50	—	ES187L4	ES187L5	ES187L6	ES187L7	ES187L8	ES187L9	ES187L10	ES187L11	ES187L12	ES187L13	ES187L14
7/32	.3437	.56	—	ES219L4	ES219L5	ES219L6	ES219L7	ES219L8	ES219L9	ES219L10	ES219L11	ES219L12	ES219L13	ES219L14
1/4	.3750	.62	—	ES250L4	ES250L5	ES250L6	ES250L7	ES250L8	ES250L9	ES250L10	ES250L11	ES250L12	ES250L13	ES250L14
5/16	.4375	.68	—	ES312L4	ES312L5	ES312L6	ES312L7	ES312L8	ES312L9	ES312L10	ES312L11	ES312L12	ES312L13	ES312L14
3/8	.5000	.75	—	ES375L4	ES375L5	ES375L6	ES375L7	ES375L8	ES375L9	ES375L10	ES375L11	ES375L12	ES375L13	ES375L14
7/16	.6250	.87	—	ES437L4	ES437L5	ES437L6	ES437L7	ES437L8	ES437L9	ES437L10	ES437L11	ES437L12	ES437L13	ES437L14
1/2	.6875	.93	—	ES500L4	ES500L5	ES500L6	ES500L7	ES500L8	ES500L9	ES500L10	ES500L11	ES500L12	ES500L13	ES500L14
9/16	.7500	1.00	—	ES562L4	ES562L5	ES562L6	ES562L7	ES562L8	ES562L9	ES562L10	ES562L11	ES562L12	ES562L13	ES562L14
5/8	.8750	1.12	—	ES625L4	ES625L5	ES625L6	ES625L7	ES625L8	ES625L9	ES625L10	ES625L11	ES625L12	ES625L13	ES625L14
3/4	1.0000	1.25	—	ES750L4	ES750L5	ES750L6	ES750L7	ES750L8	ES750L9	ES750L10	ES750L11	ES750L12	ES750L13	ES750L14

▶ CAD insertion point

# EJECTOR SLEEVES

## INCH STANDARD-EXTRA LENGTH SERIES

D Nom. I.D.	B O.D.	H Head Dia.	L=15"	L=16"	L=17"	L=18"
5/32	.2500	.43	ES156L15	ES156L16	ES156L17	ES156L18
3/16	.3125	.50	ES187L15	ES187L16	ES187L17	ES187L18
7/32	.3437	.56	ES219L15	ES219L16	ES219L17	ES219L18
1/4	.3750	.62	ES250L15	ES250L16	ES250L17	ES250L18
5/16	.4375	.68	ES312L15	ES312L16	ES312L17	ES312L18
3/8	.5000	.75	ES375L15	ES375L16	ES375L17	ES375L18
7/16	.6250	.87	ES437L15	ES437L16	ES437L17	ES437L18
1/2	.6875	.93	ES500L15	ES500L16	ES500L17	ES500L18
9/16	.7500	1.00	ES562L15	ES562L16	ES562L17	ES562L18
5/8	.8750	1.12	ES625L15	ES625L16	ES625L17	ES625L18
3/4	1.0000	1.25	ES750L15	ES750L16	ES750L17	ES750L18

### General Dimensions (Extra Length Series)

N=2-3/8" for ES156  
 N=2-3/4" for ES187 thru ES219  
 N=3-1/4" for ES250 and larger  
 T=.187" for ES156  
 T=.250" for ES187 and larger

For mold-ready Sleeves, refer to the templates in section X.

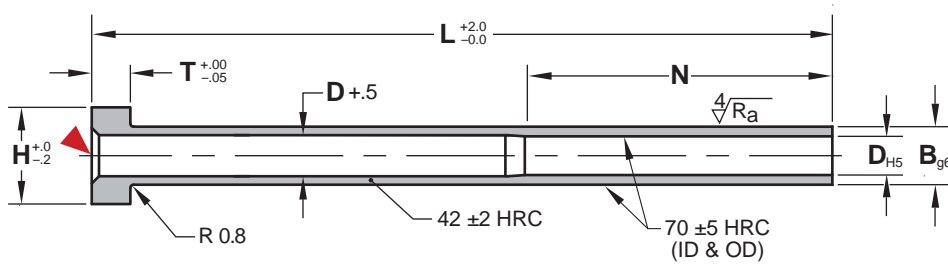
### Alternative configurations available:

- For sleeves that are .005" oversized on the outer diameter (B), add a -OS to the end of the part number. Ex. ES250L12-OS.
- Sleeves can be ordered with the Black Nitride treatment for better performance. To order, specify -BN at the end of the catalog number. Ex: ES437L7-BN.
- To achieve longer lengths, use Sleeve Extensions shown on page A-17.
- For Sleeves cut to length or keyed on the heads, refer to page A-1.



# EJECTOR SLEEVES

## DIN STANDARD



### General Dimensions

N=35mm for ESD015 thru ESD025  
 N=45mm for ESD027 thru ESD10  
 N=55mm for ESD102 and larger

T=3mm for ESD015 thru ESD032  
 T=5mm for ESD035 thru ESD062  
 T=7mm for ESD08 thru ESD125  
 T=9mm for ESD14 and larger

**M** H-13 **H** Core: 40-44 HRC, Surface: 65-75 HRC

CAD insertion point

CATALOG NUMBER	D	B	H	LENGTHS (L)													
				75mm	100mm	125mm	150mm	175mm	200mm	225mm	250mm	275mm	300mm	325mm	350mm	400mm	450mm
ESD015	1.5	3	6		•	•	•										
ESD016	1.6	3	6		•	•	•										
ESD02	2	4	8		•	•	•	•	•								
ESD022	2.2	4	8	•	•	•	•	•									
ESD025	2.5	5	10	•	•	•	•	•		•							
ESD027	2.7	5	10	•	•	•	•	•		•							
ESD03	3	5	10	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ESD032	3.2	5	10	•	•	•	•	•	•								
ESD035	3.5	6	12	•	•	•	•	•		•							
ESD037	3.7	6	12	•	•	•	•	•	•	•	•						
ESD04	4	6	12	•	•	•	•	•	•	•	•	•					
ESD042	4.2	8	14	•	•	•	•	•	•								
ESD05	5	8	14	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ESD052	5.2	8	14	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ESD055	5.5	8	14	•	•	•	•	•	•	•	•						
ESD06	6	10	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ESD062	6.2	10	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ESD08	8	12	20	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ESD082	8.2	12	20	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ESD10	10	14	22	•	•	•	•	•	•	•	•	•					
ESD102	10.2	14	22	•	•	•	•	•	•	•	•						
ESD105	10.5	14	22		•	•	•	•	•								
ESD12	12	16	22		•	•	•	•	•	•	•	•					
ESD125	12.5	16	22		•	•	•	•	•	•							
ESD14	14	18	24		•	•	•	•	•	•	•	•	•	•	•	•	•
ESD16	16	20	26		•	•	•	•	•	•	•	•	•	•	•	•	•
ESD18	18	22	28		•	•	•	•	•	•	•	•	•	•	•	•	•

### To order:

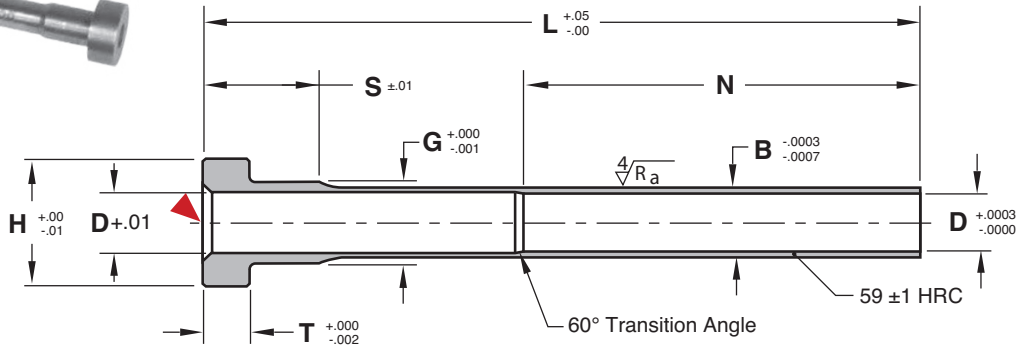
Specify prefix, inner diameter (D), and length. Ex. ESD035L175.

### Alternative configurations available:

- Sleeves can be ordered with the Black Nitride treatment for better performance. To order, specify -BN at the end of the catalog number. Ex: ESD08L250-BN.
- To achieve longer lengths, use Sleeve Extensions on page A-17.
- For Sleeves cut to length or keyed on the heads, refer to page A-1.

# EJECTOR SLEEVES

## THIN WALL SLEEVES



**M** A-2 **H** 58-60 HRC **M** Electroless Nickel PTFE Coated

CAD insertion point

D Nominal I.D.	D Decimal I.D.	B O.D.	G Shoulder Diameter	S Shoulder Length	H Head Diameter	T Head Thickness	N Bearing Length	L=4"	L=6"	L=8"	L=10"
3/32	.0937	.1563	.188	.500	.37	.187	1.75	ESTW094L4	ESTW094L6	—	—
1/8	.1250	.1875	.219	.500	.40	.187	1.75	ESTW125L4	ESTW125L6	ESTW125L8	—
5/32	.1562	.2187	.250	.500	.43	.187	2.50	ESTW156L4	ESTW156L6	ESTW156L8	ESTW156L10
3/16	.1875	.2500	.312	.625	.50	.250	2.50	ESTW187L4	ESTW187L6	ESTW187L8	ESTW187L10
7/32	.2187	.2813	.344	.625	.56	.250	2.50	ESTW219L4	ESTW219L6	ESTW219L8	ESTW219L10
1/4	.2500	.3125	.375	.625	.62	.250	2.50	ESTW250L4	ESTW250L6	ESTW250L8	ESTW250L10
5/16	.3125	.3750	.438	.625	.68	.250	2.50	ESTW312L4	ESTW312L6	ESTW312L8	ESTW312L10
3/8	.3750	.4375	.500	.625	.75	.250	2.50	ESTW375L4	ESTW375L6	ESTW375L8	ESTW375L10

### Alternative configurations available:

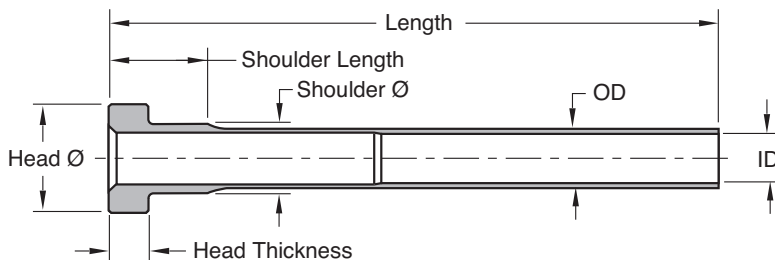
- To achieve longer lengths, use Sleeve Extensions on page A-17.
- For Sleeves cut to length or keyed on the heads, refer to page A-1.

For mold-ready Sleeves, refer to the templates in section X.

## METRIC SPECIFICATION

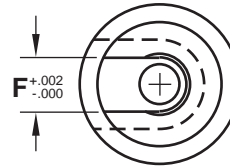
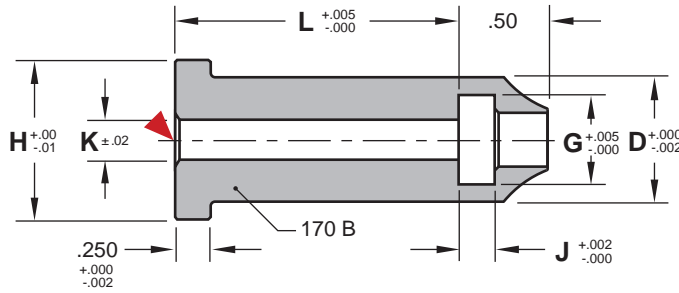
MATERIAL: M-2

Contact Customer Service for pricing and delivery for metric Thin Wall Sleeves by specifying the information shown below:





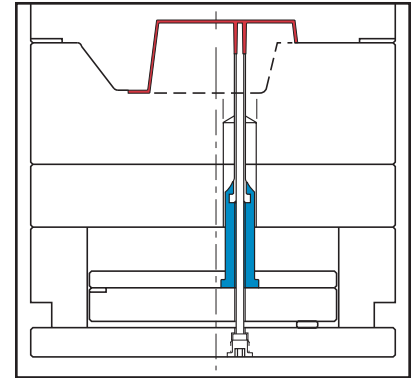
# SLEEVE EXTENSIONS



**M** AISI 1215 **H** 170 Brinell **M** Black Oxide

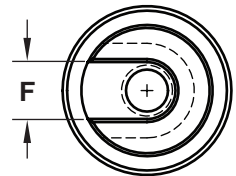
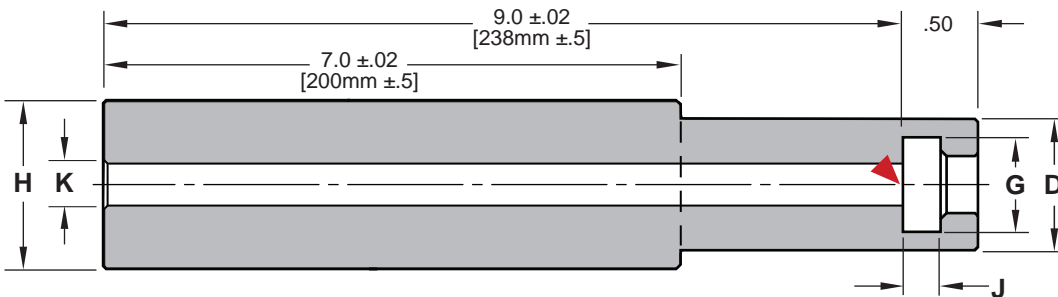
CAD insertion point

Nominal Sleeve I.D.	D O.D.	F	G	H	J	K	L=2"	L=3"	L=4"
3/32	.625	.193	.385	.875	.188	.18	SXT094L2	SXT094L3	—
1/8	.625	.224	.416	.875	.188	.18	SXT125L2	SXT125L3	SXT125L4
5/32	.625	.255	.448	.875	.188	.18	SXT156L2	SXT156L3	SXT156L4
3/16	.875	.318	.520	1.125	.251	.21	SXT187L2	SXT187L3	SXT187L4
7/32	.875	.349	.570	1.125	.251	.25	SXT219L2	SXT219L3	SXT219L4
1/4	.875	.380	.630	1.125	.251	.28	SXT250L2	SXT250L3	SXT250L4
5/16	1.000	.443	.698	1.250	.251	.34	SXT312L2	SXT312L3	SXT312L4
3/8	1.000	.505	.760	1.250	.251	.41	SXT375L2	SXT375L3	SXT375L4



# SLEEVE EXTENSIONS: BLANKS

For extending a Sleeve, begin with a Sleeve Extension Blank and lathe turn the "H" dimension to a standard Ejector Pin head size.



## Inch Standard

**M** AISI 1215 **H** 170 Brinell

CATALOG NUMBER	Nominal Sleeve I.D.	D O.D.	F +.002 - .000	G +.005 - .000	H +.00 - .01	J +.002 - .000	K ±.02
SXT094-B	3/32	.625	.193	.385	.875	.188	.18
SXT125-B	1/8	.625	.224	.416	.875	.188	.18
SXT156-B	5/32	.625	.255	.448	.875	.188	.18
SXT187-B	3/16	.875	.318	.520	1.125	.251	.21
SXT219-B	7/32	.875	.349	.570	1.125	.251	.25
SXT250-B	1/4	.875	.380	.630	1.125	.251	.28
SXT312-B	5/16	1.000	.443	.698	1.250	.251	.34
SXT375-B	3/8	1.000	.505	.760	1.250	.251	.41

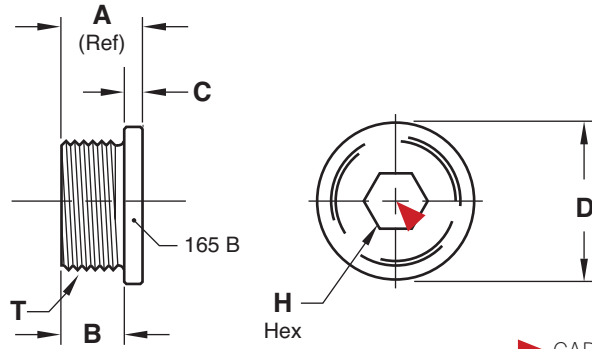
## Metric Standard

**M** AISI 1215 **H** 170 Brinell

CAD insertion point

CATALOG NUMBER	Nominal Sleeve I.D.	D O.D.	F +.05 - .00	G +.01 - .00	H +.0 - .2	J +.05 - .00	K ±.2
SXTD02-B	2 - 2.2	14	4.15	8.3	22	3.03	4
SXTD03-B	2.5 - 3.2	16	5.15	10.3	22	3.03	4
SXTD05-B	3.5 - 5.5	20	8.15	14.3	26	5.03	6
SXTD06-B	6 - 6.2	22	10.15	16.3	28	5.03	7
SXTD08-B	8 - 8.2	25	12.15	20.3	32	7.03	9
SXTD10-B	10 - 12.5	32	16.15	22.3	40	7.03	13

# CORE PIN RETAINERS



CAD insertion point

## Inch Standard

**M** AISI 12L14 **H** 165 Brinell **M** Black Oxide

CATALOG NUMBER	A	B +.001 -.000	C +.000 -.002	D +.00 -.01	H Hex	T Thread
<b>CPR-50</b>	.437	.312	.125	.750	.25	1/2-20
<b>CPR-87</b>	.437	.312	.125	1.060	.37	7/8-14

## Metric Standard

**M** AISI 12L14 **H** 165 Brinell **M** Black Oxide

CATALOG NUMBER	A	B +.02 -.00	C +.00 -.05	D +.0 -.2	H Hex	T Thread
<b>CPRM-16</b>	11	7	4	20	8	M16-1.5
<b>CPRM-20</b>	11	7	4	26	10	M20-2.5

### CPR-50

Core Pin Diameter	H
3/32 - 9/64	.563
5/32	.594
11/64 - 1/4	.625
9/32	.688

### CPR-87

Core Pin Diameter	H
5/16 - 1/2	.688

### CPRM-16

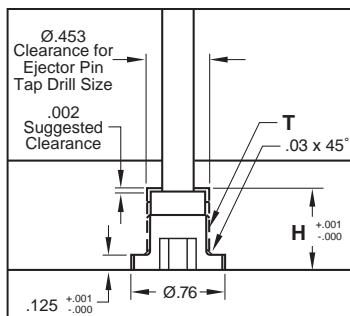
Core Pin Diameter (DIN)	H
1.2 - 2.7mm	13.02mm
3 - 5.5mm	14.02mm

### CPRM-20

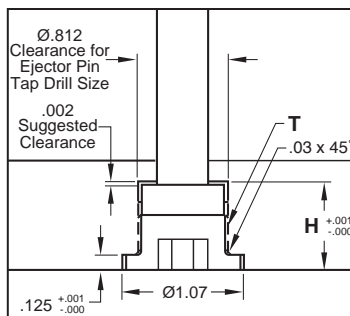
Core Pin Diameter (DIN)	H
8 - 11mm	16.02mm
12 - 12.5mm	18.02mm

## Machining Specifications:

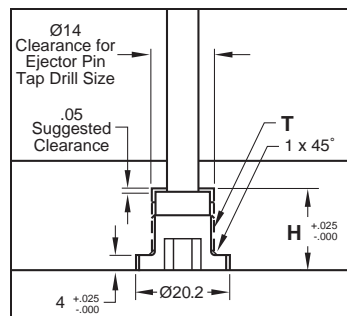
### CPR-50



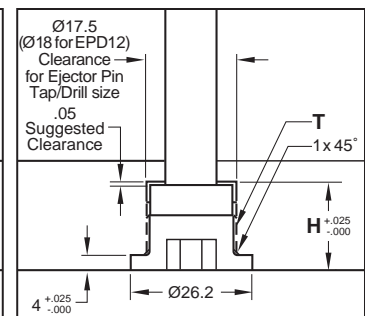
### CPR-87



### CPRM-16

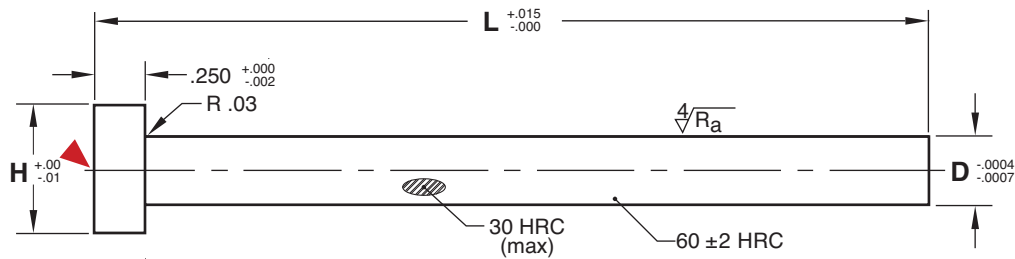


### CPRM-20





# RETURN PINS



**M** AISI 52100 **H** Core: 30 HRC max, Surface: 58-62 HRC

CAD insertion point

D=1/2 H=.75		D=5/8 H=.87		D=3/4 H=1.00		D=1 H=1.25	
L	CATALOG NUMBER	L	CATALOG NUMBER	L	CATALOG NUMBER	L	CATALOG NUMBER
3-9/16	RP50L3.56	4-1/16	RP62L4.06	4-15/16	RP75L4.93	—	—
4-1/16	RP50L4.06	4-9/16	RP62L4.56	5-7/16	RP75L5.43	—	—
4-9/16	RP50L4.56	5-1/16	RP62L5.06	5-15/16	RP75L5.93	—	—
5-1/16	RP50L5.06	5-9/16	RP62L5.56	6-7/16	RP75L6.43	6	RP100L6
5-9/16	RP50L5.56	6-1/16	RP62L6.06	6-15/16	RP75L6.93	—	—
6-1/16	RP50L6.06	6-9/16	RP62L6.56	7-7/16	RP75L7.43	—	—
6-9/16	RP50L6.56	7-1/16	RP62L7.06	7-15/16	RP75L7.93	—	—
—	—	7-9/16	RP62L7.56	8-7/16	RP75L8.43	—	—
—	—	8-1/16	RP62L8.06	8-15/16	RP75L8.93	—	—
—	—	—	—	9-7/16	RP75L9.43	10	RP100L10
—	—	—	—	—	—	18	RP100L18

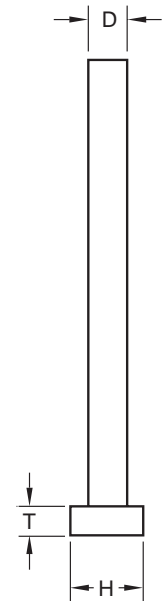


# PIN COMPARISON CHART

Pin Diameter D			Standard Head Dimensions									
Inch		Metric	US Inch			DIN Metric			JIS Metric			
Fraction	Decimal	mm	PRO Cat #	.005 O.S.	H	T	PRO Cat #	H	T	PRO Cat #	H	T
1/32	.0312	0.8	EP031	EP036	0.25	0.125	EPD008	4	2	—	—	—
	(.0354)	0.9	—	—	—	—	EPD009	4	2	—	—	—
	(.0394)	1.0	—	—	—	—	EPD01	4	2	EPJ01	4/5/6	4
	(.0433)	1.1	—	—	—	—	EPD011	4	2	—	—	—
3/64	.0469	(1.2)	EP047	EP052	0.25	0.125	—	—	—	—	—	—
	(.0472)	1.2	—	—	—	—	EPD012	3/4	1.5/2	EPJ012	5/6	4
	(.0511)	1.3	—	—	—	—	EPD013	4	2	—	—	—
	(.0551)	1.4	—	—	—	—	EPD014	4	2	—	—	—
	(.059)	1.5	—	—	—	—	EPD015	3/6	1.5/3	EPJ015	4/5/6/8	4/6
1/16	.0625	(1.6)	EP062	EP067	0.25	0.125	—	—	—	—	—	—
	(.063)	1.6	—	—	—	—	EPD016	3/6	1.5/3	—	—	—
	(.0669)	1.7	—	—	—	—	EPD017	3/6	1.5/3	—	—	—
	(.0708)	1.8	—	—	—	—	EPD018	3/6	1.5/3	—	—	—
5/64	.0781	(1.9)	EP078	EP083	0.25	0.125	—	—	—	—	—	—
	(.0787)	2.0	—	—	—	—	EPD02	4/6	2/3	EPJ02	5/6/8	4/6
	(.0855)	2.2	—	—	—	—	EPD022	4/6	2/3	—	—	—
3/32	.0937	(2.4)	EP094	EP099	0.25	0.125	—	—	—	—	—	—
	(.0984)	2.5	—	—	—	—	EPD025	5/6	2/3	EPJ025	6/8	4/6
	(1.063)	2.7	—	—	—	—	EPD027	5	2	—	—	—
7/64	.1094	(2.8)	EP109	EP114	0.25	0.125	—	—	—	—	—	—
	(.1181)	3.0	—	—	—	—	EPD03	6	3	EPJ03	6/8/9	4/6
1/8	.125	3.2	EP125	EP130	0.25	0.125	EPD032	6	3	—	—	—
	(.1378)	3.5	—	—	—	—	EPD035	7	3	EPJ035	7	4
9/64	.1406	(3.6)	EP141	EP146	0.25	0.125	—	—	—	—	—	—
	(.1457)	3.7	—	—	—	—	EPD037	7	3	—	—	—
5/32	.1562	4.0	EP156	EP161	0.28	0.156	EPD04	8	3	EPJ04	8	6
	(.1614)	4.1	—	—	—	—	EPD041	8	3	—	—	—
	(.1653)	4.2	—	—	—	—	EPD042	8	3	—	—	—
11/64	.1719	(4.4)	EP172	EP177	0.34	0.187	—	—	—	—	—	—
	(.1771)	4.5	—	—	—	—	EPD045	8	3	EPJ045	8	6
	(.185)	4.7	—	—	—	—	EPD047	8	3	—	—	—
3/16	.1875	(4.8)	EP187	EP192	0.37	0.187	—	—	—	—	—	—
	(.1968)	5.0	—	—	—	—	EPD05	10	3	EPJ05	9	6
13/64	.2031	5.2	EP203	EP208	0.37	0.187	EPD052	10	3	—	—	—
	(.2165)	5.5	—	—	—	—	EPD055	10	3	EPJ055	10	6
7/32	.2187	(5.6)	EP219	EP224	0.40	0.187	—	—	—	—	—	—
15/64	.2344	6.0	EP234	EP239	0.4	0.187	EPD06	12	5	EPJ06	10	6
	(.2402)	6.1	—	—	—	—	EPD061	12	5	—	—	—
	(.244)	6.2	—	—	—	—	EPD062	12	5	—	—	—
1/4	.25	(6.4)	EP250	EP255	0.43	0.187	—	—	—	—	—	—
	(.2559)	6.5	—	—	—	—	EPD065	12	5	—	—	—
17/64	.2656	(6.7)	EP266	EP271	0.43	0.250	—	—	—	—	—	—
	(.2756)	7.0	—	—	—	—	EPD07	12	5	EPJ07	11	6
9/32	.2812	(7.1)	EP281	EP286	0.43	0.250	—	—	—	—	—	—
19/64	.2969	7.5	EP297	EP302	0.5	0.25	EPD075	12	5	—	—	—
5/16	.3125	(7.9)	EP312	EP317	0.50	0.250	—	—	—	—	—	—
	(.315)	8.0	—	—	—	—	EPD08	14	5	EPJ08	13	8
	(.3228)	8.2	—	—	—	—	EPD082	14	5	—	—	—
21/64	.3281	(8.3)	EP328	EP333	0.56	0.25	—	—	—	—	—	—
	(.3346)	8.5	—	—	—	—	EPD085	14	5	—	—	—
11/32	.3437	(8.7)	EP344	EP349	0.56	0.25	—	—	—	—	—	—
	(.3543)	9.0	—	—	—	—	EPD09	14	5	—	—	—
23/64	.3594	(9.1)	EP359	EP364	0.62	0.25	—	—	—	—	—	—
3/8	.375	9.5	EP375	EP380	0.62	0.250	EPD095	14	5	—	—	—
25/64	.39	(9.9)	EP390	EP395	0.62	0.25	—	—	—	—	—	—
	(.3937)	10.0	—	—	—	—	EPD10	16	5	EPJ10	15	8
	(.4015)	10.2	—	—	—	—	EPD102	16	5	—	—	—
13/32	.4062	(10.3)	EP406	EP411	0.68	0.250	—	—	—	—	—	—
	(.4133)	10.5	—	—	—	—	EPD105	16	5	—	—	—
27/64	.4219	(10.7)	EP422	EP427	0.68	0.250	—	—	—	—	—	—
	(.433)	11.0	—	—	—	—	EPD11	16	5	—	—	—
7/16	.4375	(11.1)	EP437	EP442	0.68	0.250	—	—	—	—	—	—
29/64	.4531	(11.5)	EP453	EP458	0.68	0.25	—	—	—	—	—	—
15/32	.4687	(11.9)	EP469	EP474	0.75	0.250	—	—	—	—	—	—
	(.4724)	12.0	—	—	—	—	EPD12	18	7	EPJ12	17	8
	(.4803)	12.2	—	—	—	—	EPD122	18	7	—	—	—
31/64	.4844	(12.3)	EP484	EP489	0.75	0.25	—	—	—	—	—	—
	(.4921)	12.5	—	—	—	—	EPD125	18	7	—	—	—
1/2	.5	(12.7)	EP500	EP505	0.75	0.25	—	—	—	—	—	—
33/64	.5156	(13.1)	EP515	—	0.75	0.250	—	—	—	—	—	—
17/32	.5312	(13.5)	EP531	EP536	0.75	0.25	—	—	—	—	—	—
	(.5512)	14.0	—	—	—	—	EPD14	22	7	EPJ14	19	8
9/16	.5625	(14.3)	EP562	—	0.81	0.25	—	—	—	—	—	—
	(.5906)	15.0	—	—	—	—	—	—	—	EPJ15	20	8
5/8	.625	(15.9)	EP625	—	0.87	0.25	—	—	—	—	—	—
	(.6299)	16.0	—	—	—	—	EPD16	22	7	EPJ16	21	8
	(.6378)	16.2	—	—	—	—	EPD162	22	7	—	—	—
11/16	.6875	(17.5)	EP687	—	0.93	0.250	—	—	—	—	—	—
	(.7087)	18.0	—	—	—	—	EPD18	24	7	EPJ18	23	8
3/4	.75	(19.1)	EP750	—	1.00	0.250	—	—	—	—	—	—
	(.7874)	20.0	—	—	—	—	EPD20	26	8	EPJ20	25	8
7/8	.875	(22.2)	EP875	—	1.12	0.250	—	—	—	—	—	—
	(.9842)	25.0	—	—	—	—	EPD25	32	10	—	—	—
1	1.0000	(25.4)	EP1000	—	1.25	0.250	—	—	—	—	—	—
	(1.2598)	32.0	—	—	—	—	EPD32	40	10	—	—	—

This chart references standard nominal Ejector Pins and their Progressive catalog prefix.

Refer to each specific catalog page for available shoulder lengths and overall lengths.





# MOLD BASE COMPONENTS

## SECTION B



PKO Extensions	Locating Rings	Sprue Bushings	Extended Sprues	Puller Pins & Bushings
Prefix: PH, PKP	Prefix: LR	Prefix: SPR	Prefix: ESB, RX	Prefix: PP, PPB
Page: B-1	Page: B-2	Page: B-3	Page: B-4	Page: B-5



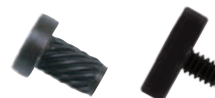
Leader Pins: Straight	Leader Pins: DIN	Leader Pins: Shoulder	Guided Ejector Pins	Bushings: Shoulder
Prefix: LP	Prefix: LPD	Prefix: SLP	Prefix: GEP, LP	Prefix: SAB, SHB, SGP, STL
Page: B-6	Page: B-7	Page: B-8	Page: B-9	Page: B-10



Bushings: Straight	Guided Ejector Bushings	Guided Ej. Bushings: QC	Front Load Pins & Bushings	Guide Blocks
Prefix: STB, STGP	Prefix: GEB, GGP, GQC	Prefix: GQC	Prefix: FLPB	Prefix: GBK
Page: B-11	Page: B-12	Page: B-13	Page: B-14	Page: B-15



Support Pillars	Support Columns	Guided Support Pillars	Urethane Springs	Springs
Prefix: SP, SPH	Prefix: SPH	Prefix: GESp	Prefix: US	Prefix: MS, HS
Page: B-16	Page: B-18	Page: B-19	Page: B-20	Page: B-21



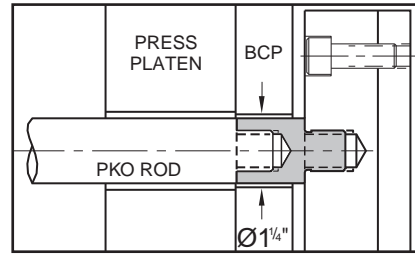
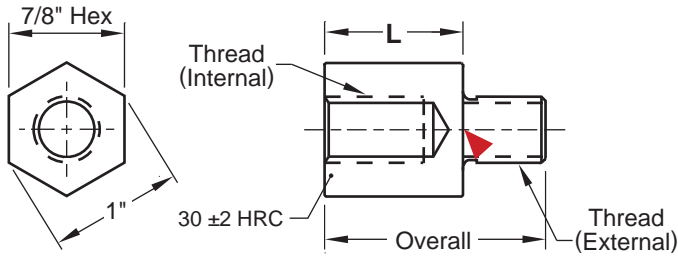
Stripper Bolts	Stripper Bolt Bushings	Tubular Dowels	Stop Discs & Pins	Mold Straps
Prefix: SBLT	Prefix: SBB	Prefix: TD	Prefix: SD, STP	Prefix: MSTRP
Page: B-24	Page: B-25	Page: B-26	Page: B-27	Page: B-27





# PKO™ EXTENSIONS

## HEX SERIES



**M** AISI 4140 Pre-Hard **H** 28-32 HRC **S** Black Oxide

▶ CAD insertion point

CATALOG NUMBER	Internal Thread	External Thread	Overall	L
PH37L10	3/8-16	3/8-16	1.672	1.052
PH50L10	1/2-13	1/2-13		
PH62L10	5/8-11	5/8-11		
PH62L10-50	1/2-13	5/8-11	1.922	
PH75L10	3/4-10	3/4-10		
PH75L10-NT	N/A	3/4-10		
PH37L13	3/8-16	3/8-16	1.922	1.302
PH50L13	1/2-13	1/2-13		
PH62L13	5/8-11	5/8-11		
PH62L13-50	1/2-13	5/8-11	2.172	
PH75L13	3/4-10	3/4-10		
PH75L13-NT	N/A	3/4-10		

CATALOG NUMBER	Internal Thread	External Thread	Overall	L
PH37L15	3/8-16	3/8-16	2.172	1.552
PH50L15	1/2-13	1/2-13		
PH50L15-NT	N/A	1/2-13		
PH62L15	5/8-11	5/8-11	2.422	
PH75L15	3/4-10	3/4-10		
PH75L15-NT	N/A	3/4-10		
PH37L18	3/8-16	3/8-16	2.422	1.802
PH50L18	1/2-13	1/2-13		
PH50L18-NT	N/A	1/2-13		
PH62L18	5/8-11	5/8-11	2.672	
PH75L18	3/4-10	3/4-10		
PH75L18-NT	N/A	3/4-10		

### "L" DIMENSIONS:

1.052 = .875 (BCP) + .187 (Stop Pins) - .010  
 1.302 = .875 (BCP) + .187 (Stop Pins) + .250 (Insulator Plate) - .010

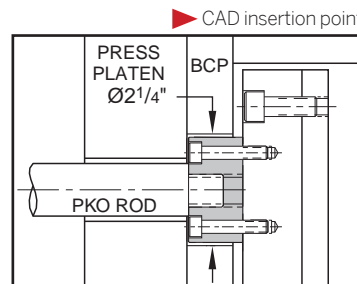
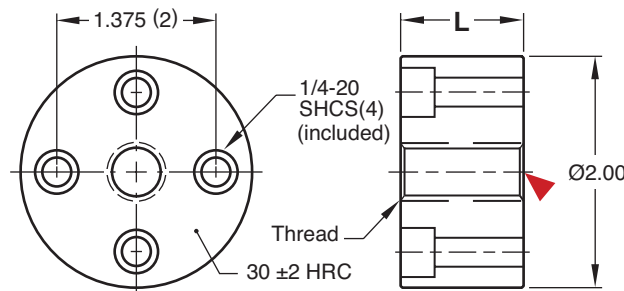
### "L" DIMENSIONS:

1.552 = 1.375 (BCP) + .187 (Stop Pins) - .010  
 1.802 = 1.375 (BCP) + .187 (Stop Pins) + .250 (Insulator Plate) - .010

For custom PKO Extensions, refer to templates in section X.

CATALOG NUMBER	Thread Internal & External	L
PKP37L10	3/8-16	1.052
PKP50L10	1/2-13	
PKP62L10	5/8-11	
PKP75L10	3/4-10	
PKPL10-NT	No Thread*	1.302
PKP37L13	3/8-16	
PKP50L13	1/2-13	
PKP62L13	5/8-11	
PKP75L13	3/4-10	1.552
PKPL13-NT	No Thread*	
PKP37L15	3/8-16	
PKP50L15	1/2-13	
PKP62L15	5/8-11	1.802
PKP75L15	3/4-10	
PKPL15-NT	No Thread*	
PKP37L18	3/8-16	
PKP50L18	1/2-13	1.802
PKP62L18	5/8-11	
PKP75L18	3/4-10	
PKPL18-NT	No Thread*	

**M** AISI 1018 **S** Black Oxide



\*Mold maker machines thread on "NT" style to suit non-standard applications.

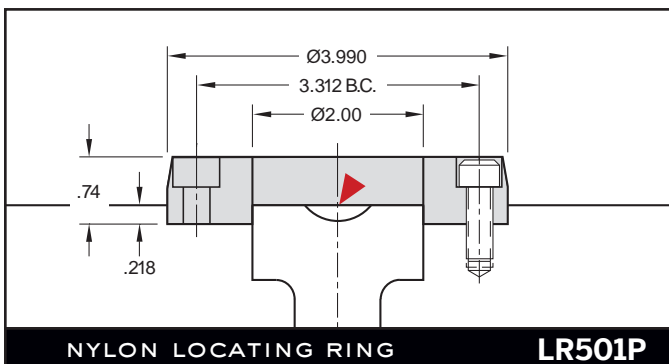
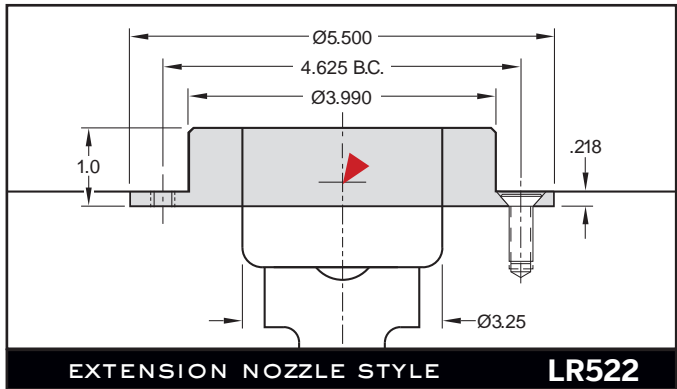
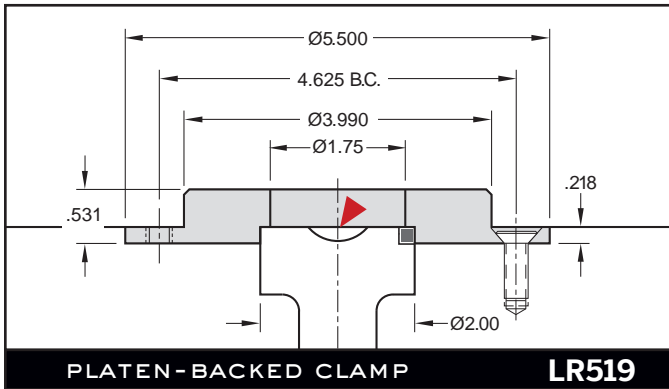
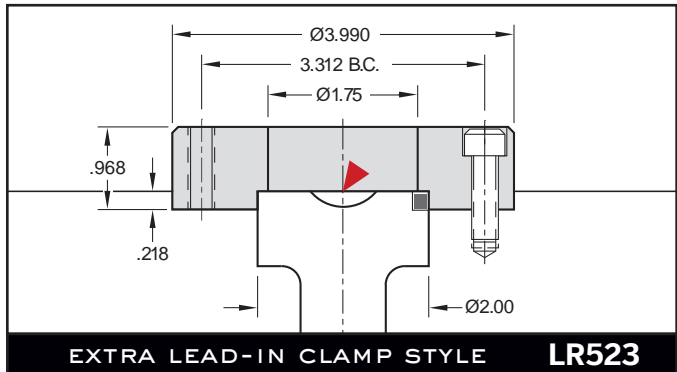
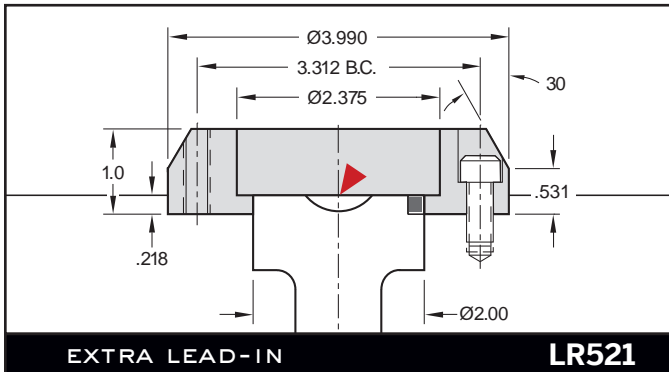
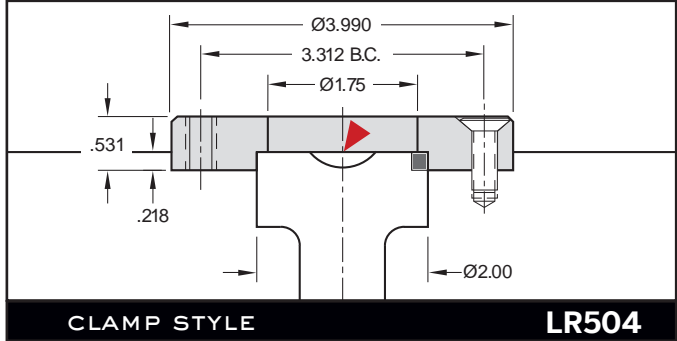
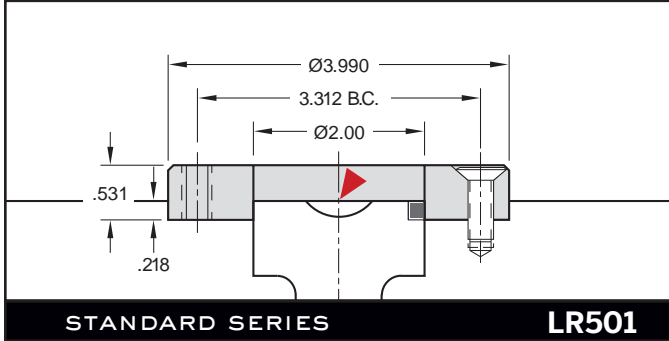
# LOCATING RINGS



**M** AISI 12L14 **H** 170 Brinell **S** Black Oxide

### Technical Information:

- Locating Rings are sized for nominal pockets.
- 5/16-18 screws and 3/16ø x 2" long dowel pin included.



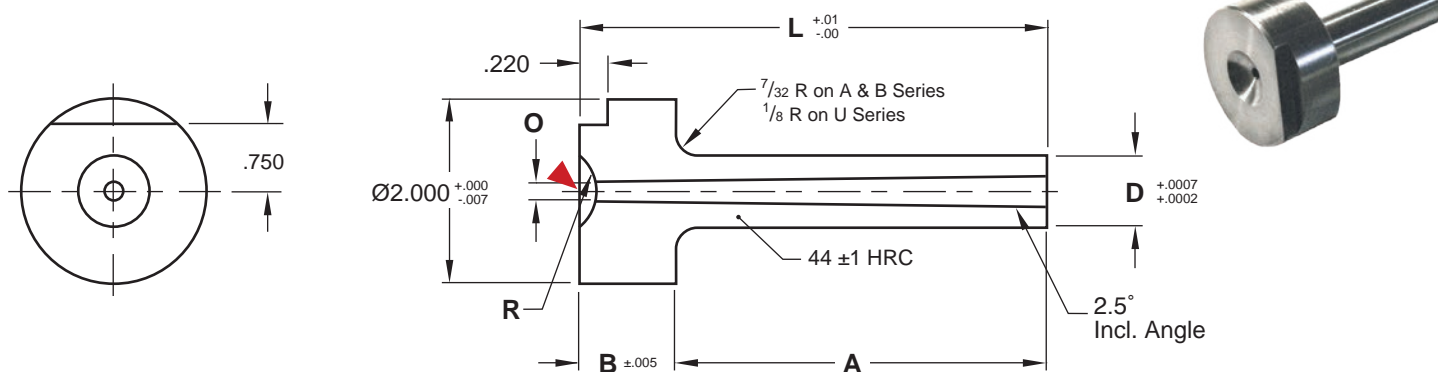
▶ CAD insertion point

Material: 100% recycled reinforced Nylon  
 Maximum temperature: 380° F (190° C)  
 Compatible with LR501.  
 5/16-18 screws included.

Patented design by G.A.I.M. Engineering.



# SPRUE BUSHINGS



**B Series**     $D=\text{Ø}1.000$      $B=.875$

**M** AISI 6150    **H** 43-45 HRC

A	L	O=5/32		O=7/32		O=9/32		O=11/32		NO HOLE	
		R=1/2	R=3/4	R=1/2	R=3/4	R=1/2	R=3/4	R=1/2	R=3/4	R=1/2	R=3/4
29/32	1-25/32	SPRB1-512	SPRB1-534	SPRB1-712	SPRB1-734	SPRB1-912	SPRB1-934	SPRB1-112	SPRB1-134	—	—
1-13/32	2-9/32	SPRB2-512	SPRB2-534	SPRB2-712	SPRB2-734	SPRB2-912	SPRB2-934	SPRB2-112	SPRB2-134	—	—
1-29/32	2-25/32	SPRB3-512	SPRB3-534	SPRB3-712	SPRB3-734	SPRB3-912	SPRB3-934	SPRB3-112	SPRB3-134	—	—
2-13/32	3-9/32	SPRB4-512	SPRB4-534	SPRB4-712	SPRB4-734	SPRB4-912	SPRB4-934	SPRB4-112	SPRB4-134	—	—
2-29/32	3-25/32	SPRB5-512	SPRB5-534	SPRB5-712	SPRB5-734	SPRB5-912	SPRB5-934	SPRB5-112	SPRB5-134	SPRB5-N12	SPRB5-N34
3-13/32	4-9/32	SPRB6-512	SPRB6-534	SPRB6-712	SPRB6-734	SPRB6-912	SPRB6-934	SPRB6-112	SPRB6-134	—	—
3-29/32	4-25/32	SPRB7-512	SPRB7-534	SPRB7-712	SPRB7-734	SPRB7-912	SPRB7-934	SPRB7-112	SPRB7-134	—	—
4-13/32	5-9/32	SPRB8-512	SPRB8-534	SPRB8-712	SPRB8-734	SPRB8-912	SPRB8-934	SPRB8-112	SPRB8-134	—	—
4-29/32	5-25/32	SPRB9-512	SPRB9-534	SPRB9-712	SPRB9-734	SPRB9-912	SPRB9-934	SPRB9-112	SPRB9-134	SPRB9-N12	SPRB9-N34
5-29/32	6-25/32	—	—	SPRB10-712	SPRB10-734	SPRB10-912	SPRB10-934	—	—	—	—
6-29/32	7-25/32	—	—	SPRB11-712	SPRB11-734	SPRB11-912	SPRB11-934	SPRB11-112	SPRB11-134	SPRB11-N12	SPRB11-N34

▶ CAD insertion point

**A Series**     $D=\text{Ø}1.000$      $B=.625$

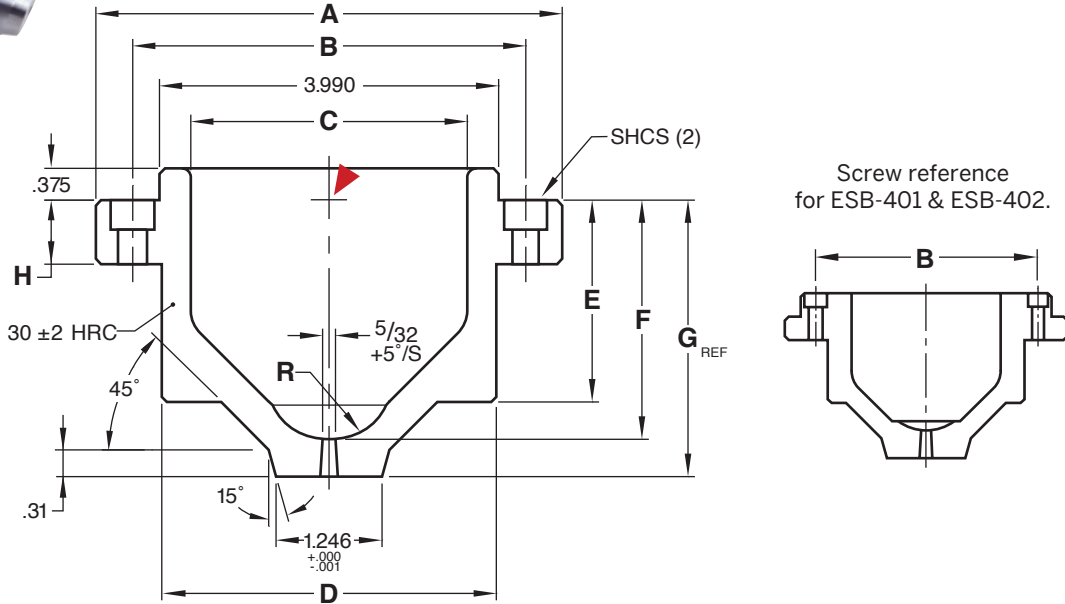
A	L	O=5/32		O=7/32		O=9/32		O=11/32		NO HOLE	
		R=1/2	R=3/4	R=1/2	R=3/4	R=1/2	R=3/4	R=1/2	R=3/4	R=1/2	R=3/4
1-3/16	1-13/16	SPRA1-512	SPRA1-534	SPRA1-712	SPRA1-734	SPRA1-912	SPRA1-934	SPRA1-112	SPRA1-134	—	—
1-11/16	2-5/16	SPRA2-512	SPRA2-534	SPRA2-712	SPRA2-734	SPRA2-912	SPRA2-934	SPRA2-112	SPRA2-134	—	—
2-3/16	2-13/16	SPRA3-512	SPRA3-534	SPRA3-712	SPRA3-734	SPRA3-912	SPRA3-934	SPRA3-112	SPRA3-134	SPRA3-N12	SPRA3-N34
2-11/16	3-5/16	SPRA4-512	SPRA4-534	SPRA4-712	SPRA4-734	SPRA4-912	SPRA4-934	SPRA4-112	SPRA4-134	—	—
3-3/16	3-13/16	SPRA5-512	SPRA5-534	SPRA5-712	SPRA5-734	SPRA5-912	SPRA5-934	SPRA5-112	SPRA5-134	—	—
3-11/16	4-5/16	SPRA6-512	SPRA6-534	SPRA6-712	SPRA6-734	SPRA6-912	SPRA6-934	SPRA6-112	SPRA6-134	—	—
4-3/16	4-13/16	SPRA7-512	SPRA7-534	SPRA7-712	SPRA7-734	SPRA7-912	SPRA7-934	SPRA7-112	SPRA7-134	SPRA7-N12	SPRA7-N34

**U Series**     $D=\text{Ø}.750$      $B=.875$

A	L	O=5/32		O=7/32		O=9/32		NO HOLE	
		R=1/2	R=3/4	R=1/2	R=3/4	R=1/2	R=3/4	R=1/2	R=3/4
29/32	1-25/32	SPRU1-512	SPRU1-534	SPRU1-712	SPRU1-734	SPRU1-912	SPRU1-934	—	—
1-13/32	2-9/32	SPRU2-512	SPRU2-534	SPRU2-712	SPRU2-734	SPRU2-912	SPRU2-934	—	—
1-29/32	2-25/32	SPRU3-512	SPRU3-534	SPRU3-712	SPRU3-734	SPRU3-912	SPRU3-934	SPRU3-N12	SPRU3-N34
2-13/32	3-9/32	SPRU4-512	SPRU4-534	SPRU4-712	SPRU4-734	SPRU4-912	SPRU4-934	—	—
2-29/32	3-25/32	SPRU5-512	SPRU5-534	SPRU5-712	SPRU5-734	SPRU5-912	SPRU5-934	SPRU5-N12	SPRU5-N34

Notes: For Hot Sprue Bushings, refer to page K-8.  
For custom sized Sprues, refer to templates in section X.

# EXTENDED SPRUE BUSHINGS



**M** AISI 4140 Pre-Hard **H** 28-32 HRC

▶ CAD insertion point

CATALOG NUMBER	A	B	C	D	E	F	G <sub>REF</sub>	H	R	SHCS
ESB-401	4.490	3.562	2.37	3.12	1.37	1.87	2.256	.375	1/2	#10-32 x 7/8"
ESB-402	4.490	3.562	2.37	3.12	1.37	1.81	2.256	.375	3/4	#10-32 x 7/8"
ESB-551	5.490	4.625	3.25	3.93	1.87	2.37	2.756	.750	1/2	5/16-18 x 1"
ESB-552	5.490	4.625	3.25	3.93	1.87	2.31	2.756	.750	3/4	5/16-18 x 1"
ESB-551L	5.490	4.625	3.25	3.93	2.37	2.87	3.256	.750	1/2	5/16-18 x 1"
ESB-552L	5.490	4.625	3.25	3.93	2.37	2.81	3.256	.750	3/4	5/16-18 x 1"

Screws included.

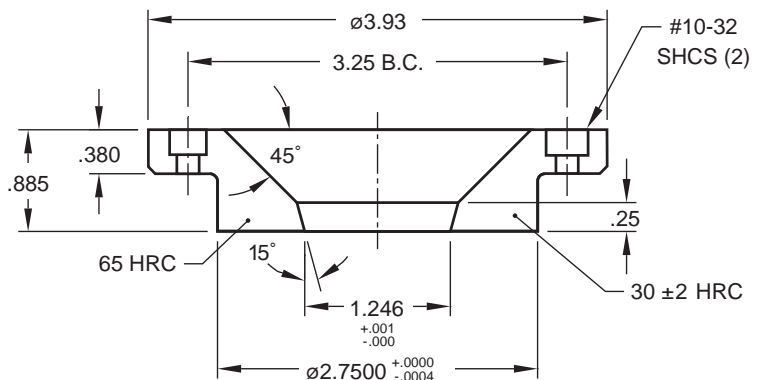
# RUNNER STRIPPER PLATE BUSHING



**M** AISI 4140 Pre-Hard **S** Salt Bath Nitride  
**H** Core: 28-32 HRC, Surface: 65 HRC

CATALOG NUMBER	DESCRIPTION
RX-40	Runner Stripper Plate Bushing

Screws included.





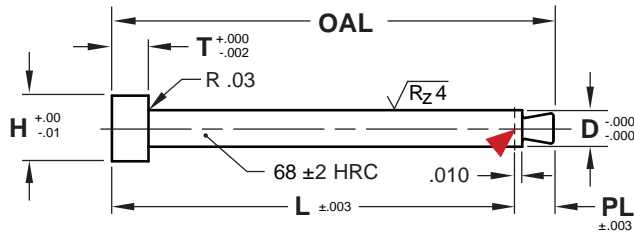


# PULLER PINS™ FOR 3-PLATE RUNNERS

## Pin Length Selection Chart

G Plate Thickness	L for 7/8" Plate	L for 1-3/8" Plate
1-3/8	1.813	2.313
1-7/8	2.313	2.813
2-3/8	2.813	3.313

Note: Standard "L" provides .010 protrusion per graphic below.



**M** H-13 **H** Core: 40-44 HRC **S** Ion Nitride 65-70 HRC

▶ CAD insertion point

Nominal Diameter	D	H	T	PL	L=1.813		L=2.313		L=2.813		L=3.313	
					OAL	CAT. #	OAL	CAT. #	OAL	CAT. #	OAL	CAT. #
5/32	.1562	.28	.156	.125	1.938	PP156L1.9	2.438	PP156L2.4	2.938	PP156L2.9	3.438	PP156L3.4
7/32	.2188	.40	.187	.187	2.000	PP219L2.0	2.500	PP219L2.5	3.000	PP219L3.0	3.500	PP219L3.5
9/32	.2812	.43	.250	.250	2.063	PP281L2.0	2.563	PP281L2.5	3.063	PP281L3.0	3.563	PP281L3.5

For custom Puller Pins, refer to templates in section X.

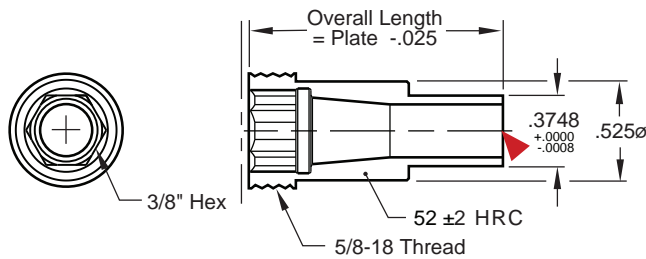
## PULLER PIN BUSHINGS



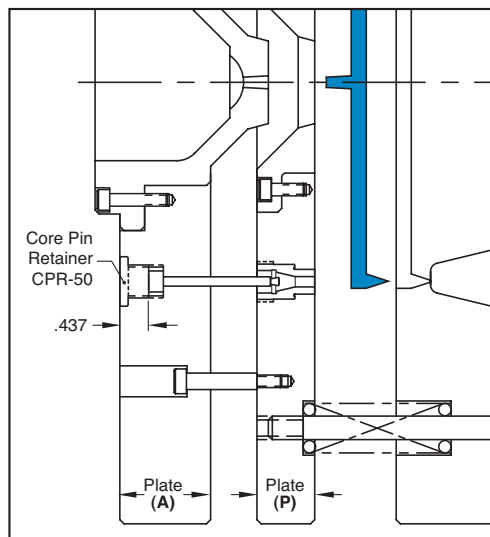
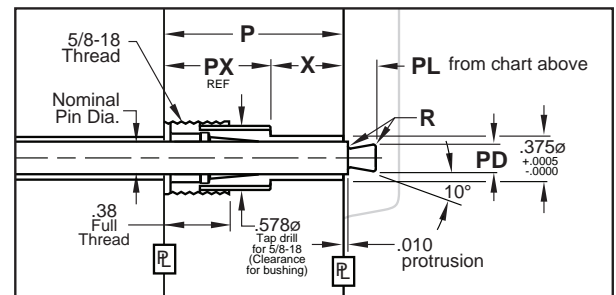
**M** 440C **H** 50-54 HRC

Puller Pin Diameter	P 7/8" Plate	P 1-3/8" Plate
5/32	PPB156L.87	PPB156L1.37
7/32	PPB219L.87	PPB219L1.37
9/32	PPB281L.87	PPB281L1.37

▶ CAD insertion point



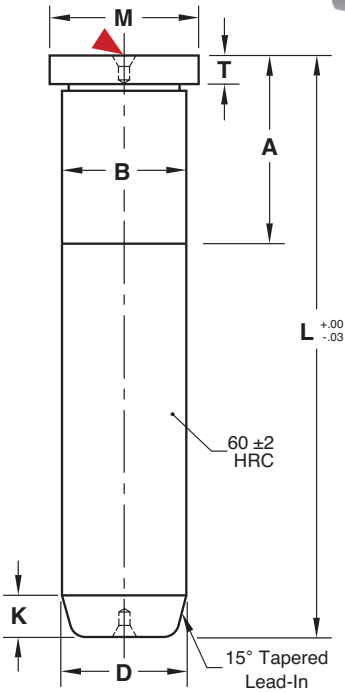
### Application



P Plate Thickness	PX REF	X	Nominal Pin Diameter	PD T.S.C.	R
7/8	1/2	.375	5/32	.145	.020
			7/32	.200	.025
			9/32	.265	.030
1-3/8	7/8	.500	5/32	.145	.020
			7/32	.200	.025
			9/32	.265	.030

# LEADER PINS

## INCH STANDARD



**M** AISI 1117 **H** Surface: 58-62 HRC

▶ CAD insertion point

L	D=3/4"			D=7/8"		D=1"		D=1-1/4"	
	A	Catalog Number	A	Catalog Number	A	Catalog Number	A	Catalog Number	
1-3/4	7/8	LP75L1.75	7/8	LP87L1.75	7/8	LP100L1.75	—	—	
2-1/4	7/8	LP75L2.25	7/8	LP87L2.25	7/8	LP100L2.25	—	—	
2-3/4	7/8	LP75L2.75	7/8	LP87L2.75	7/8	LP100L2.75	7/8	LP125L2.75	
3-1/4	7/8	LP75L3.25	7/8	LP87L3.25	7/8	LP100L3.25	7/8	LP125L3.25	
3-3/4	7/8	LP75L3.75	7/8	LP87L3.75	7/8	LP100L3.75	7/8	LP125L3.75	
4-1/4	1-3/8	LP75L4.25	1-3/8	LP87L4.25	1-3/8	LP100L4.25	7/8	LP125L4.25	
4-3/4	1-3/8	LP75L4.75	1-3/8	LP87L4.75	1-3/8	LP100L4.75	1-3/8	LP125L4.75	
5-1/4	1-3/8	LP75L5.25	1-3/8	LP87L5.25	1-3/8	LP100L5.25	1-3/8	LP125L5.25	
5-3/4	1-7/8	LP75L5.75	1-3/8	LP87L5.75	1-3/8	LP100L5.75	1-3/8	LP125L5.75	
6-1/4	1-7/8	LP75L6.25	1-3/8	LP87L6.25	1-3/8	LP100L6.25	1-3/8	LP125L6.25	
6-3/4	1-7/8	LP75L6.75	1-7/8	LP87L6.75	1-7/8	LP100L6.75	1-7/8	LP125L6.75	
7-1/4	1-7/8	LP75L7.25	1-7/8	LP87L7.25	1-7/8	LP100L7.25	1-7/8	LP125L7.25	
7-3/4	1-7/8	LP75L7.75	1-7/8	LP87L7.75	1-7/8	LP100L7.75	1-7/8	LP125L7.75	
8-1/4	—	—	1-7/8	LP87L8.25	1-7/8	LP100L8.25	1-7/8	LP125L8.25	
8-3/4	—	—	1-7/8	LP87L8.75	1-7/8	LP100L8.75	1-7/8	LP125L8.75	
9-1/4	1-7/8	LP75L9.25	—	—	1-7/8	LP100L9.25	1-7/8	LP125L9.25	
9-3/4	—	—	—	—	1-7/8	LP100L9.75	1-7/8	LP125L9.75	
10-1/4	—	—	—	—	1-7/8	LP100L10.25	1-7/8	LP125L10.25	
10-3/4	—	—	1-7/8	LP87L10.75	1-7/8	LP100L10.75	1-7/8	LP125L10.75	
11-1/4	—	—	—	—	1-7/8	LP100L11.25	1-7/8	LP125L11.25	
11-3/4	—	—	—	—	1-7/8	LP100L11.75	1-7/8	LP125L11.75	
12-1/4	—	—	1-7/8	LP87L12.25	1-7/8	LP100L12.25	1-7/8	LP125L12.25	
12-3/4	—	—	—	—	—	—	1-7/8	LP125L12.75	
13-3/4	—	—	—	—	—	—	1-7/8	LP125L13.75	
14-3/4	—	—	—	—	—	—	1-7/8	LP125L14.75	
15-3/4	—	—	—	—	—	—	1-7/8	LP125L15.75	

L	D=1-1/2"		D=2"		D=2-1/2"		D=3"	
	A	Catalog Number	A	Catalog Number	A	Catalog Number	A	Catalog Number
3-3/4	1-3/8	LP150L3.75	—	—	—	—	—	—
4-1/4	1-3/8	LP150L4.25	—	—	—	—	—	—
4-3/4	1-3/8	LP150L4.75	—	—	—	—	—	—
5-1/4	1-3/8	LP150L5.25	—	—	—	—	—	—
5-3/4	1-3/8	LP150L5.75	1-7/8	LP200L5.75	2-3/8	LP250L5.75	—	—
6-1/4	1-3/8	LP150L6.25	—	—	—	—	—	—
6-3/4	1-3/8	LP150L6.75	1-7/8	LP200L6.75	2-3/8	LP250L6.75	—	—
7-3/4	1-7/8	LP150L7.75	1-7/8	LP200L7.75	2-3/8	LP250L7.75	—	—
8-3/4	1-7/8	LP150L8.75	1-7/8	LP200L8.75	2-3/8	LP250L8.75	2-7/8	LP300L8.75
9-3/4	1-7/8	LP150L9.75	1-7/8	LP200L9.75	2-3/8	LP250L9.75	—	—
10-3/4	1-7/8	LP150L10.75	1-7/8	LP200L10.75	2-3/8	LP250L10.75	2-7/8	LP300L10.75
11-3/4	1-7/8	LP150L11.75	1-7/8	LP200L11.75	2-3/8	LP250L11.75	—	—
12-3/4	1-7/8	LP150L12.75	1-7/8	LP200L12.75	2-3/8	LP250L12.75	2-7/8	LP300L12.75
13-3/4	1-7/8	LP150L13.75	1-7/8	LP200L13.75	2-3/8	LP250L13.75	—	—
14-3/4	1-7/8	LP150L14.75	1-7/8	LP200L14.75	2-3/8	LP250L14.75	2-7/8	LP300L14.75
15-3/4	1-7/8	LP150L15.75	1-7/8	LP200L15.75	2-3/8	LP250L15.75	—	—
16-3/4	—	—	2-3/8	LP200L16.75	2-3/8	LP250L16.75	2-7/8	LP300L16.75
18-3/4	—	—	2-3/8	LP200L18.75	2-3/8	LP250L18.75	2-7/8	LP300L18.75

### Alternate Configurations Available:

- For Leader Pins with a 7/8" press fit for guided ejection applications, please refer to page B-9.
- For DIN standard Leader Pins, refer to page B-7.
- Leader Pins are available with Black Nitride treatment. To order, specify -BN at the end of the catalog number. Ex: LP125L8.25-BN

### General Dimensions

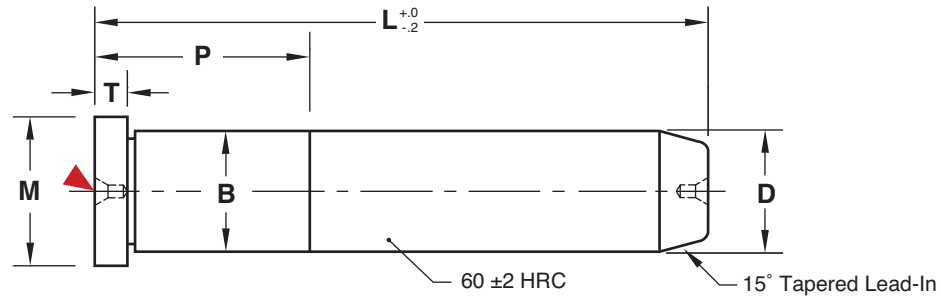
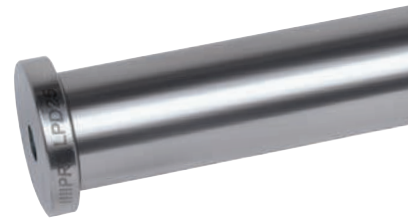
Nominal Diameter	D +.0000 -.0005	M +.00 -.01	T +.000 -.002	B +.0005 -.0000	K
3/4	.749	.990	.187	.751	3/16
7/8	.874	1.115	.250	.876	3/16
1	.999	1.240	.250	1.001	3/16
1-1/4	1.249	1.490	.312	1.251	1/4
1-1/2	1.499	1.740	.312	1.501	1/4
2	1.999	2.240	.312	2.001	1/2
2-1/2	2.499	2.740	.312	2.501	1/2
3	2.999	3.365	.500	3.001	1/2

For custom Leader Pins, refer to templates in section X.



# LEADER PINS

## DIN STANDARD



### General Dimensions

<b>D</b> -.007 -.026	<b>B</b> +.011 +.002	<b>M</b> +.0 -.2	<b>T</b>
20	20	24	8
25	25	28	15
30	30	36	15

▶ CAD insertion point

**M** AISI 1117 (1.7131) **H** Core: Approx. 25 HRC, Surface: 58-62 HRC

<b>L</b>	<b>D=20MM</b>		<b>D=25MM</b>		<b>D=30MM</b>	
	<b>P</b>	Catalog Number	<b>P</b>	Catalog Number	<b>P</b>	Catalog Number
<b>100</b>	28	LPD20L100	35	LPD25L100	45	LPD30L100
<b>120</b>	28	LPD20L120	35	LPD25L120	45	LPD30L120
<b>140</b>	28	LPD20L140	35	LPD25L140	45	LPD30L140
<b>160</b>	—	—	—	—	45	LPD30L160

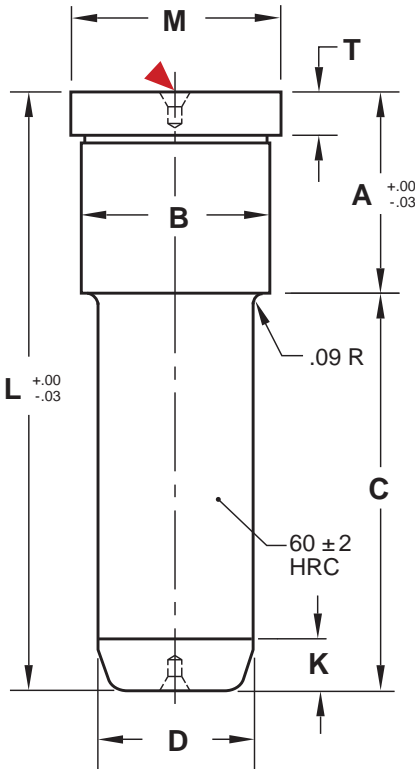
### Alternate Configurations Available:

- Leader Pins are available with Black Nitride treatment. To order, specify -BN at the end of the catalog number. Ex: LPD20L140-BN



For custom Leader Pins, refer to templates in section X.

# LEADER PINS SHOULDER STYLE



**M** AISI 1117 **H** Surface: 58-62 HRC

CAD insertion point

A	C	L	D=1/2"	D=3/4"	D=1"	D=1-1/4"
7/8	7/8	1-3/4	SLP50X87L175	SLP75X87L175	—	—
	1-3/8	2-1/4	SLP50X87L225	SLP75X87L225	—	—
	1-7/8	2-3/4	SLP50X87L275	—	—	—
	2-3/8	3-1/4	SLP50X87L325	SLP75X87L325	—	—
	2-7/8	3-3/4	—	SLP75X87L375	SLP100X87L375	—
1-3/8	7/8	2-1/4	SLP50X137L225	SLP75X137L225	—	—
	1-3/8	2-3/4	SLP50X137L275	SLP75X137L275	SLP100X137L275	—
	1-7/8	3-1/4	SLP50X137L325	SLP75X137L325	SLP100X137L325	—
	2-3/8	3-3/4	—	SLP75X137L375	—	—
	2-7/8	4-1/4	—	SLP75X137L425	SLP100X137L425	—
	3-3/8	4-3/4	—	SLP75X137L475	—	SLP125X137L475
1-7/8	7/8	2-3/4	SLP50X187L275	—	—	—
	1-3/8	3-1/4	SLP50X187L325	SLP75X187L325	—	—
	1-7/8	3-3/4	SLP50X187L375	SLP75X187L375	SLP100X187L375	—
	2-3/8	4-1/4	—	SLP75X187L425	SLP100X187L425	SLP125X187L425
	2-7/8	4-3/4	—	SLP75X187L475	SLP100X187L475	—
	3-3/8	5-1/4	—	SLP75X187L525	—	—
2-3/8	3-7/8	5-3/4	—	SLP75X187L575	—	SLP125X187L575
	7/8	3-1/4	SLP50X237L325	—	—	—
	1-3/8	3-3/4	—	SLP75X237L375	—	—
	1-7/8	4-1/4	—	SLP75X237L425	SLP100X237L425	—
	2-3/8	4-3/4	—	SLP75X237L475	SLP100X237L475	—
	2-7/8	5-1/4	—	SLP75X237L525	—	SLP125X237L525
2-7/8	3-3/8	5-3/4	—	—	SLP100X237L575	—
	3-7/8	6-1/4	—	—	—	SLP125X237L625
	1-3/8	4-1/4	—	SLP75X287L425	—	—
	1-7/8	4-3/4	—	SLP75X287L475	SLP100X287L475	—
	2-3/8	5-1/4	—	SLP75X287L525	SLP100X287L525	—
	2-7/8	5-3/4	—	SLP75X287L575	SLP100X287L575	SLP125X287L575
3-3/8	3-3/8	6-1/4	—	—	SLP100X287L625	—
	3-7/8	6-3/4	—	SLP75X287L675	—	—
	4-3/8	7-1/4	—	—	—	SLP125X287L725
	2-3/8	5-3/4	—	SLP75X337L575	—	—
	3-3/8	6-3/4	—	SLP75X337L675	—	—
3-7/8	4-3/8	7-3/4	—	—	SLP100X337L775	—
	2-3/8	6-1/4	—	SLP75X387L625	SLP100X387L625	—
	2-7/8	6-3/4	—	SLP75X387L675	SLP100X387L675	—
4-3/8	2-7/8	7-1/4	—	—	SLP100X437L725	—
	3-3/8	7-3/4	—	—	—	SLP125X437L775
4-7/8	3-7/8	8-3/4	—	—	SLP100X487L875	SLP125X487L875
5-7/8	3-7/8	9-3/4	—	—	SLP100X587L975	—
	5-7/8	11-3/4	—	—	—	SLP125X587L1175

### General Dimensions

Nominal Diameter	D +.0000 -.0005	B +.0005 -.0000	M +.000 -.010	T +.000 -.002	K
1/2	.499	.751	.853	.187	3/16
3/4	.749	1.126	1.250	.312	3/16
1	.999	1.376	1.500	.312	3/16
1-1/4	1.249	1.626	1.750	.312	1/4

### Alternate Configurations Available:

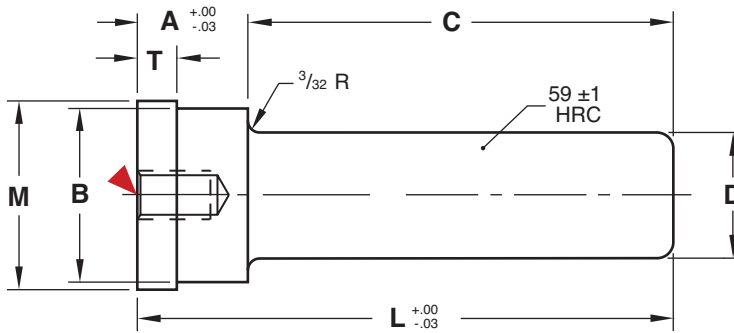
- Shoulder Leader Pins are available with Black Nitride treatment. To order, specify -BN at the end of the catalog number. Ex: SLP75X387L625-BN

For custom Leader Pins, refer to templates in section X.



# GUIDED EJECTOR PINS

## SHOULDER STYLE



### General Dimensions

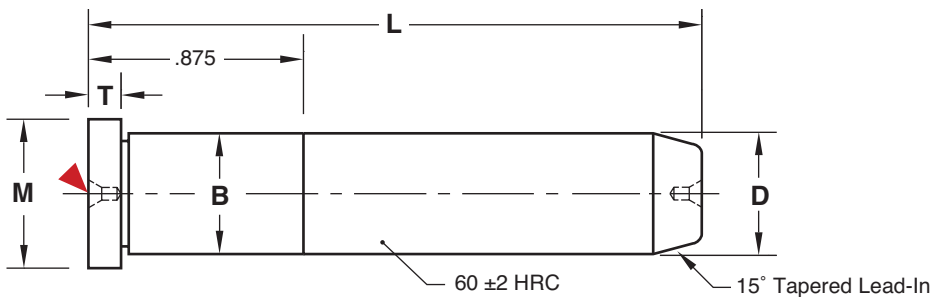
**M** AISI 8620 **H** Core: Approx. 25 HRC, Surface: 58-60 HRC

Nominal Diameter	D +.0000 -.0005	B +.0005 -.0000	M +.00 -.01	T +.000 -.015
1/2	.499	.751	.853	.187
3/4	.749	1.126	1.250	.312
1	.999	1.376	1.500	.312

A	C	L	D=1/2"	D=3/4"	D=1"
7/8	2-7/8	3-3/4	GEP50X87L375	—	—
	3-3/8	4-1/4	GEP50X87L425	GEP75X87L425	GEP100X87L425
	3-7/8	4-3/4	GEP50X87L475	GEP75X87L475	GEP100X87L475
	4-3/8	5-1/4	GEP50X87L525	GEP75X87L525	GEP100X87L525
	4-7/8	5-3/4	—	GEP75X87L575	GEP100X87L575
1-3/8	3-7/8	5-1/4	—	—	GEP100X137L525
	4-3/8	5-3/4	—	—	GEP100X137L575
	4-7/8	6-1/4	—	—	GEP100X137L625

For custom pins, refer to the templates in section X.

CAD insertion point



### STRAIGHT STYLE



### General Dimensions: Inch

**M** AISI 1117 **H** Core: Approx. 25 HRC, Surface: 58-62 HRC

D +.0000 -.0005	B +.0005 -.0000	M +.00 -.01	T +.000 -.015
.749	.751	.990	.187
.874	.876	1.115	.250
.999	1.001	1.240	.250

L +.00 -.03	D=3/4"	D=7/8"	D=1"
4-1/4	LP75L4.25-P	LP87L4.25-P	LP100L4.25-P
4-3/4	LP75L4.75-P	LP87L4.75-P	LP100L4.75-P
5-1/4	LP75L5.25-P	LP87L5.25-P	LP100L5.25-P
5-3/4	LP75L5.75-P	LP87L5.75-P	LP100L5.75-P
6-1/4	LP75L6.25-P	LP87L6.25-P	LP100L6.25-P

CAD insertion point

### Alternate Configurations Available:

- Leader Pins are available with Black Nitride treatment. To order, specify -BN at the end of the catalog number. Ex: LP100L6.25-P-BN

For custom pins, refer to the templates in section X.

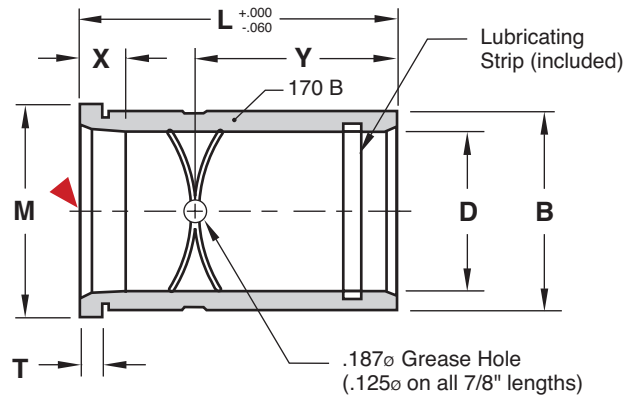
# BUSHINGS

## SHOULDER STYLE



### General Dimensions

Nominal Diameter	D +.0005 -.0000	B +.0005 -.0000	M +.00 -.01	T +.00 -.01
1/2	.5005	.7505	.853	.187
3/4	.7505	1.1255	1.302	.187
7/8	.8755	1.2505	1.427	.187
1	1.0005	1.3755	1.552	.187
1-1/4	1.2505	1.6255	1.802	.187
1-1/2	1.5005	2.0005	2.177	.187
2	2.0005	2.5005	2.677	.187
2-1/2	2.5005	3.2505	3.427	.187
3	3.0005	3.7505	3.990	.500



**M** CA954 Solid Bronze **H** 170 Brinell

CAD insertion point

L	D=1/2"	D=3/4"	D=7/8"	D=1"	D=1-1/4"	D=1-1/2"	D=2"	D=2-1/2"	D=3"
7/8	SAB50L.87	SAB75L.87	SAB87L.87	SAB100L.87	SAB125L.87	SAB150L.87	—	—	—
1-3/8	SAB50L1.37	SAB75L1.37	SAB87L1.37	SAB100L1.37	SAB125L1.37	SAB150L1.37	SAB200L1.37	SAB250L1.37	—
1-7/8	SAB50L1.87	SAB75L1.87	SAB87L1.87	SAB100L1.87	SAB125L1.87	SAB150L1.87	SAB200L1.87	SAB250L1.87	—
2-3/8	SAB50L2.37	SAB75L2.37	SAB87L2.37	SAB100L2.37	SAB125L2.37	SAB150L2.37	SAB200L2.37	SAB250L2.37	—
2-7/8	—	SAB75L2.87	SAB87L2.87	SAB100L2.87	SAB125L2.87	SAB150L2.87	SAB200L2.87	SAB250L2.87	—
3-3/8	—	SAB75L3.37	SAB87L3.37	SAB100L3.37	SAB125L3.37	SAB150L3.37	SAB200L3.37	SAB250L3.37	—
3-7/8	—	SAB75L3.87	SAB87L3.87	SAB100L3.87	SAB125L3.87	SAB150L3.87	SAB200L3.87	SAB250L3.87	SAB300L3.87
4-3/8	—	SAB75L4.37	SAB87L4.37	SAB100L4.37	SAB125L4.37	SAB150L4.37	SAB200L4.37	SAB250L4.37	—
4-7/8	—	SAB75L4.87	SAB87L4.87	SAB100L4.87	SAB125L4.87	SAB150L4.87	SAB200L4.87	SAB250L4.87	SAB300L4.87
5-7/8	—	SAB75L5.87	SAB87L5.87	SAB100L5.87	SAB125L5.87	SAB150L5.87	SAB200L5.87	SAB250L5.87	SAB300L5.87
7-7/8	—	—	—	—	—	—	—	—	SAB300L7.87

### Grease Hole and Clearance Dimensions

L	D=1/2" - 7/8"		D=1"		D=1-1/4"		D=1-1/2"		D=2"		D=2-1/2" - 3	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
7/8	—	.43	—	.43	—	.43	—	.43	—	—	—	—
1-3/8	—	.62	—	.62	—	.62	—	.62	—	.62	—	.62
1-7/8	—	.62	—	.62	—	.62	—	.62	—	.62	—	.62
2-3/8	.50	.81	—	.81	—	.81	—	.81	—	.81	—	.81
2-7/8	.50	.81	.50	.81	—	.81	—	.81	—	.81	—	.81
3-3/8	1.00	.81	.50	.81	.50	.81	—	.81	—	.81	—	.81
3-7/8	1.00	.81	.50	.81	.50	.81	.50	.81	—	.81	—	.81
4-3/8	1.50	.81	1.00	.81	1.00	.81	.50	.81	—	.81	—	.81
4-7/8	1.50	.81	1.00	.81	1.00	.81	1.00	.81	.50	1.31	—	1.31
5-7/8	2.00	.81	1.50	.81	1.50	.81	1.50	.81	1.00	1.31	.50	1.31
7-7/8	—	—	—	—	—	—	—	—	—	—	.50	1.31

Note: To order replacement lubricating strips, specify the prefix BSHSTRP with the inner diameter. Ex: BSHSTRP-125.



# BUSHINGS SHOULDER STYLE

## BRONZE PLATED SHOULDER BUSHINGS

**M** AISI 1026 **H** 22-28 HRC **S** Bronze Plated: .004" Deep

To order: Specify "SHB" in the prefix to replace "SAB" in the chart at left.  
Example: SHB200L2.37 for 2" ID x 2.37 long bushings

Notes: Bronze plated shoulder bushings have internal grease grooves.  
Grease entry hole to be machined by mold maker.  
The bearing of the inner diameter is through, where the clearance "X" on the previous page does not apply.  
Not available in 1/2" diameter.



## GRAPHITE PLUGGED SHOULDER BUSHINGS

**M** CA954 with oil impregnated graphite plugs **H** 170 Brinell

To order: Specify "SGP" in the prefix to replace "SAB" in the chart at left.  
Example: SGP200L2.37 for 2" ID x 2.37 long bushings

Notes: Graphite plugs are not compatible with grease.  
Use a light 20 weight oil at startup to begin lubrication.  
The bearing of the inner diameter is through, where the clearance "X" on the previous page does not apply.  
Not available in 1/2" diameter.



## STEEL SHOULDER BUSHINGS

**M** AISI 1117 **H** 58-62 HRC

To order: Specify "STL" in the prefix to replace "SAB" in the chart at left.  
Example: STL200L2.37 for 2" ID x 2.37 long bushings

Notes: Steel (Hardened) shoulder bushings have internal grease grooves.  
Grease entry hole to be machined by mold maker.  
The bearing of the inner diameter is 2 x the ID, where the clearance "X" on the previous page does not apply.  
Steel Bushings are available with Black Nitride treatment. To order, specify -BN at the end of the catalog number. Ex: STL200L5.87-BN.



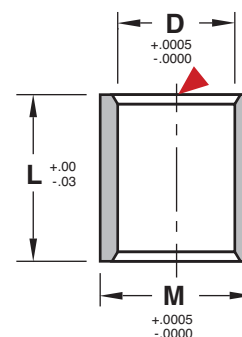
# BUSHINGS STRAIGHT STYLE

**M** Non-Plated Steel: AISI 1117 **H** 58-62 HRC

**M** Graphite Plugged: CA954 **H** 170 Brinell

CAD insertion point

Nominal Diameter	D +.0005 -.0000	M +.0005 -.0000	L +.00 -.03	CATALOG NUMBER STANDARD STEEL	CATALOG NUMBER GRAPHITE PLUGGED
1/2	.5005	.7505	7/8 1-3/8	STB50L.87 STB50L1.37	— —
3/4	.7505	1.1255	7/8 1-3/8	STB75L.87 STB75L1.37	STGP75L.87 STGP75L1.37
7/8	.8755	1.2505	1-3/8 1-1/2	STB87L1.37 —	— STGP87L1.50
1	1.0005	1.3755	1-3/8	STB100L1.37	STGP100L1.37
1-1/4	1.2505	1.6255	1-3/8 1-7/8	STB125L1.37 STB125L1.87	STGP125L1.37 STGP125L1.87
1-1/2	1.5005	2.0005	1-3/8 1-7/8	STB150L1.37 STB150L1.87	STGP150L1.37 STGP150L1.87
2	2.0005	2.5005	3-7/8	STB200L3.87	STGP200L3.87
2-1/2	2.5005	3.2505	4-7/8	STB250L4.87	STGP250L4.87



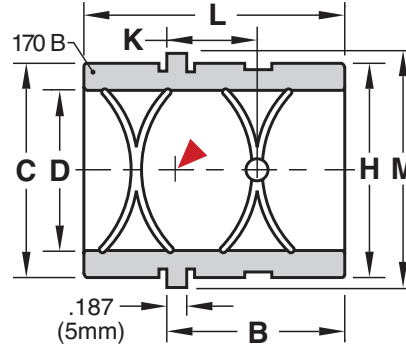
Using grease will inhibit the function of the graphite plugs. Instead, use a light 20 weight oil at startup to begin lubrication.





# GUIDED EJECTOR BUSHINGS

## SOLID BRONZE



**M** CA954 Solid Bronze **H** 170 Brinell

### Inch Standard

▶ CAD insertion point

CATALOG NUMBER	Nominal Diameter	D +.0005 -.0000	H +.0005 -.0000	C +.000 -.001	M +.00 -.01	B	K	L +.00 -.03
GEB50	1/2	.5005	.7505	.7490	.853	1.00	.56	1.50
GEB75	3/4	.7505	1.1255	1.1240	1.302	1.00	.56	1.50
GEB87	7/8	.8755	1.2505	1.2490	1.427	1.00	.56	1.50
GEB100	1	1.0005	1.3755	1.3740	1.552	1.12	.62	1.75
GEB125	1-1/4	1.2505	1.6255	1.6240	1.802	1.12	.62	1.75
GEB150	1-1/2	1.5005	2.0005	1.9990	2.177	1.12	.62	1.75
GEB200	2	2.0005	2.5005	2.4990	2.687	1.62	.80	2.25

### Metric Standard

CATALOG NUMBER	D +.013 +.026	H +.01 -.00	C -.01 -.03	M +.00 -.13	B	K	L +.0 -.8
GEBD20	20	26	26	28	25	15	37
GEBD25	25	32	32	35	29	16	45
GEBD30	30	38	38	41	29	16	45


# GRAPHITE PLUGGED



**M** CA954 with oil impregnated graphite plugs **H** 170 Brinell

CATALOG NUMBER	Nominal Diameter	D +.0005 -.0000	H +.0005 -.0000	C +.000 -.001	M +.00 -.01	B	L +.00 -.03
GGP75	3/4	.751	1.1255	1.1240	1.302	1.00	1.50
GGP87	7/8	.876	1.2505	1.2490	1.427	1.00	1.50
GGP100	1	1.001	1.3755	1.3740	1.552	1.12	1.75
GGP125	1-1/4	1.251	1.6255	1.6240	1.802	1.12	1.75
GGP150	1-1/2	1.501	2.0005	1.9990	2.177	1.12	1.75
GGP200	2	2.001	2.5005	2.4990	2.687	1.62	2.25

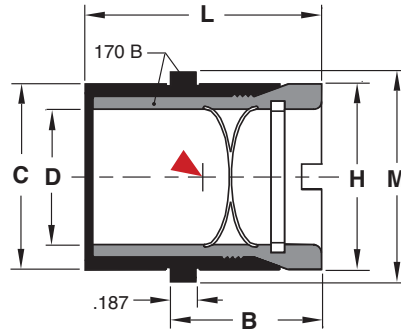
Using grease will inhibit the function of the graphite plugs. Instead, use a light 20 weight oil at startup to begin lubrication.

 For custom Bushings, refer to the templates in section X.



# GUIDED EJECTOR BUSHINGS

## QC™ BUSHINGS



Liner: **M** CA954 Solid Bronze **H** 170 Brinell  
 Body: **M** AISI 12L14 **H** 170 Brinell **S** Black Oxide

CAD insertion point

CATALOG NUMBER	Nominal Diameter	D +.0005 -.0000	H +.0005 -.0000	C +.000 -.001	M +.00 -.01	B	L +.000 -.015
<b>GQC50</b>	1/2	.5005	.7505	.7490	.853	1.00	1.50
<b>GQC75</b>	3/4	.7505	1.1255	1.1240	1.302	1.00	1.50
<b>GQC87</b>	7/8	.8755	1.2505	1.2490	1.427	1.00	1.50
<b>GQC100</b>	1	1.0005	1.3755	1.3740	1.552	1.12	1.75
<b>GQC125</b>	1-1/4	1.2505	1.6255	1.6240	1.802	1.12	1.75
<b>GQC150</b>	1-1/2	1.5005	2.0005	1.9990	2.177	1.12	1.75

- Bushings are sold in assembly.
- Replacement liners are sold below. For additional sizes, contact Customer Service.
- To order replacement lubricating strips, specify the prefix BSHSTRP with the inner diameter. Ex: BSHSTRP-125.

**M** CA954 Solid Bronze **H** 170 Brinell

## REPLACEMENT LINERS

INNER DIAMETER	LINER CATALOG NUMBER	FITS BUSHINGS
<b>1/2"</b>	BL50L1.50	GQC50
	BL75L.87	SQC75L.87
<b>3/4"</b>	BL75L1.37	GQC75
		SQC75L1.37
		SQC75L1.87
		SQC75L2.37
		SQC75L2.87
<b>7/8"</b>	BL87L.87	SQC87L.87
	BL87L1.37	GQC87
		SQC87L1.37
		SQC87L1.87
		SQC87L2.37
		SQC87L2.87

INNER DIAMETER	LINER CATALOG NUMBER	FITS BUSHINGS
<b>1"</b>	BL100L1.37	SQC100L1.37
	BL100L1.75	GQC100
		SQC100L1.87
		SQC100L2.37
		SQC100L3.37
<b>1-1/4"</b>	BL125L1.37	SQC125L1.37
	BL125L1.75	GQC125
		SQC125L1.87
		SQC125L2.37
		SQC125L2.87
		SQC125L3.37
<b>1-1/2"</b>	BL150L1.75	GQC150
		SQC150L1.87

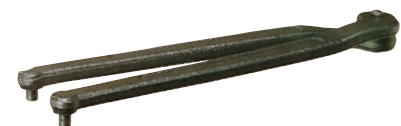


- To order replacement lubricating strips, specify the prefix BSHSTRP with the inner diameter. Ex: BSHSTRP-125.
- References to "SQC" Shoulder Bushings are for legacy tools. For tools requiring Shoulder Bushings, please refer to pages B-10 & B-11.

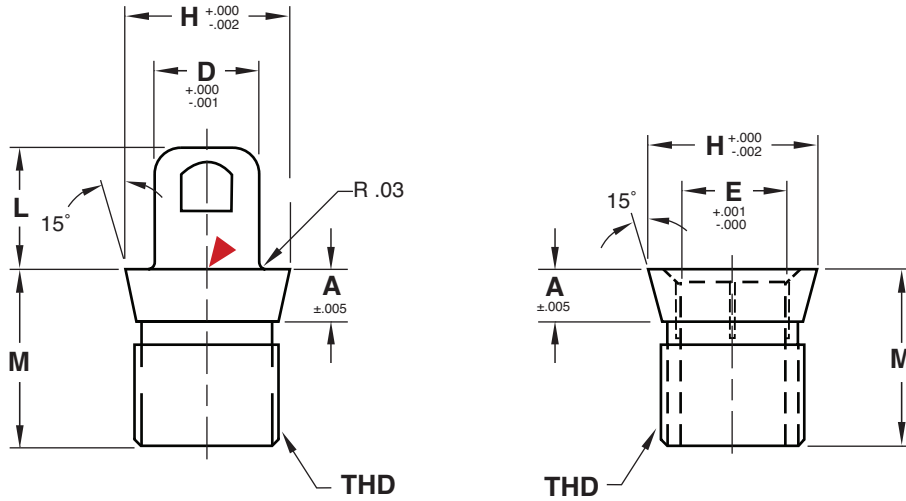
**M** Hardened Steel

## SPANNER WRENCH

CATALOG NUMBER	DESCRIPTION
<b>SW-100</b>	Adjustable Spanner Wrench



# FRONT LOADING PINS AND BUSHINGS



**M** H-13 **H** Core: 40-45 HRC, Surface: 65-70 HRC **S** Nitride ▶ CAD insertion point

CATALOG NUMBER	Nominal Diameter	D Pin Diameter	E Bushing Diameter	THD UNF	H	L	M	A
FLPB31L.62	5/16	.3125	.3130	1/2-20	.609	.62	.670	.20
FLPB43L.57	7/16	.4375	.4380	5/8-18	.747	.57	.850	.25
FLPB43L.75	7/16	.4375	.4380	5/8-18	.747	.75	.850	.25
FLPB50L.58	1/2	.5000	.5005	11/16-16	.807	.58	.845	.25
FLPB75L.70	3/4	.7500	.7505	1-12	1.115	.70	1.255	.25
FLPB75L1.10	3/4	.7500	.7505	1-12	1.115	1.10	1.255	.25
FLPB75L1.75	3/4	.7500	.7505	1-12	1.115	1.75	1.255	.25
FLPB100L1.10	1	1.0000	1.0005	11/4-16	1.370	1.10	1.224	.25

Sold in sets of (1) pin and (1) bushing.

## INSTALLATION WRENCH



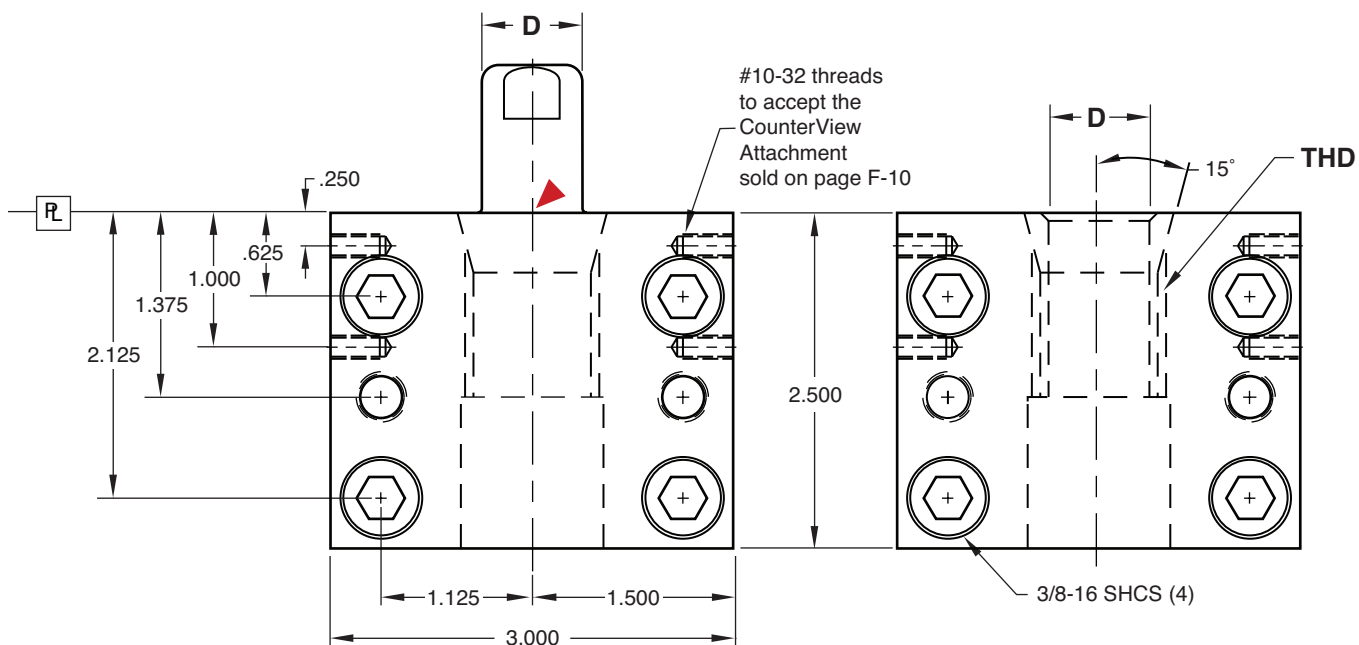
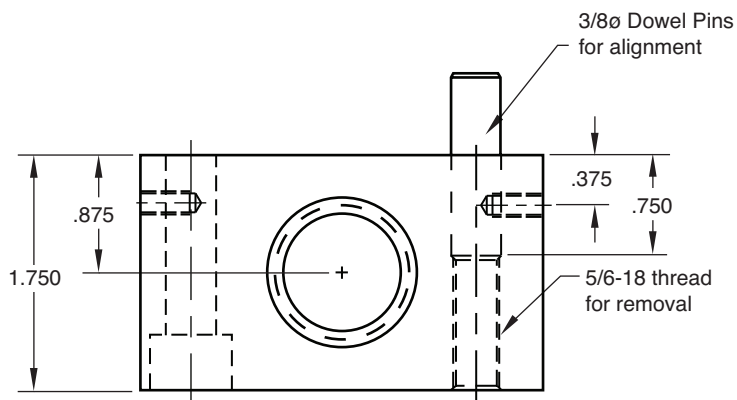
**M** CRS **H** Case Hardened **S** Black Oxide

CATALOG NUMBER	DESCRIPTION
WR-312	For 5/16" ID Bushing
WR-437	For 7/16" ID Bushing
WR-500	For 1/2" ID Bushing
WR-750	For 3/4" ID Bushing
WR-100	For 1" ID Bushing



# GUIDE BLOCKS

## FRONT LOADING PINS & BUSHINGS SERIES



**M** A-36 **H** Pre-Hard **S** Black Oxide

CATALOG NUMBER	D Pin/Bushing Diameter	THD UNF
GBK-75	3/4	1-12
GBK-100	1	1 1/4-16

CAD insertion point

Sold in sets of (2) identical blocks.  
Pins and bushings sold separately on page B-14.

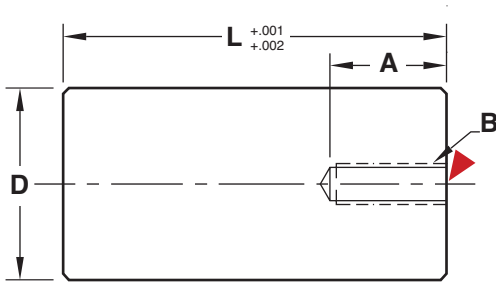
# SUPPORT PILLARS



**M** AISI 1018 **H** 90 Brinell

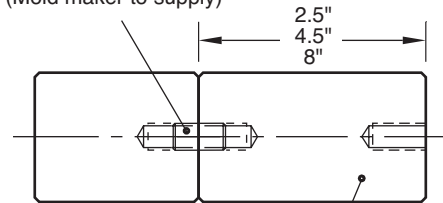
CAD insertion point

## Threaded Support Pillars



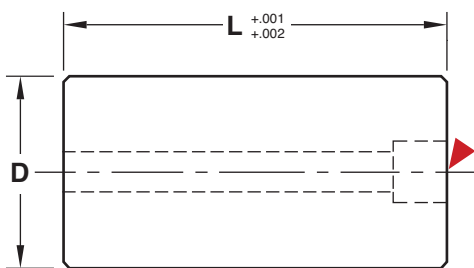
Socket Head Cap Screws are included with all Support Pillars. 1" long screws are used with the Threaded Pillars. Refer to the chart for the Counterbored Pillar screw size.

Optional Set Screw (Mold maker to supply)



All 2.5", 4.5" and 8" long Threaded Support Pillars are tapped for a set screw enabling a second pillar to be attached as an extension.

## Counterbored Support Pillars



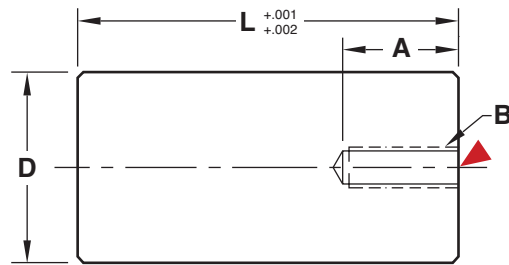
D	L	THREADED SUPPORT PILLARS			COUNTERBORED SUPPORT PILLARS			
		CATALOG NUMBER	A	B	CATALOG NUMBER	SHCS		
1	2.5	SP100L2.5	.62	3/8-16	SP100L2.5-CB	3/8-16 x 2.5"		
	3	SP100L3			SP100L3-CB	3/8-16 x 3"		
	3.5	SP100L3.5			SP100L3.5-CB	3/8-16 x 3.5"		
	4	SP100L4			SP100L4-CB	3/8-16 x 4"		
1.25	4.5	SP100L4.5	.62	3/8-16	SP100L4.5-CB	3/8-16 x 4.5"		
	2.5	SP125L2.5			SP125L2.5-CB	3/8-16 x 2.5"		
	3	SP125L3			SP125L3-CB	3/8-16 x 3"		
	3.5	SP125L3.5			SP125L3.5-CB	3/8-16 x 3.5"		
	4	SP125L4			SP125L4-CB	3/8-16 x 4"		
	4.5	SP125L4.5			SP125L4.5-CB	3/8-16 x 4.5"		
1.5	5	SP125L5	.62	3/8-16	SP125L5-CB	3/8-16 x 5"		
	6	SP125L6			SP125L6-CB	3/8-16 x 6"		
	2.5	SP150L2.5			.62	3/8-16	SP150L2.5-CB	3/8-16 x 2.5"
	3	SP150L3					SP150L3-CB	3/8-16 x 3"
	3.5	SP150L3.5					SP150L3.5-CB	3/8-16 x 3.5"
	4	SP150L4					SP150L4-CB	3/8-16 x 4"
	4.5	SP150L4.5					SP150L4.5-CB	3/8-16 x 4.5"
5	SP150L5	SP150L5-CB	3/8-16 x 5"					
6	SP150L6	SP150L6-CB	3/8-16 x 6"					
2	7	SP150L7	.62	3/8-16	SP150L7-CB	3/8-16 x 7"		
	2.5	SP200L2.5			.62	3/8-16	SP200L2.5-CB	3/8-16 x 2.5"
	3	SP200L3					SP200L3-CB	3/8-16 x 3"
	3.5	SP200L3.5					SP200L3.5-CB	3/8-16 x 3.5"
	4	SP200L4					SP200L4-CB	3/8-16 x 4"
	4.5	SP200L4.5					SP200L4.5-CB	3/8-16 x 4.5"
	5	SP200L5					SP200L5-CB	3/8-16 x 5"
	6	SP200L6					SP200L6-CB	3/8-16 x 6"
	7	SP200L7					SP200L7-CB	3/8-16 x 7"
8	SP200L8	SP200L8-CB	3/8-16 x 8"					
2.5	9	SP200L9	.62	3/8-16	SP200L9-CB	3/8-16 x 9"		
	5	SP250L5			.62	3/8-16	SP250L5-CB	3/8-16 x 5"
	6	SP250L6					SP250L6-CB	3/8-16 x 6"
	7	SP250L7					SP250L7-CB	3/8-16 x 7"
8	SP250L8	SP250L8-CB	3/8-16 x 8"					
3	5	SP300L5	1.25	5/8-11	SP300L5-CB	5/8-11 x 5.5"		
	6	SP300L6			SP300L6-CB	5/8-11 x 6.5"		
	7	SP300L7			SP300L7-CB	5/8-11 x 7.5"		
	8	SP300L8			SP300L8-CB	5/8-11 x 8.5"		
	9	SP300L9			SP300L9-CB	5/8-11 x 9.5"		
	10	SP300L10			SP300L10-CB	5/8-11 x 10.5"		
4	5	SP400L5	1.25	5/8-11	SP400L5-CB	5/8-11 x 5.5"		
	6	SP400L6			SP400L6-CB	5/8-11 x 6.5"		
	8	SP400L8			SP400L8-CB	5/8-11 x 8.5"		

Smaller diameter Support Pillars available on page L-21.  
For custom Support Pillars, refer to section X.



# SUPPORT PILLARS

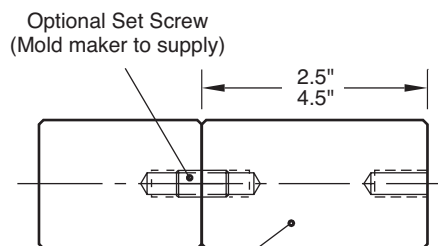
## STAINLESS STEEL



**M** 410 Stainless Steel **H** 30-34 HRC ▶ CAD insertion point

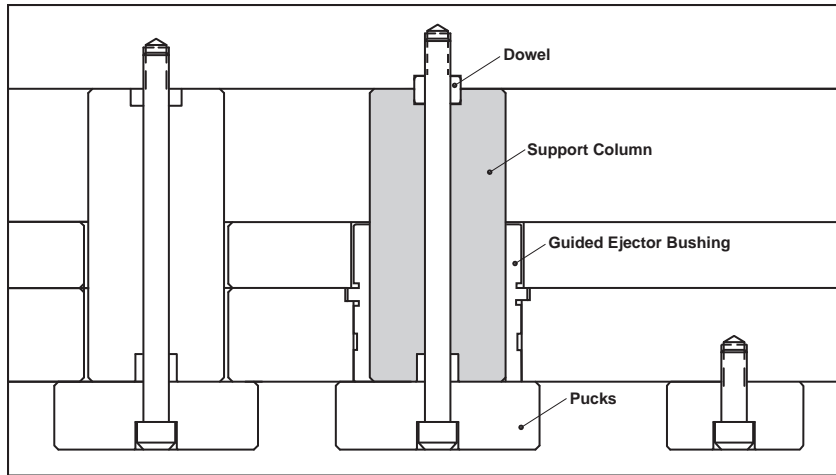
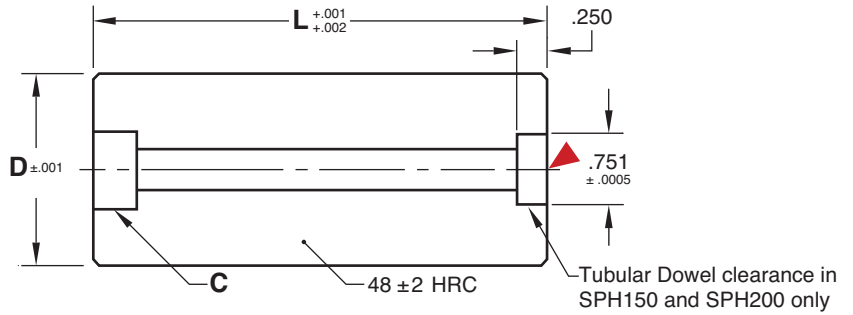
D	CATALOG NUMBER	L	A	B
1	SP100L2.5-SS	2.5	.62	3/8-16
	SP100L3-SS	3		
	SP100L3.5-SS	3.5		
	SP100L4.5-SS	4.5		
1.25	SP125L3-SS	3	.62	3/8-16
	SP125L3.5-SS	3.5		
	SP125L4-SS	4		
	SP125L4.5-SS	4.5		
1.5	SP150L3-SS	3	.62	3/8-16
	SP150L3.5-SS	3.5		
	SP150L4-SS	4		
	SP150L4.5-SS	4.5		
2	SP200L3-SS	3	.62	3/8-16
	SP200L3.5-SS	3.5		
	SP200L4-SS	4		
	SP200L4.5-SS	4.5		
	SP200L5-SS	5		
3	SP300L5-SS	5	1.25	5/8-11
	SP300L6-SS	6		

1" Long Stainless Socket Head Cap Screw included.  
For custom Support Pillars refer to section X.



All 2.5" and 4.5" long Threaded Support Pillars are tapped for a set screw enabling a second pillar to be attached as an extension.

# SUPPORT COLUMNS FOR DIE CAST DIES



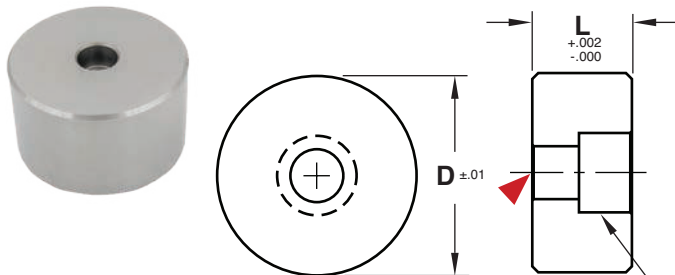
**M** AISI 4140 **H** 46-50 HRC ▶ CAD insertion point

Nominal Diameter	D ±.001	CATALOG NUMBER	L +.001 +.002	C
1.5	1.496	SPH150L3	3	3/8-16
		SPH150L3.5	3.5	
		SPH150L4	4	
		SPH150L4.5	4.5	
		SPH150L5	5	
2	1.996	SPH200L3	3	3/8-16
		SPH200L3.5	3.5	
		SPH200L4	4	
		SPH200L4.5	4.5	
		SPH200L5	5	
		SPH200L6	6	

Nominal Diameter	D ±.001	CATALOG NUMBER	L +.001 +.002	C
3	2.996	SPH300L4	4	5/8-11
		SPH300L4.5	4.5	
		SPH300L5	5	
		SPH300L6	6	
		SPH300L7	7	
		SPH300L8	8	
4	3.996	SPH400L5	5	5/8-11
		SPH400L6	6	
		SPH400L7	7	
		SPH400L8	8	

Guided Ejector Bushings sold separately on page B-12.

## SUPPORT COLUMN PUCKS



Counterbored for 3/8-16 SHCS except for SDB75L1 (1/4-20 SHCS)

**M** AISI 1018 ▶ CAD insertion point

D ±.01	L=.75	L=1.00	L=1.50	L=2.00
.750	—	SDB75L1*	—	—
1.000	SDB100L.75	SDB100L1	SDB100L1.5	—
1.500	SDB150L.75	SDB150L1	SDB150L1.5	—
2.000	—	SDB200L1	SDB200L1.5	—
2.500	—	SDB250L1	SDB250L1.5	SDB250L2
3.000	—	SDB300L1	SDB300L1.5	SDB300L2
4.000	—	—	SDB400L1.5	SDB400L2
5.000	—	—	SDB500L1.5	SDB500L2

Sized for retaining pin plates in die cast dies.

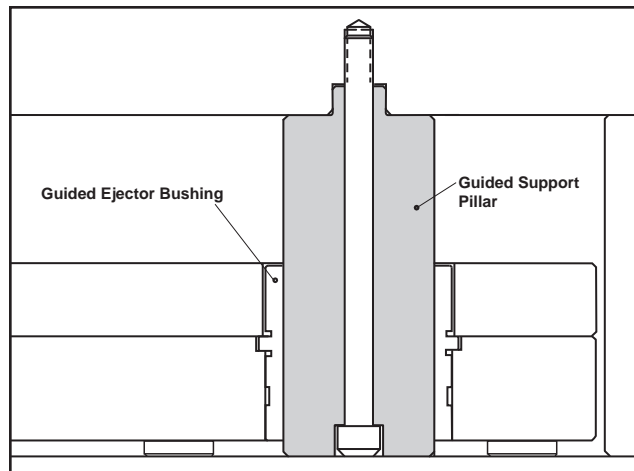
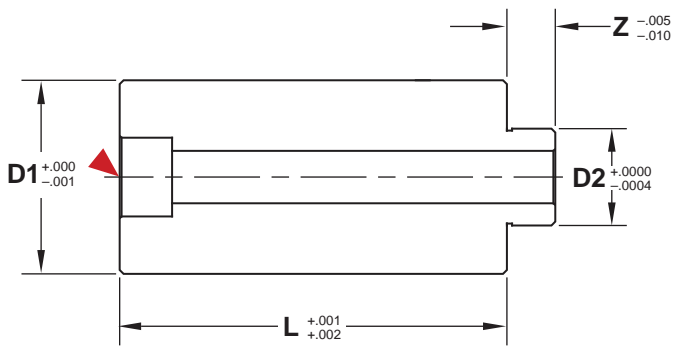
Screws included.

\* L = 1.125 for SDB75L1





# GUIDED SUPPORT PILLARS



**M** AISI 4140 **H** 58-62 HRC **S** Black Oxide

▶ CAD insertion point

Nominal Diameter	D1 +.000 -.001	D2 +.0000 -.0004	Z -.005 -.010	CATALOG NUMBER	L +.001 +.002	SHCS
<b>.75</b>	.7495	.4685	.278	GESP75L2.5	2.5	1/4-20 x 2.75"
				GESP75L3	3	1/4-20 x 3.25"
				GESP75L3.5	3.5	1/4-20 x 3.75"
				GESP75L4	4	1/4-20 x 4.25"
<b>1</b>	.9995	.4998	.309	GESP100L2.5	2.5	5/16-18 x 3"
				GESP100L3	3	5/16-18 x 3.5"
				GESP100L3.5	3.5	5/16-18 x 4"
				GESP100L4	4	5/16-18 x 4.5"
				GESP100L4.5	4.5	5/16-18 x 5"
<b>1.25</b>	1.2495	.6873	.309	GESP125L3	3	5/16-18 x 3.5"
				GESP125L3.5	3.5	5/16-18 x 4"
				GESP125L4	4	5/16-18 x 4.5"
				GESP125L4.5	4.5	5/16-18 x 5"
				GESP125L5	5	5/16-18 x 5.5"
<b>1.5</b>	1.4995	.7498	.372	GESP150L3.5	3.5	3/8-16 x 4"
				GESP150L4	4	3/8-16 x 4.5"
				GESP150L4.5	4.5	3/8-16 x 5"
				GESP150L5	5	3/8-16 x 5.5"

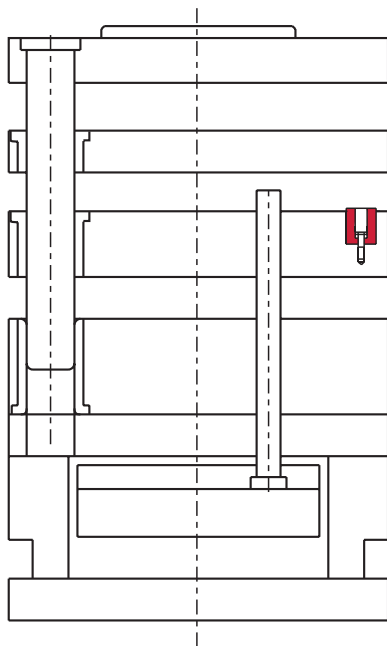
Notes: Includes (1) Socket Head Cap Screw as shown in the chart.  
Guided Ejector Bushings are sold separately on page B-12.

# SPRINGS

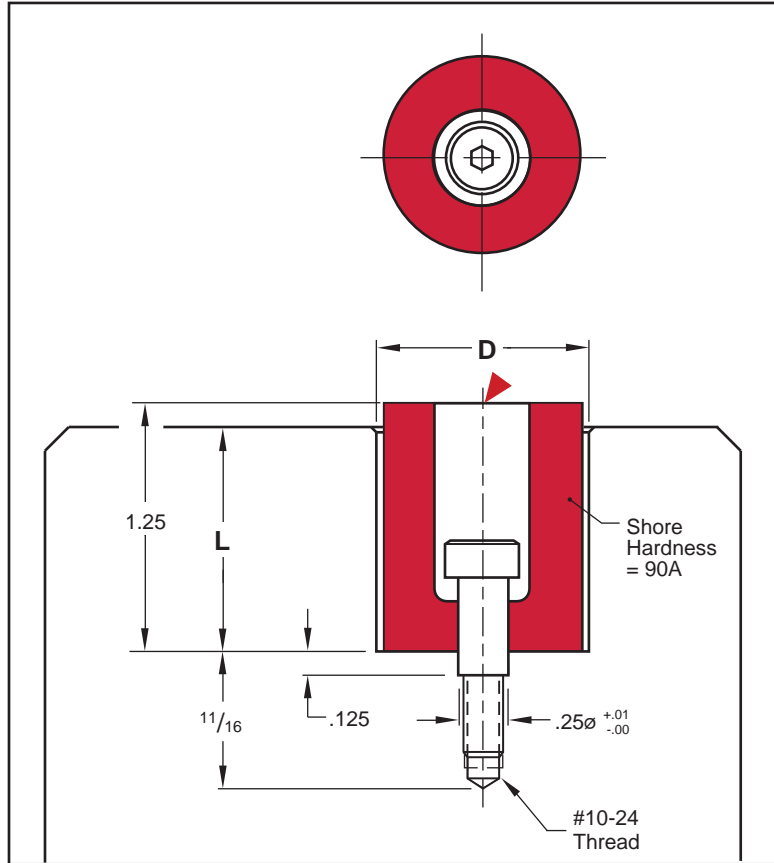
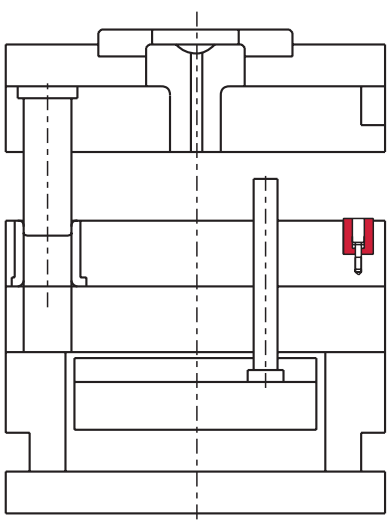
## URETHANE SPRINGS



Separate parting lines in sequence



Cushion parting lines



**Specifications:**

- Maximum Mold Temperature: 150° F (65° C)
- Stripper bolt included.

**M** Solid Urethane

CAD insertion point

Deflection	D	L	Approximate Spring Pressure
1/8"	1.06	1.12	520 lbs.
1/4"	1.12	1.00	790 lbs.

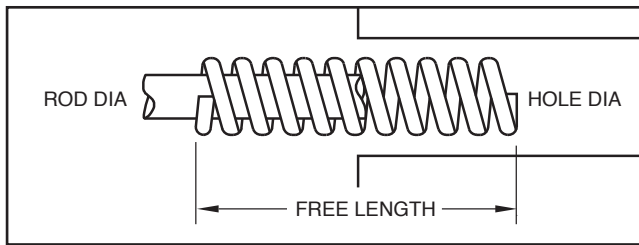
CATALOG NUMBER	DESCRIPTION
<b>US-100</b>	1" Urethane Spring with 1/4" x 1/2" SBLT



# SPRINGS

## INCH, ISO & JIS STANDARDS

**M** Raymond® Chrome-vanadium alloy



### To identify and order replacement springs:

1. Choose the color below.
2. Determine the rod (ID) of the spring.
3. Determine the hole diameter (OD) of the spring.
4. Determine the length.
5. With all information, contact Customer Service for pricing and delivery or refer to the page specified.

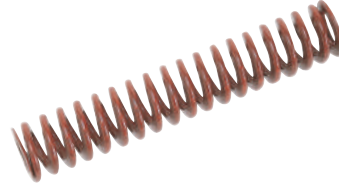
#### Blue

Inch Standard: Medium Duty,  
Full specifications are on page B-22.  
ISO Standard: Medium Duty  
JIS Standard: Light Duty



#### Red

Inch Standard: Medium-Heavy Duty,  
Full specifications are on page B-23.  
ISO Standard: Heavy Duty  
JIS Standard: Medium Duty



#### Green

Inch Standard: Extra Heavy Duty  
ISO Standard: Light Duty  
JIS Standard: Heavy Duty



#### Yellow

ISO Standard: Extra Heavy Duty  
JIS Standard: Extra Light Duty



#### Gold

Inch Standard: Heavy Duty



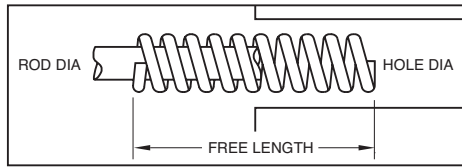
#### Brown

JIS Standard: Extra Heavy Duty



# SPRINGS

## MEDIUM DUTY: INCH STANDARD



Recommended Deflection:  
 25% = Long Life  
 35% = Average Life  
 40% = Maximum Operating Deflection

Hole Diameter	Rod Diameter	Free Length	CATALOG NUMBER	Approx. Load at 1/10" Deflec. (lbs)	Load at 25% Deflec. (lbs)	Load at 40% Deflec. (lbs)		
3/8	3/16	1.00	MS37L1	6.0	15.0	24.0		
		1.25	MS37L1.25	5.4	16.9	27.0		
		1.50	MS37L1.5	4.0	15.0	24.0		
		1.75	MS37L1.75	3.4	14.9	23.8		
		2.00	MS37L2	2.8	14.0	22.4		
		2.50	MS37L2.5	2.4	15.0	24.0		
		3.00	MS37L3	2.1	15.8	25.2		
		12.00	MS37L12	.6	18.0	28.8		
1/2	9/32	1.00	MS50L1	11.0	27.5	44.0		
		1.25	MS50L1.25	8.2	25.6	41.0		
		1.50	MS50L1.5	6.8	25.5	40.8		
		1.75	MS50L1.75	6.0	26.3	42.0		
		2.00	MS50L2	5.5	27.5	44.0		
		2.50	MS50L2.5	4.5	28.1	45.0		
		3.00	MS50L3	3.5	26.3	42.0		
		3.50	MS50L3.5	3.0	26.3	42.0		
		4.50	MS50L4.5	2.5	28.1	45.0		
		5.50	MS50L5.5	2.1	28.9	46.2		
		6.50	MS50L6.5	1.4	22.8	36.4		
		7.50	MS50L7.5	1.2	22.5	36.0		
12.00	MS50L12	.7	21.0	33.6				
5/8	11/32	1.00	MS62L1	16.4	41.0	65.6		
		1.25	MS62L1.25	12.8	40.0	64.0		
		1.50	MS62L1.5	10.8	40.5	64.8		
		1.75	MS62L1.75	9.6	42.0	67.2		
		2.00	MS62L2	8.8	44.0	70.4		
		2.50	MS62L2.5	6.0	37.5	60.0		
		3.00	MS62L3	5.6	42.0	67.2		
		3.50	MS62L3.5	4.8	42.0	67.2		
		4.00	MS62L4	4.4	44.0	70.4		
		12.00	MS62L12	1.6	48.0	76.8		
		3/4	3/8	1.00	MS75L1	31.2	78.0	124.8
				1.25	MS75L1.25	25.6	80.0	128.0
1.50	MS75L1.5			20.0	75.0	120.0		
1.75	MS75L1.75			17.6	77.0	123.2		
2.00	MS75L2			14.4	72.0	115.2		
2.50	MS75L2.5			12.0	75.0	120.0		
3.00	MS75L3			9.6	72.0	115.2		
3.50	MS75L3.5			8.0	70.0	112.0		
4.00	MS75L4			7.2	72.0	115.2		
4.50	MS75L4.5			6.4	72.0	115.2		
5.00	MS75L5			6.0	75.0	120.0		
5.50	MS75L5.5			5.5	75.6	121.0		
6.00	MS75L6			5.0	75.0	120.0		
6.50	MS75L6.5			4.5	73.1	117.0		
7.50	MS75L7.5			3.8	71.3	114.0		
12.00	MS75L12			2.4	72.0	115.2		
1	1/2	1.00	MS100L1	55.0	137.5	220.0		
		1.25	MS100L1.25	45.0	140.6	225.0		
		1.50	MS100L1.5	35.0	131.3	210.0		
		1.75	MS100L1.75	30.0	131.3	210.0		
		2.00	MS100L2	26.0	130.0	208.0		
		2.50	MS100L2.5	20.0	125.0	200.0		

Hole Diameter	Rod Diameter	Free Length	CATALOG NUMBER	Approx. Load at 1/10" Deflec. (lbs)	Load at 25% Deflec. (lbs)	Load at 40% Deflec. (lbs)		
1	1/2	3.00	MS100L3	16.5	123.8	198.0		
		3.50	MS100L3.5	15.0	131.3	210.0		
		4.00	MS100L4	12.0	120.0	192.0		
		4.50	MS100L4.5	10.4	117.0	187.2		
		5.00	MS100L5	9.6	120.0	192.0		
		5.50	MS100L5.5	8.8	121.0	193.6		
		6.00	MS100L6	8.0	120.0	192.0		
		7.00	MS100L7	7.2	126.0	201.6		
		8.00	MS100L8	6.0	120.0	192.0		
		12.00	MS100L12	4.0	120.0	192.0		
		1-1/4	5/8	1.50	MS125L1.5	49.6	186.0	297.6
				1.75	MS125L1.75	42.4	185.5	296.8
2.00	MS125L2			35.2	176.0	281.6		
2.50	MS125L2.5			28.8	180.0	288.0		
3.00	MS125L3			24.0	180.0	288.0		
3.50	MS125L3.5			20.0	175.0	280.0		
4.00	MS125L4			17.6	176.0	281.6		
4.50	MS125L4.5			16.0	180.0	288.0		
5.00	MS125L5			13.6	170.0	272.0		
5.50	MS125L5.5			12.8	176.0	281.6		
6.00	MS125L6			12.0	180.0	288.0		
7.00	MS125L7			10.4	182.0	291.2		
8.00	MS125L8			8.8	176.0	281.6		
10.00	MS125L10			7.2	180.0	288.0		
12.00	MS125L12			6.0	180.0	288.0		
1-1/2	3/4			2.00	MS150L2	53.0	265.0	424.0
		2.50	MS150L2.5	45.0	281.3	450.0		
		3.00	MS150L3	36.0	270.0	432.0		
		3.50	MS150L3.5	30.0	262.5	420.0		
		4.00	MS150L4	27.0	270.0	432.0		
		4.50	MS150L4.5	23.0	258.8	414.0		
		5.00	MS150L5	21.0	262.5	420.0		
		5.50	MS150L5.5	18.5	254.4	407.0		
		6.00	MS150L6	17.0	255.0	408.0		
		7.00	MS150L7	14.5	253.8	406.0		
		8.00	MS150L8	12.8	256.0	409.6		
		10.00	MS150L10	10.0	250.0	400.0		
12.00	MS150L12	8.0	240.0	384.0				
2	1	2.50	MS200L2.5	100.0	625.0	1000.0		
		3.00	MS200L3	83.0	622.5	996.0		
		3.50	MS200L3.5	64.8	567.0	907.2		
		4.00	MS200L4	60.0	600.0	960.0		
		4.50	MS200L4.5	53.0	596.3	954.0		
		5.00	MS200L5	47.0	587.5	940.0		
		5.50	MS200L5.5	39.2	539.0	862.4		
		6.00	MS200L6	39.0	585.0	936.0		
		7.00	MS200L7	31.2	546.0	873.6		
		8.00	MS200L8	28.5	570.0	912.0		
		10.00	MS200L10	20.8	520.0	832.0		
		12.00	MS200L12	17.5	525.0	840.0		

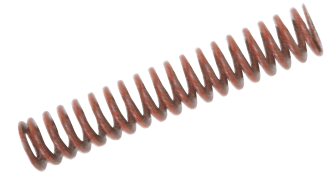
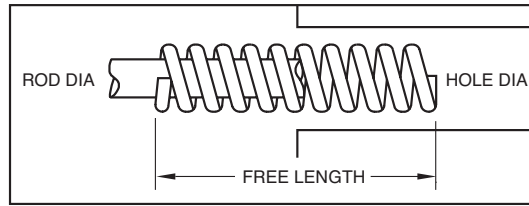
Note: All pressure ratings are approximate and are subject to +10% over amounts shown for deflection.



# SPRINGS

## MEDIUM-HEAVY DUTY: INCH STANDARD

Recommended Deflection:  
 20% = Long Life  
 25% = Average Life  
 30% = Maximum Operating Deflection



Hole Diameter	Rod Diameter	Free Length	CATALOG NUMBER	Approx. Load at 1/10' Deflec. (lbs)	Load at 20% Deflec. (lbs)	Load at 30% Deflec. (lbs)
<b>3/8</b>	<b>3/16</b>	1.00	HS37L1	9.0	18.0	27.0
		1.25	HS37L1.25	7.3	18.3	27.4
		1.50	HS37L1.5	6.7	20.1	30.2
		1.75	HS37L1.75	5.8	20.3	30.5
		2.00	HS37L2	5.0	20.0	30.0
		2.50	HS37L2.5	4.2	21.0	31.5
		3.00	HS37L3	3.0	18.0	27.0
		12.00	HS37L12	.9	21.6	32.4
<b>1/2</b>	<b>9/32</b>	1.00	HS50L1	16.8	33.6	50.4
		1.25	HS50L1.25	13.0	32.5	48.8
		1.50	HS50L1.5	9.5	28.5	42.8
		1.75	HS50L1.75	8.5	29.8	44.6
		2.00	HS50L2	7.5	30.0	45.0
		2.50	HS50L2.5	6.0	30.0	45.0
		3.00	HS50L3	5.7	34.2	51.3
		3.50	HS50L3.5	4.0	28.0	42.0
<b>5/8</b>	<b>11/32</b>	1.00	HS62L1	30.0	60.0	90.0
		1.25	HS62L1.25	21.5	53.8	80.6
		1.50	HS62L1.5	19.0	57.0	85.5
		1.75	HS62L1.75	16.8	58.8	88.2
		2.00	HS62L2	14.8	59.2	88.8
		2.50	HS62L2.5	11.5	57.5	86.3
		3.00	HS62L3	10.0	60.0	90.0
		3.50	HS62L3.5	8.5	59.5	89.3
		4.00	HS62L4	7.6	60.8	91.2
		12.00	HS62L12	2.7	64.8	97.2
<b>3/4</b>	<b>3/8</b>	1.00	HS75L1	50.0	100.0	150.0
		1.25	HS75L1.25	38.0	95.0	142.5
		1.50	HS75L1.5	32.0	96.0	144.0
		1.75	HS75L1.75	28.8	100.8	151.2
		2.00	HS75L2	24.8	99.2	148.8
		2.50	HS75L2.5	19.2	96.0	144.0
		3.00	HS75L3	14.4	86.4	129.6
		3.50	HS75L3.5	12.8	89.6	134.4
		4.00	HS75L4	12.0	96.0	144.0
		4.50	HS75L4.5	11.2	100.8	151.2
		5.00	HS75L5	9.0	90.0	135.0
		5.50	HS75L5.5	8.0	88.0	132.0
		6.00	HS75L6	7.5	90.0	135.0
		12.00	HS75L12	3.6	86.4	129.6
<b>1</b>	<b>1/2</b>	1.00	HS100L1	76.0	152.0	228.0
		1.25	HS100L1.25	62.4	156.0	234.0
		1.50	HS100L1.5	49.6	148.8	223.2
		1.75	HS100L1.75	44.0	154.0	231.0
		2.00	HS100L2	40.0	160.0	240.0
		2.50	HS100L2.5	31.0	155.0	232.5

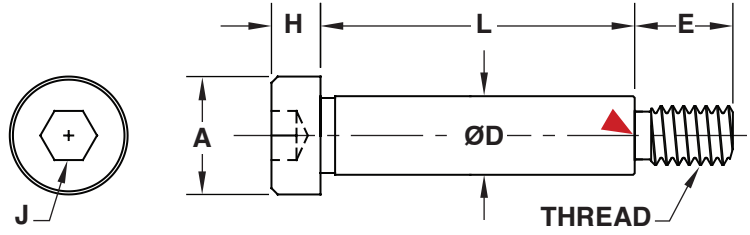
Note: All pressure ratings are approximate and are subject to +10% over amounts shown for deflection.

Hole Diameter	Rod Diameter	Free Length	CATALOG NUMBER	Approx. Load at 1/10' Deflec. (lbs)	Load at 20% Deflec. (lbs)	Load at 30% Deflec. (lbs)
<b>1</b>	<b>1/2</b>	3.00	HS100L3	25.0	150.0	225.0
		3.50	HS100L3.5	21.6	151.2	226.8
		4.00	HS100L4	18.4	147.2	220.8
		4.50	HS100L4.5	17.0	153.0	229.5
		5.00	HS100L5	14.4	144.0	216.0
		5.50	HS100L5.5	12.8	140.8	211.2
		6.00	HS100L6	12.0	144.0	216.0
		7.00	HS100L7	10.0	140.0	210.0
<b>1-1/4</b>	<b>5/8</b>	8.00	HS100L8	8.8	140.8	211.2
		12.00	HS100L12	6.2	148.8	223.2
		1.50	HS125L1.5	114.4	343.2	514.8
		1.75	HS125L1.75	100.8	352.8	529.2
<b>1-1/2</b>	<b>3/4</b>	2.00	HS125L2	86.4	345.6	518.4
		2.50	HS125L2.5	62.4	312.0	468.0
		3.00	HS125L3	51.2	307.2	460.8
		3.50	HS125L3.5	44.0	308.0	462.0
		4.00	HS125L4	36.8	294.4	441.6
		4.50	HS125L4.5	32.0	288.0	432.0
		5.00	HS125L5	29.0	290.0	435.0
		5.50	HS125L5.5	26.4	290.4	435.6
		6.00	HS125L6	25.0	300.0	450.0
		7.00	HS125L7	20.0	280.0	420.0
		8.00	HS125L8	18.4	294.4	441.6
		10.00	HS125L10	14.5	290.0	435.0
		12.00	HS125L12	12.4	297.6	446.4
		<b>1-1/2</b>	<b>3/4</b>	2.00	HS150L2	108.0
2.50	HS150L2.5			85.6	428.0	642.0
3.00	HS150L3			62.4	374.4	561.6
3.50	HS150L3.5			52.8	369.6	554.4
4.00	HS150L4			48.0	384.0	576.0
4.50	HS150L4.5			43.2	388.8	583.2
5.00	HS150L5			36.8	368.0	552.0
5.50	HS150L5.5			34.4	378.4	567.6
6.00	HS150L6			30.4	364.8	547.2
7.00	HS150L7			26.4	369.6	554.2
8.00	HS150L8			22.0	352.0	528.0
10.00	HS150L10			17.6	352.0	528.0
<b>2</b>	<b>1</b>	12.00	HS150L12	14.4	345.6	518.4
		2.50	HS200L2.5	118.4	592.0	888.0
		3.00	HS200L3	96.0	576.0	864.0
		3.50	HS200L3.5	80.0	560.0	840.0
		4.00	HS200L4	66.4	531.2	796.8
		4.50	HS200L4.5	60.0	540.0	810.0
		5.00	HS200L5	56.0	560.0	840.0
		5.50	HS200L5.5	50.4	554.4	831.6
		6.00	HS200L6	47.2	566.4	849.6
		7.00	HS200L7	40.0	560.0	840.0
		8.00	HS200L8	35.2	563.2	844.8
		10.00	HS200L10	26.0	520.0	780.0
12.00	HS200L12	22.4	537.6	806.4		

# STRIPPER BOLTS



- Precise diameters exceeding industry standards.
- Tighter length tolerance for uniform plate-stop positioning.



**M** SCM440 **H** 42-48 HRC

CAD insertion point

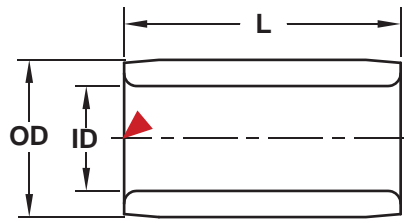
ØD +0.00 -0.01	L ± .001	CATALOG NUMBER	J	A	H	E	THREAD 3A
.249	1	SBLT25L1	1/8	.37	.18	.37	#10-24
	1.25	SBLT25L1.25					
	1.5	SBLT25L1.5					
.311	1	SBLT31L1	5/32	.43	.21	.43	1/4-20
	1.25	SBLT31L1.25					
	1.5	SBLT31L1.5					
	1.75	SBLT31L1.75					
	2	SBLT31L2					
.374	1	SBLT37L1	3/16	.56	.25	.50	5/16-18
	1.25	SBLT37L1.25					
	1.5	SBLT37L1.5					
	1.75	SBLT37L1.75					
	2	SBLT37L2					
	2.25	SBLT37L2.25					
	2.5	SBLT37L2.5					
	2.75	SBLT37L2.75					
	3	SBLT37L3					
	3.25	SBLT37L3.25					
	3.5	SBLT37L3.5					
	3.75	SBLT37L3.75					
	4	SBLT37L4					
4.25	SBLT37L4.25						
4.5	SBLT37L4.5						
.499	1	SBLT50L1	1/4	.75	.31	.62	3/8-16
	1.25	SBLT50L1.25					
	1.5	SBLT50L1.5					
	1.75	SBLT50L1.75					
	2	SBLT50L2					
	2.25	SBLT50L2.25					
	2.5	SBLT50L2.5					
	2.75	SBLT50L2.75					
	3	SBLT50L3					
	3.25	SBLT50L3.25					
	3.5	SBLT50L3.5					
	3.75	SBLT50L3.75					
	4	SBLT50L4					
	4.25	SBLT50L4.25					
	4.5	SBLT50L4.5					
	4.75	SBLT50L4.75					
	5	SBLT50L5					
5.5	SBLT50L5.5						
6	SBLT50L6						
7	SBLT50L7						

ØD +0.00 -0.01	L ± .001	CATALOG NUMBER	J	A	H	E	THREAD 3A
.624	1.25	SBLT62L1.25	5/16	.87	.37	.75	1/2-13
	1.5	SBLT62L1.5					
	1.75	SBLT62L1.75					
	2	SBLT62L2					
	2.25	SBLT62L2.25					
	2.5	SBLT62L2.5					
	2.75	SBLT62L2.75					
	3	SBLT62L3					
	3.25	SBLT62L3.25					
	3.5	SBLT62L3.5					
	3.75	SBLT62L3.75					
	4	SBLT62L4					
	4.25	SBLT62L4.25					
	4.5	SBLT62L4.5					
	4.75	SBLT62L4.75					
5	SBLT62L5						
5.5	SBLT62L5.5						
6	SBLT62L6						
7	SBLT62L7						
.749	1.5	SBLT75L1.5	3/8	1.00	.50	.87	5/8-11
	1.75	SBLT75L1.75					
	2	SBLT75L2					
	2.25	SBLT75L2.25					
	2.5	SBLT75L2.5					
	2.75	SBLT75L2.75					
	3	SBLT75L3					
	3.25	SBLT75L3.25					
	3.5	SBLT75L3.5					
	3.75	SBLT75L3.75					
	4	SBLT75L4					
	4.25	SBLT75L4.25					
	4.5	SBLT75L4.5					
	4.75	SBLT75L4.75					
	5	SBLT75L5					
5.5	SBLT75L5.5						
6	SBLT75L6						
7	SBLT75L7						
8	SBLT75L8						

Stripper Bolt Bushings sold separately on page B-25.



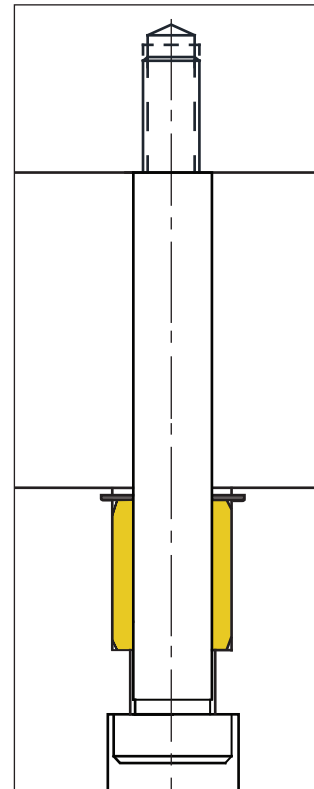
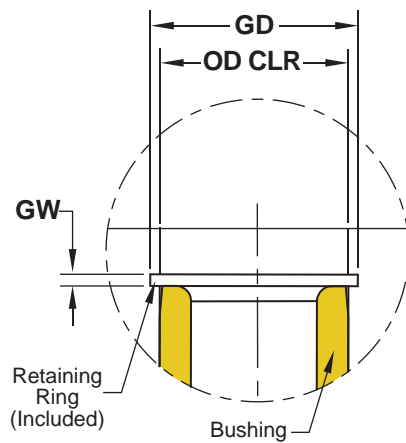
# STRIPPER BOLT BUSHINGS



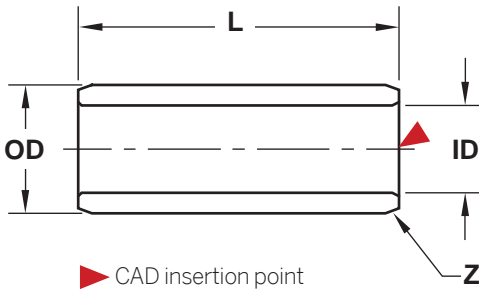
**M** SAE841 Bronze

CATALOG NUMBER	ID +.000 -.001	OD +.000 -.001	L ±.005	GD +.005 -.000	GW +.003 -.000	OD CLR +.005 -.000
<b>SBB25L.50</b>	.251	.439	.500	.530	.029	.448
<b>SBB31L.62</b>	.312	.627	.625	.665	.039	.635
<b>SBB37L.75</b>	.376	.627	.750	.665	.039	.635
<b>SBB50L1.00</b>	.500	.752	1.000	.825	.046	.780
<b>SBB63L1.50</b>	.625	.877	1.500	1.000	.046	.950
<b>SBB75L1.50</b>	.750	1.002	1.500	1.091	.046	1.040

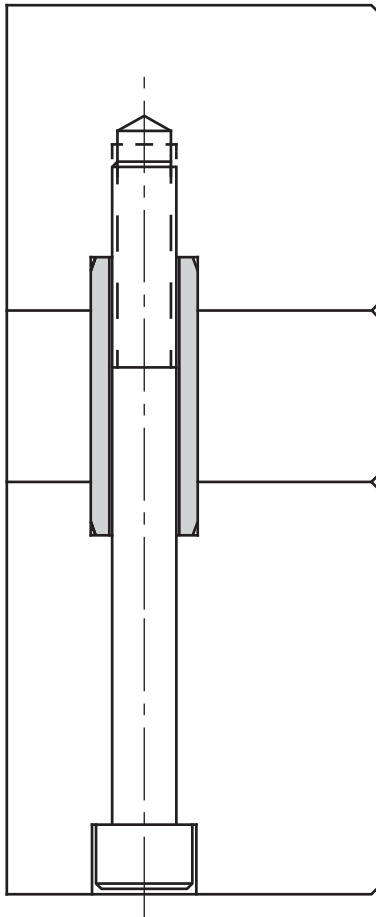
Note: Replacement Retaining Rings are available with pricing listed in the price list.



# TUBULAR DOWELS



▶ CAD insertion point



Progressive Tubular Dowels provide alignment between mold plates with screw and dowel in one location.

## Inch Standard

**M** Carbon Steel **H** 55 HRC

CATALOG NUMBER	OD ±.0001	ID +.01 -.00	L +.00 -.02	Z Chamfer
TD37L.37	.3752	.260	.375	.04 x 20°
TD37L.87			.875	.04 x 20°
TD62L.50	.6252	.385	.500	.04 x 20°
TD62L1.37			1.375	.08 x 20°
TD62L1.87			1.875	.08 x 20°
TD62L2.37			2.375	.08 x 20°
TD75L.37	.7502	.510	.375	.04 x 20°
TD75L.50			.500	.04 x 20°
TD75L1.37			1.375	.08 x 20°
TD75L1.87			1.875	.08 x 20°
TD75L2.37			2.375	.08 x 20°
TD75L2.87			2.875	.08 x 20°
TD75L3.37			3.375	.08 x 20°
TD75L3.87			3.875	.08 x 20°
TD87L.50	.8752	.635	.500	.04 x 20°
TD87L2.37			2.375	.08 x 20°
TD87L2.87			2.875	.08 x 20°

## Metric Standard

**M** Carbon Steel **H** 55 HRC

CATALOG NUMBER	OD ±.003	ID +.25 -.00	L +.00 -.50	Z Chamfer
TDM10L20	10	6.2	20	1 x 20°
TDM10L30			30	1 x 20°
TDM14L30	14	8.5	30	1 x 20°
TDM14L40			40	2 x 20°
TDM14L50			50	2 x 20°
TDM14L60			60	2 x 20°
TDM14L70	18	10.5	70	2 x 20°
TDM18L40			40	1 x 20°
TDM18L60			60	1 x 20°
TDM18L80			80	2 x 20°
TDM18L100	24	13	100	2 x 20°
TDM24L60			60	1 x 20°
TDM24L80			80	2 x 20°
TDM24L100			100	2 x 20°





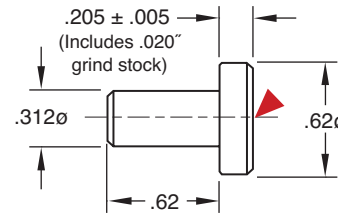
# STOP PINS

## Dowel Type

**M** Pre-Hard Steel **H** Black Oxide

CATALOG NUMBER	DESCRIPTION
STP-1	Stop Pins

▶ CAD insertion point

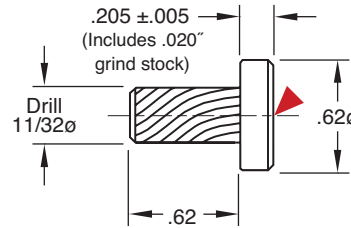


## Self-Tapping

**M** AISI 4037 **H** 40-44 HRC **S** Black Oxide

CATALOG NUMBER	DESCRIPTION
STP-2	Self-Tapping Stop Pins

▶ CAD insertion point



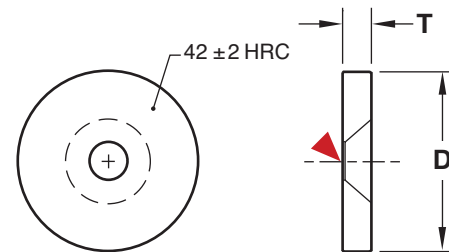
# STOP DISCS

**M** 4140 **H** 40-44 HRC **S** Black Oxide

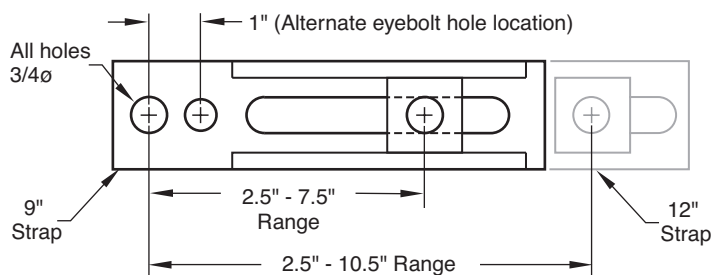
CATALOG NUMBER	D +.000 -.015	T +.003 +.005	Flat Head Counterbore
SD68	.687	.188	#10-24
SD100	1.000	.188	1/4-20
SD118	1.187	.188	1/4-20
SD168	1.687	.251	5/16-18

1/2" long FHCS included.

▶ CAD insertion point



# MOLD STRAPS

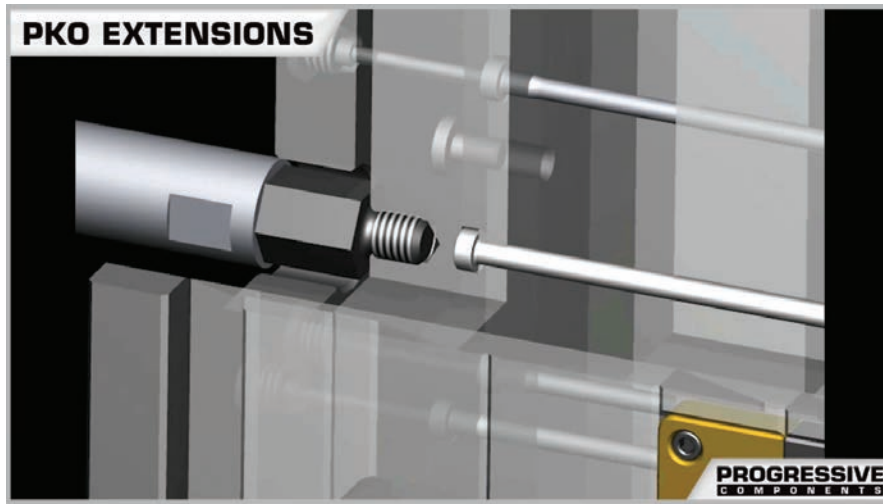


For use with shoulder-type eyebolts only (1/2" - 3/4").  
Patented design by G.A.I.M. Engineering.

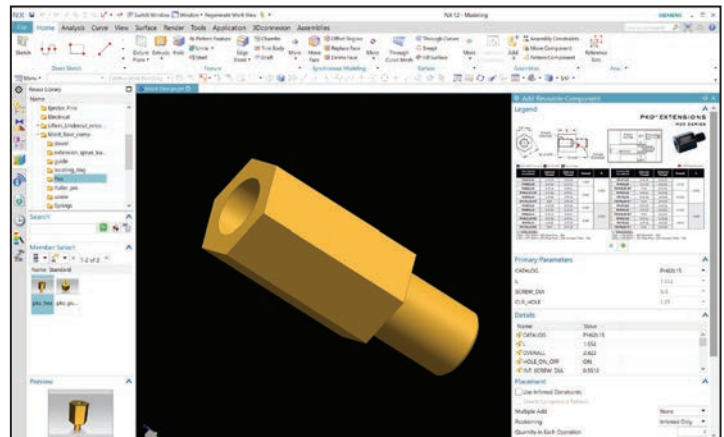
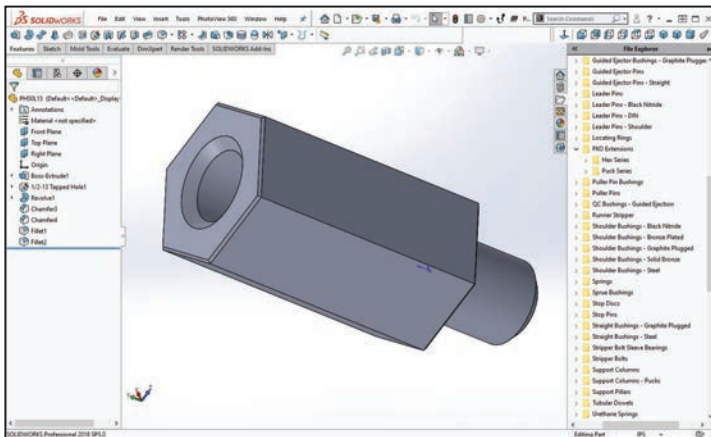
**M** 100% recycled reinforced Nylon

CATALOG NUMBER	DESCRIPTION
MSTRP-9	Plastic Mold Strap, 9" long
MSTRP-12	Plastic Mold Strap, 12" long

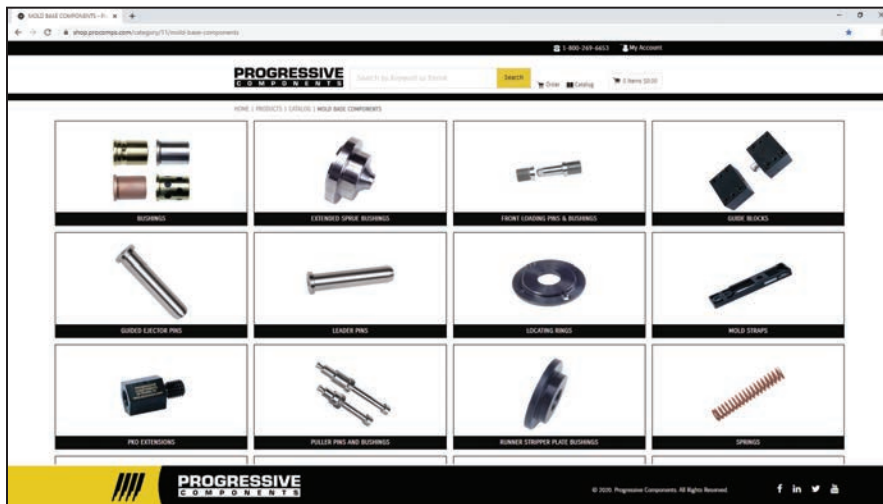
# ONLINE RESOURCES



When considering design options, numerous animations can be viewed at [procomps.com/animations](http://procomps.com/animations).



CAD geometry is available online as individual downloads or as part of the CADalog system. The seven formats include: IGES (.igs), ACIS (.sat), STEP (.step), Parasolid (.x\_t), Solidworks (.sldasm), NX (.prt) (Re-Use and MoldWizard) and Visi (.wkt).

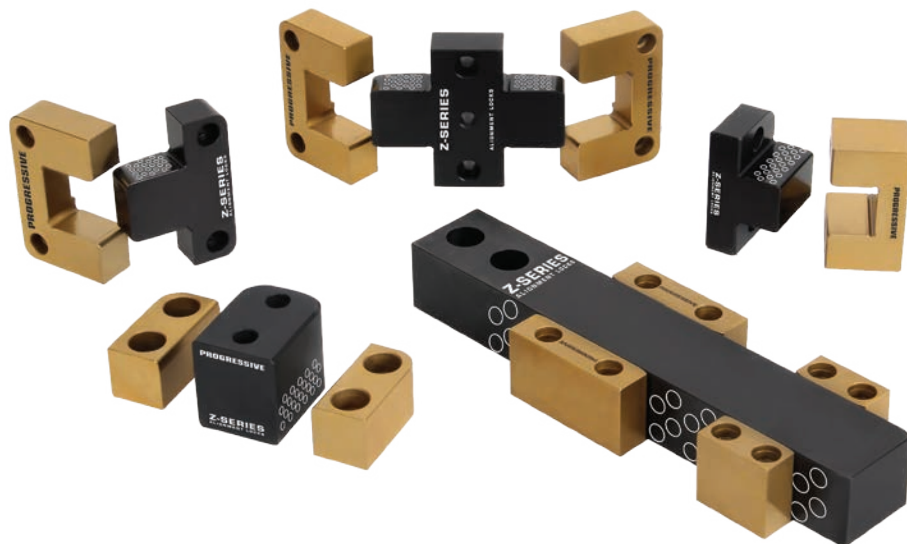


Industry-leading web store expedites the purchasing process. Go to [shop.procomps.com](http://shop.procomps.com) for information and additional resources.



# ALIGNMENT LOCKS

## SECTION C



Bar Locks	Inserted Bar Locks	Side Locks	Top Locks
Prefix: BLB & BLG	Prefix: BLN, BLG	Prefix: SL, SLM	Prefix: TL, TLM
Page: C-4	Page: C-7	Page: C-8	Page: C-9



Guide Locks	X-Style Side Locks	Shuttle Mold Sets	Cavity Interlocks: Flat
Prefix: GL, GLM	Prefix: SLX	Suffix: -SF, -SM	Prefix: CF, CFM
Page: C-10	Page: C-11	Page: C-11	Page: C-12



Cavity Interlocks: Round	Taper Locks & Plates	Top Lock - 20MM Square	Needle Bearing Locks
Prefix: CRS, CRSM	Prefix: MTL, FTL, TLP	Prefix: TLM	Prefix: SLR, SLRM, TLR
Page: C-13	Page: C-14	Page: C-14	Page: C-15



Side Locks: Steel	Side Locks: Graphite
Prefix: SLS, SLMS	Prefix: SLPM
Page: C-17	Page: C-18





# ALIGNMENT LOCKS PERFORMANCE TESTING

Progressive Components regularly tests products through independent testing facilities nationwide.

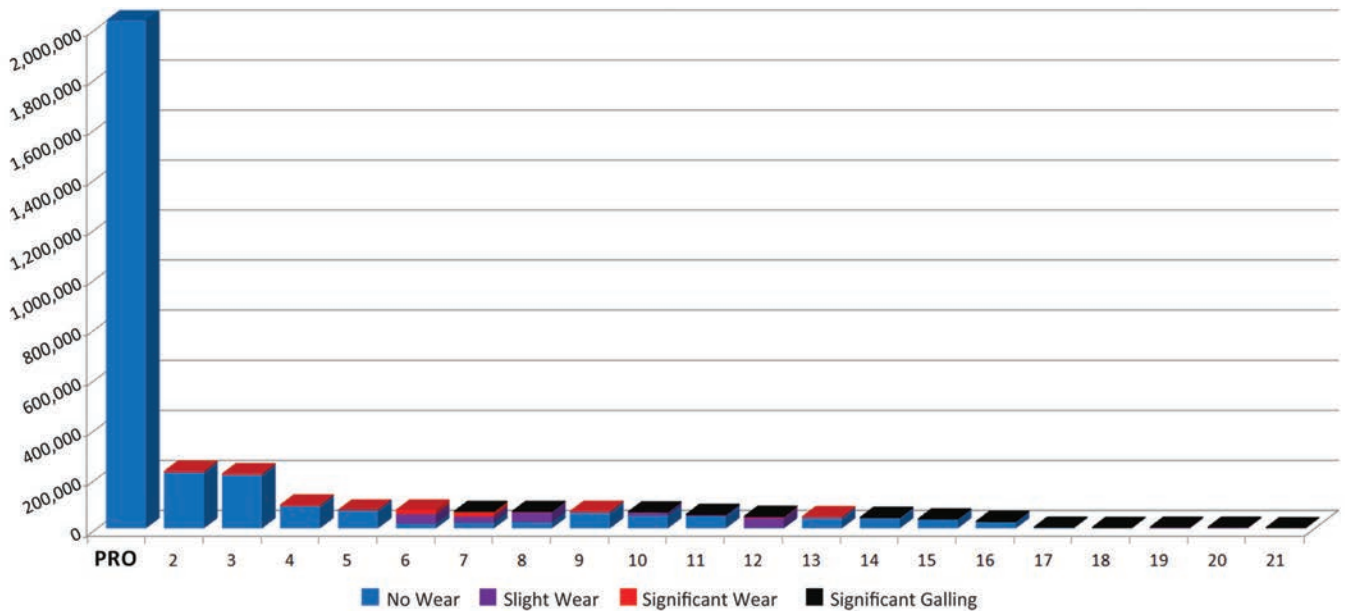
Before launching of the Z-Series™ Alignment Locks, Progressive contracted Element Materials Technology to provide a thorough mold lock Performance Evaluation:

“Element Materials Technology has conducted independent life cycle testing of mold interlocks since 1999. The processes with fixtures and cycling were established to simulate use in the molding environment, but more severe loads were used to accelerate the failures at 4400 lbs of pressure. The locks tested have been from Progressive as well as other standard lock distributors in the US and Asia, plus several additional material and treatment combinations were tested for comparison.”

It was determined that the Progressive Components' Z-Series Alignment Locks exceeded the 2-million cycle mark, and still displayed no measurable signs of wear or any type.

“During the past year, over 21 different tests were performed with the purpose of cycling until failure occurred. At no time during our tests over the years have we seen cycle performance at the level of this new design, represented as PRO in the chart below.”

With the industry's widest selection of sizes in stock and competitively priced, specifying alignment locks from Progressive Components means your molds will have unmatched protection from damage and downtime.



## ONLINE DATA

**Lifetime Of Perfect Alignment**

**OVERVIEW**

Progressive's Z-Series Alignment Locks are the industry's most advanced mold interlocks. They are designed to provide superior performance, longer life and reduce maintenance.

**Z-SERIES ALIGNMENT LOCKS**

[LEARN MORE](#)

Learn more at [procomps.com/z-series](http://procomps.com/z-series).

**TOP LOCKS Z-SERIES**

CATALOG TYPE #	T (mm)	W (mm)	A (mm)	B (mm)	C (mm)	D (mm)	S1 (mm)	S2 (mm)	R (mm)	Z (mm)	SHCS
TL50000	508	1500	308	110	30	75	25	18	18	0.1	M 8-32 x 1/2" F 80-32 x 3/4"
TL62025	625	1250	325	100	41	43	33	25	25	0.1	M 8-32 x 3/8" F 80-32 x 3/4"
TL70025	700	1250	325	100	48	43	33	25	25	0.1	M 8-32 x 3/8" F 80-32 x 3/4"
TL70050	700	1500	375	100	37	50	41	1000	250	0.1	M 8-32 x 3/8" F 80-32 x 1"
TL80000	1000	1500	375	100	37	50	500	1000	250	0.1	M 8-32 x 1/2" F 80-32 x 1"
TL80000	1000	1500	375	100	75	75	500	1000	375	0.1	M 8-32 x 1/2" F 80-32 x 1 1/2"
TL112000	1125	2000	475	100	50	75	563	1375	375	0.1	M 1/4-20 x 3/4" F 1/4-20 x 1"
TL140000	1425	2000	475	100	37	100	563	1375	375	0.1	M 1/4-20 x 3/4" F 1/4-20 x 1 1/2"
TL150000	1500	2500	575	100	37	100	563	1375	375	0.1	M 1/4-20 x 3/4" F 1/4-20 x 1 1/2"
TL170000	1700	2500	575	100	37	125	625	1500	375	0.1	M 1/4-20 x 3/4" F 1/4-20 x 1 1/2"

All catalog pages are online for forward-ing to suppliers, customers, etc.

**TESTS AND RESULTS**

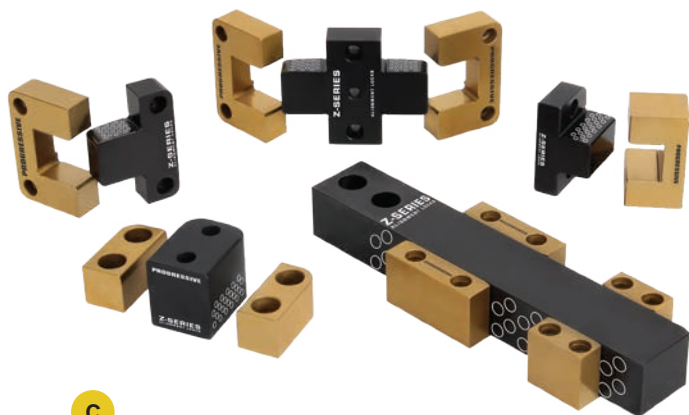
Sample ID	Material	Coating	Core Hardness	Material	Coating	Core Hardness	Lube	Cycles	Pages
PRO Z-Series	D-2	TiN	58-62 HRC	H 13	Nitro Carbide	43-48 HRC	Serrol IN7300	2000000	3
PCS Top Lock	A-2	Black Oxide	58-60 HRC	A-2	Black Oxide	58-60 HRC	PCS Nano	215000	4
EMS	S-7	TiN	54-56 HRC	O-6	Black Oxide	58-60 HRC	IN7300	215000	5
Self Lube	S-7	TiN	60-62 HRC	O-6	Black Oxide	60-62 HRC	Serrol IN7300	100000	6
PCS	A-2	TiN	58-62 HRC	H 13	Melinite	40-44 HRC	Lithium	80000	7
SMG	8030	TiN	56-62 HRC	H 13	Melinite	60-64 HRC	Lithium	40000	8
PCS Old	8620	Amorphous	54-56 HRC	O-6	Black Oxide	60-62 HRC	PCS Nano	40000	9
China Brand	D-2	TiN	58-62 HRC	YK30	Black Oxide	50-53 HRC	Lithium	400	10

View the entire independent testing report online.



# ALIGNMENT LOCKS

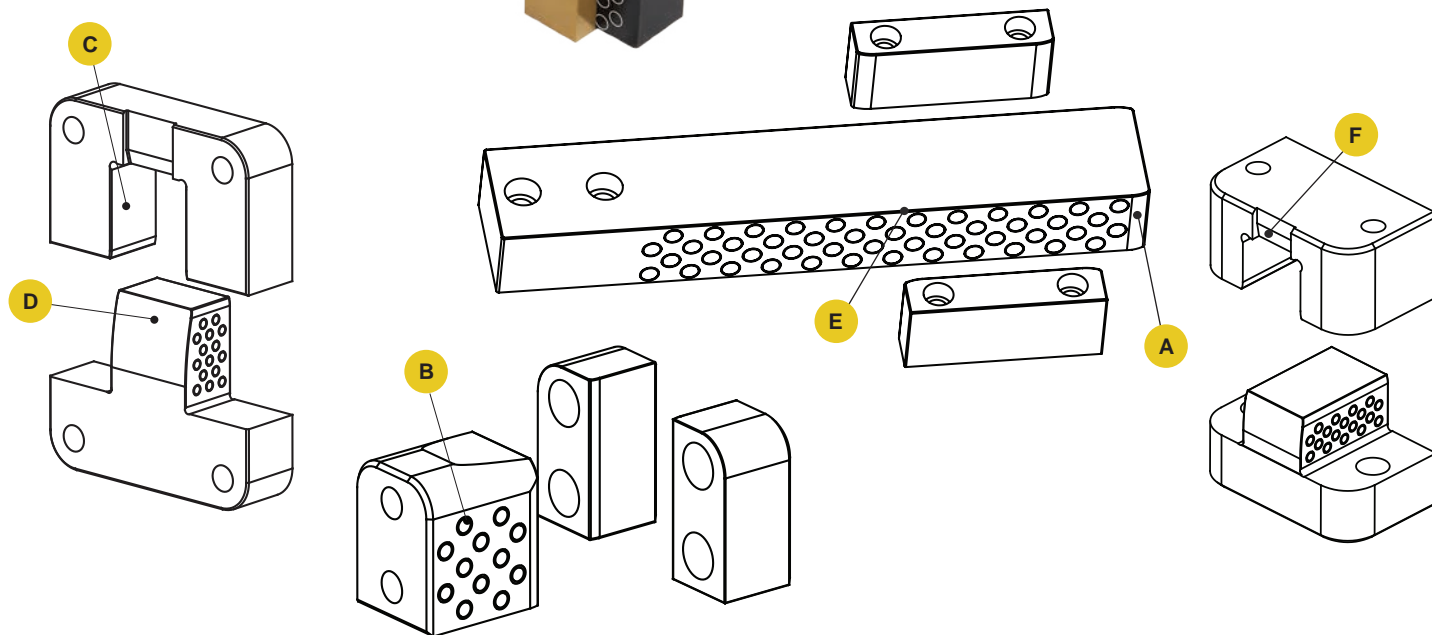
## Z-SERIES™



Progressive's Alignment Locks have been advanced to outperform other styles. This is achieved through a combination of engagement geometry, particulate capturing rings, materials and treatments, and lubrication.

Benefits of the Z-Series Alignment Locks include:

- Longevity that far surpasses others, confirmed by extensive independent lab testing as well as monitoring performance in harsh, 'real world' conditions.
- Exclusive features maintain clean and consistent lubrication.
- Bar Lock, Guide Lock, Side Lock, X-Style Side Lock and Top Lock styles available.



**A Engagement Ramp:** A fine finish radial lead-in for smooth lifting upon engagement of the mold halves.

**B Particle Rings:** Particle rings on the width of the male locks trap material and debris to avoid "picking up" or galling of the alignment surface.

**C Longer Engagement:** Using the maximum allowable engagement area on all locks surpasses previously-established industry standards.

**D Arced Relief:** Reduces the possibility of parts sticking to the lock at the bottom of the mold.

**E Rounded Edges:** A larger radius for all protruding surfaces to eliminate operator "reach in" injury.

**F Pry Slot Lead-In:** Expanded the entry of pry slots to ease removal.

**G Premium Materials:** Males: H-13, 42-48 HRC, Surface: 70 HRC; Females: D-2, 58-62 HRC, Surface: 80 HRC.

### Lubrication & Maintenance:

- Non-drying, non-hardening food grade grease is applied to all areas, including the particle rings.
- For production, install the locks and wipe down the outside of the locks only; maintain the grease on the mating surfaces and within the rings as provided.



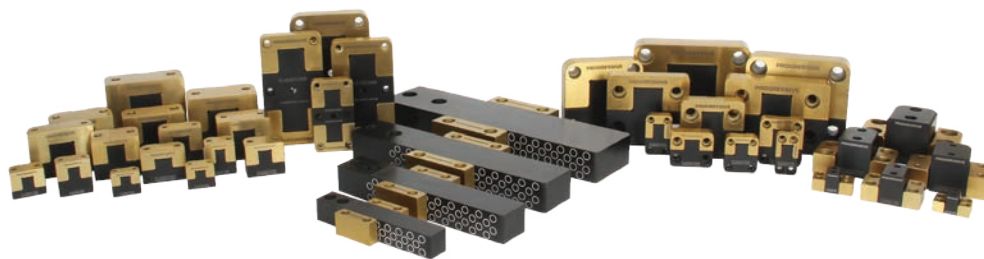
# SIDE/TOP/GUIDE LOCK SELECTION GUIDE

Refer to the chart below to match the correct alignment lock for the corresponding mold size and weight of B-Side and press platen, using four locks per mold. Clean and lubricate lock every 100,000 cycles, and prevent corrosion during mold storage.

RECOMMENDED MAX MOLD SIZE (LXWXH)	SIDE LOCKS	METRIC SIDE LOCKS	GUIDE LOCKS	TOP LOCKS	TOTAL MAX WEIGHT B SIDE + PRESS PLATEN (LBS/KG)
<b>RTI AND MOLDS 8 X 8 X 8 AND SMALLER</b>	SL37X100, SL50X125 SL50X150, SL50X200 SLS62X150, SLS62X200 SLR50X125, SLR50X150	SLM16X50, SLP16X20 SLPM16X40, SLP20X25 SLPM20X50, SLM13X38 SLMS16X50	GL100X150 GLM25X45	TL50X100, TL62X125 TL75X125, TLM26X35 TLR87X150	2,000 / 900
<b>11 X 16 X 10</b>	SL50X125, SL50X150 SL50X200, SLS62X150 SLS62x200, SLS75X300 SLS75X400, SLR50X150 SLR50X200	SLM16X50, SLM19X75 SLPM25X32, SLP25X63 SLPM32X40, SLP32X80 SLPM40X50 SLPM40X100 SLMS19X100	GL100X150 GL150X250 GLM25X45	TL62X125, TL75X125 TLM26X35 TLR87X150 TLR112X200	5,000 / 2,300
<b>16 X 24 X 16</b>	SL50X150, SL50X200 SL75X300, SLS112X500 SLS75X300, SLS75X400 SLR75X300, SLR100X400	SLM19X75, SLM19X100 SLMS25X125 SLPM50X56, SLP50X112 SLRM32X63, SLRM40X100	GL150X250 GLM40X65	TL75X125, TL87X150 TLM26X35, TLM30X45 TLR112X200 TLR150X250	7,000 / 3,200
<b>28 X 34 X 24</b>	SL75X300, SLS112X500	SLM19X75, SLM19X100	GL200X350 GL150X250 GLM40X65	TL100X150, TL100X200 TL112X200, TL112X300 TLM26X35, TLM30X45	10,000 / 4,500
<b>32 X 40 X 28</b>	SL100X400	SLM25X125	GL200X350 GLM40X65	TL112X200, TL112X300 TLM36X55, TLM36X75	15,000 / 6,800
<b>42 X 48 X 34</b>	SL125X500		GL250X450 GLM50X90	TL150X250, TL175X300 TLM36X55, TLM36X75	20,000 / 9,000
<b>48 X 52 X 38</b>	SL150X600		GL250X450	TL175X300, TL200X350 TLM45X100	26,000 / 11,800

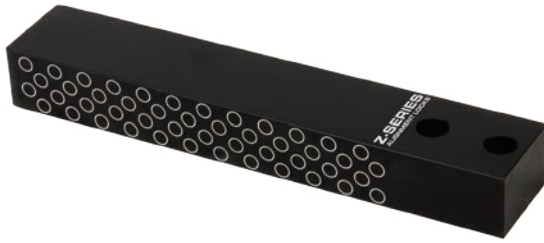
# BAR LOCK SELECTION GUIDE

BAR CATALOG NUMBER	GUIDE CATALOG NUMBER	BAR LOCK ENGAGEMENT	TOTAL MAX WEIGHT SUPPORTED (LBS/KG)
BLB100L4	BLG100L1.3, BLG100L1.8	2.50	<b>15,000 / 6,800</b>
BLB100L6	BLG100L2.3, BLG100L2.8	4.50	
BLBM25L125	BLGM25L27, BLGM25L36	89 mm	<b>15,000 / 6,800</b>
BLB125L5	BLG125L1.3, BLG125L1.8	3.00	<b>20,000 / 9,000</b>
BLB125L9	BLG125L2.3, BLG125L2.8	7.00	
BLBM32L160	BLGM32L36, BLGM32L46	114 mm	<b>20,000 / 9,000</b>
BLB137L6	BLG137L1.8, BLG137L2.3	3.50	<b>23,000 / 10,400</b>
BLB137L11	BLG137L2.8, BLG137L3.3, BLG137L3.8	8.50	
BLBM38L250	BLGM38L46, BLGM38L76	194 mm	<b>26,000 / 11,800</b>
BLB150L8	BLG150L1.8, BLG150L2.3	4.50	<b>26,000 / 11,800</b>
BLB150L16	BLG150L2.8, BLG150L3.3, BLG150L3.8	12.50	
BLN150L8	BLG150L1.8, BLG150L2.3 BLG150L2.8, BLG150L3.3, BLG150L3.8	3.75	<b>25,000 / 11,340</b>
BLN250L10	BLG250L4.3	5.00	<b>50,000 / 22,500</b>
BLN350L13	BLG350L4.8	6.00	<b>75,000 / 34,000</b>



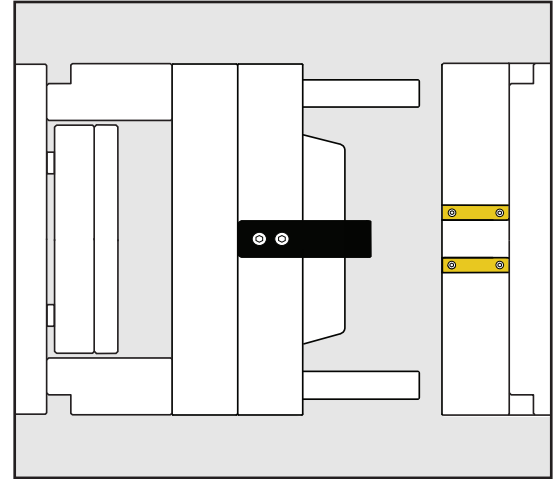
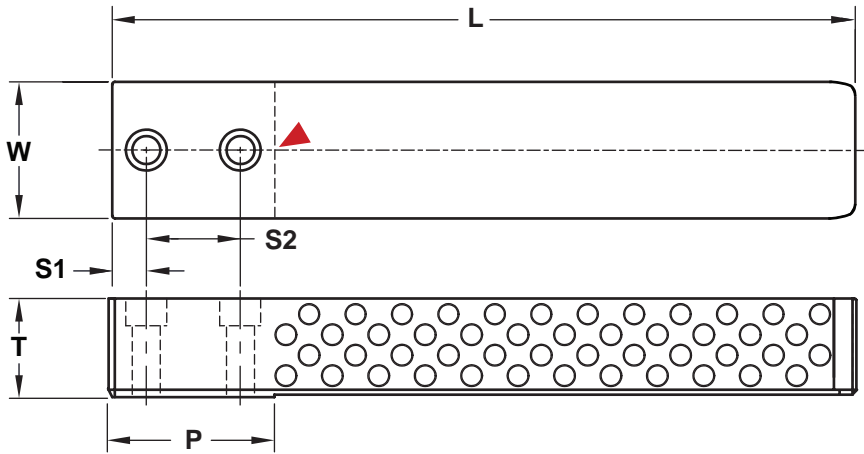
# BAR LOCKS

## Z-SERIES



Progressive's Bar Locks enable mold designers to select off-the-shelf components for alignment of large molds and molds with multiple moving plates.

Long-term precision alignment of plates is achieved through Progressive's Z-Series proprietary treatments, engagement ramp geometry and particle rings on the guiding surfaces.



### MALE BAR LOCKS

#### Inch Standard

**M** H-13 **H** Core: 42-48 HRC, Surface 70 HRC **S** Salt Bath Nitride **▶** CAD insertion point

CATALOG NUMBER	L	T +0.000 - .005	W +0.000 - .0005	P Minimum Pocket Length	S1 ±.01	S2 ±.01	SHCS
BLB100L4	3.88	1.000	1.000	1.38	.38	.69	5/16-18 x 1.25
BLB100L6	6.00						
BLB125L5	4.88	1.250	1.500	1.88	.50	1.00	3/8 - 16 x 1.50
BLB125L9	8.88						
BLB137L6	5.88	1.375	2.000	2.38	.50	1.38	3/8 - 16 x 1.50
BLB137L11	10.88						
BLB150L8	7.88	1.500	3.000	3.38	.63	2.00	1/2 - 13 x 1.75
BLB150L16	15.88						

Note: Sold individually. Each catalog number includes (1) Bar and (2) Screws.

Guides are sold separately on page C-5.

Note: 500°F max operating temperature.

### MALE BAR LOCKS

#### Metric Standard


**M** H-13 **H** Core: 42-48 HRC, Surface 70 HRC **S** Salt Bath Nitride

CATALOG NUMBER	L	T +0 - .1	W +0.00 - .01	P Minimum Pocket Length	S1 ±.25	S2 ±.25	SHCS
BLBM25L125	125	25	25	36	10	18	M8-1.25 x 30
BLBM32L160	160	32	38	46	12.5	25	M10-1.5 x 35
BLBM38L250	250	38	50	56	15	30	M12-1.75 x 45

Note: Sold individually. Each catalog number includes (1) Bar and (2) Screws.

Guides are sold separately on page C-5.

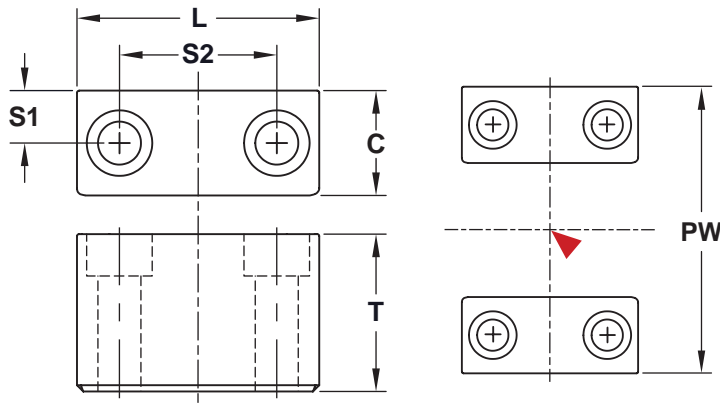
Note: 260°C max operating temperature.

 Bars can be cut to length and have radii machined and Guides can be provided with radii machined. Refer to page C-6 for details. Bars and Guides can also be made to customer specifications by referring to the template in section X.





# BAR LOCKS GUIDES



PW Tolerances:  
Standard Bars:  
+.0003/+.0006  
(+.007/+.015mm)  
Inserted Bars:  
+.0010/+.0015  
(+.025/+.038mm)

▶ CAD insertion point

**M** D-2 **H** Core: 58-62 HRC, Surface 80 HRC **S** Titanium Nitride Coated

**Inch Standard**

CATALOG NUMBER	T +.000 -.005	L +.000 -.005	C +.0000 -.0003	S1 ±.01	S2 ±.01	SHCS	PW	USE WITH
BLG100L1.3	1.000	1.310	.500	.250	.750	#10-32 x 1.25	2.000	BLB100L4 & BLB100L6
BLG100L1.8		1.810			1.125			
BLG100L2.3		2.310			1.250			
BLG100L2.8		2.810			1.625			
BLG125L1.3	1.250	1.310	.625	.312	.750	1/4-20 x 1.50	2.750	BLB125L5 & BLB125L9
BLG125L1.8		1.810			1.125			
BLG125L2.3		2.310			1.250			
BLG125L2.8		2.810			1.625			
BLG137L1.8	1.375	1.810	.750	.375	1.125	5/16-18 x 1.50	3.500	BLB137L6 & BLB137L11
BLG137L2.3		2.310			1.250			
BLG137L2.8		2.810			1.625			
BLG137L3.3		3.310			2.250			
BLG137L3.8		3.810			2.500			
BLG150L1.8	1.500	1.810	1.000	.500	1.000	3/8-16 x 1.75	5.000 (6.000 for BLN150)	BLN150L8, BLB150L8, & BLB150L16
BLG150L2.3		2.310			1.500			
BLG150L2.8		2.810			1.625			
BLG150L3.3		3.310			2.250			
BLG150L3.8		3.810			2.500			
BLG250L4.3	2.500	4.310	1.250	.625	3.00	1/2-13 x 2.75	7.500	BLN250L10
BLG350L4.8	3.500	4.810	1.750	.875	3.25	5/8-11 x 3.75	9.500	BLN350L13

Note: 500°F max operating temperature.

**M** D-2 **H** Core: 58-62 HRC, Surface 80 HRC **S** Titanium Nitride Coated

**Metric Standard**

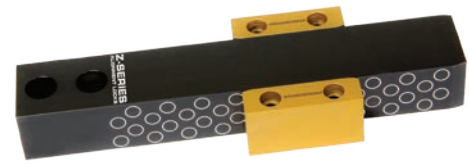
CATALOG NUMBER	T +0 -.1	L +0 -.1	C +.000 -.007	S1 ±.25	S2 ±.25	SHCS	PW	USE WITH
BLGM25L27	25	27	12	6	14	M4-0.7 x 25	49	BLBM25L125
BLGM25L36		36			20			
BLGM32L36	32	36	16	8	20	M6-1.0 x 35	70	BLBM32L160
BLGM32L46		46			30			
BLGM38L46	38	46	22	11	24	M10-1.5 x 40	94	BLBM38L250
BLGM38L76		76			54			

Guides are sold in pairs. Each catalog number includes (2) Guides and (4) Screws.

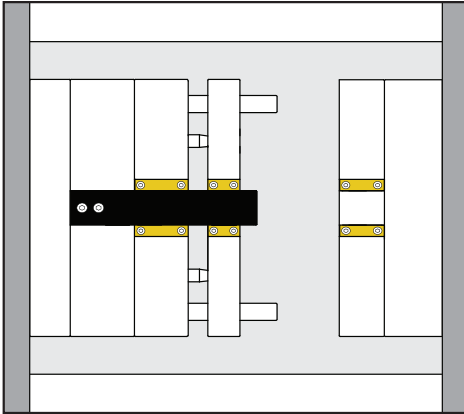
Note: 260°C max operating temperature.

Bars can be cut to length and have radii machined and Guides can be provided with radii machined. Refer to page C-6 for details.  
 Bars and Guides can also be made to customer specifications by referring to the template in section X.

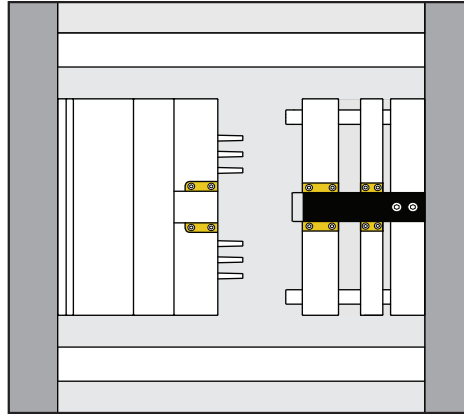
# BAR LOCKS APPLICATIONS



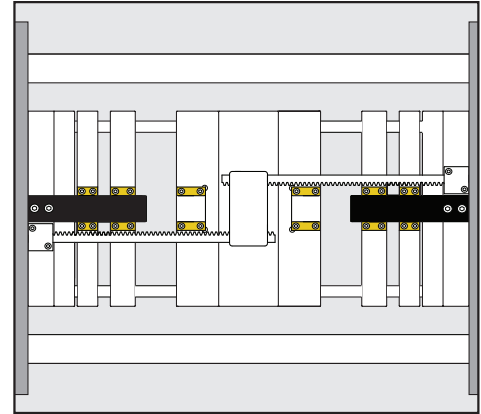
## Stripper Plate Application



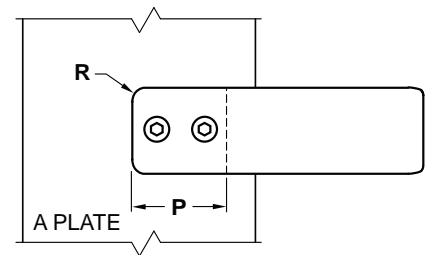
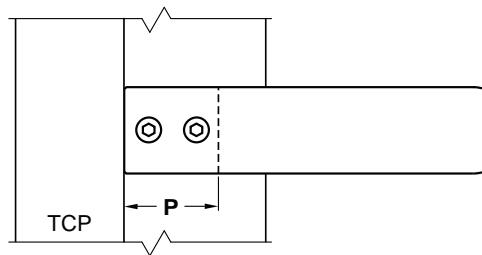
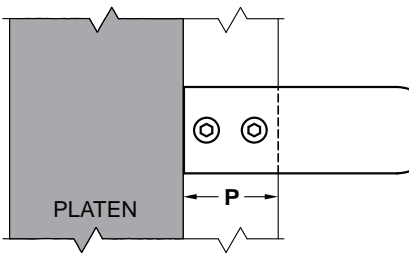
## Three Plate Application



## Stack Mold Application



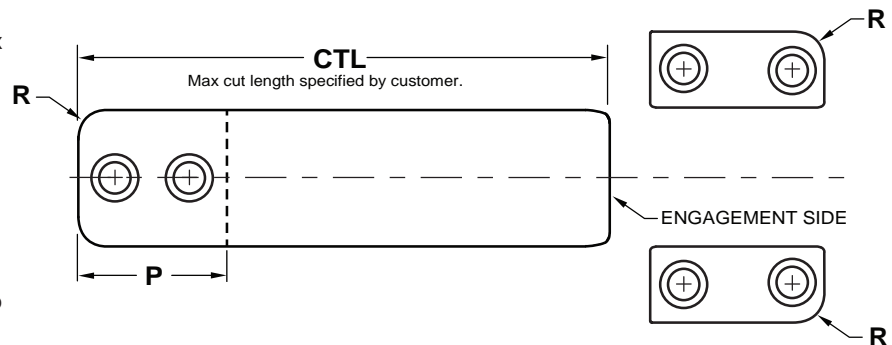
The minimum pocket length (P) is shown below in different applications. Refer to the information below for mold-ready options.



### How to Order:

- For Bars cut to length, specify the prefix of the Bar and the finished length. Ex. BLB100L4.56. (See max length in the chart below.)
- For Bars cut to length with pocket radii (sizes shown in the chart), specify the prefix of the Bar with the finished length and add -R to the end of the catalog number. Ex. BLB100L4.56-R.
- For Bars with pocket radii in standard lengths, specify the full catalog number of the Bar and add -R to the end. Ex. BLB100L6-R.
- For Guides with corner radii on both parts, add -R to the end of the catalog number. Ex. BLG150L2.8-R.

### MOLD-READY SPECIALS

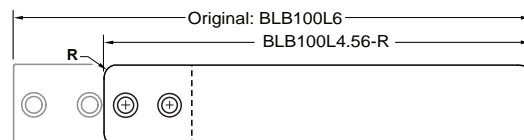


BAR CATALOG PREFIX	CTL Max	R Pocket Radius
BLB100	4.62	.25
BLB125	7.00	.31
BLB137	8.50	.37
BLB150	12.50	.50
BLBM25	89 mm	6 mm
BLBM32	114 mm	8 mm
BLBM38	194 mm	10 mm

GUIDE CATALOG PREFIX	R Pocket Radius
BLG100	.18
BLG125	.25
BLG137	.31
BLG150	.37
BLG250	.37
BLG350	.50
BLGM25	5 mm
BLGM32	6 mm
BLGM38	7 mm

### Design Guidelines:

- For Guides, the pocket radii are machined on opposing sides as shown above.
- Bar lengths are modified from standards and radii are machined on the pocket side to maintain the integrity of the material and treatment on the engagement side.

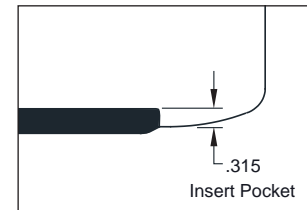
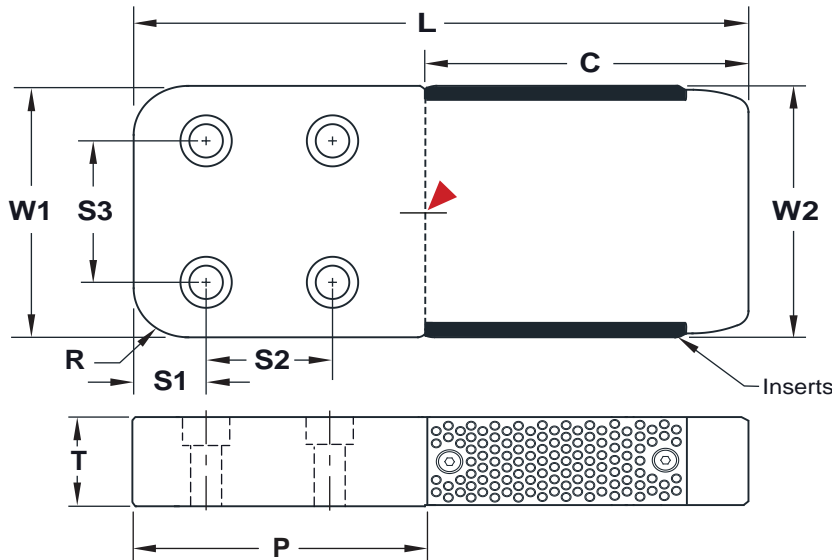




# BAR LOCKS Z-SERIES-INSERTED

Progressive's Inserted Bar Locks are engineered for long-term alignment of very large molds:

- Longevity that far surpasses others, confirmed by extensive independent lab testing as well as monitored performance in harsh, 'real world' conditions.
- Designed to align large injection molds up to 75,000 pounds (B-Side and platen).
- Inserts are also sold individually for new tooling or to retrofit onto existing molds.
- Guides are available in several lengths and sold separately on page C-5.



## MALE BAR LOCK ASSEMBLIES

Bar: **M** 4140 **H** Core: 36-40 HRC **S** Black Oxide

Inserts: **M** H-13 **H** Core: 42-48 HRC, Surface 70 HRC **S** Salt Bath Nitride

CAD insertion point

CATALOG NUMBER	T +0.00 -0.05	W1 +0.000 -0.0005	W2	L	C REF	S1 ±0.1	S2 ±0.1	S3 ±0.1	R Pocket Radius	P Minimum Pocket Length	SHCS
<b>BLN150L8</b>	1.500	4.000	4.000 +0.000/-0.002	7.75	3.75	1.00	2.000	2.250	.75	4.00	1/2-13 x 1.75
<b>BLN250L10</b>	2.500	5.000	5.000 +0.000/-0.002	10.38	5.00	1.25	3.250	3.250	1.00	5.38	5/8-11 x 2.75
<b>BLN350L13</b>	3.500	6.000	6.000 +0.000/-0.003	12.88	6.00	1.50	4.000	3.500	1.00	6.88	3/4-10 x 3.75

Each catalog number includes (1) Bar and (2) Inserts with screws. Guides are sold separately on page C-5.

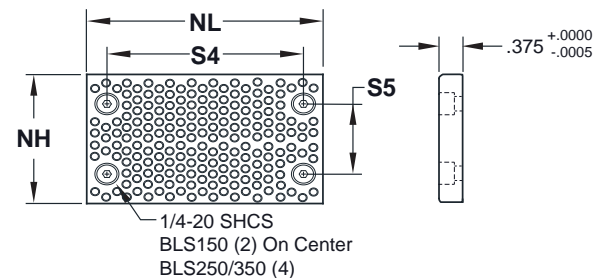
Note: 500°F max operating temperature.

Inserts: **M** H-13 **H** Core: 42-48 HRC, Surface 70 HRC **S** Salt Bath Nitride

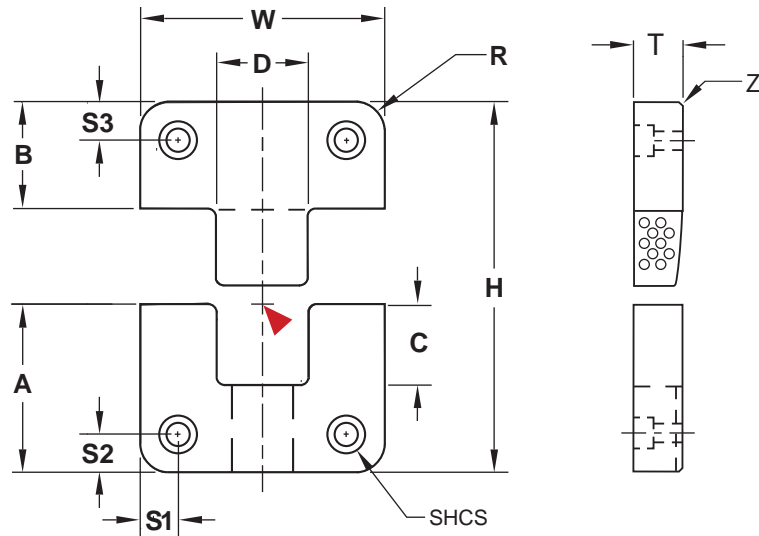
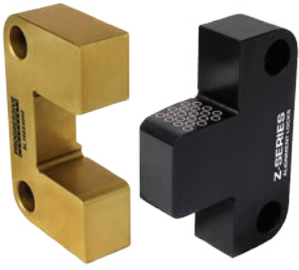
CATALOG NUMBER	NH +0.00 -0.05	NL +0.00 -0.002	S4 ±0.1	S5 ±0.1
<b>BLS150</b>	1.440	2.999	1.750	---
<b>BLS250</b>	2.440	3.999	2.250	1.500
<b>BLS350</b>	3.375	4.999	3.000	2.500

Inserts sold individually and include screws.

## INSERTS



# SIDE LOCKS Z-SERIES



### Inch Standard

Female: **M** D-2 **H** Core: 58-62 HRC, Surface: 80 HRC **S** Titanium Nitride Coated  
 Male: **M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

CAD insertion point

CATALOG NUMBER	T +0.00 -0.02	W +0.000 -0.004	A +0.00 -0.02	B +0.00 -0.02	C	D .0001/.0003 Clearance Per Side	H +0.00 -0.04	R Pocket Radius	S1/S2/S3 ±.01	Z Chamfer	SHCS
SL37X100	.375	1.000	1.125	.875	.62	.500	2.000	.187	.250	.015	#10-32 x 1/2"
SL50X125	.490	1.250	1.125	.875	.68	.500	2.000	.187	.250	.03	#8-32 x 5/8"
SL50X150	.500	1.500	.875	.875	.56	.563	1.750	.187	.250	.03	#8-32 x 5/8"
SL50X200	.500	2.000	1.375	.875	.86	.750	2.250	.187	.312	.03	#10-32 x 5/8"
SL75X300	.750	3.000	1.875	.875	1.18	1.250	2.750	.250	.375	.03	1/4-20 x 3/4"
SL100X400	1.000	4.000	2.375	1.375	1.43	1.500	3.750	.500	.500	.03	3/8-16 x 1"
SL125X500	1.250	5.000	2.875	1.375	1.75	2.000	4.250	.500	.625	.03	1/2-13 x 1-1/4"
SL150X600	1.500	6.000	2.875	1.375	1.87	2.500	4.250	.500	.625	.03	1/2-13 x 1-1/2"

Screws included.

### Inch Standard-Compatible

CATALOG NUMBER	T +0.00 -0.02	W +0.000 -0.004	A +0.00 -0.02	B +0.00 -0.02	C	D .0001/.0003 Clearance Per Side	H +0.00 -0.04	R Pocket Radius	S1 ±.01	S2 ±.01	S3 ±.01	Z Chamfer	SHCS
SLC62X150	.620	1.500	.870	.870	.41	.500	1.74	.187	.281	.281	.437	.03	1/4-20 x 3/4"
SLC62X200	.620	2.000	.870	.870	.41	.680	1.74	.187	.375	.375	.437	.03	1/4-20 x 3/4"
SLC75X300	.745	3.000	1.370	1.360	.68	1.000	2.73	.187	.375	.688	.688	.03	3/8-16 x 1"

Note: 500°F max operating temperature.

Screws included.

### Metric Standard

CATALOG NUMBER	T +0.0 -0.05	W +0.0 -0.01	A +0.0 -0.05	B +0.0 -0.05	C	D .002/.008 Clearance Per Side	H +0.0 -0.1	R Pocket Radius	S1 ±.25	S2/S3 ±.25	Z Chamfer	SHCS
SLM16X50	16	50	21.5	21.5	13	17	43	5	8	11	.8	M6-1.0 x 18
SLM19X75	19	75	36	36	22.5	25	72	5	12.5	18	.8	M10-1.5 x 20
SLM19X100	19	100	45	45	30	35	90	5	15	22	.8	M10-1.5 x 20
SLM25X125	25	125	45	45	28.7	35	90	5	20.5	22	.8	M10-1.5 x 25

Note: 260°C max operating temperature.

Screws included.

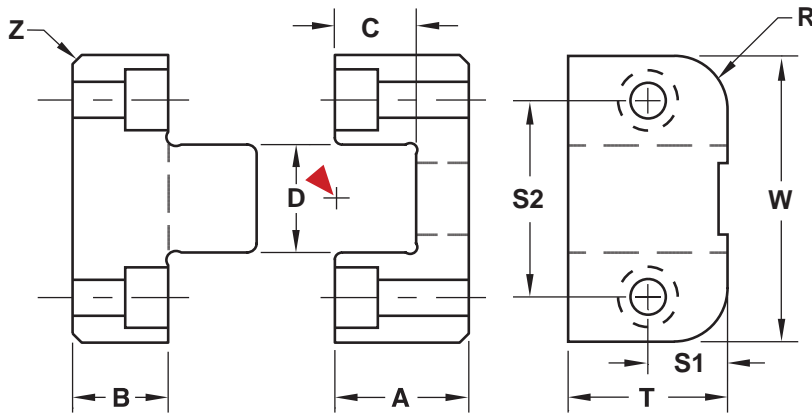
For custom Locks, refer to the templates in section X.

### Alternative Configurations:

- To order Shuttle Mold sets or special male/female configurations, refer to page C-11.



# TOP LOCKS Z-SERIES



▶ CAD insertion point



Female: **M** D-2 **H** Core: 58-62 HRC, Surface: 80 HRC **S** Titanium Nitride Coated  
 Male: **M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

**Inch Standard**

CATALOG NUMBER	T +.000 -.002	W +.0000 -.0004	A +.000 -.002	B +.000 -.002	C	D .0001/.0003 Clearance Per Side	S1 ±.01	S2 ±.01	R Pocket Radius	Z Chamfer	SHCS	
TL50X100	.500	1.000	.500	.375	.30	.375	.250	.688	.188	.03	M: #6-32 x 1/2"	F: #6-32 x 5/8"
TL62X125	.625	1.250	.625	.500	.41	.438	.312	.875	.250	.03	M: #6-32 x 5/8"	F: #6-32 x 3/4"
TL75X125	.750	1.250	.625	.500	.38	.438	.375	.875	.250	.04	M: #8-32 x 5/8"	F: #8-32 x 3/4"
TL87X150	.875	1.500	.875	.750	.57	.500	.437	1.000	.250	.04	M: #8-32 x 7/8"	F: #8-32 x 1"
TL100X150	1.000	1.500	.875	.375	.57	.500	.500	1.000	.250	.04	M: #10-32 x 1/2"	F: #10-32 x 1"
TL100X200	1.000	2.000	1.125	.750	.75	.750	.500	1.375	.375	.04	M: #10-32 x 7/8"	F: #10-32 x 1-1/8"
TL112X200	1.125	2.000	.875	.625	.50	.750	.563	1.375	.375	.04	M: 1/4-20 x 3/4"	F: 1/4-20 x 1"
TL112X300	1.125	3.000	1.500	.750	.87	1.125	.563	2.250	.500	.04	M: 1/4-20 x 7/8"	F: 1/4-20 x 1-5/8"
TL150X250	1.500	2.500	1.375	.625	.85	1.000	.750	1.750	.375	.04	M: 1/4-20 x 3/4"	F: 1/4-20 x 1-1/2"
TL175X300	1.750	3.000	1.250	.875	.75	1.125	.875	2.250	.500	.06	M: 5/16-18 x 1"	F: 5/16-18 x 1-1/4"
TL200X350	2.000	3.500	1.750	.750	1.07	1.500	1.000	2.500	.500	.06	M: 3/8-16 x 7/8"	F: 3/8-16 x 2"

Note: 500°F max operating temperature.

Screws included.

**Metric Standard**

CATALOG NUMBER	T +.00 -.05	W +.00 -.01	A +.00 -.05	B +.00 -.05	C	D .002/.008 Clearance Per Side	S1 ±.25	S2 ±.25	R Pocket Radius	Z Chamfer	SHCS	
TLM26X35	26	35	25	15	17	11	13	23	8	1	M: M5 x 16	F: M5 x 25
TLM30X45	30	45	25	15	17	15	15	30	8	1	M: M6 x 18	F: M6 x 25
TLM36X55	36	55	30	20	21.5	20	18	37.5	8	1	M: M8 x 22	F: M8 x 35
TLM36X75	36	75	35	20	26	30	18	52	8	1.5	M: M10 x 25	F: M10 x 35
TLM45X100	45	100	60	20	42	40	22.5	70	8	1.5	M: M10 x 25	F: M10 x 65

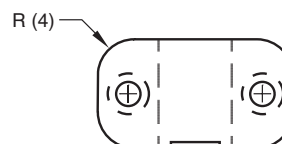
Note: 260°C max operating temperature.

Screws included.

For custom Locks, refer to the templates in section X.

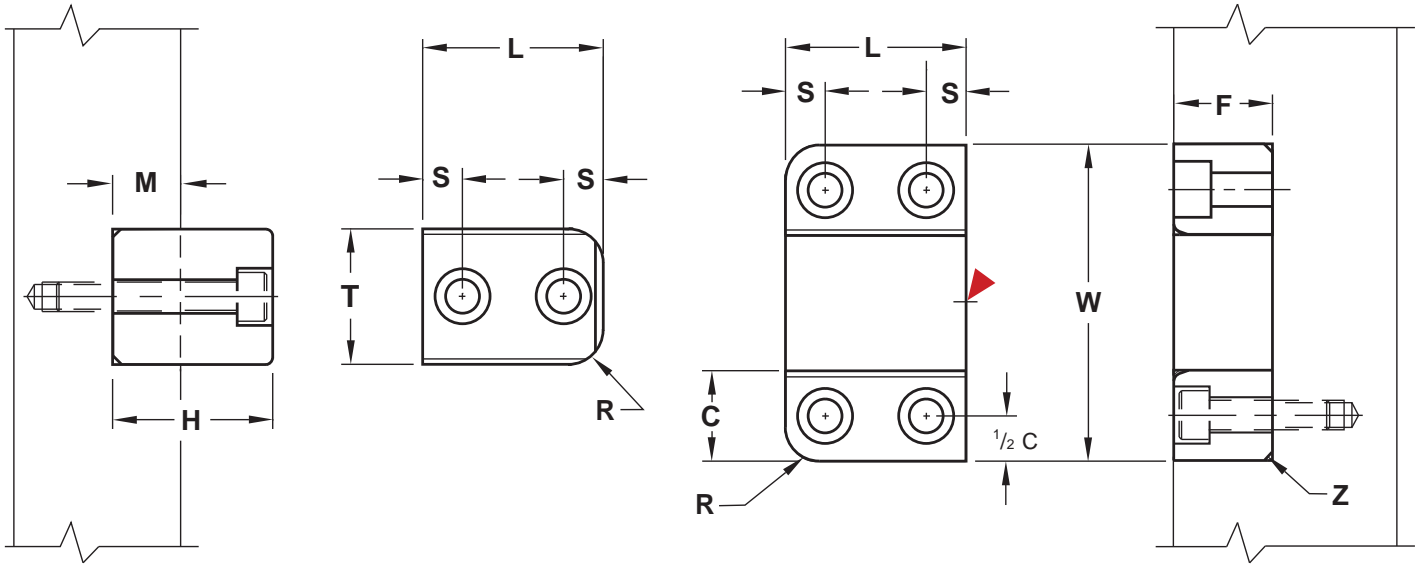
### Alternative Configurations:

- To order Shuttle Mold sets or special male/female configurations, refer to page C-11.
- For information on the 20mm square size Top Lock, refer to page C-14.



# GUIDE LOCKS

## Z-SERIES



Females (2): **M** D-2 **H** Core: 58-62 HRC, Surface: 80 HRC **S** Titanium Nitride Coated  
 Male: **M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

### Inch Standard

CAD insertion point

CATALOG NUMBER	L +0.00 -0.10	W +0.003 +0.006	C +0.000 -0.003	F +0.000 -0.005	T +0.000 -0.003	M	H +0.00 -0.01	S ±0.01	R Pocket Radius	Z Chamfer	SHCS	
GL100X150	1.000	1.500	.500	.500	.500	.375	.85	.25	.187	.03	M: #10-32 x 1"	F: #10-32 x 5/8"
GL150X250	1.500	2.500	.750	.750	1.000	.625	1.35	.31	.250	.06	M: 1/4-20 x 1-1/2"	F: 1/4-20 x 7/8"
GL200X350	2.000	3.500	1.000	1.000	1.500	.750	1.73	.44	.375	.06	M: 3/8-16 x 2"	F: 3/8-16 x 1-1/4"
GL250X450	2.500	4.500	1.250	1.250	2.000	.875	2.11	.56	.500	.09	M: 1/2-13 x 2-1/4"	F: 1/2-13 x 1-1/2"

Note: 500°F max operating temperature.

Screws included.

### Metric Standard

CATALOG NUMBER	L +0.00 -0.25	W +0.008 +0.015	C +0.00 -0.01	F +0.00 -0.12	T +0.00 -0.01	M	H +0.0 -0.2	S ±0.25	R Pocket Radius	Z Chamfer	SHCS	
GLM25X45	25	45	15	15	15	10	24	7	4	1	M: M4 x 25	F: M4 x 14
GLM40X65	40	65	20	20	25	15	34	10	9	1.5	M: M5 x 35	F: M5 x 22
GLM50X90	50	90	25	25	40	20	44	10	9	1.5	M: M6 x 45	F: M6 x 30

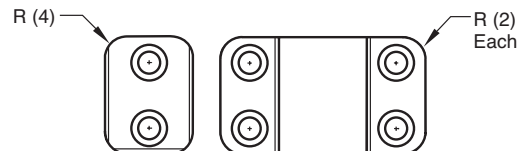
Note: 260°C max operating temperature.

Screws included.

For custom Locks, refer to the templates in section X.

### Alternative Configurations:

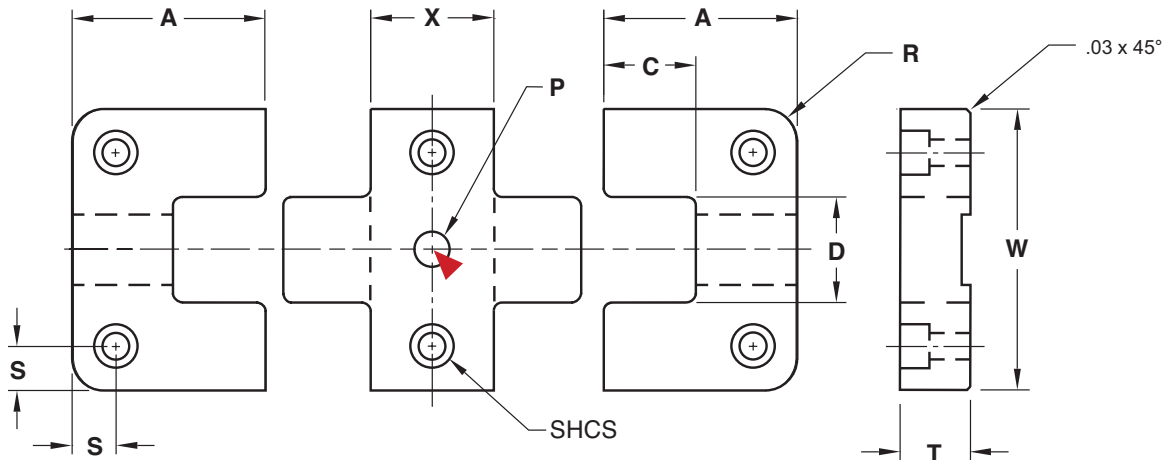
- To order Guide Locks with dual radii for mounting internally, specify the catalog number followed by "-R". Ex. GL200X350-R.
- To order Shuttle Mold sets or special male/female configurations, refer to page C-11.





# X-STYLE SIDE LOCKS

## Z-SERIES



Females (2): **M** D-2 **H** Core: 58-62 HRC, Surface: 80 HRC **S** Titanium Nitride Coated  
 Male: **M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

CAD insertion point

CATALOG NUMBER	T +.000 -.002	W +.0000 -.0004	X +.000 -.002	A +.000 -.002	C ±.01	D .0001/.0003 Clearance Per Side	R Pocket Radius	S ±.01	P +.001 -.000	SHCS
SLX50X87	.500	2.000	.875	1.375	.87	.750	.187	.312	.250	#10-32 x 5/8"
SLX75X137	.750	3.000	1.375	1.875	1.18	1.250	.250	.375	.313	1/4-20 x 3/4"
SLX75X187	.750	3.000	1.875	1.875	1.18	1.250	.250	.375	.313	1/4-20 x 3/4"
SLX100X137	1.000	4.000	1.375	2.375	1.43	1.500	.500	.500	.375	3/8-16 x 1"

Note: 500°F max operating temperature.

Screws included.

For custom Locks, refer to the templates in section X.

## SHUTTLE MOLD SETS

Examples of Shuttle Mold configurations:

### 2 Female Inserts : 1 Male Insert

To order, specify "-SF" after the catalog number of the lock.  
 Examples: SL50X200-SF GL100X150-SF TL75X125-SF TL50X100-R-SF  
 CF31X62-SF CRSM08-SF

### 2 Male Inserts : 1 Female Insert

To order, specify "-SM" after the catalog number of the lock.  
 Example: SL75X300-SM GL250X450-SM TL112X200-SM TL150X250-R-SM  
 CF31X62-SM CRSM08-SM

Individual males and females and special configurations (Ex. 4M:1F) are available.  
 Contact Customer Service for pricing and availability.



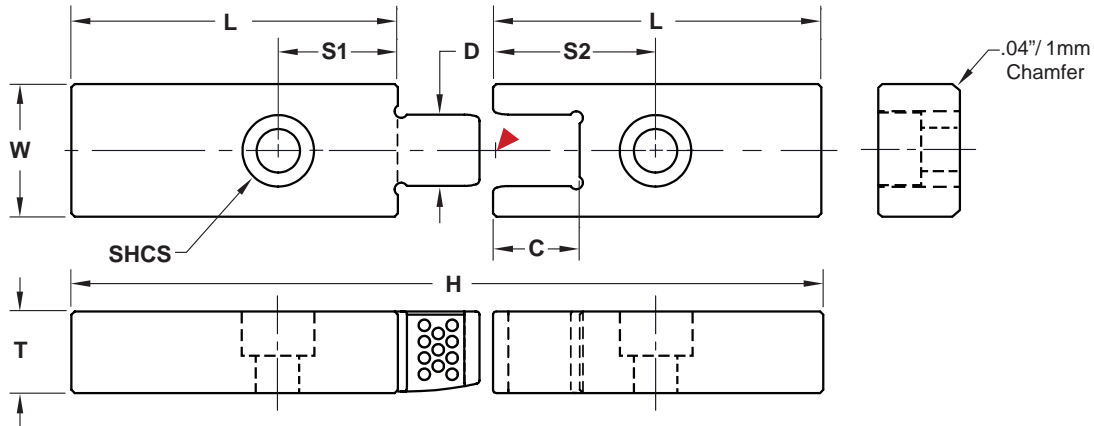


# CAVITY INTERLOCKS

## FLAT SERIES



Flat Cavity Interlocks are a space-saving design for mounting directly within a mold's inserts. The overall lengths are sized for nominal plate thicknesses and can be modified for smaller insert heights.



### Inch Standard

Male: **M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

Female: **M** DC53 **H** Core: 58-62 HRC, Surface: 80 HRC **S** Titanium Nitride Coated

CAD insertion point

CATALOG NUMBER	T +.000 -.002	W +.0000 -.0002	L +.000 -.002	C	D .0001/.00025 Clearance Per Side	H +.000 -.004	S1 ±.01	S2 ±.01	SHCS
CF31X62	.312	.625	1.875	.343	.312	3.750	.688	.688	#8-32 x 3/8"
CF50X87	.500	.875	2.875	.530	.438	5.750	1.000	1.000	1/4-20 x 5/8"

Note: 500°F max operating temperature.

Screws included.

### Metric Standard

Male: **M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

Female: **M** DC53 **H** Core: 58-62 HRC, Surface: 80 HRC **S** Titanium Nitride Coated

CATALOG NUMBER	T +.00 -.05	W +.000 -.005	L +.00 -.05	C	D .003/.006 Clearance Per Side	H +.0 -.1	S1 ±.25	S2 ±.25	SHCS
CFM08X16	8	16	46	8.8	8	92	12.5	20	M4-0.7 x 10
CFM12X20	12	20	66	12.8	12	132	18.5	30	M6-1.0 x 14

Note: 260°C max operating temperature.

Screws included.

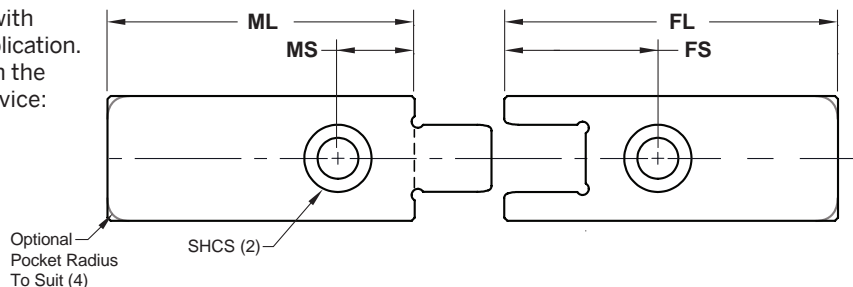
### Alternative Configurations:

- To order Shuttle Mold sets or special male/female configurations, refer to page C-11.

### MOLD-READY INTERLOCKS

Progressive can supply Flat Cavity Interlocks complete with screw hole locations and lengths modified to suit your application. To order, specify the item code that will be modified from the charts above, and provide the following to Customer Service:

- ML=Male Length
- MS=Male Screw Location (Will be on center.)
- FL=Female Length
- FS=Female Screw Location (Will be on center.)
- Pocket Radius: If required, add "-R" to the specification. (Radius is designed to suit Interlock size.)



Note: SHCS size will be the same as within the standards.



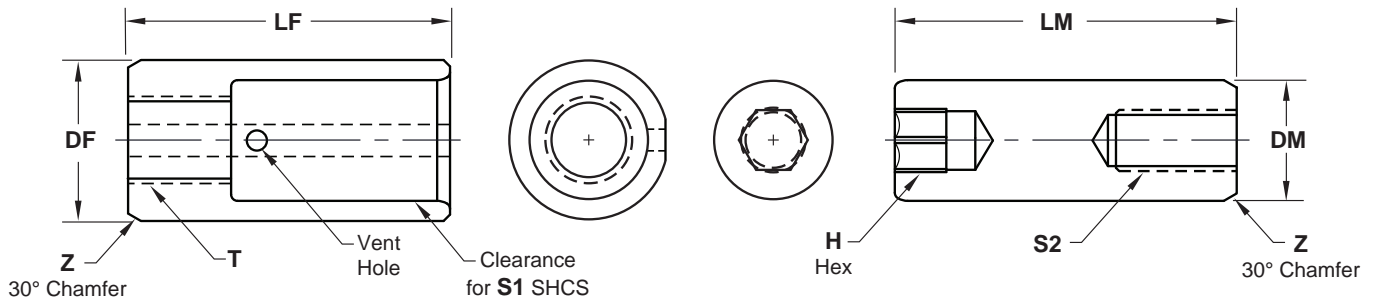


# CAVITY INTERLOCKS

## ROUND SERIES

Round Cavity Interlocks are offered in small diameters to enable mounting within a mold's inserts. The design features the maximum amount of straight alignment engagement for the minimum amount of pocket depth required.

- Can be mounted from parting line or bolted from the back of the inserts.
- Vent hole and flat provided on female insert.



Female: **M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

Male: **M** DC53 **H** Core: 58-62 HRC, Surface: 80 HRC **S** Titanium Nitride Coated

**Inch Standard**

CATALOG NUMBER	DM -.0001 -.0002	DF +.0000 -.0002	LF +.000 -.002	LM +.000 -.002	PM	E	Z	S1 SHCS Size	T Thread	S2 Set Screw Size	H
CRS250	.2500	.3750	.687	.812	.500	.23	.03	#6-32 x 3/8"	#10-32	#6-32 x 1/2	1/8
CRS375	.3750	.5000	1.000	1.062	.625	.36	.04	#10-32 x 5/8"	1/4-20	#10-32 x 5/8	3/16
CRS500	.5000	.6250	1.375	1.375	.750	.51	.04	1/4-20 x 7/8"	5/16-18	1/4-20 x 3/4	3/16

Note: 500°F max operating temperature.

Socket Head Cap Screw & Set Screw included.

Female: **M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

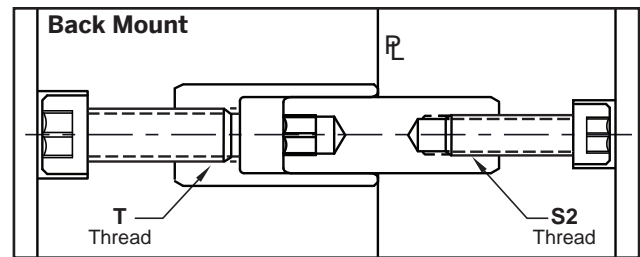
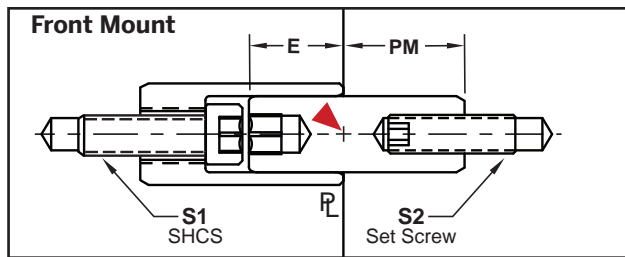
Male: **M** DC53 **H** Core: 58-62 HRC, Surface: 80 HRC **S** Titanium Nitride Coated

**Metric Standard**

CATALOG NUMBER	DM -.002 -.006	DF +.000 -.005	LF +.0 -.1	LM +.0 -.1	PM	E	Z	S1 SHCS Size	T Thread	S2 Set Screw Size	H
CRSM06	6	8	16	18	10	6	.3	M3-0.5 x 8	M4-0.7	M4-0.7 x 12	3
CRSM08	8	12	20	24	14	8	.3	M4-0.7 x 10	M5-0.8	M5-0.8 x 16	4
CRSM10	10	14	22	26	14	10	.3	M4-0.7 x 10	M5-0.8	M6-1.0 x 16	5
CRSM12	12	16	30	32	17	13	.5	M6-1.0 x 16	M8-1.25	M6-1.0 x 16	5

Note: 260°C max operating temperature.

Socket Head Cap Screw & Set Screw included.



▶ CAD insertion point

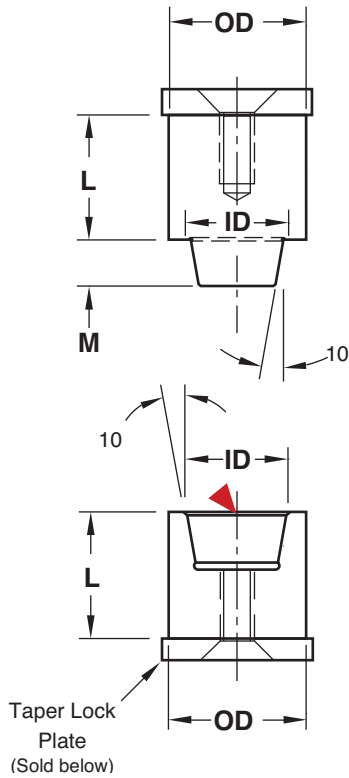
### Installation Guidelines:

- Diameter (DF & DM) Machining Tolerances: Inch: +.0002" / Metric: +.005mm
- Maximum chamfer size should be .02" / .5mm on counterbore.
- Maximum clearance between female and male insert is .0006" / .015mm total.
- The fasteners provided are for parting line installation shown in the graphic above left. For bolting in back, the mold maker will select fasteners to accommodate insert thickness.

### Alternative Configurations:

- To order Shuttle Mold sets or special male/female configurations, refer to page C-11.

# TAPER LOCKS

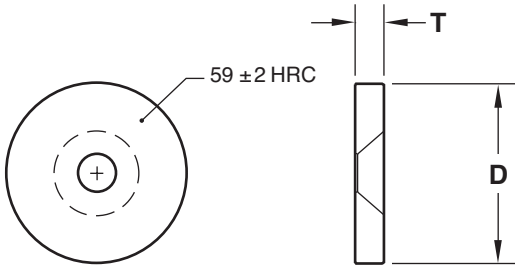


**M** H-13 **H** 48-52 HRC

**▶** CAD insertion point

O. D. +0.000 -0.003	I. D.	M	Thread Size	L +0.04 +0.08	MALE CATALOG NUMBER	FEMALE CATALOG NUMBER
1/2	.312	.250	#10-24	11/16	MTL50L.68	FTL50L.68
				7/8	MTL50L.87	FTL50L.87
				1-3/16	MTL50L1.18	FTL50L1.18
				1-3/8	MTL50L1.37	FTL50L1.37
3/4	.500	.281	1/4-20	11/16	MTL75L.68	FTL75L.68
				7/8	MTL75L.87	FTL75L.87
				1-3/16	MTL75L1.18	FTL75L1.18
				1-3/8	MTL75L1.37	FTL75L1.37
1	.625	.343	1/4-20	11/16	MTL100L.68	FTL100L.68
				7/8	MTL100L.87	FTL100L.87
				1-3/16	MTL100L1.18	FTL100L1.18
				1-3/8	MTL100L1.37	FTL100L1.37
1-1/2	1.000	.500	5/16-18	1-1/8	MTL150L1.12	FTL150L1.12
				1-3/8	MTL150L1.37	FTL150L1.37
				1-5/8	MTL150L1.62	FTL150L1.62
2	1.500	.500	5/16-18	1-1/8	MTL200L1.12	FTL200L1.12
				1-3/8	MTL200L1.37	FTL200L1.37
				1-5/8	MTL200L1.62	FTL200L1.62

# TAPER LOCK PLATES



**M** AISI 52100 **H** 57-61 HRC **S** Black Oxide

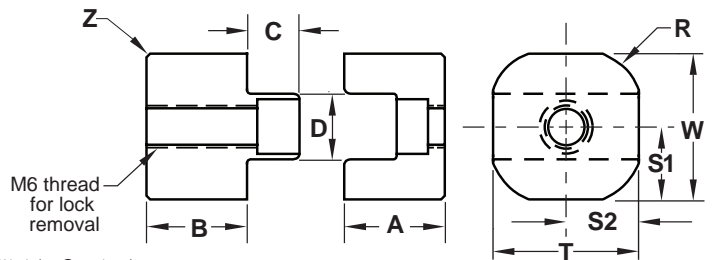
CATALOG NUMBER	Taper Lock OD	D +0.00 -0.015	T +0.00 -0.002	Flat Head Counterbore
TLP50	1/2	.687	.187	#10-24
TLP75	3/4	1.000	.187	1/4-20
TLP100	1	1.187	.187	1/4-20
TLP150	1-1/2	1.687	.250	5/16-18
TLP200	2	2.187	.250	5/16-18

1/2" long FHCS included.

# TOP LOCK-20MM SQUARE Z-SERIES



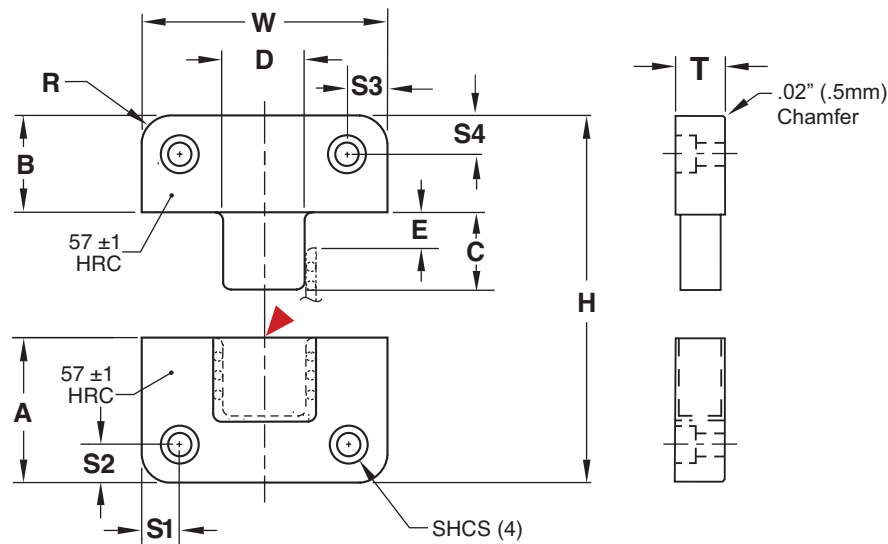
Female: **M** D-2 **H** Core: 58-62 HRC, Surface: 80 HRC **S** Titanium Nitride Coated  
 Male: **M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride



CATALOG NUMBER	T +0.0 -0.05	W +0.0 -0.01	A +0.0 -0.05	B +0.0 -0.05	C	D .002/.008 Clearance Per Side	S1 ±.25	S2 ±.25	R Pocket Radius	Z Chamfer	SHCS
TLM20X20	20	20	14	14	7	9	Center	Center	5	1	M: M4 x 25 F: M4 x 10



# SIDE LOCKS NEEDLE BEARING



## Inch Standard

**M** O-2 **H** 56-58 HRC **S** Black Oxide

CAD insertion point

CATALOG NUMBER	T +.000 -.005	W ±.0002	W Pocket Width +.0005 -.0000	A +.000 -.005	B +.000 -.005	C	D	E	H +.000 -.004	R Pocket Radius	S1 ±.01	S2 ±.01	S3 ±.01	S4 ±.01	SHCS
SLR50X125	.500	1.2495	1.250	1.375	.875	.66	.412	.210	2.250	.187	.171	.250	.171	.437	#8-32 x 5/8"
SLR50X150	.500	1.4995	1.500	.875	.875	.40	.500	.210	1.750	.187	.250	.250	.250	.250	#8-32 x 5/8"
SLR50X150-L	.500	1.4995	1.500	1.375	.875	.66	.550	.250	2.250	.187	.182	.376	.182	.500	#8-32 x 5/8"
SLR50X200	.500	1.9995	2.000	1.375	.875	.66	.750	.325	2.250	.187	.312	.312	.312	.312	#10-32 x 5/8"
SLR75X300	.750	2.9995	3.000	1.875	.875	.95	1.188	.575	2.750	.250	.375	.375	.375	.375	1/4-20 x 3/4"
SLR100X400	1.000	3.9995	4.000	2.375	1.375	1.34	1.855	.450	3.750	.500	.500	.500	.500	.500	3/8-16 x 1-1/8"

For technical information, refer to page C-16.

Screws included.

Note: Cages are manufactured from resin or aluminium, depending on size.

## Metric Standard

**M** O-2 **H** 56-58 HRC **S** Black Oxide

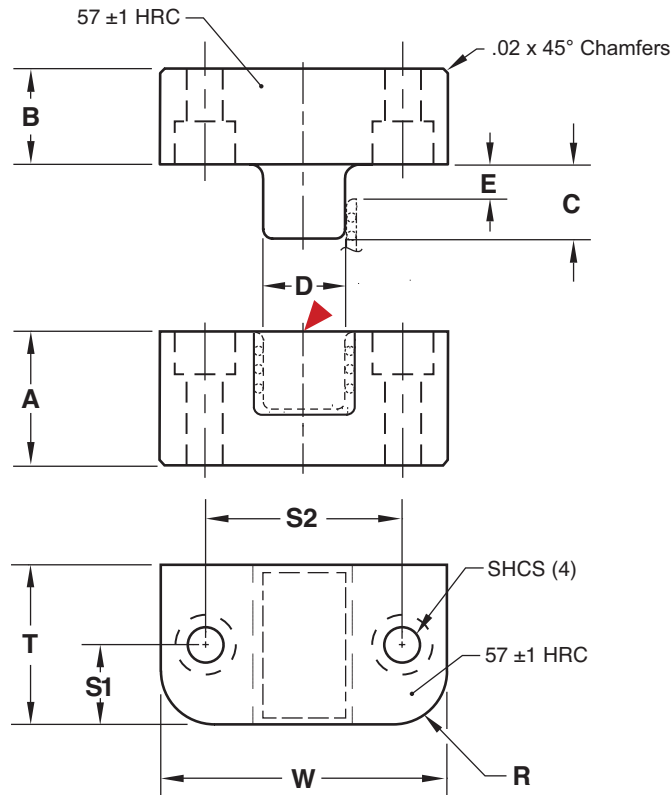
CATALOG NUMBER	T +.00 -.12	W ±.005	W Pocket Width +.012 -.000	A +.00 -.12	B +.00 -.12	C	D	E	H +.00 -.01	R Pocket Radius	S1 ±.25	S2 ±.25	S3 ±.25	SHCS
SLRM32X63	32	62.9	63	46	46	27	21	12.1	92	8	9	11	35	M8-1.25 x 35
SLRM40X100	40	99.9	100	66	66	36	33	19.5	132	10	13	18	48	M12-1.75 x 45

For technical information, refer to page C-16.

Screws included.

Note: Cages are manufactured from resin or aluminium, depending on size.

# TOP LOCKS NEEDLE BEARING



**Inch Standard**

**M** O-2 **H** 56-58 HRC **S** Black Oxide

▶ CAD insertion point

CATALOG NUMBER	T +.000 -.005	W +.0002 -.0000	W Pocket Width +.0005 -.0000	A +.000 -.005	B +.000 -.005	C	D	E	S1 ±.01	S2 ±.01	R Pocket Radius	SHCS
TLR87X150	.875	1.4995	1.500	1.375	.750	.66	.550	.225	.438	1.143	.250	M: #8-32 x 7/8" F: #8-32 x 1-1/2"
TLR112X200	1.125	1.9995	2.000	1.375	.625	.62	.660	.425	.563	1.375	.375	M: 1/4-20 x 3/4" F: 1/4-20 x 1-1/2"
TLR150X250	1.500	2.4995	2.500	1.375	.625	.62	.900	.400	.750	1.750	.375	M: 1/4-20 x 3/4" F: 1/4-20 x 1-1/2"
TLR150X250-L	1.500	2.4995	2.500	1.875	.875	1.02	1.015	.350	.750	1.875	.375	M: 1/4-20 x 1" F: 1/4-20 x 2"

Note: Cages are manufactured from resin or aluminium, depending on size.

Screws included.

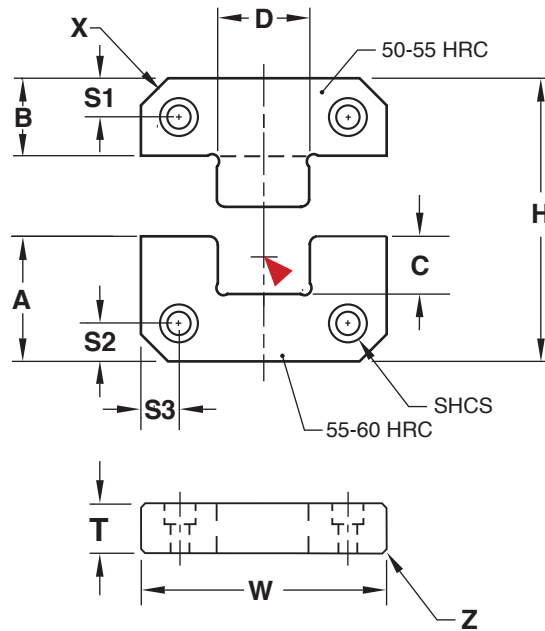
**Technical Information:**

- Zero clearance between male and female (D) dimensions.
- Bearings: 64 HRC
- Maximum Mold Temperature: 300° F (150° C)
- Engagement occurs at E dimension shown.
- Locks are to be mounted in the mold base and not in the core or cavity inserts.
- For optimal performance, pockets are to be machined to nominal "W" pocket width dimensions in each table. If replacing locks in existing pockets, ensure .0004" clearance, and the lock may be modified to suit.
- As with other mold mechanisms, clean and maintain locks at the mold's scheduled PMs.





# SIDE LOCKS



Female: **M** O-2 **H** 55-60 HRC

Male: **M** O-2 **H** 50-55 HRC

Inch Standard

▶ CAD insertion point

CATALOG NUMBER	T +.000 -.002	W +.0000 -.0004	A +.0000 -.0008	B +.0000 -.0008	C	D .0001/.0003 Clearance Per Side	H +.000 -.002	X Corner Chamfer	Z Chamfer	S1 ±.01	S2 ±.01	S3 ±.01	SHCS
SLS62X150	.620	1.500	.870	.870	.33	.500	1.74	.19	.02	.437	.281	.281	1/4-20 x 3/4"
SLS62X200	.620	2.000	.870	.870	.33	.680	1.74	.19	.04	.437	.375	.375	1/4-20 x 3/4"
SLS75X300	.745	3.000	1.370	1.360	.57	1.000	2.73	.38	.04	.688	.688	.375	3/8-16 x 1"
SLS75X400	.745	4.000	1.870	1.870	.79	1.375	3.74	.50	.04	.875	.875	.625	3/8-16 x 1"
SLS112X500	1.120	5.000	1.870	1.870	.79	1.750	3.74	.50	.04	.875	.875	.750	1/2-13 x 1-1/4"

Screws included.

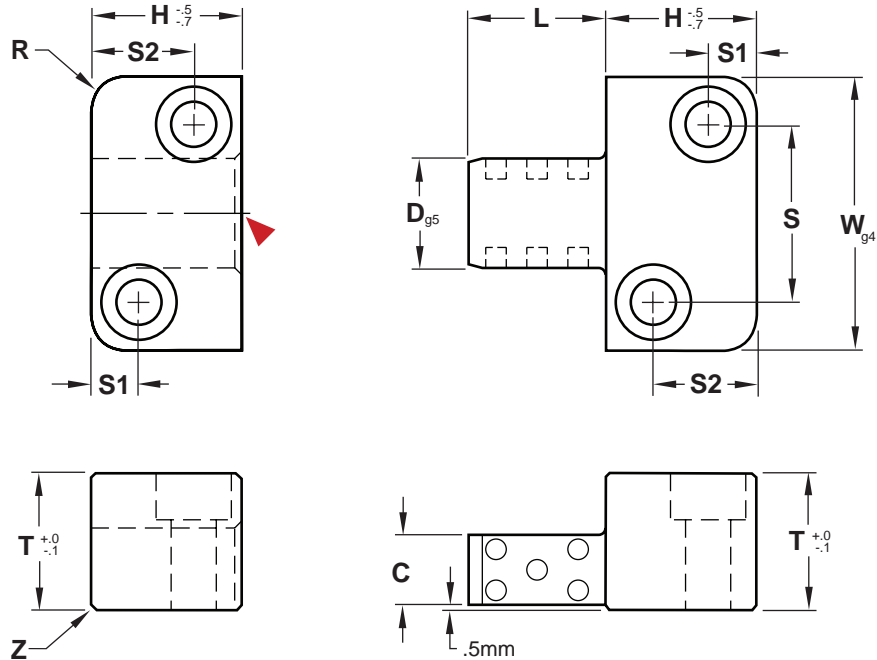
Metric Standard

CATALOG NUMBER	T +.00 -.05	W +.00 -.01	A +.00 -.02	B +.00 -.02	C	D .002/.008 Clearance Per Side	H +.00 -.04	X Corner Chamfer	Z Chamfer	S1/S2 ±.25	S3 ±.2	SHCS
SLMS13X38	13	38	22	22	8.5	12	44	5	.5	7	8	M5-8 x 15
SLMS16X50	16	50	21.5	21.5	9.5	17	43	5	1	11	8	M6-1.0 x 18
SLMS19X75	19	75	36	36	15	25	72	8	1	18	12.5	M10-1.5 x 20
SLMS19X100	19	100	45	45	21	35	90	10	1	22	15	M10-1.5 x 20
SLMS25X125	25	125	45	45	21	45	90	10	1	22	20.5	M10-1.5 x 25

Screws included.

# SIDE LOCKS

## GRAPHITE PLUGGED



### Metric Standard

**M** 0-2 **H** 56-60 HRC

▶ CAD insertion point

CATALOG NUMBER	L	D	T	W	C	H	S1	S2	S	R	Z	Screw Size
SLPM16X20	20	16	20	40	11	22	7	15	26	6	1	M6-1.0 x 25
SLPM16X40	40											
SLPM20X25	25	20	22	45	13	27	7	19	31	6	1	M6-1.0 x 25
SLPM20X50	50											
SLPM25X32	32	25	25	50	14	36	9	27	35	8	1	M6-1.0 x 30
SLPM25X63	63											
SLPM32X40	40	32	32	63	19	46	11	35	45	8	1	M8-1.25 x 35
SLPM32X80	80											
SLPM40X50	50	40	36	85	22	56	15	40	60	10	1.5	M10-1.5 x 40
SLPM40X100	100											
SLPM50X56	56	50	40	100	24	66	18	48	74	10	1.5	M12-1.75 x 45
SLPM50X112	112											

Using grease will inhibit the function of the graphite plugs.  
Instead, use a light 20 weight oil at startup to begin lubrication.

Screws included.



# DATERS, AIR VALVES

## SECTION D



Locking Series	Tapered Series	RF Series	20 Series
Prefix: DN, DTN	Prefix: DTPR	Prefix: DF	Prefix: DL
Pages: D-1	Page: D-3	Page: D-4	Page: D-5



D Series	CH Series	FD Series	Multi-Daters
Prefix: DC, Suffix: -D	Prefix: DC	Prefix: DFD	Prefix: DMD
Page: D-5	Page: D-6	Page: D-7	Page: D-8



Retro Plugs	MicroDaters	LG Series	Recycle Inserts
Prefix: DP	Prefix: MD	Prefix: DLB, DLS	Prefix: RI
Page: D-9	Page: D-10	Page: D-11	Page: D-12



Air Valves & Poppets
Prefix: AV, APV
Page: D-13

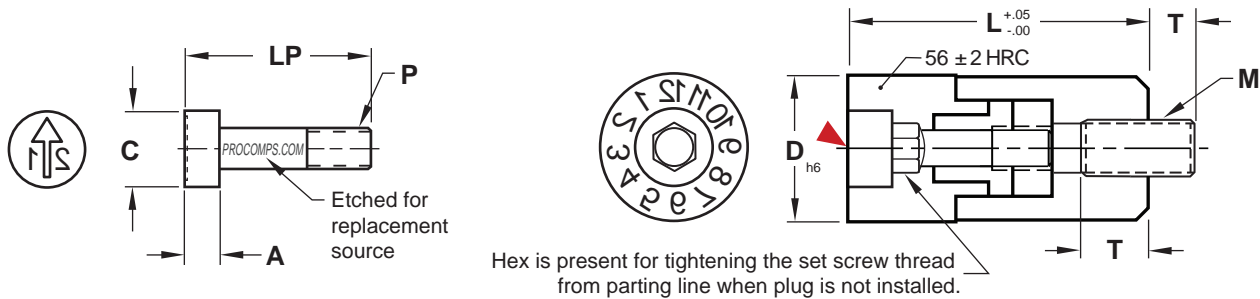






# DATE STAMPS

## LOCKING DETENT SERIES



### PLUGS



**M** 420 Stainless (1.4034) **H** 54-58 HRC

CATALOG NUMBER	C	A	LP	P	Engraving Depth (Arrow)
DNP04-21	2.5	2.3	10.5	M1.4 x 0.2	.30
DNP05-21	3.1	2.8	13.0	M1.6 x 0.2	.40
DNP06-21	3.1	2.8	13.0	M1.6 x 0.2	.40
DNP08-21	4.6	4.0	14.0	M2.5 x 0.35	.40
DNP10-21	4.6	4.0	14.0	M2.5 x 0.35	.40
DNP12-21	6.4	4.0	17.0	M3 x 0.5	.60
DNP16-21	8.4	5.0	23.0	M3.5 x 0.6	.60

### RINGS



CATALOG NUMBER	D	L	M	T	Engraving Depth
DN04	4	14	M2 x 0.4	3	.10
DN05	5	17	M3 x 0.5	3	.20
DN06	6	17	M3 x 0.5	3	.20
DN08	8	20	M4 x 0.7	4	.20
DN10	10	20	M5 x 0.8	4	.20
DN12	12	25	M6 x 1.0	6	.25
DN16	16	33	M8 x 1.25	8	.25

▶ CAD insertion point

**Additional Plug and Ring Options:** Specify catalog number as shown below for the different style plugs and rings.

#### Plug Styles: Recessed Lettering

**Arrow Only**  
Cat #: DNP-Diam-AO  
Ex.: DNP05-AO

**C**  
Cat #: DNP-Diam-C  
Ex.: DNP05-C

#### Ring Styles: Recessed Lettering

**0 - 9**  
Cat #: DNN-Diam  
Ex.: DNN05

**A - L**  
Cat #: DNA-Diam  
Ex.: DNA05

**0 - 30**  
Cat #: DNT-Diam  
Ex.: DNT05

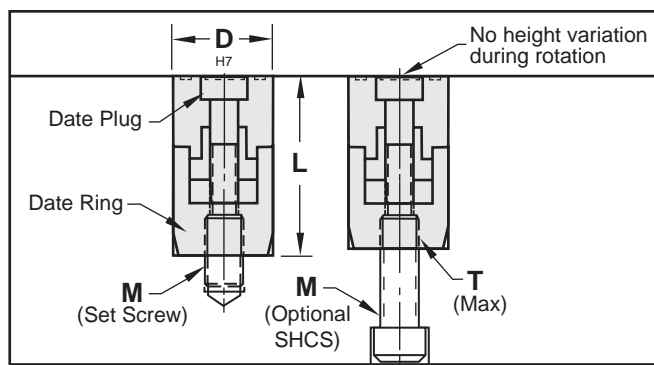
**M - X**  
Cat #: DNZ-Diam  
Ex.: DNZ05

**Blank**  
Cat #: DN-Diam-B  
Ex.: DN05-B

**Years**  
Cat #: DNY-Diam-Starting Year\*  
Ex.: DNY05-21

#### Installation Guidelines:

Ring can be installed using the included set screw or retained with a screw from the back.



Maximum mold temperature: 450° F (230° C)

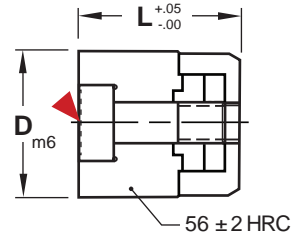
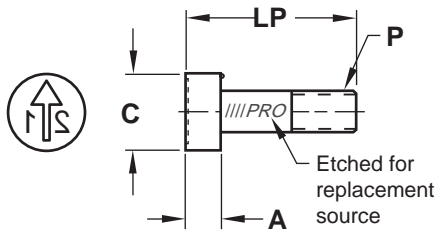
\*Where years are specified, any year can be ordered by changing the suffix. Example DNP05-22 or DNY05-23.

To create Date Stamps for days, purchase both the 0-30 ring (DNT) and the 0-9 ring (DNN) and the desired plugs.

Special configurations are available.  
Contact Customer Service for more information.

# DATE STAMPS

## COMPACT LOCKING DETENT SERIES



### PLUGS



**M** 420 Stainless (1.4034) **H** 54-58 HRC

CATALOG NUMBER	C	A	LP	P	Engraving Depth (Arrow)
DTNP03-21	1.6	1.0	3.8	M1 x 0.25	.20
DTNP04-21	2.5	1.2	4.8	M1.4 x 0.2	.30
DTNP05-21	3.1	2.0	7.8	M1.6 x 0.2	.40
DTNP06-21	3.1	2.0	7.8	M1.6 x 0.2	.40
DTNP08-21	4.4	2.5	9.8	M2.3 x 0.25	.40
DTNP10-21	5.2	3.0	11.8	M2.5 x 0.35	.40
DTNP12-21	6.2	3.0	13.8	M3 x 0.35	.60
DTNP16-21	8.2	3.5	13.8	M4 x 0.35	.60
DTNP20-21	11.0	4.5	15.8	M4 x 0.35	.60

### RINGS



CATALOG NUMBER	D	L	B Max From Graphic Below	Engraving Depth
DTN03	3	4	1.6	.10
DTN04	4	5	2.2	.15
DTN05	5	8	3.2	.20
DTN06	6	8	3.2	.20
DTN08	8	10	4.2	.20
DTN10	10	12	5.2	.20
DTN12	12	14	6.2	.25
DTN16	16	14	8.2	.25
DTN20	20	16	10.2	.30

▶ CAD insertion point

**Additional Plug and Ring Options:** Specify catalog number as shown below for the different style plugs and rings.

#### Plug Styles: Recessed Lettering

**Arrow Only**  
Cat #: DTNP-Diam-AO  
Ex.: DTNP05-AO

**C**  
Cat #: DTNP-Diam-C  
Ex.: DTNP05-C

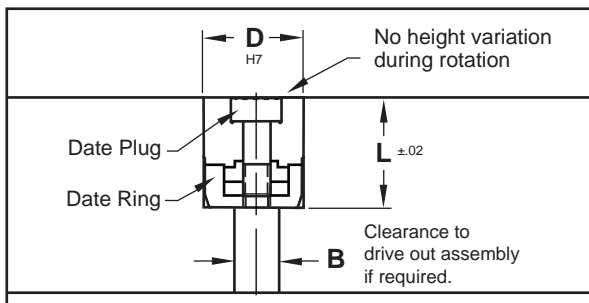
#### Ring Styles: Recessed Lettering

**0 - 9** Cat #: DTNN-Diam Ex.: DTNN05 **A - L** Cat #: DTNA-Diam Ex.: DTNA05

**0 - 30** Cat #: DTNT-Diam Ex.: DTNT05 **M - X** Cat #: DTNZ-Diam Ex.: DTNZ05

**Blank** Cat #: DTN-Diam-B Ex.: DTN05-B **Years** Cat #: DTNY-Diam-Starting Year\* Ex.: DTNY05-21

#### Installation Guidelines:



Maximum mold temperature: 572° F (300° C)  
Maximum molding pressure: 20,000 psi/2,000 bar

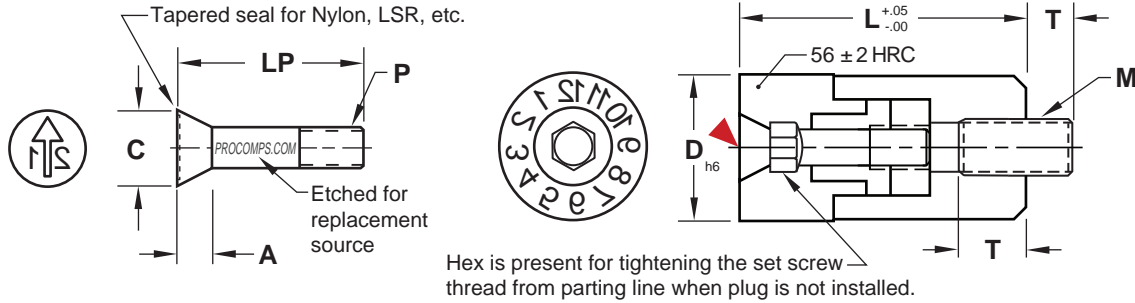
\*Where years are specified, any year can be ordered by changing the suffix. Example DTNP05-22 or DTNY05-23.

To create Date Stamps for days, purchase both the 0-30 ring (DTNT) and the 0-9 ring (DTNN) and the desired plugs.

Special configurations are available.  
Contact Customer Service for more information.



# DATE STAMPS TAPERED SERIES



## PLUGS



## RINGS





**M** 420 Stainless (1.4034) **H** 54-58 HRC

CATALOG NUMBER	C	A	LP	P	Engraving Depth (Arrow)
DTPRP04-21	2.5	2.3	10.5	M1.4 x 0.2	.30
DTPRP05-21	3.1	2.8	13.0	M1.6 x 0.2	.40
DTPRP06-21	3.1	2.8	13.0	M1.6 x 0.2	.40
DTPRP08-21	4.6	4.0	14.0	M2.5 x 0.35	.60
DTPRP10-21	4.6	4.0	14.0	M2.5 x 0.35	.60
DTPRP12-21	6.4	4.0	17.0	M3 x 0.5	.60
DTPRP16-21	8.4	5.0	23.0	M3.5 x 0.6	.60
DTPRP20-21	11	6.5	23.0	M3.5 x 0.6	.60







CATALOG NUMBER	D	L	M	T	Engraving Depth
DTPR04	4	14	M2 x 0.4	3	.15
DTPR05	5	17	M3 x 0.5	3	.20
DTPR06	6	17	M3 x 0.5	3	.20
DTPR08	8	20	M4 x 0.7	4	.30
DTPR10	10	20	M5 x 0.8	4	.30
DTPR12	12	25	M6 x 1.0	6	.30
DTPR16	16	33	M8 x 1.25	8	.30
DTPR20	20	33	M8 x 1.25	8	.30

**Additional Plug and Ring Options:** Specify catalog number as shown below for the different style plugs and rings. ▶ CAD insertion point

### Plug Styles: Recessed Lettering

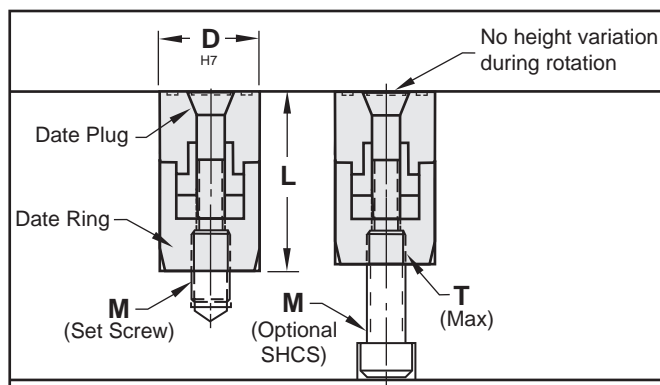
-  **Arrow Only**  
Cat #: DTPRP-Diam-AO  
Ex.: DTPRP05-AO
-  **C**  
Cat #: DTPRP-Diam-C  
Ex.: DTPRP05-C

### Ring Styles: Recessed Lettering

-  **0 - 9**  
Cat #: DTPRN-Diam  
Ex.: DTPRN05
-  **A - M**  
Cat #: DTPRA-Diam  
Ex.: DTPRA05
-  **0 - 30**  
Cat #: DTPRT-Diam  
Ex.: DTPRT05
-  **N - Z**  
Cat #: DTPRZ-Diam  
Ex.: DTPRZ05
-  **Blank**  
Cat #: DTPR-Diam-B  
Ex.: DTPR05-B
-  **Years**  
Cat #: DTPRY-Diam-Starting Year\*  
Ex.: DTPRY05-21

### Installation Guidelines:

Ring can be installed using the included set screw or retained with a screw from the back.



Maximum mold temperature: 450° F (230° C)

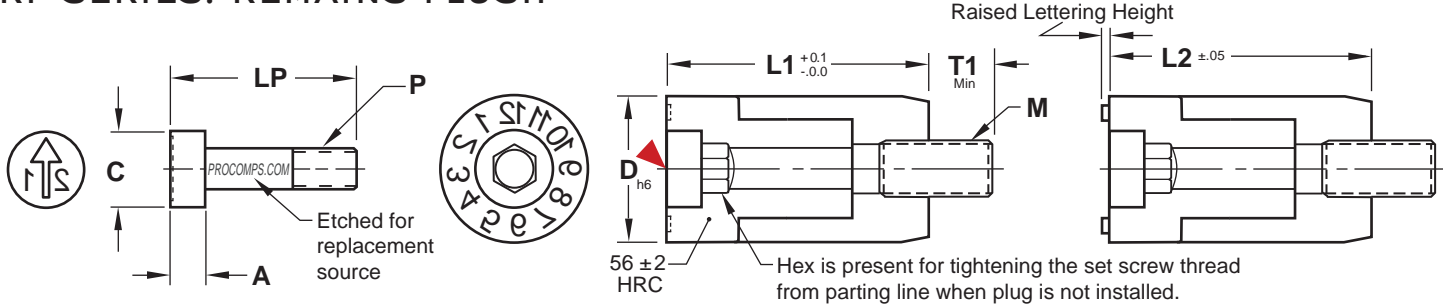
\*Where years are specified, any year can be ordered by changing the suffix. Example DTPRP05-22 or DTPRY05-23.

To create Date Stamps for days, purchase both the 0-30 ring (DTPRT) and the 0-9 ring (DTPRN) and the desired plugs.

Special configurations are available.  
Contact Customer Service for more information.

# DATE STAMPS

## RF SERIES: REMAINS FLUSH



### PLUGS



**M** 420 Stainless (1.4034) **H** 54-58 HRC

### RINGS



RECESSED CATALOG NUMBER	C	A	LP	P	Recessed Engraving Depth	Engraving Depth (Arrow)	Raised Slot Depth
DFP03-21	1.6	2.0	9.0	M1 x 0.25	0.10	.30	N/A†
DFP04-21	2.5	2.3	10.5	M1.4 x 0.2	0.10	.30	.25
DFP05-21	3.1	2.8	13.0	M1.6 x 0.2	0.15	.40	.30
DFP06-21	3.1	2.8	13.0	M1.6 x 0.2	0.15	.40	.30
DFP08-21	4.6	4.0	14.0	M2.5 x 0.35	0.20	.40	.35
DFP10-21	4.6	4.0	14.0	M2.5 x 0.35	0.20	.40	.35
DFP12-21	6.4	4.0	17.0	M3 x 0.5	0.25	.60	.40
DFP16-21	8.4	5.0	23.0	M3.5 x 0.6	0.25	.60	.40

RECESSED CATALOG NUMBER	D	L1 Recessed	L2 Raised	M	T1	T2
DF03	3	14	N/A†	M2 x 0.4	4	N/A†
DF04	4	14	13.80	M2 x 0.4	4	3
DF05	5	17	16.75	M3 x 0.5	4	3
DF06	6	17	16.75	M3 x 0.5	4	3
DF08	8	20	19.70	M4 x 0.7	4	4
DF10	10	20	19.70	M5 x 0.8	4	4
DF12	12	25	24.70	M6 x 1.0	6	6
DF16	16	33	32.70	M8 x 1.25	8	8

† 3mm size not available with raised lettering.

Raised Lettering Height is equal to L1-L2 at each available diameter.

► CAD insertion point

**Additional Plug and Ring Options:** Specify catalog number as shown below for the different style plugs and rings.

#### Plug Styles: Recessed Lettering

- Arrow Only**  
Cat #: DFP-Diam-AO  
Ex.: DFP05-AO
- C**  
Cat #: DFP-Diam-C  
Ex.: DFP05-C

#### Plug Styles: Raised Lettering

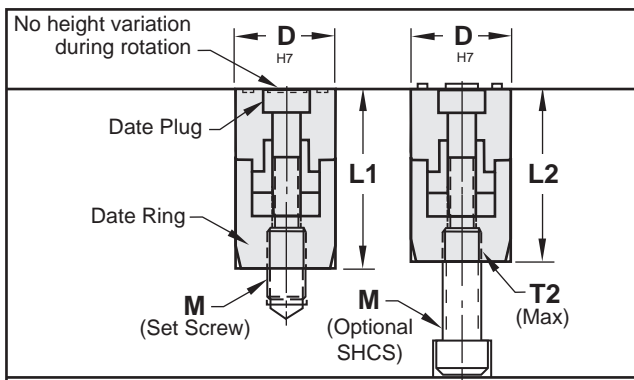
- Year**  
Cat #: DFRP-Diam-Year\*  
Ex.: DFRP05-21
- Arrow Only**  
Cat #: DFRP-Diam-AO  
Ex.: DFRP05-AO
- C**  
Cat #: DFRP-Diam-C  
Ex.: DFRP05-C

#### Ring Styles: Recessed Lettering

- 0 - 9**  
Cat #: DFN-Diam  
Ex.: DFN05
- Blank**  
Cat #: DF-Diam-B  
Ex.: DF05-B
- A - M**  
Cat #: DFA-Diam  
Ex.: DFA05
- Days**  
Cat #: DFL-Diam  
Ex.: DFL05
- N - Z**  
Cat #: DFZ-Diam  
Ex.: DFZ05
- Years**  
Cat #: DFY-Diam-Starting Year\*  
Ex.: DFY05-21

#### Installation Guidelines:

Ring can be installed using the included set screw or retained with a screw from the back.



Maximum mold temperature: 450° F (230° C)

#### Ring Styles: Raised Lettering

- 0 - 9**  
Cat #: DFRN-Diam  
Ex.: DFRN05
- Days**  
Cat #: DFRL-Diam  
Ex.: DFRL05
- A-M**  
Cat #: DFRA-Diam  
Ex.: DFRA05
- Months**  
Cat #: DFR-Diam  
Ex.: DFR05
- N-Z**  
Cat #: DFRZ-Diam  
Ex.: DFRZ05
- Years**  
Cat #: DFRY-Diam-Starting Year\*  
Ex.: DFRY05-21

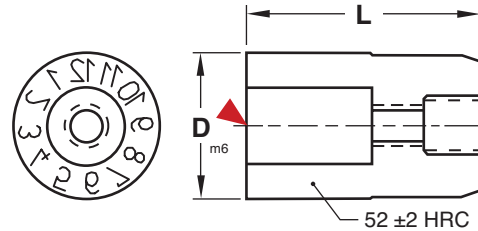
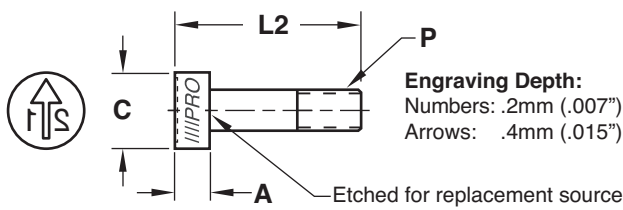
\*Where years are specified, any year can be ordered by changing the suffix. Example DFP05-22 or DFY05-23.

Special configurations are available.  
Contact Customer Service for more information.

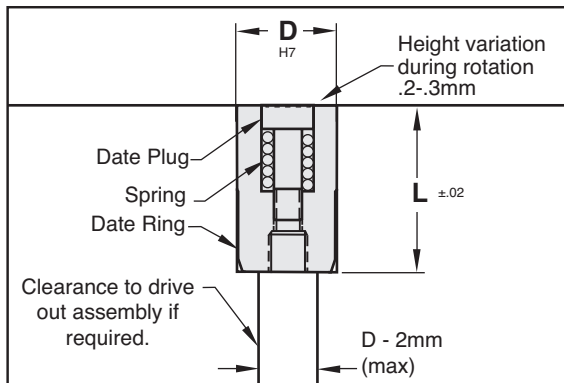


# DATE STAMPS

## 20 SERIES: 20MM LENGTH



### Installation Guidelines:



Maximum mold temperature: 285° F (140° C)

For other date plugs, modify catalog number for the year required. Example: DLP06-22.

Plugs include springs and replacements are available.

### PLUGS



**M** 420 Stainless (1.4034) **H** 50-54 HRC

CATALOG NUMBER	C	A	L2	P	ARROW ONLY
DLP06-21	3.1	3.0	13	M1.6x0.20	DLP06-AO
DLP08-21	4.6	4.0	14	M2.5x0.35	DLP08-AO
DLP10-21	4.6	4.0	14	M2.5x0.35	DLP10-AO
DLP16-21	8.2	3.5	14	M4x0.35	DLP16-AO

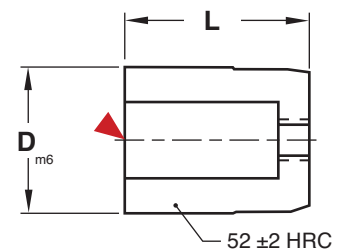
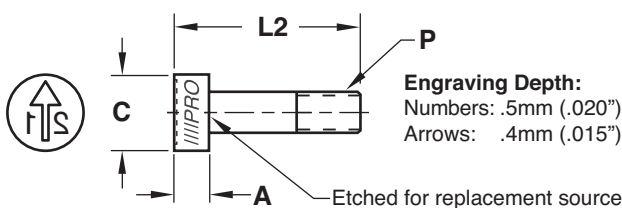
▶ CAD insertion point

### RINGS



CATALOG NUMBER	D	L
DL06	6	20
DL08	8	
DL10	10	
DL16	16	

## D SERIES: DEEP ENGRAVING



### PLUGS

**M** 420 Stainless (1.4034) **H** 50-54 HRC

CATALOG NUMBER	C	A	L2	P	ARROW ONLY
DCP10D-21	5.2	3.0	12	M2.5x0.35	DCP10-AO
DCP12D-21	6.2	3.0	14	M3x0.35	DCP12-AO
DCP16D-21	8.2	3.5	14	M4x0.35	DCP16-AO
DCP20D-21	11.0	4.5	16	M4x0.35	DCP20-AO

For other date plugs, modify catalog number for the year required. Example: DCP16D-22.

Maximum mold temperature: 285° F (140° C).

Plugs include springs and replacements are available.

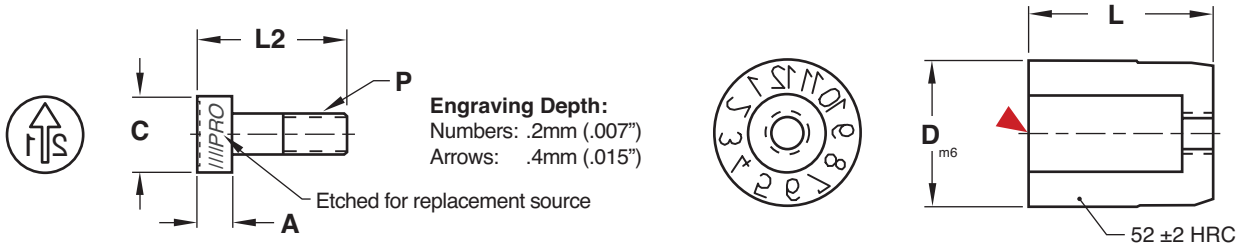
### RINGS

CATALOG NUMBER	D Ring Diameter	L
DC10-D	10	12
DC12-D	12	14
DC16-D	16	14
DC20-D	20	16

▶ CAD insertion point

# DATE STAMPS

## CH SERIES: COMPACT HEIGHT



### PLUGS



**M** 420 Stainless (1.4034) **H** 54-58 HRC

CATALOG NUMBER	C	A	L2	P
DCP04-21	2.2	2.0	8	M1x0.25
DCP05-21	3.1	2.0	8	M1.6x0.20
DCP06-21	3.1	2.0	8	M1.6x0.20
DCP08-21	4.4	2.5	10	M2.3x0.25
DCP10-21	5.2	3.0	12	M2.5x0.35
DCP12-21	6.2	3.0	14	M3x0.35
DCP16-21	8.2	3.5	14	M4x0.35
DCP20-21	11.0	4.5	16	M4x0.35

### RINGS



CATALOG NUMBER	D	L	B From Graphic Below
DC04	4	8	1.4
DC05	5	8	2
DC06	6	8	2
DC08	8	10	3
DC10	10	12	3
DC12	12	14	4
DC16	16	14	5
DC20	20	16	5

▶ CAD insertion point

**Additional Plug and Ring Options:** Specify catalog number as shown below for the different style plugs and rings.

#### Plug Styles: Recessed Lettering

**Arrow Only**  
 Cat #: DCP-Diam-AO  
 Ex.: DCP05-AO

**C**  
 Cat #: DCP-Diam-C  
 Ex.: DCP05-C

#### Ring Styles: Recessed Lettering

**0 - 9**  
 Cat #: DCN-Diam  
 Ex.: DCN05

**A - M**  
 Cat #: DCA-Diam  
 Ex.: DCA05

**Blank**  
 Cat #: DC-Diam-B  
 Ex.: DC05-B

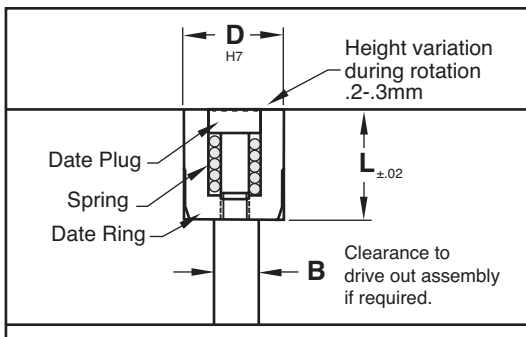
**N - Z**  
 Cat #: DCZ-Diam  
 Ex.: DCZ05

**Days**  
 Cat #: DCL-Diam  
 Ex.: DCL05

**Years**  
 Cat #: DCY-Diam-Starting Year\*  
 Ex.: DCY05-21

Note: The DCL04 and DCL05 does not have tick marks.

#### Installation Guidelines:



Maximum mold temperature: 285° F (140° C)

\*Where years are specified, any year can be ordered by changing the suffix. Example DCP05-22 or DCY05-23.

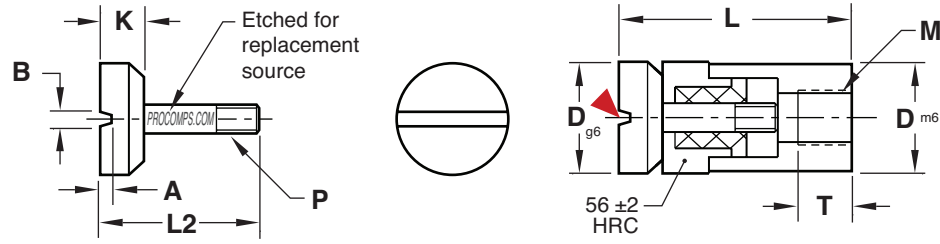
Special configurations are available. Contact Customer Service for more information.

Plugs include springs and replacements are available.



# DATE STAMPS

## FD SERIES: FULL DIAMETER PLUG



### PLUGS



### SHELL



**M** 420 Stainless (1.4034) **H** 54-58 HRC

CATALOG NUMBER	A	B	K	L2	P
DFDPY03-21	.3	.3	2.0	9.0	M1x0.25
DFDPY04-21	.3	.3	2.3	10.5	M1.4x0.2

CATALOG NUMBER	D	T	L	M
DFD03-S	3	3	14	M2 x 0.4
DFD04-S	4	3	14	M2 x 0.4

▶ CAD insertion point

**To Order Plugs:** Specify catalog number as shown below for the different plug style plugs. Plugs and shells are sold separately.

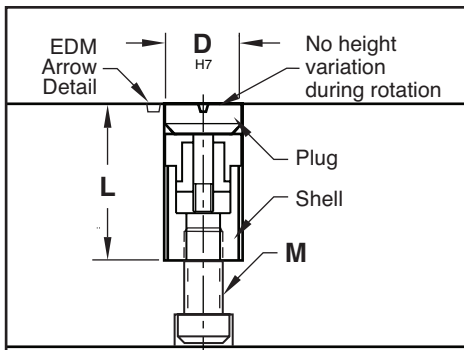


**Month & Year\***  
 Cat #: DFDPY-Diam-Starting Year\*  
 Ex.: DFDPY03-21



**Months**  
 Cat #: DFDP-Diam  
 Ex.: DFDP03

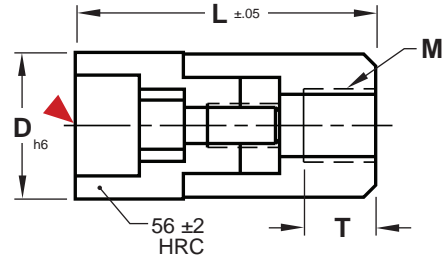
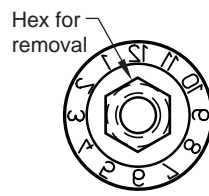
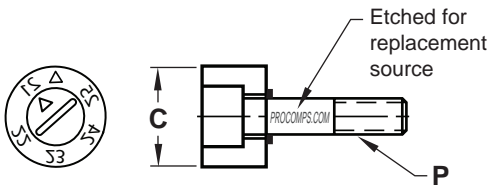
### Installation Guidelines:



\*Where years are specified, any year can be ordered by changing the suffix.  
 Example DFDPY03-22 or DFDPY03-23.  
 Special configurations are available.  
 Contact Customer Service for more information.

# DATE STAMPS

## MULTI-DATERS



### PLUGS



**M** 420 Stainless (1.4034) **H** 54-58 HRC

CATALOG NUMBER	C	Slot Depth	P	Engraving Depth (Arrow)
<b>DMDP06-21</b>	4.2	0.4	M1.6x0.2	0.10
<b>DMDP08-21</b>	5.8	0.4	M2.5x0.35	0.10
<b>DMDP10-21</b>	7.0	0.4	M2.5x0.35	0.10
<b>DMDP12-21</b>	8.5	0.6	M3.0x0.5	0.20
<b>DMDP16-21</b>	11.5	0.6	M3.0x0.6	0.25

### RINGS



CATALOG NUMBER	D	L	M	T	Engraving Depth
<b>DMD06</b>	6	17	M3 x 0.5	3	0.10
<b>DMD08</b>	8	20	M4 x 0.7	4	0.12
<b>DMD10</b>	10	20	M5 x 0.8	4	0.13
<b>DMD12</b>	12	25	M6 x 1.0	6	0.20
<b>DMD16</b>	16	33	M8 x 1.25	8	0.25

▶ CAD insertion point



**Years & Months** plug style is featured in the table above.



**Months** ring style is featured in the table above.

**Additional Plug and Ring Options:** Specify catalog number as shown below for the different style plugs and rings.

#### Plug Styles: Recessed Lettering



**Arrow & 5 Years**  
Cat #: DMDP-Diam-Starting Year\*-5  
Ex.: DMDP06-215



**Arrow & 11 Years**  
Cat #: DMDP-Diam-Starting Year\*-11  
Ex.: DMDP06-2111

#### Ring Styles: Recessed Lettering



**Days**  
Cat #: DMDL-Diam  
Ex.: DMDL06

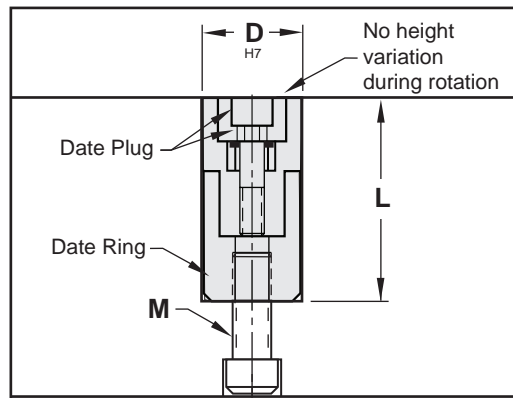


**Weeks**  
Cat #: DMDW-Diam  
Ex.: DMDW06

\*Where years are specified, any year can be ordered by changing the suffix. Example DMDP10-22 or DMDP06-23.

Special configurations are available. Contact Customer Service for more information.

#### Installation Guidelines:



Maximum mold temperature: 450° F (230° C)

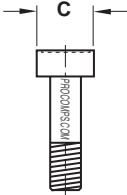




# DATE STAMPS REPLACEMENT PLUGS

## Locking Series Plugs

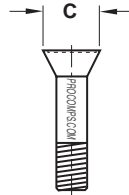
To replace Progressive's Locking Series plugs



CATALOG NUMBER	Date Ring Catalog Number	C
DNP04-21	DN04	2.5
DNP05-21	DN05	3.1
DNP06-21	DN06	3.1
DNP08-21	DN08	4.6
DNP10-21	DN10	4.6
DNP12-21	DN12	6.4
DNP16-21	DN16	8.4

## Tapered Series

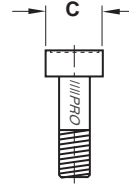
To replace Progressive's Tapered Series plugs



CATALOG NUMBER	Date Ring Catalog Number	C
DTPRP04-21	DTPR04	2.5
DTPRP05-21	DTPR05	3.1
DTPRP06-21	DTPR06	3.1
DTPRP08-21	DTPR08	4.6
DTPRP10-21	DTPR10	4.6
DTPRP12-21	DTPR12	6.4
DTPRP16-21	DTPR16	8.4
DTPRP20-21	DTPR20	11.0

## Compact Locking Plugs

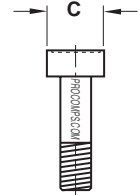
To replace Progressive's Compact Locking Series plugs



CATALOG NUMBER	Date Ring Catalog Number	C
DTNP03-21	DTN03	1.6
DTNP04-21	DTN04	2.5
DTNP05-21	DTN05	3.1
DTNP06-21	DTN06	3.1
DTNP08-21	DTN08	4.4
DTNP10-21	DTN10	5.2
DTNP12-21	DTN12	6.2
DTNP16-21	DTN16	8.2
DTNP20-21	DTN20	11.0

## RF Series Plugs

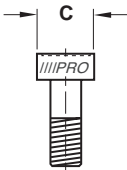
To replace Progressive's RF or H Series plugs.



CATALOG NUMBER	Date Ring Catalog Number	C
DFP03-21	DF03	1.6
DFP04-21	DF04	2.5
DFP05-21	DF05	3.1
DFP06-21	DF06	3.1
DFP08-21	DF08	4.6
DFP10-21	DF10	4.6
DFP12-21	DF12	6.4
DFP16-21	DF16	8.4

## CH & D Series Plugs

To replace Progressive's CH or D Series plugs or DME front style plugs. Springs included.

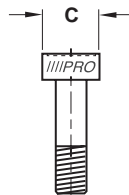


CATALOG NUMBER	Date Ring Catalog Number	C
DCP04-21	DC04	2.2
DCP05-21	DC05	3.1
DCP06-21	DC06	3.1
DCP08-21	DC08	4.4
DCP10-21	DC10	5.2
DCP12-21	DC12	6.2
DCP16-21	DC16	8.2
DCP20-21	DC20	11.0

For D Series replacements, add "D" to the catalog number. Ex. DCP16D-21.

## 20 Series Plugs

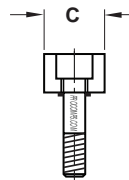
To replace Progressive's 20 Series plugs. Springs included.



CATALOG NUMBER	Date Ring Catalog Number	C
DLP06-21	DL06	3.1
DLP08-21	DL08	4.6
DLP10-21	DL10	4.6
DLP16-21	DL16	8.2

## Multi-Daters

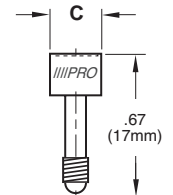
To replace Progressive's Multi-Dater Plugs.



CATALOG NUMBER	Date Ring Catalog Number	C
DMDP06-21	DMD06	4.2
DMDP08-21	DMD08	5.8
DMDP10-21	DMD10	7.0
DMDP12-21	DMD12	8.5
DMDP16-21	DMD16	11.5

## Retro Plugs

To replace plugs previously purchased for PCS/Cumsa style rings.



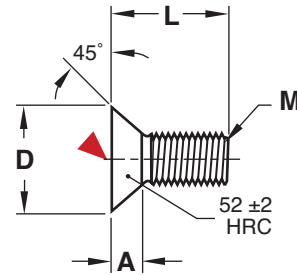
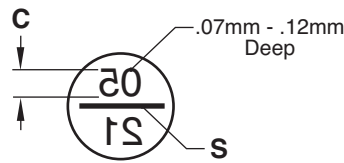
CATALOG NUMBER	Date Ring Catalog Number	C
DP32-21	DS06	3.2
DP47-21	DS08	4.7
DP57-21	DS10	5.7
DP67-21	DS12	6.7
DP87-21	DS16	8.7

For Retro Plugs outside of North America, call for availability from local distributors. \*Retro Date Rings are not available.

Refer to the catalog pages for the specific series required for plugs with alternate engraving such as "C", "Arrow Only", or raised versions. Contact Customer Service for availability of special plugs or for verification of the plugs required.

# DATE STAMPS

## MICRODATERS®



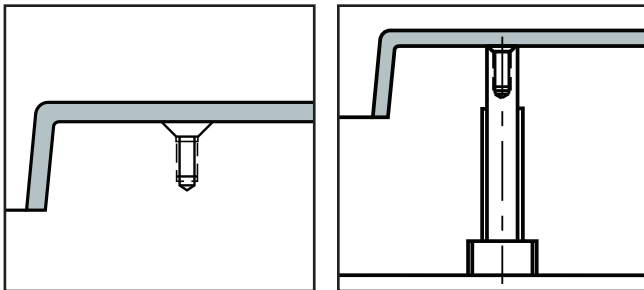
**M** 420 Stainless (1.4034) **H** 50-54 HRC

CAD insertion point

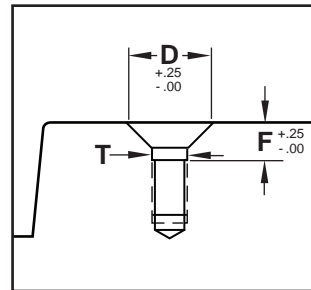
CATALOG NUMBER	D	L	A	M	C	F	T	S Width x Depth	BLANK CAT. NO.
MD02	2	5	.45	M1.4x0.3	.50	1.14	1.4	.38 x .25	MD02-B
MD03	3	5	.76	M1.8x0.35	.75	1.52	1.8	.38 x .38	MD03-B
MD04	4	6	.89	M2.5x0.45	1.0	1.65	2.7	.38 x .38	MD04-B

Blank (-B) MicroDaters do not have numbers or the removal slot, ready for custom engraving by the mold maker.

### Design Options:



### Installation Guidelines:

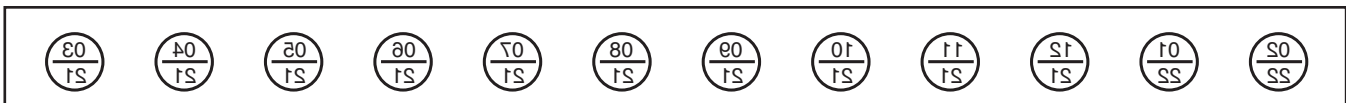


Microdaters can be installed directly into the plates or inserts or into a core pin or ejector pin with the material hardness around 35-40 HRC to utilize conventional machining methods.

Drill, tap and counterbore the dater as shown at left and to the dimensions in the chart above.

### To Order:

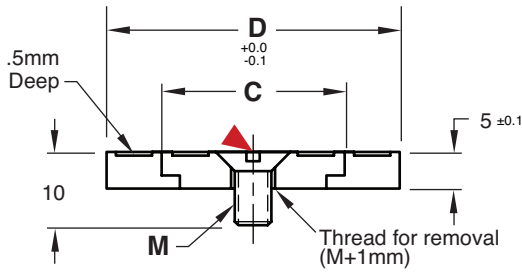
- MicroDaters can be ordered individually or in 12-month sets.
- For individual month daters, specify the 2-digit month and year at the end of the catalog number:  
Ex. MD04-03-21 for a 4mm screw for March 2021.
- To order a 12-month set, specify a "Y" at the end of the catalog number, followed by the 2-digit month and year that begins the series:  
Ex. MD03-Y-03-21 would yield (12) 3mm screws starting with March 2021, ending with February 2022. Shown below at 2:1 scale.



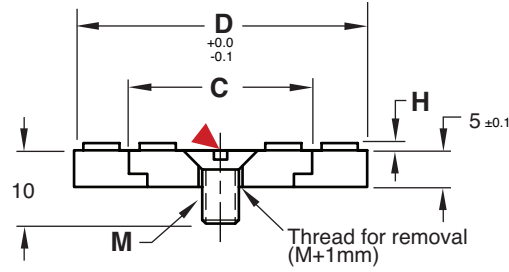


# DATE STAMPS

## LG SERIES: LARGE MOLD, STRUCTURAL FOAM/BLOW MOLDS



**Recessed Lettering**



**Raised Lettering**



Brass: **M** Ms 58

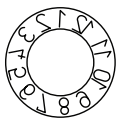
Steel: **M** O-1 (1.2510) **H** 52-56 HRC

D Nominal Ring Diameter	C	M	H Raised Height
15	10	M3 x 0.5	0.5
20	13	M3 x 0.5	1.0
30	19	M4 x 0.7	1.0
40	25	M5 x 0.8	1.0

▶ CAD insertion point

**To Order:** Specify catalog number as shown below for the different style rings and plugs.

### Ring Styles: Recessed Lettering



**Months**

Cat #: DLB-Diam (Brass)  
DLS-Diam (Steel)  
Ex.: DLB40, DLS40



**Days**

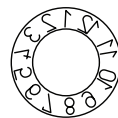
Cat #: DLBL-Diam (Brass)  
DLSL-Diam (Steel)  
Ex.: DLBL40, DLSL40



**Year**

Cat #: DLBY-Diam – Starting Year\* (Brass)  
DLSY-Diam – Starting Year\* (Steel)  
Ex.: DLBY40-21, DLSY40-21

### Ring Styles: Raised Lettering



**Months**

Cat #: DLBR-Diam (Brass)  
DLSR-Diam (Steel)  
Ex.: DLBR40, DLSR40



**Days**

Cat #: DLBRL-Diam (Brass)  
DLSRL-Diam (Steel)  
Ex.: DLBRL40, DLSRL40



**Year**

Cat #: DLBRY-Diam – Starting Year\* (Brass)  
DLSRY-Diam – Starting Year\* (Steel)  
Ex.: DLBRY40-21, DLSRY40-21

### Plug Styles: Recessed Lettering



**Arrow Only**

Cat #: DLBP-Diam – AO (Brass)  
DLSP-Diam – AO (Steel)  
Ex.: DLBP40-AO, DLSP40-AO



**Year**

Cat #: DLBP-Diam – Year\* (Brass)  
DLSP-Diam – Year\* (Steel)  
Ex.: DLBP40-21, DLSP40-21

### Plug Styles: Raised Lettering



**Arrow Only**

Cat #: DLBRP-Diam – AO (Brass)  
DLSRP-Diam – AO (Steel)  
Ex.: DLBRP40-AO, DLSRP40-AO



**Year**

Cat #: DLBRP-Diam – Year\* (Brass)  
DLSRP-Diam – Year\* (Steel)  
Ex.: DLBRP40-21, DLSRP40-21

\*Where years are specified, any year can be ordered by changing the suffix. Example DLBP15-22 or DLSP15-23.

Special configurations are available. Contact Customer Service for more information.

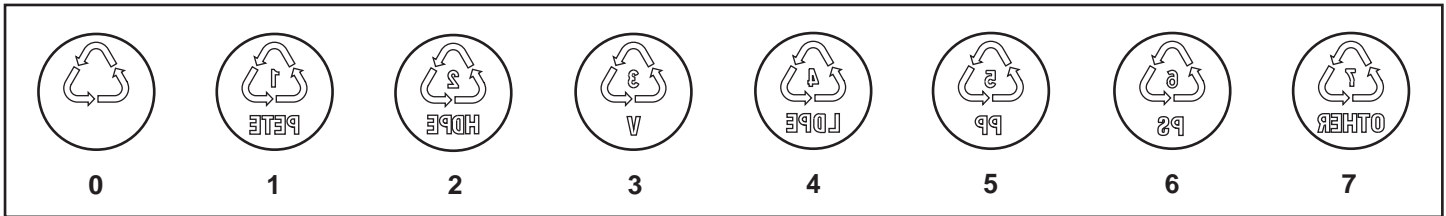
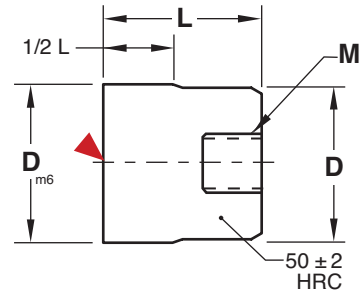
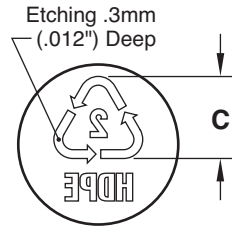
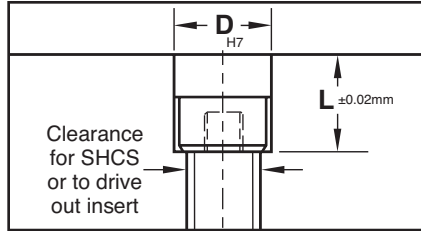
# RECYCLE INSERTS

## SPI STANDARD



### Installation Guidelines:

To avoid damage to face, press insert into hole using a brass or plastic mallet.



**M** 420 Stainless (1.4034) **H** 50-54 HRC

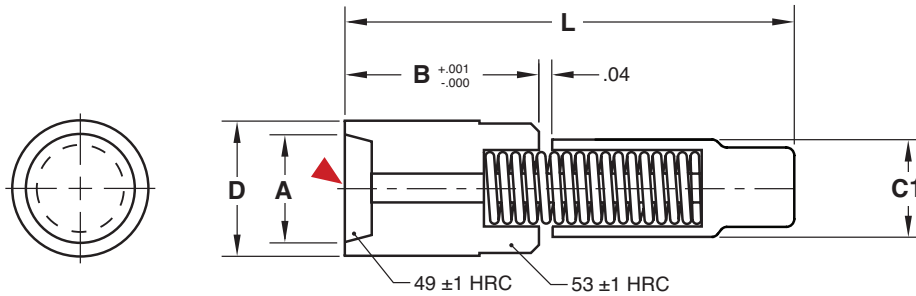
CAD insertion point

CATALOG NUMBER	D	Material Code	Material	L	C	M
RI-10-0	10 mm (.3937")	N/A	BLANK	12 mm (.4724")	6 mm (.2362")	M5 x .08
RI-10-1		1	POLYETHYLENE TEREPHTHALATE			
RI-10-2		2	HIGH DENSITY POLYETHYLENE			
RI-10-3		3	POLYVINYL CHLORIDE			
RI-10-4		4	LOW DENSITY POLYETHYLENE			
RI-10-5		5	POLYPROPYLENE			
RI-10-6		6	POLYSTYRENE			
RI-10-7		7	OTHER			
RI-16-0	16 mm (.6299")	N/A	BLANK	14 mm (.5518")	10 mm (.3937")	M6 x 1.0
RI-16-1		1	POLYETHYLENE TEREPHTHALATE			
RI-16-2		2	HIGH DENSITY POLYETHYLENE			
RI-16-3		3	POLYVINYL CHLORIDE			
RI-16-4		4	LOW DENSITY POLYETHYLENE			
RI-16-5		5	POLYPROPYLENE			
RI-16-6		6	POLYSTYRENE			
RI-16-7		7	OTHER			
RI-20-0	20 mm (.7874")	N/A	BLANK	16 mm (.6299")	12 mm (.4724")	M6 x 1.0
RI-20-1		1	POLYETHYLENE TEREPHTHALATE			
RI-20-2		2	HIGH DENSITY POLYETHYLENE			
RI-20-3		3	POLYVINYL CHLORIDE			
RI-20-4		4	LOW DENSITY POLYETHYLENE			
RI-20-5		5	POLYPROPYLENE			
RI-20-6		6	POLYSTYRENE			
RI-20-7		7	OTHER			

Contact Customer Service for pricing and availability of other sizes or material engraving.



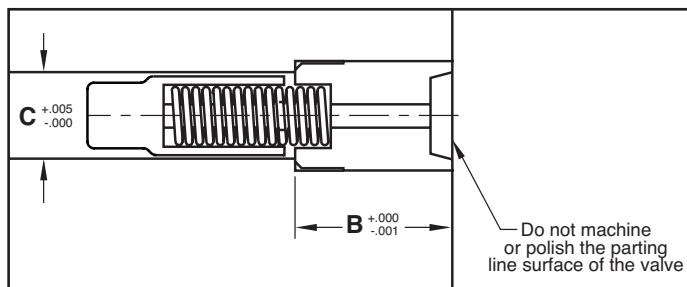
# AIR VALVES



**M** 420 Stainless (1.4034) **H** Body: 52-54 HRC, Plunger: 48-50 HRC

CAD insertion point

CATALOG NUMBER	D		A		B		C1		L		
	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	
AV-08	8	.3149	$+0.0006$ $+0.0002$	6.5	.256	11	.433	6	.24	24	1.0
AV-12	12	.4724	$+0.0007$ $+0.0003$	9.7	.382	18	.708	8	.32	34	1.4
AV-18	18	.7086	$+0.0007$ $+0.0003$	14.8	.583	22	.866	12	.47	46	1.8

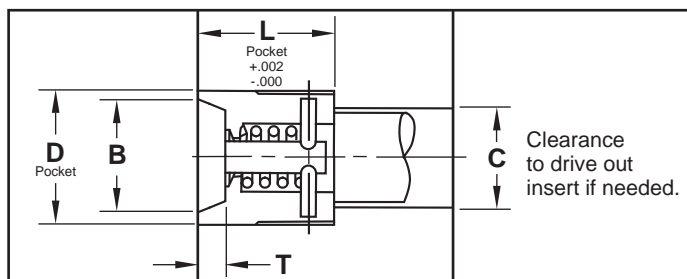


## Suggested Machining Diameters:

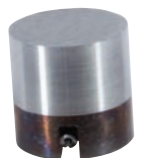
CATALOG NUMBER	C
AV-08	.265
AV-12	.354
AV-18	.551

## Specifications:

- Pressure Required: 29-140 psi
- Maximum Mold Temperature: 265° F (130° C)



# AIR POPPETS



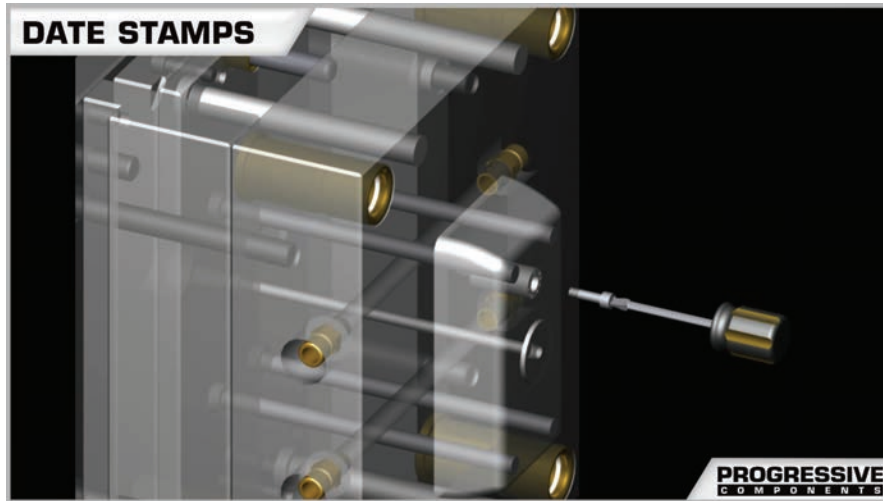
## Specifications:

- Pressure Required: 80-100 psi
- Maximum Mold Temperature: 285° F (140° C)
- Repair kit includes spring and pin.

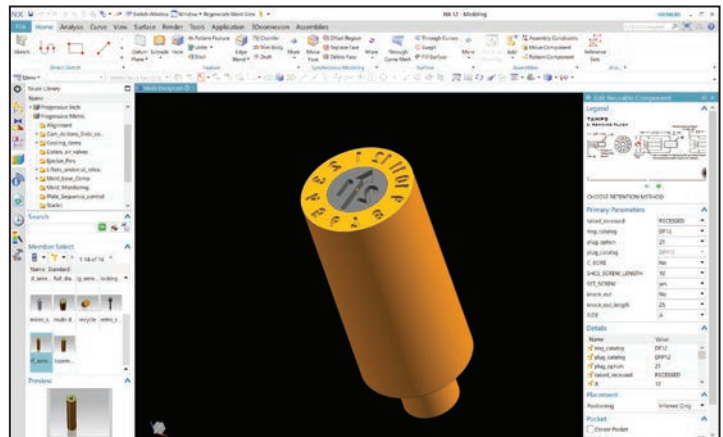
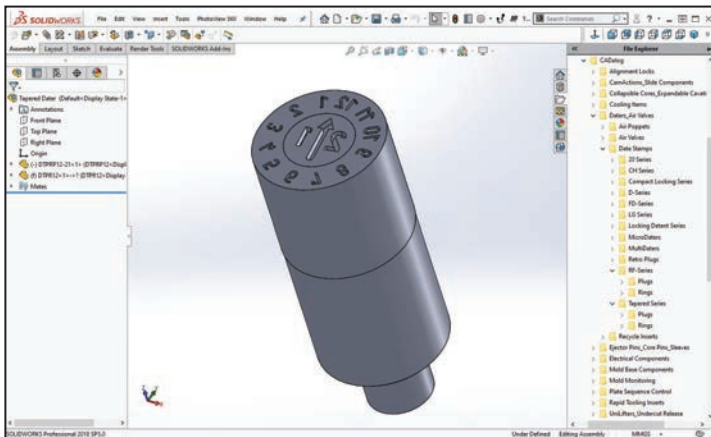
**M** 420 Stainless (1.4034) **H** 40-44 HRC

AIR POPPET CATALOG NUMBER	D ±.0002	B	C	T	L	REPAIR KIT CATALOG NUMBER
APV-25	.250	.215	3/16	.06	.375	APVR-25
APV-37	.375	.325	9/32	.07	.375	APVR-37
APV-50	.500	.437	3/8	.10	.500	APVR-50
APV-75	.750	.656	9/16	.15	.750	APVR-75
APV-100	1.000	.875	3/4	.20	1.000	APVR-100
APV-150	1.500	1.312	1	.30	1.500	APVR-150

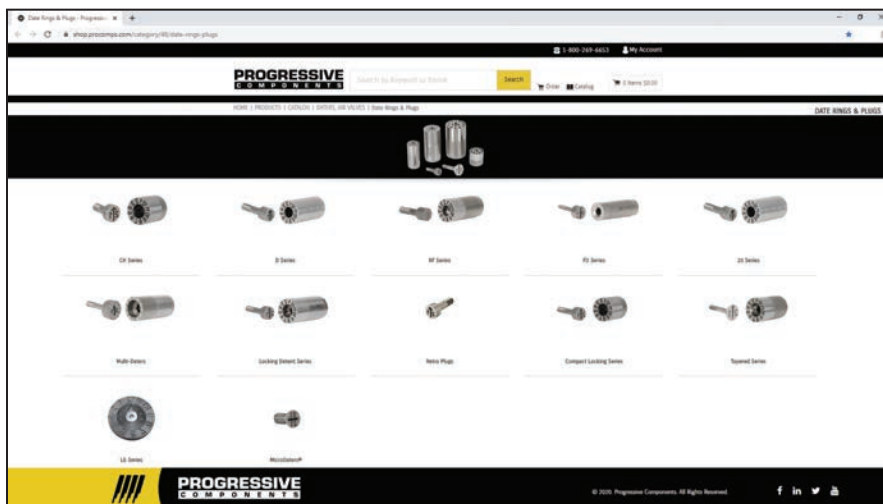
# ONLINE RESOURCES



When considering design options, numerous animations can be viewed at [procomps.com/animations](http://procomps.com/animations).



CAD geometry is available online as individual downloads or as part of the CADalog system. The seven formats include: IGES (.igs), ACIS (.sat), STEP (.step), Parasolid (.x\_t), Solidworks (.sldasm), NX (.prt) (Re-Use and MoldWizard) and Visi (.wkt).



Industry-leading web store expedites the purchasing process. Go to [shop.procomps.com](http://shop.procomps.com) for information and additional resources.



# COOLING ITEMS

## SECTION E



Pipe Check	Baffles	Jumper Baffles	Reverse Flow Baffles	Cascade: Nipple Type
Prefix: PC	Prefix: SB, TB	Prefix: JBA	Prefix: RFB	Prefix: NC
Page: E-1	Page: E-2	Page: E-4	Page: E-5	Page: E-6



Cascade: High Flow	Cascade: Rear Load Nipple	Cascade: RL Quick Coupler	Cascade: Hex Key, Compact	Cascade: Quick Coupler
Prefix: HFC	Prefix: RLN	Prefix: RLQC	Prefix: HKC, CC	Prefix: QC
Page: E-7	Page: E-8	Page: E-9	Page: E-10	Page: E-11



Bubbler Base	Inlet Cascade	Metric Tubes: High Flow, Hex	Tubes: High Flow, Hex	Tubes: Piston, Brass
Prefix: BBL	Prefix: CF	Prefix: HFTM, HEXM, EHEXM	Prefix: HFT, HEXT	Prefix: PT, T
Page: E-12	Page: E-13	Page: E-14	Page: E-15	Page: E-16



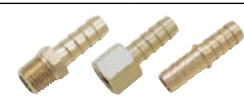
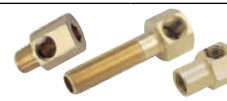
O-Rings	Pipe Plugs	Extension Plugs	Connector Plugs	Socket Connectors
Prefix: OR	Prefix: BR, ST, SS	Prefix: Numeral	Prefix: Numeral	Prefix: SC
Page: E-17	Page: E-20	Page: E-21	Page: E-24	Page: E-25



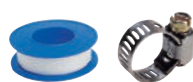
Connector Plugs: Keyed	Socket Connectors: Keyed	Safety Clips	Adjustable Hex Nipples	Hex Key Extension Pipes
Prefix: Numeral, Suffix: -K	Prefix: SC, Suffix: -K	Prefix: SC	Prefix: APN	Prefix: HKEPN
Page: E-26	Page: E-27	Page: E-27	Page: E-28	Page: E-28



Elbows: Hex Key	Pipe Nipples	Push-Lok Hose	Plugs: Water Blockers	Plugs: Threadless
Prefix: HK, HKEE, HKL	Prefix: BPN, GPN	Prefix: WJH	Prefix: WB	Prefix: TWP, TAP, TDP
Page: E-29	Page: E-30	Page: E-30	Page: E-31	Page: E-32



Diverting Rods & Plugs	Water Jumpers	Water Jumpers: Swivel	Elbows: Hex, Extension	Hose Barbs & Splicers
Prefix: D, DR	Prefix: WJ	Prefix: WJ	Prefix: HELS, HELB	Prefix: MB, FB, HS
Page: E-33	Page: E-34	Page: E-35	Page: E-36	Page: E-37



Combination Hose Inserts	Cover Plugs, Clamps & Tape	Tees & Elbows	Reducers & Couplings
Prefix: Numeral	Prefix: CP, HC, TT	Prefix: T, MT, ELS, EL, ELA	Prefix: RB, MR, C, HN
Page: E-38	Page: E-39	Page: E-40	Page: E-41



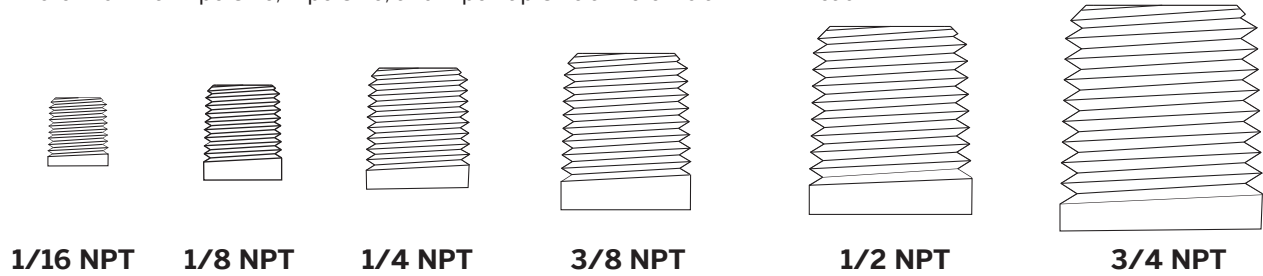




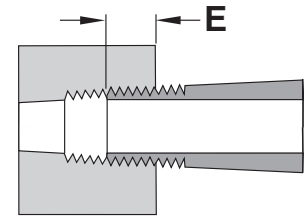


# PIPE THREAD DATA

The table below lists standard pipe sizes along with the actual O.D. and I.D. for each size. The nominal size of any pipe does not in fact refer to either the outside diameter (O.D.) or the inside diameter (I.D.) of the pipe. Actual size drawings of pipes from 1/16" to 3/4" are shown below. Note: Nominal Pipe Size, Pipe Size, and Pipe Tap Size all refer to an NPT thread.



Pipe Size	Threads Per Inch	Outside Diameter of Pipe	Inside Diameter of Pipe	Tap Drill Size Without Ream	Tap Drill Size With Ream	E Thread Engagement
1/16	27	.312	.209	1/4	15/64	.250
1/8	27	.405	.269	11/32	21/64	.250
1/4	18	.540	.364	7/16	27/64	.300
3/8	18	.675	.493	9/16	9/16	.300
1/2	14	.840	.622	45/64	11/16	.420
3/4	14	1.050	.824	29/32	57/64	.545
1	11-1/2	1.315	1.049	1-9/64	1-1/8	.661
1-1/4	11-1/2	1.660	1.380	1-31/64	1-15/32	.681
1-1/2	11-1/2	1.900	1.610	1-23/32	1-45/64	.681
2	11-1/2	2.375	2.067	2-3/16	2-11/64	.697



The Thread Engagement column ("E") can be used to determine the length of the component required to properly assemble when fully tightened. The drawing above illustrates this measurement.

# PIPE CHECK

**M** Hard anodized aluminum

CATALOG NUMBER	DESCRIPTION
PC-100	Pipe Thread Check



# SPECIAL COOLING PRODUCTS

Progressive Components can provide special length items, such as Tubes, Extension Plugs, and Adjustable Pipe Nipples by contacting Customer Service with your product code and the length required.

In addition, custom bubblers, tubes, or blades can be manufactured according to your specifications.

Contact Engineering for an application review by sending your prints or design to tech@procomps.com.

Templates for Extension Plugs and Tube configurations are located in section X.

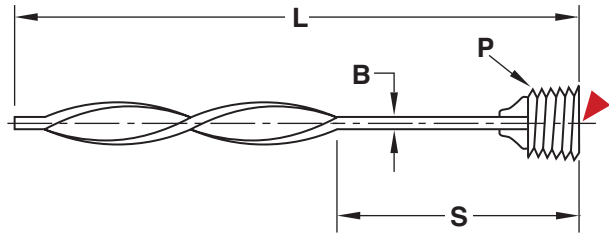
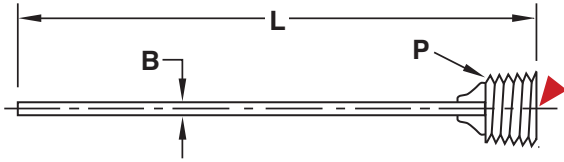


# BAFFLES

## NPT SERIES



Progressive Baffles feature patented XT Extra torque technology. A deeper socket and keyed design provide 3 times the torque over brazed baffles of the past.



### Straight

**M** Brass ▶ CAD insertion point

CATALOG NUMBER	P Plug Size (NPT)	L Overall Length	B Blade Thickness	Blade Width -.005 -.010
SB06L4	1/16-27	4	.057	.250
SB06L8	1/16-27	8	.057	.250
SB06L12	1/16-27	12	.057	.250
SB12L4	1/8-27	4	.057	.312
SB12L8	1/8-27	8	.057	.312
SB12L12	1/8-27	12	.057	.312
SB25L5	1/4-18	5	.085	.437
SB25L10	1/4-18	10	.085	.437
SB25L15	1/4-18	15	.085	.437
SB37L6	3/8-18	6	.093	.562
SB37L12	3/8-18	12	.093	.562
SB37L18	3/8-18	18	.093	.562
SB50L8	1/2-14	8	.093	.687
SB50L16	1/2-14	16	.093	.687
SB75L12	3/4-14	12	.093	.937
SB75L20	3/4-14	20	.093	.937
SB100L16	1-11 1/2	16	.093	1.125
SB100L24	1-11 1/2	24	.093	1.125
SB125L16	1 1/4-11 1/2	16	.093	1.484
SB125L24	1 1/4-11 1/2	24	.093	1.484

### Turbo

**M** Brass ▶ CAD insertion point

CATALOG NUMBER	P Plug Size (NPT)	L Overall Length	S Straight Length	B Blade Thickness	Blade Width -.005 -.010
TB06L4	1/16-27	4	2	.057	.250
TB06L8	1/16-27	8	4	.057	.250
TB06L12	1/16-27	12	6	.057	.250
TB12L4	1/8-27	4	2	.057	.312
TB12L8	1/8-27	8	4	.057	.312
TB12L12	1/8-27	12	6	.057	.312
TB25L5	1/4-18	5	2	.085	.437
TB25L10	1/4-18	10	4	.085	.437
TB25L15	1/4-18	15	6	.085	.437
TB37L6	3/8-18	6	2	.093	.562
TB37L12	3/8-18	12	4	.093	.562
TB37L18	3/8-18	18	6	.093	.562
TB50L8	1/2-14	8	3	.093	.687
TB50L16	1/2-14	16	5	.093	.687
TB75L12	3/4-14	12	4	.093	.937
TB75L20	3/4-14	20	6	.093	.937
TB100L16	1-11 1/2	16	5	.093	1.125
TB100L24	1-11 1/2	24	8	.093	1.125
TB125L16	1 1/4-11 1/2	16	5	.093	1.484
TB125L24	1 1/4-11 1/2	24	8	.093	1.484

## BLADE MATERIAL

CATALOG NUMBER	B Blade Thickness	Blade Width -.005 -.010
BM06	.057	.250
BM12	.057	.312
BM25	.085	.437
BM25-B	.085	.421
BM37	.093	.562
BM50	.093	.687
BM75	.093	.937
BM75-B	.093	.906
BM100	.093	1.125
BM125	.093	1.484



### Alternative configurations and materials available:

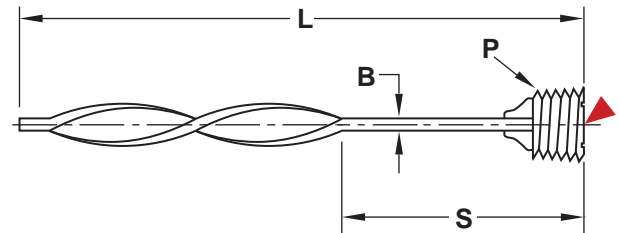
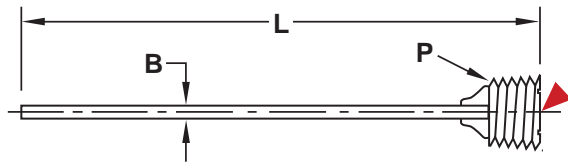
- Straight Baffle Blade Material: Order according to the chart at left. Material is sold in 36" lengths, and other lengths can be provided upon request.
- For Baffles with brass blades and stainless steel pipe plugs, add an "-SS" to the end of the catalog number. Ex. SB25L5-SS or TB75L12-SS. Call for pricing on 1-1/4 baffles with stainless steel pipe plugs.
- Baffles can be ordered cut to any length, in any quantity. To order, specify the prefix and plug size and the required length. For Turbo Baffles, the closest straight length (S) is used, but can be provided to a different length, upon request. Ex. SB25L6.25 or TB37L5.75-SS (with a 2" "S" dimension)
- BSPT plug baffles are sold separately on page E-3.



# BAFFLES BSPT SERIES

Progressive Baffles feature patented XT Extra torque technology. A deeper socket and keyed design provide 3 times the torque over brazed baffles of the past.

- End of baffle has a ring for identification.



## Straight

**M** Brass

▶ CAD insertion point

CATALOG NUMBER	P Plug Size (BSPT)	L Overall Length	B Blade Thickness	Blade Width -.005 -.010
SB12L4-BSP	1/8-28	4	.057	.312
SB12L8-BSP	1/8-28	8	.057	.312
SB12L12-BSP	1/8-28	12	.057	.312
SB25L5-BSP	1/4-19	5	.085	.421
SB25L10-BSP	1/4-19	10	.085	.421
SB25L15-BSP	1/4-19	15	.085	.421
SB37L6-BSP	3/8-19	6	.093	.562
SB37L12-BSP	3/8-19	12	.093	.562
SB37L18-BSP	3/8-19	18	.093	.562
SB50L8-BSP	1/2-14	8	.093	.687
SB50L16-BSP	1/2-14	16	.093	.687
SB75L12-BSP	3/4-14	12	.093	.906
SB75L20-BSP	3/4-14	20	.093	.906
SB100L16-BSP	1-11	16	.093	1.125
SB100L24-BSP	1-11	24	.093	1.125

## Turbo

**M** Brass

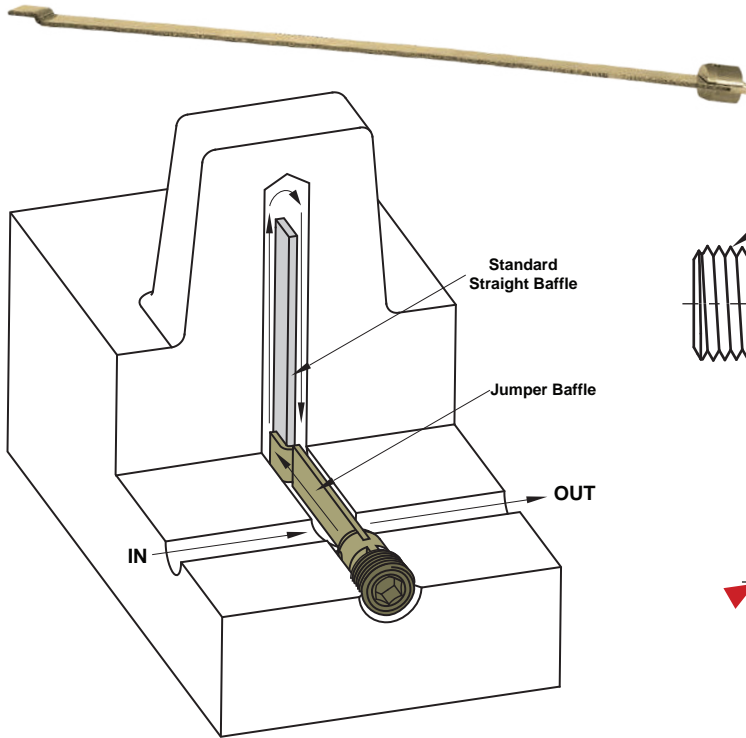
▶ CAD insertion point

CATALOG NUMBER	P Plug Size (BSPT)	L Overall Length	S Straight Length	B Blade Thickness	Blade Width -.005 -.010
TB12L4-BSP	1/8-28	4	2	.057	.312
TB12L8-BSP	1/8-28	8	4	.057	.312
TB12L12-BSP	1/8-28	12	6	.057	.312
TB25L5-BSP	1/4-19	5	2	.085	.421
TB25L10-BSP	1/4-19	10	4	.085	.421
TB25L15-BSP	1/4-19	15	6	.085	.421
TB37L6-BSP	3/8-19	6	2	.093	.562
TB37L12-BSP	3/8-19	12	4	.093	.562
TB37L18-BSP	3/8-19	18	6	.093	.562
TB50L8-BSP	1/2-14	8	3	.093	.687
TB50L16-BSP	1/2-14	16	5	.093	.687
TB75L12-BSP	3/4-14	12	4	.093	.906
TB75L20-BSP	3/4-14	20	6	.093	.906
TB100L16-BSP	1-11	16	5	.093	1.125
TB100L24-BSP	1-11	24	8	.093	1.125

## Alternative configurations and materials available:

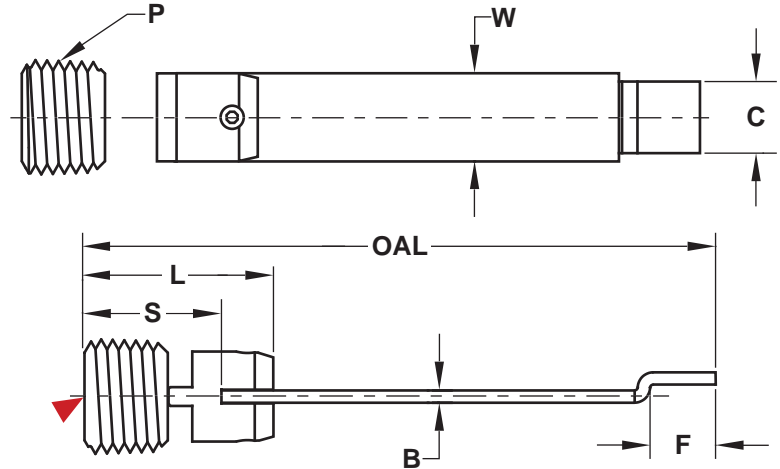
- For Baffles with brass blades and stainless steel pipe plugs, add an "-SS" to the end of the catalog number and contact Customer Service for pricing. Ex. SB25L5-BSP-SS or TB75L12-BSP-SS
- Baffles can be ordered cut to any length, in any quantity. To order, specify the prefix and plug size and the required length. For Turbo Baffles, the closest straight length (S) is used, but can be provided to a different length, upon request. Ex. SB25L6.25-BSP or TB37L5.75-BSP-SS (with a 2" "S" dimension)
- Straight Baffle Material is available on page E-2.

# JUMPER BAFFLES



Jumper Baffles enable water routing via interconnected baffles.

- Allows for flow to turn corners and reach angles within a single circuit.
- Simplifies design and machining of a complex circuit, reducing the number of feedlines required.



**M** Brass

CAD insertion point

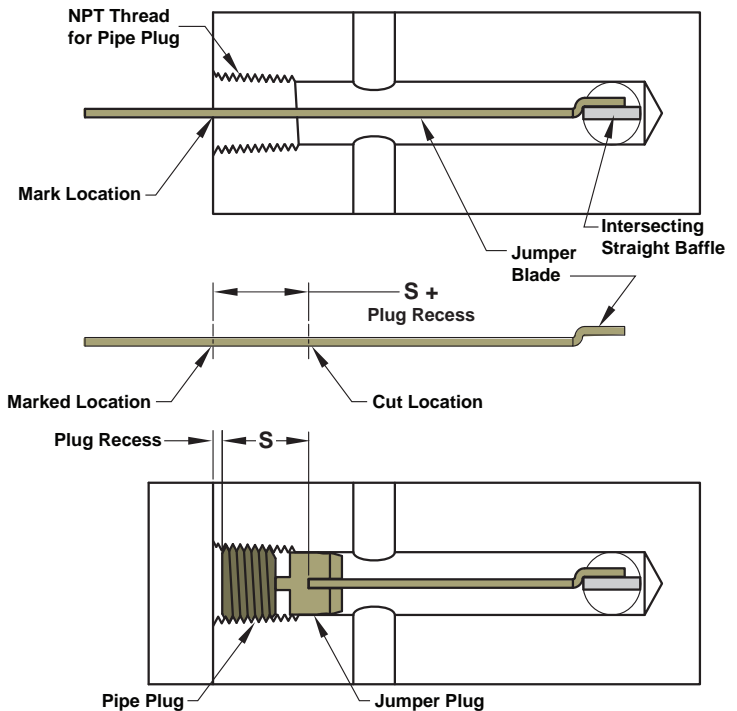
CATALOG NUMBER	P Pipe Plug Size (NPT)	B	W -.005 -.010	L	OAL	S	C	F	Set Screw Size
JBA12	1/8	.06	.312	.66	12.50	.50	.242	.25	#4-40 x 3/32"
JBA25	1/4	.06	.437	.90	12.63	.63	.352	.30	#6-32 x 1/8"
JBA37	3/8	.06	.562	.90	12.63	.63	.477	.43	#10-32 x 1/8"
JBA50	1/2	.06	.687	1.06	12.75	.75	.602	.52	#10-32 x 3/16"
JBA75	3/4	.09	.937	1.09	12.75	.75	.852	.70	#10-32 x 3/16"

Note: Each assembly includes a Jumper Blade, a Jumper Plug, two (2) Set Screws and a Pipe Plug.

## Installation Guidelines:

1. Install the Jumper Blade so its shoulder rests against the intersection of the Straight Baffle and mark this location.
2. Calculate the distance from this marked location by adding the S dimension of the Jumper Plug to the distance that the plug will be recessed into the insert. Cut the Jumper Blade to this length.
3. Attach the Jumper Blade to the Jumper Plug using the two set screws.
4. Install the assembly into the waterline until it rests against the Straight Baffle. Then, insert the Pipe Plug until it is secured against the Jumper Plug.

For application assistance, contact [tech@procomps.com](mailto:tech@procomps.com).

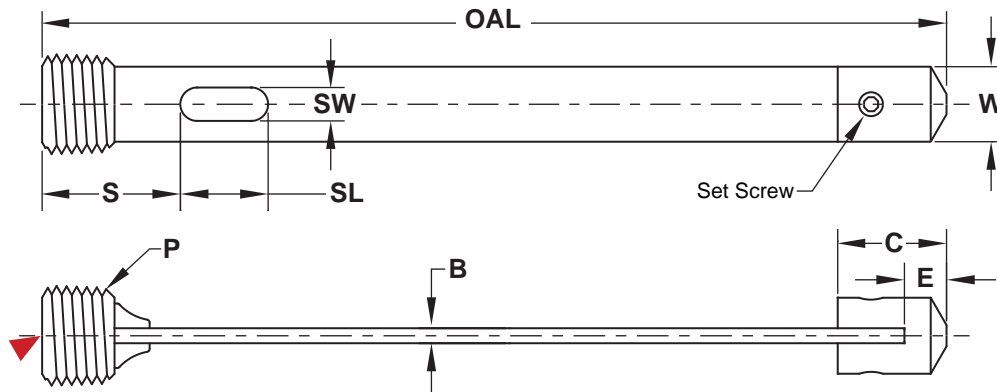




# REVERSE FLOW BAFFLES

Reverse Flow Baffles enables the feed line to a baffle to be located opposite the plug end of the baffle to avoid interfering with bushing holes, return pin holes, etc.

- Provides an alternative to circuits with long cross plate gun drilled lines and placement of in-line diverters, simplifying design, machining, and waterline cleaning.



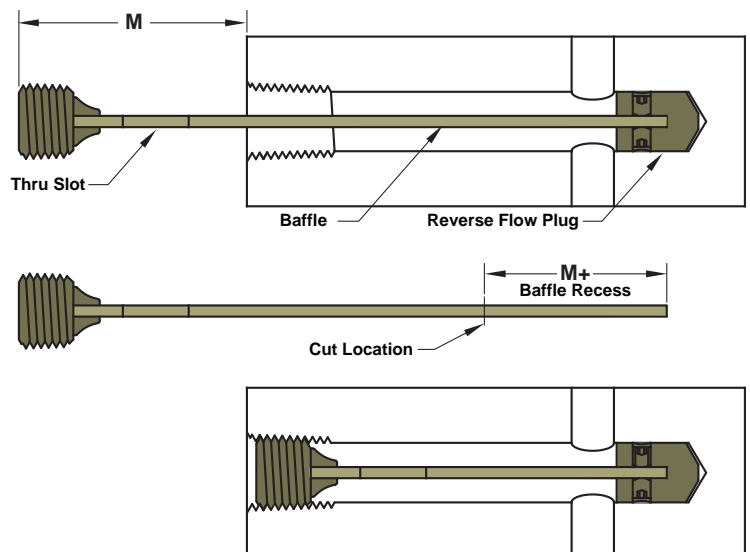
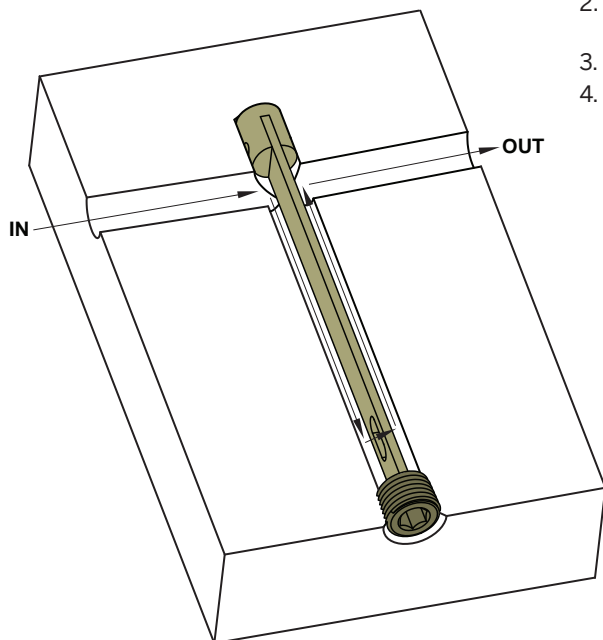
**M** Brass

▶ CAD insertion point

CATALOG NUMBER	P Pipe Plug Size (NPT)	OAL (REF)	B	W -.005 -.010	S	SL	SW	C	E	Set Screw Size (2)
RFB06L8	1/16	8.16	.057	.250	.44	.18	.13	.38	.16	#4-40 x 3/32"
RFB12L8	1/8	8.23	.057	.312	.44	.22	.16	.50	.23	#4-40 x 3/32"
RFB25L10	1/4	10.25	.085	.437	.62	.35	.19	.62	.25	#8-32 x 1/8"
RFB37L12	3/8	12.28	.093	.562	.62	.41	.28	.75	.28	#10-32 x 3/16"
RFB50L16	1/2	16.28	.093	.687	.75	.50	.31	.75	.28	1/4-20 x 3/16"
RFB75L20	3/4	20.38	.093	.937	.75	.77	.44	.87	.38	1/4-20 x 3/8"
RFB100L24	1	24.38	.093	1.125	.87	1.00	.50	.87	.38	1/4-20 x 3/8"
RFB125L24	1-1/4	24.50	.093	1.484	1.35	1.22	.50	1.00	.50	1/4-20 x 1/2"

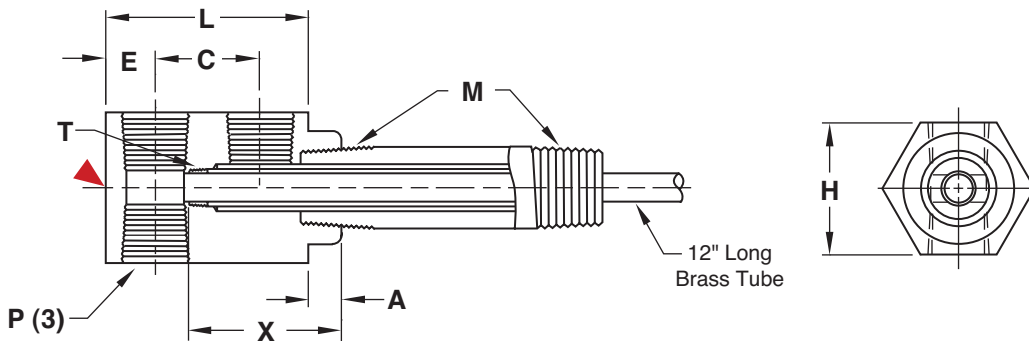
## Installation Guidelines:

1. Install the Reverse Flow Baffle into the waterline and measure the distance the Baffle extends out of the plate, "M" as shown below.
2. Remove the Reverse Flow Plug and cut the measured length from the end of the Baffle including any recess required.
3. Re-attach the Reverse Flow Plug to the Baffle using the two set screws.
4. Install the assembly into the water line, ensuring a tight seal and proper orientation.



# CASCADES

## NIPPLE TYPE



**M** Head: Brass, Tube: Brass, 2" Long Pipe Nipple: Stainless Steel

CAD insertion point

CATALOG NUMBER	M Pipe NPT	P In/Out NPT	H Hex Size	E	C	A	L	T	Brass Tube Catalog # (Included)	X Tube End	HEAD ONLY CATALOG NUMBER
<b>NC1816</b>	1/8	1/16	.75	.21	.50	.28	.937	#10-32	T187L12	.90	<b>NCH1816</b>
<b>NC1818</b>	1/8	1/8	.87	.32	.68	.28	1.343	#10-32	T187L12	1.06	<b>NCH1818</b>
<b>NC18181</b>	1/8	1/8	.87	.32	1.00	.28	1.656	#10-32	T187L12	1.18	<b>NCH18181</b>
<b>NC1418</b>	1/4	1/8	1.00	.32	.68	.21	1.343	1/4-28	T250L12	1.05	<b>NCH1418</b>
<b>NC1414</b>	1/4	1/4	1.00	.32	.68	.21	1.343	1/4-28	T250L12	1.80	<b>NCH1414</b>
<b>NC14181</b>	1/4	1/8	1.00	.32	1.00	.43	1.656	1/4-28	T250L12	1.44	<b>NCH14181</b>
<b>NC14141</b>	1/4	1/4	1.00	.32	1.00	.43	1.656	1/4-28	T250L12	1.44	<b>NCH14141</b>
<b>NC3818</b>	3/8	1/8	1.00	.34	1.00	.40	1.687	5/16-24	T312L12	1.44	<b>NCH3818</b>
<b>NC3814</b>	3/8	1/4	1.00	.34	1.00	.40	1.687	5/16-24	T312L12	1.44	<b>NCH3814</b>
<b>NC1214</b>	1/2	1/4	1.25	.40	1.00	.56	1.812	7/16-20	T437L12	1.80	<b>NCH1214</b>
<b>NC3438</b>	3/4	3/8	1.50	.50	1.25	.75	2.250	5/8-18	T625L12	2.20	<b>NCH3438</b>

Brass pipe plug included.

### Alternative configurations and materials available:

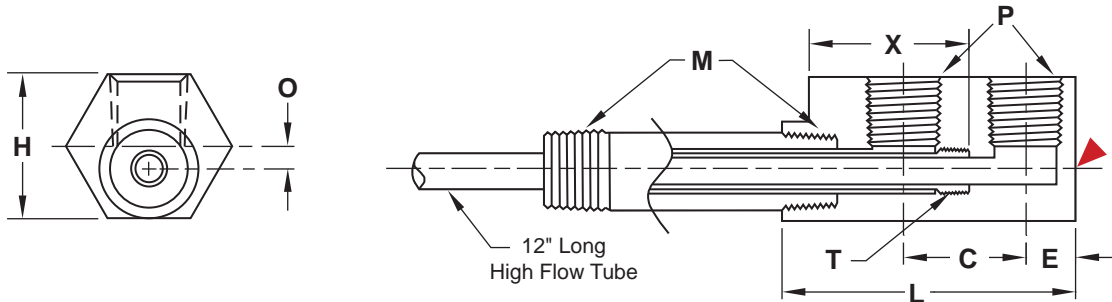
- Cascade Heads are available with thread sizes to accept High Flow Tubes. To order, specify -HFT at the end of the catalog number for Cascade assemblies or for Heads only. Ex. NC1818-HFT or NCH1818-HFT (Note: NC3438 is not available with the High Flow Tube option).
- Cascade heads are available manufactured from steel. To order, add an "S" to the end of the catalog number for Cascade assemblies or for Heads only. Ex. NC1818S or NCH1818S
- These Cascades can also be used with Adjustable Hex Nipples instead of Pipe Nipples. Refer to page E-28 for available sizes and lengths.
- For complete Tube specifications, refer to page E-16.



# CASCADDES HIGH FLOW



High Flow Cascades provide 35-65% higher flow rates than standard Nipple Type Cascades. The offset design provides more sealing threads without pipe interference.



**M** Head: Brass, Tube: Stainless Steel, 2" Long Pipe Nipple: Stainless Steel

▶ CAD insertion point

CATALOG NUMBER	M Pipe NPT	P In/Out NPT	H Hex Size	O Offset	E	C	L	T Tube Thread	High Flow Tube Catalog # (Included)	X Tube End	HEAD ONLY CATALOG NUMBER
<b>HFC1616</b>	1/16	1/16	.62	.094	.25	.50	1.25	#10-32	HFT125L12	.88	<b>HFH1616</b>
<b>HFC1818</b>	1/8	1/8	.75	.094	.31	.68	1.62	1/4-28	HFT187L12	1.14	<b>HFH1818</b>
<b>HFC18181</b>	1/8	1/8	.75	.094	.31	1.00	1.93	1/4-28	HFT187L12	1.15	<b>HFH18181</b>
<b>HFC1414</b>	1/4	1/4	1.00	.156	.34	.68	1.87	5/16-24	HFT250L12	1.30	<b>HFH1414</b>
<b>HFC14141</b>	1/4	1/4	1.00	.156	.34	1.00	2.18	5/16-24	HFT250L12	1.55	<b>HFH14141</b>
<b>HFC3814</b>	3/8	1/4	1.12	.125	.34	1.00	2.25	7/16-20	HFT375L12	1.64	<b>HFH3814</b>
<b>HFC1214</b>	1/2	1/4	1.37	.125	.37	1.00	2.37	1/2-20	HFT437L12	1.77	<b>HFH1214</b>

### Alternative configurations and materials available:

- For High Flow Cascade assemblies with a steel head, add an "S" to the end of the catalog number. Ex. HFC1616S or HFC3814S
- For High Flow Cascade Heads manufactured out of steel, add an "S" to the end of the head catalog number. Ex. HFH1414S or HFH1616S
- High Flow Cascades can also be used with Adjustable Hex Nipples instead of Stainless Nipples. Refer to page E-24 for available sizes and lengths.
- For complete High Flow Tube specifications, refer to page E-15.

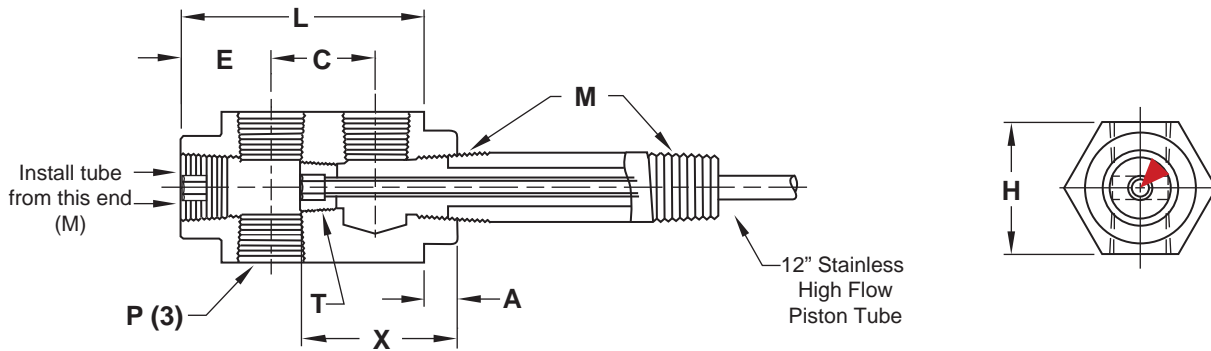
# CASCADES

## REAR LOADING NIPPLE



Progressive's Rear Loading Nipple type cascade provides the following benefits:

- Allows easy access to the High Flow Tube.
- Positive adjustment of inner tube at assembly.
- High flow design for maximum cooling rates.



**M** Head: Brass, Tube & Pipe Nipple: Stainless Steel, 2" Long Pipe Nipple: Stainless Steel

▶ CAD insertion point

CATALOG NUMBER	M Pipe NPT	P In/Out NPT	H Hex Size	E	C	A	L	Piston Tube Catalog # (Included)	T Tube Thread	X Tube End	HEAD ONLY CATALOG NUMBER
<b>RLNC1618</b>	1/8	1/16	3/4	.500	5/8	9/32	1.625	PT06-187L12	1/16	.93	<b>RLCNH1618</b>
<b>RLNC1818</b>	1/8	1/8	7/8	.609	11/16	9/32	1.960	PT06-187L12	1/16	1.08	<b>RLCNH1818</b>
<b>RLNC18181</b>	1/8	1/8	7/8	.609	1	9/32	2.218	PT06-187L12	1/16	1.39	<b>RLCNH18181</b>
<b>RLNC1414</b>	1/4	1/4	1	.781	1	7/16	2.562	PT12-250L12	1/8	1.44	<b>RLCNH1414</b>
<b>RLNC1438</b>	3/8	1/4	1	.781	1	7/16	2.562	PT25-312L12	1/4	1.50	<b>RLCNH1438</b>

Includes 12" long Piston Tube, 2" long Stainless Pipe Nipple.

### Alternative configurations and materials available:

- For Cascade assemblies with a steel head, add an "S" to the end of the catalog number. Ex. RLNC1618S or RLNC18181S
- For Cascade Heads manufactured out of steel, add an "S" to the end of the head catalog number. Ex. RLCNH1618S or RLCNH18181S
- For complete Piston Tube specifications and longer lengths, refer to page E-16.

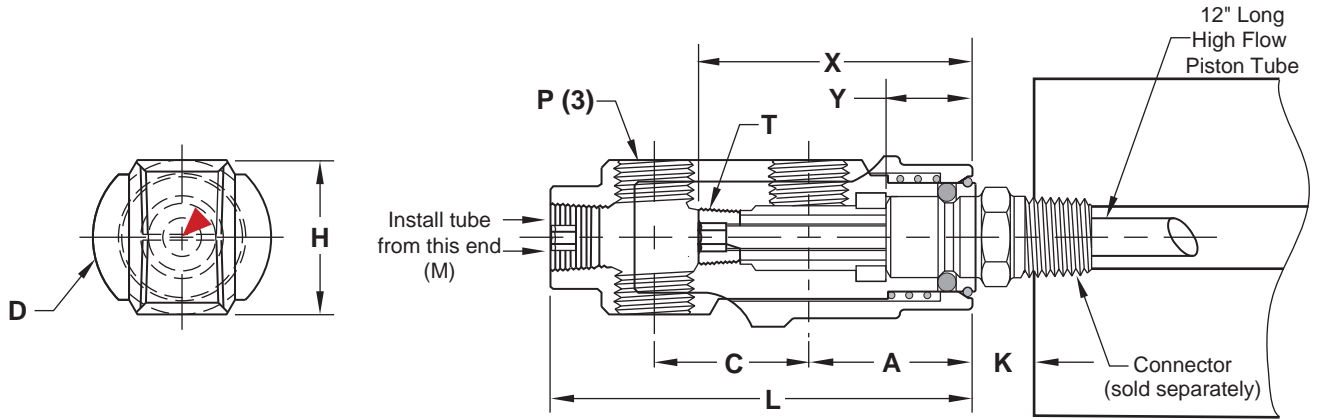
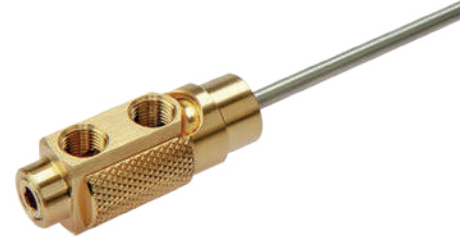




# CASCADES REAR LOAD QUICK COUPLER

Progressive's Rear Load Quick Coupler type cascade provides the following benefits:

- Allows access to the inner cooling tube without removing the cascade assembly.
- Can be installed and removed without disconnecting cooling lines.
- Easy adjustment of inner tube at assembly.
- High flow design provides maximum cooling rates.



**M** Head: Brass, Tube: Stainless Steel, Seals: Viton

▶ CAD insertion point

CATALOG NUMBER	Connector Series	M Plug Size NPT	P In/Out NPT	C	A	H	D	L	Piston Tube Catalog # (Included)	T Tube Thread	X Tube End	Y Connector End	HEAD ONLY CATALOG NUMBER
RLQC1814	200	1/8	1/8	11/16	31/32	13/16	7/8	2.187	PT06-187L12	1/16	1.45	.370	RLQCH1814
RLQC1815	200	1/8	1/8	1	31/32	13/16	7/8	2.500	PT06-187L12	1/16	1.54	.370	RLQCH1815
RLQC1418	300	1/8	1/4	1	1-5/32	1	1-1/8	2.937	PT12-250L12	1/8	1.89	.590	RLQCH1418
RLQC1422	500	1/2	1/4	1-1/4	1-3/8	1-1/4	1-3/8	3.687	PT37-437L12	3/8	2.25	.730	RLQCH1422
RLQC3822	500	1/2	3/8	1-1/4	1-3/8	1-1/4	1-3/8	3.687	PT37-437L12	3/8	2.25	.730	RLQCH3822

Includes 12" long Piston Tube.

CATALOG NUMBER	Connector	K Min.
RLQC1814 RLQC1815	251	.32
	252	.43
	253	.49
RLQC1418	351*	.34
	352	.42
	353	.45
	354	.57
RLQC1422 RLQC3822	553**	.55
	554	.54
	556	.57

### Alternative configurations and materials available:

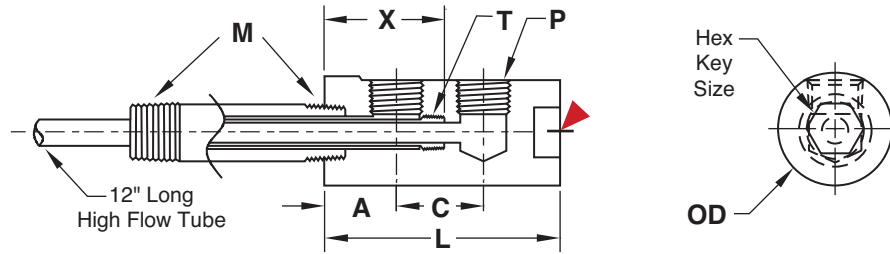
- For Cascade assemblies with a steel head, add an "S" to the end of the catalog number. Ex. RLQC1814S or RLQC1418S
- For Cascade Heads manufactured out of steel, add an "S" to the end of the head catalog number. Ex. RLQCH1814S or RLQCH1418S
- For complete Piston Tube specifications and longer lengths, refer to page E-16.

\* Uses High Flow Tube PT12-187

\*\* Uses High Flow Tube PT37-375

# CASCADES

## HEX KEY

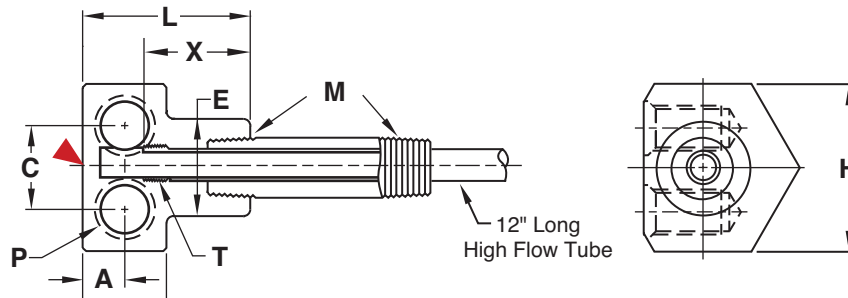


**M** Head: Brass, Tube: Stainless Steel, 2" Long Pipe Nipple: Stainless Steel. Note: HKC1616 includes a Brass Pipe Nipple

CATALOG NUMBER	M Pipe NPT	P In/Out NPT	L	C	A	Hex Key Size	OD	High Flow Tube Catalog # (Included)	T Tube Thread	Nominal Clearance Drill	X Tube End	HEAD ONLY CATALOG NUMBER
HKC1616	1/16	1/16	1.625	.56	.50	5/16	.610	HFT125L12	#10-32	5/8	.89	HKCH1616
HKC1816	1/8	1/16	1.687	.56	.56	3/8	.735	HFT187L12	1/4-28	3/4	.98	HKCH1816
HKC1818	1/8	1/8	1.875	.68	.56	3/8	.860	HFT187L12	1/4-28	7/8	1.00	HKCH1818
HKC18181	1/8	1/8	2.187	1.00	.56	3/8	.860	HFT187L12	1/4-28	7/8	1.20	HKCH18181
HKC1418	1/4	1/8	2.187	.68	.81	1/2	.985	HFT250L12	5/16-24	1	1.32	HKCH1418
HKC14181	1/4	1/8	2.500	1.00	.81	1/2	.985	HFT250L12	5/16-24	1	1.38	HKCH14181
HKC1414	1/4	1/4	2.312	.68	.87	1/2	.985	HFT250L12	5/16-24	1	1.33	HKCH1414
HKC14141	1/4	1/4	2.625	1.00	.87	1/2	.985	HFT250L12	5/16-24	1	1.48	HKCH14141
HKC3814	3/8	1/4	2.625	1.00	.87	1/2	.985	HFT312L12	3/8-24	1	1.56	HKCH3814
HKC1214	1/2	1/4	2.812	1.00	1.00	1/2	1.235	HFT375L12	7/16-20	1-1/4	1.73	HKCH1214

▶ CAD insertion point

## COMPACT



**M** Head: Brass, Tube: Stainless Steel, 2" Long Pipe Nipple: Stainless Steel

CATALOG NUMBER	M Pipe NPT	P In/Out NPT	H Hex Size	A	B	C	E	L	High Flow Tube Catalog # (Included)	T Tube Thread	X Tube End	HEAD ONLY CATALOG NUMBER
CC1816	1/8	1/16	.93	.21	.437	.50	.625	1.00	HFT187L12	1/4-28	.60	CCH1816
CC1418	1/4	1/8	1.25	.31	.625	.68	.750	1.25	HFT250L12	5/16-24	.82	CCH1418
CC1414	1/4	1/4	1.50	.37	.750	.75	.875	1.50	HFT250L12	5/16-24	.90	CCH1414
CC3814	3/8	1/4	1.50	.37	.750	.75	1.000	1.50	HFT312L12	3/8-24	.92	CCH3814
CC1214	1/2	1/4	1.75	.37	.750	1.0	1.187	1.75	HFT375L12	7/16-20	1.13	CCH1214
CC3438	3/4	3/8	2	.437	.875	1.125	1.375	1.875	HFT500L12	9/16-18	1.21	CCH3438

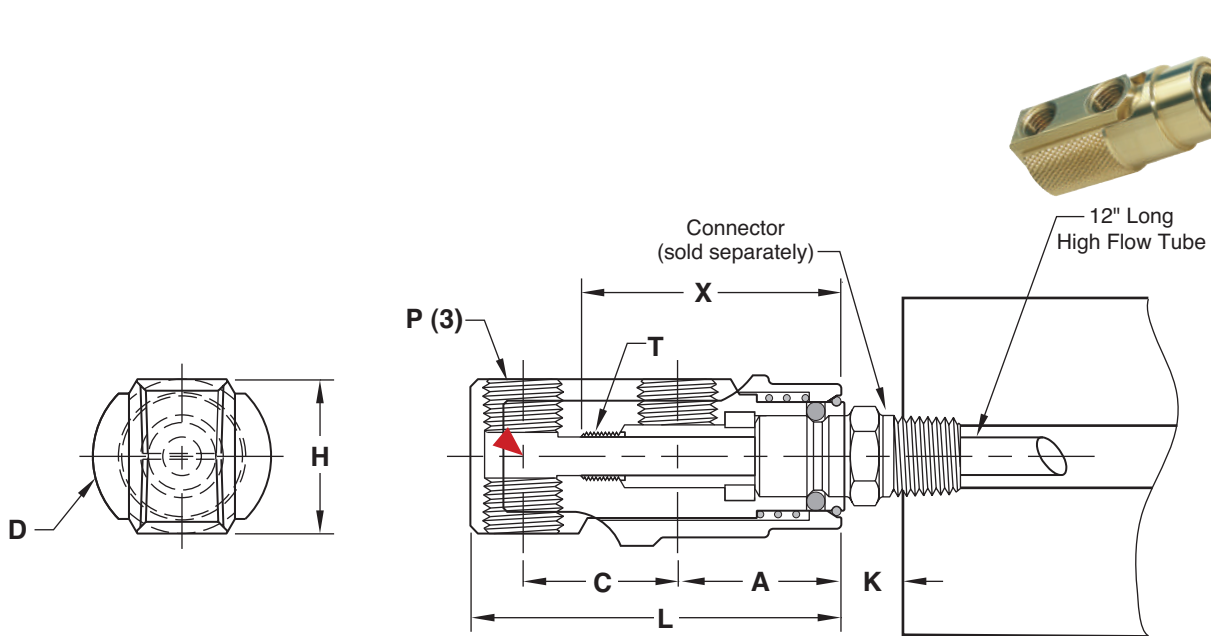
▶ CAD insertion point

### Alternative configurations and materials available:

- For Compact Cascade assemblies with a steel head, add an "S" to the end of the catalog number. Ex. CC3814S
- For Compact Cascade Heads manufactured out of steel, add an "S" to the end of the head catalog number. Ex. CCH1418S
- Both the Hex Key and Compact Cascades can also be used with Adjustable Hex Nipples instead of Stainless Nipples. Refer to page E-28 for available sizes and lengths.
- For complete High Flow Tube specifications, refer to page E-15.



# CASCADES QUICK COUPLER



**M** Cascade Head: Brass, Tube: Stainless Steel, Seals: Viton

▶ CAD insertion point

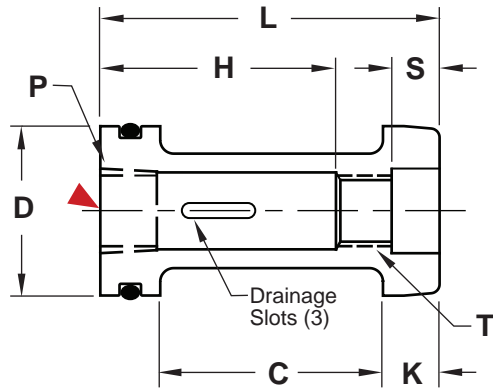
CATALOG NUMBER	Connector Series	P Pipe Tap Size NPT	C	A	H	D	L	High Flow Tube Catalog # (Included)	T Tube Thread	X Tube End	HEAD ONLY CATALOG NUMBER
QC1819	200	1/8	.687	.968	.812	.875	1.937	HFT187L12	1/4-28	1.45	QCH1819
QC1822	200	1/8	1.000	.968	.812	.875	2.250	HFT187L12	1/4-28	1.54	QCH1822
QC1421	300	1/4	.687	1.156	1.000	1.125	2.187	HFT250L12	5/16-24	1.63	QCH1421
QC1425	300	1/4	1.000	1.156	1.000	1.125	2.500	HFT250L12	5/16-24	1.70	QCH1425
QC1431	500	1/4	1.250	1.375	1.250	1.375	3.125	HFT437L12	1/2-20	2.20	QCH1431
QC3831	500	3/8	1.250	1.375	1.250	1.375	3.125	HFT437L12	1/2-20	2.20	QCH3831

Longer High Flow Tubes and complete tube specifications can be found on page E-15.

CATALOG NUMBER	Connector	K Min.
QC1819 QC1822	251	.32
	252	.43
	253	.49
QC1421 QC1425	351*	.34
	352	.42
	353	.45
	354	.57
QC1431 QC3831	553**	.55
	554	.54
	556	.57

\* Uses High Flow Tube HFTJ187.  
 \*\* Uses High Flow Tube HFTJ375.

# BUBBLER BASE™



**M** Brass with Viton O-Ring

▶ CAD insertion point

CATALOG NUMBER	D	L	C	K	S	H Stop for High Flow Tube	T Tube Thread	P Pipe Thread for Removal	Compatible High Flow Tube	Compatible Hex Series Tube
<b>BBL05</b>	.374	.750	.35	.19	.160	.45	#5-44	#10-32	HFT078 / HFT094	HEXT078 / HEXT094
<b>BBL10</b>	.436	1.000	.55	.23	.190	.61	#10-32	1/4-28	HFTJ078 / HFT125	HEXTJ094 / HEXT125
<b>BBL25</b>	.560	1.250	.72	.27	.255	.72	1/4-28	1/16-27 NPT	HFTJ125 / HFT187	HEXTJ125 / HEXT187
<b>BBL31</b>	.748	1.500	.98	.27	.285	.92	5/16-24	1/8-27 NPT	HFTJ187 / HFT250	HEXTJ187 / HEXT250

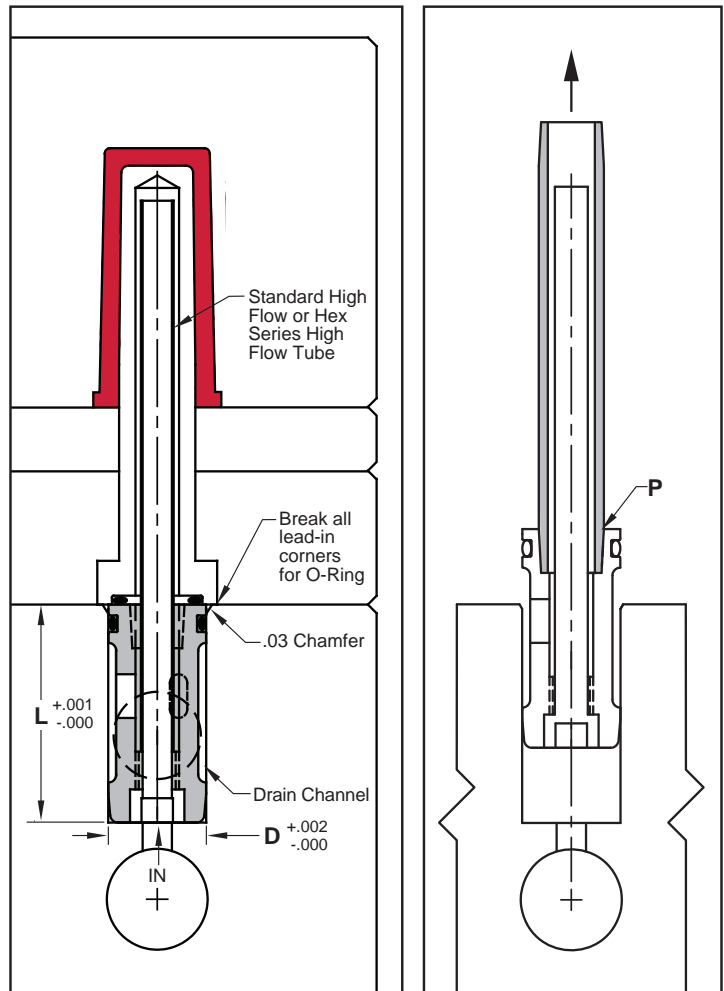
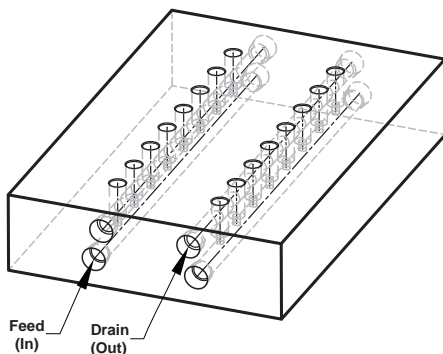
High Flow Tubes and Hex Series Tubes are sold separately on page E-15.

### Features:

- The Bubbler Base allows for positive positioning of cooling tubes over previous methods.
- The compact design enables minimal center-to-center pin locations.
- Each Bubbler Base includes the O-Ring, to ensure a positive seal within the core pin.
- Compatible with either High Flow Tubes or Hex Series Tubes.
- Maximum temperature: 400° F (200° C)

### Application Guidelines:

- Utilize the largest diameter tube possible, and match the inlet diameter's area.
- Core pin diameter head should be large enough to incorporate a standard O-ring to seal around the tube.
- Water line location can be anywhere within the relief channel.
- To remove the Bubbler Base/Tube without damage, slip a pipe nipple around the tube that matches the "P" thread size, and fasten into the base as shown.
- Easy removal by hand, or by wrench on pipe nipple (P).
- Quantity of Bubbler Bases and Tubes in line is dependent upon the mold design application and waterline calculations. For assistance in determining the optimal waterline circuit, please contact Engineering at tech@procomps.com.

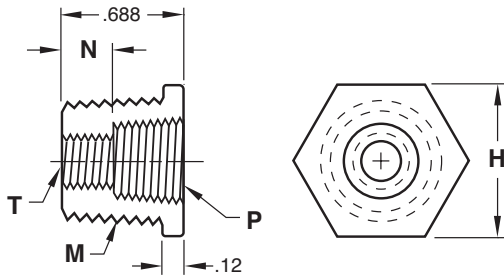


Application

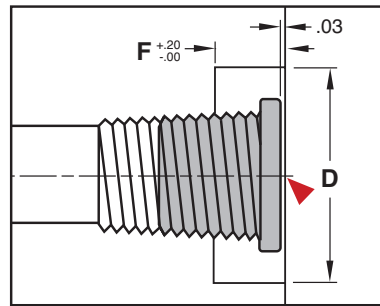
Maintenance/Removal



# INLET CASCADE™ CASCADE TUBE FITTING



## Installation Guidelines:

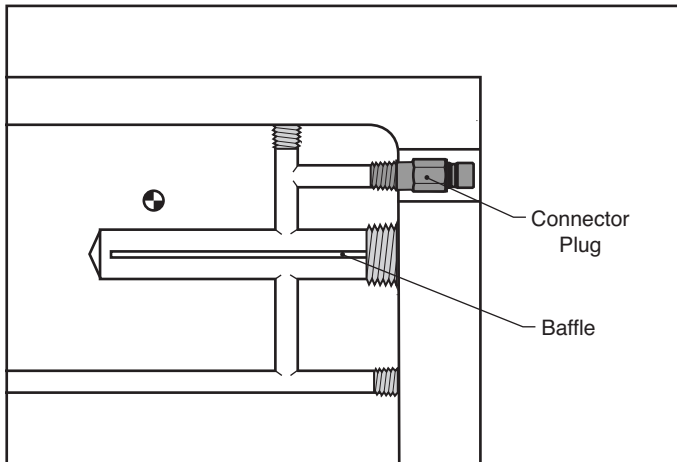


**M** 303 Stainless Steel **H** 18-22 HRC

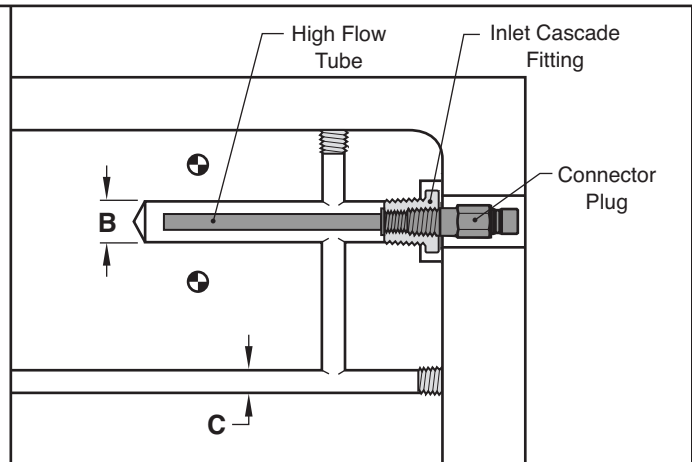
▶ CAD insertion point

CATALOG NUMBER	M Waterline NPT	P NPT	T Tube Thread	N	H Hex	D Hex Clearance	F Hex C'Bore	Compatible High Flow Tube	B Diameter	C Diameter	Recommended Connector Plug
CF25	1/4	1/8	5/16-24	.33	.56	1.00	.430	HFT250	7/16	5/16	251, 351
CF37	3/8	1/4	3/8-24	.24	.68	1.12	.430	HFT312	9/16	7/16	352
CF50	1/2	3/8	7/16-20	.24	.87	1.50	.330	HFT375	11/16	9/16	553

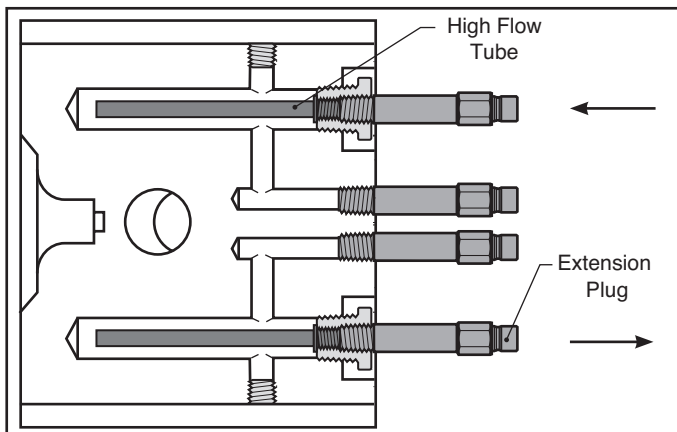
## Previous Method:



## Inlet Cascade Method:



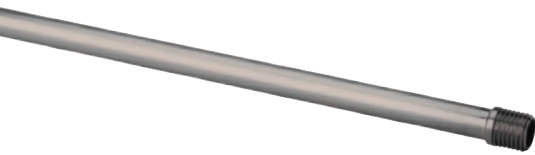
## Slide Application:



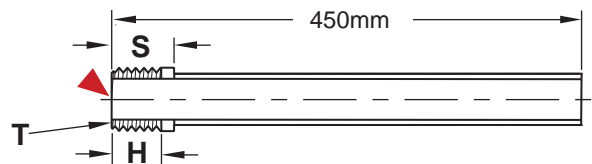
The Inlet Cascade Fitting can be used when waterline space is limited, such as under a runner and between ejector pins or to provide a water circuit in a slide.

The Inlet Cascade Fitting attaches to standard tubes and Extension or Connector Plugs, eliminating the machining required for an extra "in" line to achieve consistent cooling.

# HIGH FLOW TUBES METRIC



Tubes can be ordered cut to a specific length or provided in longer lengths. To order, replace the length on any given catalog number with the desired length: HFTM79L200



**M** Stainless Steel ▶ CAD insertion point

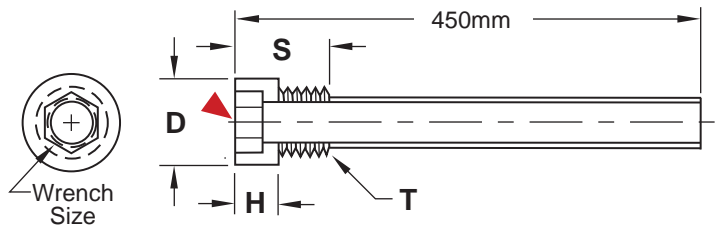
CATALOG NUMBER	Tube O.D.	Tube I.D.	T Thread	S Shoulder Length	H Thread Length
HFTM18L450	1.8	1.5	M4 x .7	5	4
HFTM23L450	2.3	1.9	M5 x .8	6	5
HFTM32L450	3.2	2.8	M6 x 1.0	7	6
HFTM48L450	4.8	4.2	M8 x 1.25	10	8
HFTM64L450	6.4	5.8	M10 x 1.5	12	10
HFTM79L450	7.9	7.3	M12 x 1.75	14	12

# HEX SERIES TUBES METRIC



Metric Hex Series Tubes can be utilized in applications where installation is required from the back.

Tubes can be ordered cut to a specific length or provided in longer lengths. To order, replace the length on any given catalog number with the desired length: HEXM79L200



**M** Stainless Steel ▶ CAD insertion point

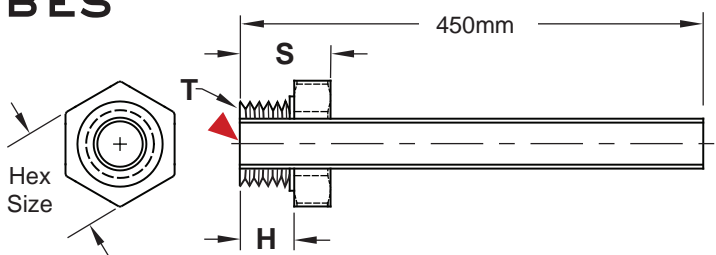
CATALOG NUMBER	Tube O.D.	Tube I.D.	T Thread	S Shoulder Length	D Diameter	H Head Height	Wrench Size
HEXM18L450	1.8	1.5	M4 x .7	8	5	4	3
HEXM23L450	2.3	1.9	M5 x .8	10	6	5	4
HEXM32L450	3.2	2.8	M6 x 1.0	12	8	6	5
HEXM48L450	4.8	4.2	M8 x 1.25	16	10	8	6
HEXM64L450	6.4	5.8	M10 x 1.5	16	12	8	6
HEXM79L450	7.9	7.3	M12 x 1.75	16	14	8	8

# EXTERNAL HEX SERIES TUBES METRIC



Metric External Hex Tubes can be utilized in applications where connectivity to other cooling fittings is necessary.

Tubes can be ordered cut to a specific length or provided in longer lengths. To order, replace the length on any given catalog number with the desired length: EHEXM79L200

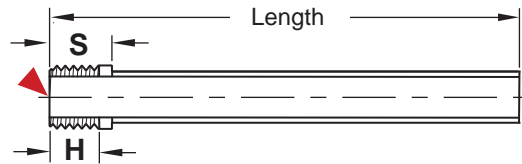


**M** Stainless Steel ▶ CAD insertion point

CATALOG NUMBER	Tube O.D.	Tube I.D.	T Thread	S Shoulder Length	H Thread Length	Hex Size
EHEXM18L450	1.8	1.5	M4 x .7	7	4	6
EHEXM23L450	2.3	1.9	M5 x .8	9	5	7
EHEXM32L450	3.2	2.8	M6 x 1.0	10	6	8
EHEXM48L450	4.8	4.2	M8 x 1.25	12	8	10
EHEXM64L450	6.4	5.8	M10 x 1.5	15	10	13
EHEXM79L450	7.9	7.3	M12 x 1.75	18	12	15



# HIGH FLOW TUBES



**M** Stainless Steel

CAD insertion point

Tube O.D.	Tube I.D.	Thread Size	H Thread Length	S Shoulder Length	12" Length	18" Length	24" Length	36" Length
.072	.060	#5-44	.125	.140	HFT078L12	HFT078L18	HFT078L24	HFT078L36
		#10-32	.156	.203	HFTJ078L12	HFTJ078L18	HFTJ078L24	HFTJ078L36
.090	.076	#5-44	.125	.140	HFT094L12	HFT094L18	HFT094L24	HFT094L36
		#10-32	.156	.203	HFTJ094L12	HFTJ094L18	HFTJ094L24	HFTJ094L36
.125	.109	#10-32	.156	.203	HFT125L12	HFT125L18	HFT125L24	HFT125L36
		1/4-28	.203	.255	HFTJ125L12	HFTJ125L18	HFTJ125L24	HFTJ125L36
.187	.167	1/4-28	.203	.255	HFT187L12	HFT187L18	HFT187L24	HFT187L36
		5/16-24	.235	.290	HFTJ187L12	HFTJ187L18	HFTJ187L24	HFTJ187L36
.250	.230	5/16-24	.235	.290	HFT250L12	HFT250L18	HFT250L24	HFT250L36
		3/8-24	.296	.359	HFTJ250L12	HFTJ250L18	HFTJ250L24	HFTJ250L36
.312	.288	3/8-24	.296	.359	HFT312L12	HFT312L18	HFT312L24	HFT312L36
		7/16-20	.359	.437	HFTJ312L12	HFTJ312L18	HFTJ312L24	HFTJ312L36
.365	.340	7/16-20	.359	.437	HFT375L12	HFT375L18	HFT375L24	HFT375L36
		1/2-20	.421	.500	HFTJ375L12	HFTJ375L18	HFTJ375L24	HFTJ375L36
.427	.397	1/2-20	.421	.500	HFT437L12	HFT437L18	HFT437L24	HFT437L36
		9/16-18	.421	.500	HFTJ437L12	HFTJ437L18	HFTJ437L24	HFTJ437L36
.500	.444	9/16-18	.421	.531	HFT500L12	HFT500L18	HFT500L24	HFT500L36
		5/8-18	.421	.531	HFTJ500L12	HFTJ500L18	HFTJ500L24	HFTJ500L36

High Flow tubes are for use with High Flow Cascade Heads, Compact Cascade Heads, Quick Coupling Cascade Heads and Hex Key Cascade Heads.

Tubes can be ordered cut to a specific length or provided in longer lengths.

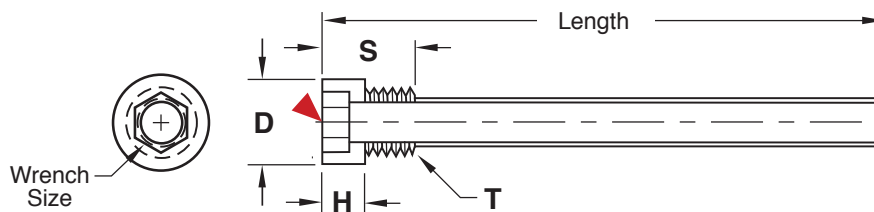
To order, replace the length on any given catalog number with the desired length.

Ex. HFT125L14.5



For special High Flow Tube configurations and design guidelines, refer to the templates in section X.

# HEX SERIES TUBES



**M** Stainless Steel

CAD insertion point

Tube O.D.	Tube I.D.	T Thread	Wrench Size	S	D Diameter	H Head Height	12" Length	18" Length	24" Length	36" Length
.072	.060	#5-44	1/8	.312	.182	.156	HEXT078L12	HEXT078L18	HEXT078L24	HEXT078L36
		#10-32	1/8	.406	.245	.187	HEXTJ078L12	HEXTJ078L18	HEXTJ078L24	HEXTJ078L36
.090	.076	#5-44	1/8	.312	.182	.156	HEXT094L12	HEXT094L18	HEXT094L24	HEXT094L36
		#10-32	1/8	.406	.245	.187	HEXTJ094L12	HEXTJ094L18	HEXTJ094L24	HEXTJ094L36
.125	.109	#10-32	5/32	.406	.245	.187	HEXT125L12	HEXT125L18	HEXT125L24	HEXT125L36
		1/4-28	5/32	.406	.307	.250	HEXTJ125L12	HEXTJ125L18	HEXTJ125L24	HEXTJ125L36
.187	.167	1/4-28	3/16	.500	.307	.250	HEXT187L12	HEXT187L18	HEXT187L24	HEXT187L36
		5/16-24	1/4	.562	.370	.281	HEXTJ187L12	HEXTJ187L18	HEXTJ187L24	HEXTJ187L36
.250	.230	5/16-24	1/4	.562	.370	.281	HEXT250L12	HEXT250L18	HEXT250L24	HEXT250L36
		3/8-24	5/16	.625	.495	.312	HEXTJ250L12	HEXTJ250L18	HEXTJ250L24	HEXTJ250L36
.312	.288	3/8-24	5/16	.625	.495	.312	HEXT312L12	HEXT312L18	HEXT312L24	HEXT312L36
		1/2-20	3/8	.750	.620	.375	HEXTJ312L12	HEXTJ312L18	HEXTJ312L24	HEXTJ312L36

Hex Series Tubes can be utilized with the Bubbler Bases or in applications where installation in cores is required from the back as they are easily removed with the wrench hex.

Tubes can be ordered cut to a specific length or provided in longer lengths. To order, replace the length on any given catalog number with the desired length. Ex. HEXT125L14.5



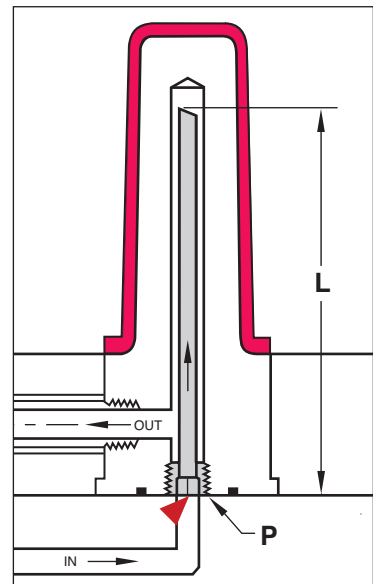
# TUBES

## PISTON TUBES



**M** Tube: High Flow Stainless Steel, Pipe Plug: Stainless Steel ▶ CAD insertion point

P (NPT)	Tube O.D.	Tube I.D.	12" Length	18" Length	24" Length	36" Length	48" Length
<b>1/16</b>	.072	.060	PT06-078L12	PT06-078L18	PT06-078L24	PT06-078L36	PT06-078L48
	.090	.076	PT06-094L12	PT06-094L18	PT06-094L24	PT06-094L36	PT06-094L48
	.109	.095	PT06-109L12	PT06-109L18	PT06-109L24	PT06-109L36	PT06-109L48
	.125	.109	PT06-125L12	PT06-125L18	PT06-125L24	PT06-125L36	PT06-125L48
	.187	.167	PT06-187L12	PT06-187L18	PT06-187L24	PT06-187L36	PT06-187L48
<b>1/8</b>	.125	.109	PT12-125L12	PT12-125L18	PT12-125L24	PT12-125L36	PT12-125L48
	.187	.167	PT12-187L12	PT12-187L18	PT12-187L24	PT12-187L36	PT12-187L48
	.250	.230	PT12-250L12	PT12-250L18	PT12-250L24	PT12-250L36	PT12-250L48
<b>1/4</b>	.187	.167	PT25-187L12	PT25-187L18	PT25-187L24	PT25-187L36	PT25-187L48
	.250	.230	PT25-250L12	PT25-250L18	PT25-250L24	PT25-250L36	PT25-250L48
<b>3/8</b>	.312	.288	PT25-312L12	PT25-312L18	PT25-312L24	PT25-312L36	PT25-312L48
	.312	.288	PT37-312L12	PT37-312L18	PT37-312L24	PT37-312L36	PT37-312L48
	.365	.340	PT37-375L12	PT37-375L18	PT37-375L24	PT37-375L36	PT37-375L48
<b>1/2</b>	.427	.397	PT37-437L12	PT37-437L18	PT37-437L24	PT37-437L36	PT37-437L48
	.427	.397	PT50-437L12	PT50-437L18	PT50-437L24	PT50-437L36	PT50-437L48
	.500	.444	PT50-500L12	PT50-500L18	PT50-500L24	PT50-500L36	PT50-500L48
<b>3/4</b>	.625	.569	PT75-625L12	PT75-625L18	PT75-625L24	PT75-625L36	PT75-625L48
	.427	.397	PT75-437L12	PT75-437L18	PT75-437L24	PT75-437L36	PT75-437L48
	.500	.444	PT75-500L12	PT75-500L18	PT75-500L24	PT75-500L36	PT75-500L48



Stainless steel Piston Tubes available with Brass Pipe Plug. To order, specify "B" at the end of the catalog numbers. Ex. PT25-250L12B, PT50-437L12B.

Also, longer lengths and Piston Tubes cut to length are available. Contact Customer Service for pricing and delivery.

## BRASS TUBES



**M** Half-Hard Tempered Brass

Tube O.D.	Tube I.D.	Thread Size	Thread Length	12" Length	18" Length	24" Length	36" Length
.125	.061	#5-44	.187	T125L12	T125L18	T125L24	T125L36
.187	.123	#10-32	.187	T187L12	T187L18	T187L24	T187L36
.250	.170	1/4-28	.250	T250L12	T250L18	T250L24	T250L36
.312	.210	5/16-24	.312	T312L12	T312L18	T312L24	T312L36
.375	.273	3/8-24	.375	T375L12	T375L18	T375L24	T375L36
.437	.307	7/16-20	.437	T437L12	T437L18	T437L24	T437L36
.625	.495	5/8-18	.625	T625L12	T625L18	T625L24	T625L36

Brass Tubes are for use with Nipple Type Cascade Heads.

To order tubes with both ends threaded, add a "T" to the end of the catalog number. Ex. T125L12T

Tubing is available in stainless steel and threaded both ends. To order, specify "--SST" in the catalog number above. Ex. T125L12-SST. (Note: Not available in 5/8 OD.)

Longer length tubes or tubes cut to length can be ordered by contacting Customer Service.





# O-RINGS FACE SEAL

## Face Seal Dimensions

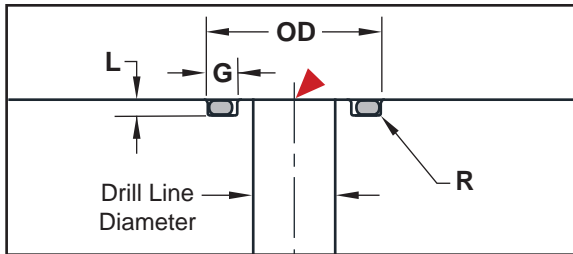
Dash Number	Cross Section	G	L	R
-013 through -025	1/16	.101 to .107	.050 to .054	.005 to .015
-112 through -125	3/32	.136 to .142	.074 to .080	.005 to .015



## Technical Information:

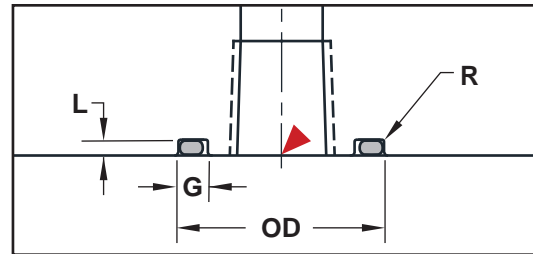
- Buna-N temperature range is -20° F to 225 °F (-28°C to 107°C)
- Viton® temperature range is -0° F to 400°F (-17°C to 204°C)

## Drill Line: Face Sealing



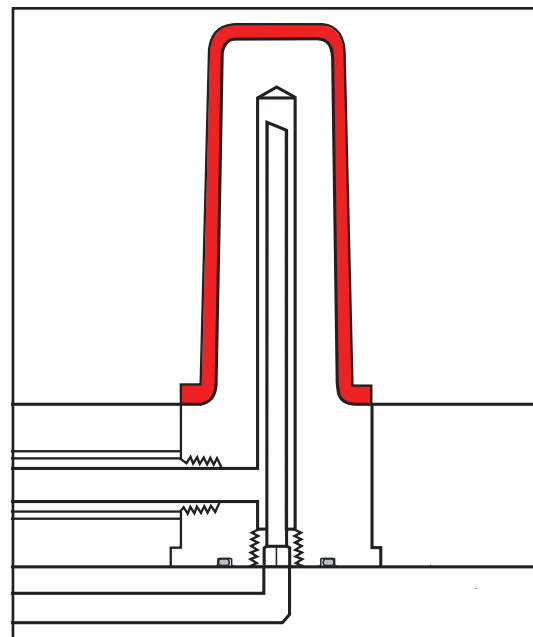
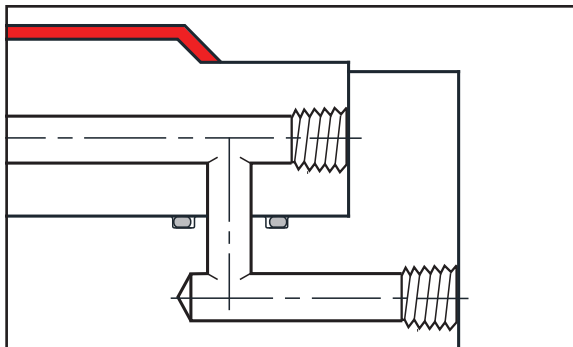
DRILL LINE DIAMETER	CATALOG NUMBER		OD
	BUNA-N	VITON	
Ø.25 (1/4)	OR-013	OR-013-V	.566
	OR-112	OR-112-V	.693
Ø.312 (5/16)	OR-014	OR-014-V	.629
	OR-113	OR-113-V	.755
Ø.375 (3/8)	OR-015	OR-015-V	.691
	OR-114	OR-114-V	.818
Ø.421 (27/64)	OR-016	OR-016-V	.754
	OR-114	OR-114-V	.818
Ø.437 (7/16)	OR-017	OR-017-V	.816
	OR-115	OR-115-V	.880
Ø.500 (7/16)	OR-018	OR-018-V	.879
	OR-116	OR-116-V	.943
Ø.562 (9/16)	OR-019	OR-019-V	0.941
	OR-117	OR-117-V	1.005
Ø.687 (11/16)	OR-021	OR-021-V	1.066
	OR-119	OR-119-V	1.130
Ø.906 (29/32)	OR-024	OR-024-V	1.254
	OR-123	OR-123-V	1.380
Ø.937 (15/16)	OR-025	OR-025-V	1.316
	OR-124	OR-124-V	1.443

## NPT: Face Sealing



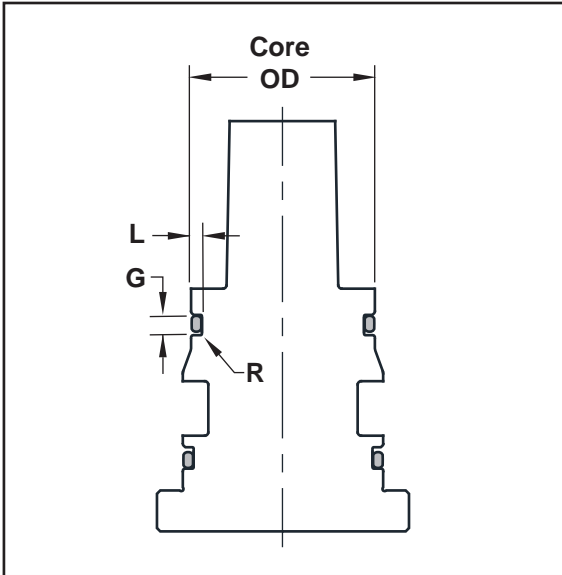
NPT	CATALOG NUMBER		OD
	BUNA-N	VITON	
1/16	OR-015	OR-015-V	.691
	OR-113	OR-113-V	.755
1/8	OR-016	OR-016-V	.754
	OR-114	OR-114-V	.818
1/4	OR-018	OR-018-V	.879
	OR-116	OR-116-V	.943
3/8	OR-020	OR-020-V	1.004
	OR-118	OR-118-V	1.068
1/2	OR-023	OR-023-V	1.191
	OR-122	OR-122-V	1.318
3/4	OR-026	OR-026-V	1.379
	OR-125	OR-125-V	1.505

## Applications:



# O-RINGS

## CORE DIAMETER SEAL



### Core Seal Dimensions

Dash Number	Cross Section	G	L	R
-014 through -048	1/16	.093 to .098	.048 to .049	.005 to .015
-114 through -157	3/32	.140 to .145	.079 to .080	.005 to .015
-208 through -247	1/8	.187 to .192	.109 to .110	.005 to .015

### Technical Information:

- Buna-N temperature range is -20° F to 225 °F (-28°C to 107°C)
- Viton® temperature range is -0° F to 400°F (-17°C to 204°C)

### To Order:

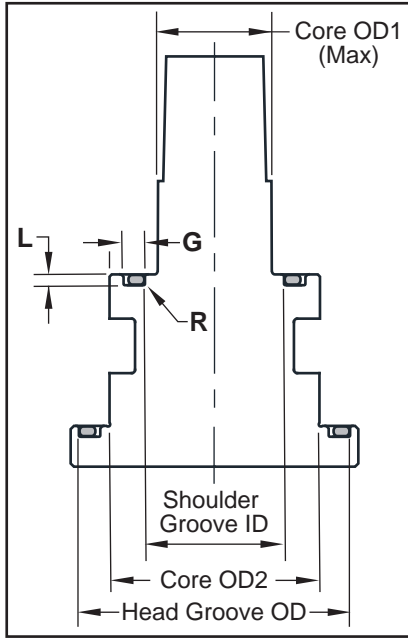
- Buna-N O-Rings: Specify the prefix "OR" before the dash number. Ex. OR-127 or OR-241.
- Viton O-Rings: Specify the prefix "OR" before the dash number and "-V" as the suffix. Ex. OR-127-V or OR-241-V.
- O-Rings are sold in quantities of 25.

NOMINAL CORE DIAMETER	1/16 CROSS SECTION		3/32 CROSS SECTION		1/8 CROSS SECTION	
	DASH NUMBER	CORE OD +.000 - .001	DASH NUMBER	CORE OD +.000 - .001	DASH NUMBER	CORE OD +.000 - .001
5/8	-014	0.623	-	-	-	-
11/16	-015	0.685	-	-	-	-
3/4	-016	0.748	-	-	-	-
13/16	-017	0.81	-114	0.81	-	-
7/8	-018	0.873	-115	0.873	-208	0.872
15/16	-019	0.935	-116	0.935	-209	0.934
1	-020	0.998	-117	0.998	-210	0.997
1-1/16	-021	1.06	-118	1.06	-211	1.059
1-1/8	-022	1.123	-119	1.123	-212	1.122
1-3/16	-023	1.185	-120	1.185	-213	1.184
1-1/4	-024	1.248	-121	1.248	-214	1.247
1-5/16	-025	1.31	-122	1.31	-215	1.309
1-3/8	-026	1.373	-123	1.373	-216	1.372
1-7/16	-027	1.435	-124	1.435	-217	1.434
1-1/2	-028	1.498	-125	1.498	-218	1.497
1-9/16	-	-	-126	1.56	-219	1.559
1-5/8	-029	1.623	-127	1.623	-220	1.622
1-11/16	-	-	-128	1.685	-221	1.684
1-3/4	-030	1.748	-129	1.748	-222	1.747
1-13/16	-	-	-130	1.81	-	-
1-7/8	-031	1.873	-131	1.873	-223	1.872
1-15/16	-	-	-132	1.935	-	-
2	-032	1.998	-133	1.998	-224	1.997
2-1/16	-	-	-134	2.06	-	-
2-1/8	-033	2.123	-135	2.123	-225	2.122
2-3/16	-	-	-136	2.185	-	-
2-1/4	-034	2.248	-137	2.248	-226	2.247
2-5/16	-	-	-138	2.31	-	-
2-3/8	-035	2.373	-139	2.373	-227	2.372
2-7/16	-	-	-140	2.435	-	-
2-1/2	-036	2.498	-141	2.498	-228	2.497
2-9/16	-	-	-142	2.56	-	-
2-5/8	-037	2.623	-143	2.623	-229	2.622
2-11/16	-	-	-144	2.685	-	-
2-3/4	-038	2.748	-145	2.748	-230	2.747
2-13/16	-	-	-146	2.81	-	-
2-7/8	-039	2.873	-147	2.873	-231	2.872
2-15/16	-	-	-148	2.935	-	-
3	-040	2.998	-149	2.998	-232	2.997
3-1/16	-	-	-150	3.06	-	-
3-1/8	-041	3.123	-151	3.185	-233	3.122
3-1/4	-	-	-	-	-234	3.247
3-3/8	-042	3.373	-	-	-235	3.372
3-7/16	-	-	-152	3.435	-236	3.497
3-5/8	-043	3.623	-	-	-237	3.622
3-11/16	-	-	-153	3.685	-	-
3-3/4	-	-	-	-	-238	3.747
3-7/8	-044	3.873	-	-	-239	3.872
3-15/16	-	-	-154	3.935	-	-
4	-	-	-	-	-240	3.997
4-1/8	-045	4.123	-	-	-241	4.122
4-3/16	-	-	-155	4.185	-	-
4-1/4	-	-	-	-	-242	4.247
4-3/8	-046	4.373	-	-	-243	4.372
4-7/16	-	-	-156	4.435	-	-
4-1/2	-	-	-	-	-244	4.497
4-5/8	-047	4.623	-	-	-245	4.622
4-11/16	-	-	-157	4.685	-	-
4-3/4	-	-	-	-	-246	4.747
4-7/8	-048	4.873	-	-	-247	4.872



# O-RINGS

## CORE FACE SEAL



### Face Seal Dimensions

Dash Number	Cross Section	G Groove Width	L	R
-025 through -046	1/16	.101 to .107	.050 to .054	.005 to .015
-123 through -157	3/32	.136 to .142	.074 to .080	.005 to .015
-217 through -245	1/8	.177 to .187	.101 to .107	.005 to .015

### Design Guidelines:

- The Shoulder Groove ID is to be determined by the inner diameter (ID) of the O-Ring and groove width.
- The corresponding Head Groove OD is to be determined by the outer diameter (OD) of the O-Ring and groove width.

### To Order:

- Buna-N O-Rings: Specify the prefix "OR" before the dash number. Ex. OR-127 or OR-241.
- Viton O-Rings: Specify the prefix "OR" before the dash number and "-V" as the suffix. Ex. OR-127-V or OR-241-V.
- O-Rings are sold in quantities of 25.

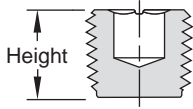
### Technical Information:

- Buna-N temperature range is -20° F to 225 °F (-28°C to 107°C)
- Viton® temperature range is -0° F to 400°F (-17°C to 204°C)

CORE OD1	1/16 CROSS SECTION					3/32 CROSS SECTION					1/8 CROSS SECTION				
	SHOULDER		CORE OD2	HEAD		SHOULDER		CORE OD2	HEAD		SHOULDER		CORE OD2	HEAD	
	DASH NUMBER	GROOVE ID		DASH NUMBER	GROOVE OD	DASH NUMBER	GROOVE ID		DASH NUMBER	GROOVE OD	DASH NUMBER	GROOVE ID		DASH NUMBER	GROOVE OD
1	-025	1.176	1-5/8	-033	2.129	-123	1.174	1-11/16	-136	2.193	-217	1.171	1-3/4	-	-
1-1/16	-026	1.239	1-11/16	-033	2.129	-124	1.237	1-3/4	-137	2.256	-218	1.234	1-13/16	-227	2.387
1-1/8	-027	1.301	1-3/4	-034	2.254	-125	1.299	1-13/16	-138	2.318	-219	1.296	1-7/8	-	-
1-3/16	-028	1.364	1-13/16	-034	2.254	-126	1.362	1-7/8	-139	2.381	-220	1.359	1-15/16	-228	2.512
1-1/4	-	-	1-7/8	-	-	-127	1.424	1-15/16	-140	2.443	-221	1.421	2	-	-
1-5/16	-029	1.489	1-15/16	-035	2.379	-128	1.487	2	-141	2.506	-222	1.484	2-1/16	-229	2.637
1-3/8	-	-	2	-	-	-129	1.549	2-1/16	-142	2.568	-	-	2-1/8	-	-
1-7/16	-030	1.614	2-1/16	-036	2.504	-130	1.612	2-1/8	-143	2.631	-223	1.609	2-3/16	-230	2.762
1-1/2	-	-	2-1/8	-	-	-131	1.674	2-3/16	-144	2.693	-	-	2-1/4	-	-
1-9/16	-031	1.739	2-3/16	-037	2.629	-132	1.737	2-1/4	-145	2.756	-224	1.734	2-5/16	-231	2.887
1-5/8	-	-	2-1/4	-	-	-133	1.799	2-5/16	-146	2.818	-	-	2-3/8	-	-
1-11/16	-032	1.864	2-5/16	-038	2.754	-134	1.862	2-3/8	-	-	-225	1.859	2-7/16	-232	3.012
1-3/4	-	-	2-3/8	-	-	-135	1.924	2-7/16	-148	2.943	-	-	2-1/2	-	-
1-13/16	-033	1.989	2-7/16	-039	2.879	-136	1.987	2-1/2	-149	3.006	-226	1.984	2-9/16	-233	3.137
1-7/8	-	-	2-1/2	-	-	-137	2.049	2-9/16	-150	3.068	-	-	2-5/8	-	-
1-15/16	-034	2.114	2-9/16	-040	3.004	-138	2.112	2-5/8	-	-	-227	2.109	2-11/16	-234	3.262
2	-	-	2-5/8	-	-	-139	2.174	2-11/16	-151	3.193	-	-	2-3/4	-	-
2-1/16	-035	2.239	2-11/16	-041	3.129	-140	2.237	2-3/4	-	-	-228	2.234	2-13/16	-235	3.387
2-1/8	-	-	2-3/4	-	-	-141	2.299	2-13/16	-	-	-	-	2-7/8	-	-
2-3/16	-036	2.364	2-13/16	-	-	-142	2.362	2-7/8	-	-	-229	2.359	2-15/16	-236	3.512
2-1/4	-	-	2-7/8	-	-	-143	2.424	2-15/16	-152	3.443	-	-	3	-	-
2-5/16	-037	2.489	2-15/16	-042	3.379	-144	2.487	3	-	-	-230	2.484	3-1/16	-237	3.637
2-3/8	-	-	3	-	-	-145	2.549	3-1/16	-	-	-	-	3-1/8	-	-
2-7/16	-038	2.614	3-1/16	-	-	-146	2.612	3-1/8	-153	3.693	-231	2.609	3-3/16	-238	3.762
2-1/2	-	-	3-1/8	-	-	-147	2.674	3-3/16	-	-	-	-	3-1/4	-	-
2-9/16	-039	2.739	3-3/16	-043	3.629	-148	2.737	3-1/4	-	-	-232	2.734	3-5/16	-239	3.887
2-5/8	-	-	3-1/4	-	-	-149	2.799	3-5/16	-	-	-	-	3-3/8	-	-
2-11/16	-040	2.864	3-5/16	-	-	-150	2.862	3-3/8	-	-	-233	2.859	3-7/16	-240	4.012
2-3/4	-	-	3-3/8	-	-	-151	2.924	3-7/16	-154	3.943	-	-	3-1/2	-	-
2-13/16	-041	2.989	3-7/16	-044	3.879	-	-	3-1/2	-	-	-234	2.984	3-9/16	-241	4.137
2-15/16	-	-	3-9/16	-	-	-	-	3-5/8	-	-	-235	3.109	3-11/16	-242	4.262
3	-	-	3-5/8	-	-	-	-	3-11/16	-155	4.193	-	-	3-3/4	-	-
3-1/16	-042	3.239	3-11/16	-045	4.129	-152	3.237	3-3/4	-156	4.443	-236	3.234	3-13/16	-243	4.387
3-3/16	-	-	3-13/16	-	-	-	-	3-7/8	-	-	-237	3.359	3-15/16	-244	4.512
3-5/16	-043	3.489	3-15/16	-046	4.379	-153	3.487	4	-157	4.693	-238	3.484	4-1/16	-245	4.637

# PIPE PLUGS

## NPT STANDARD



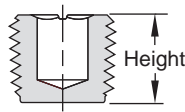
Standard Plugs are flush type, 7/8" taper per foot. Oversize Plugs available with 3/4" taper per foot.

To order Oversize Pipe Plugs, add a "-O" to the end of the catalog number.  
Ex. BR50-O

**M** Brass, Alloy Steel, and Stainless Steel

Pipe Thread NPT	Brass Catalog Number	Steel Catalog Number	Stainless Catalog Number	Flush Height	Oversize Height
1/16	BR06	ST06	SS06	.25	.31
1/8	BR12	ST12	SS12	.25	.31
1/4	BR25	ST25	SS25	.40	.43
3/8	BR37	ST37	SS37	.40	.50
1/2	BR50	ST50	SS50	.53	.56
3/4	BR75	ST75	SS75	.53	.62
1	BR100	ST100	SS100	.65	.75
1-1/4	BR125	ST125	SS125	.65	.81
1-1/2	BR150	ST150	SS150	.65	.81
2	BR200	ST200	SS200	.65	.87

## NPT STANDARD-DEEP HEX

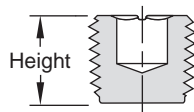


The extra deep hex is stronger and will not strip out.

**M** Brass

Pipe Thread NPT	CATALOG NUMBER	Height
1/16	BRHD06	.289
1/8	BRHD12	.312
1/4	BRHD25	.445
3/8	BRHD37	.513
1/2	BRHD50	.625
3/4	BRHD75	.625

## BSPT STANDARD



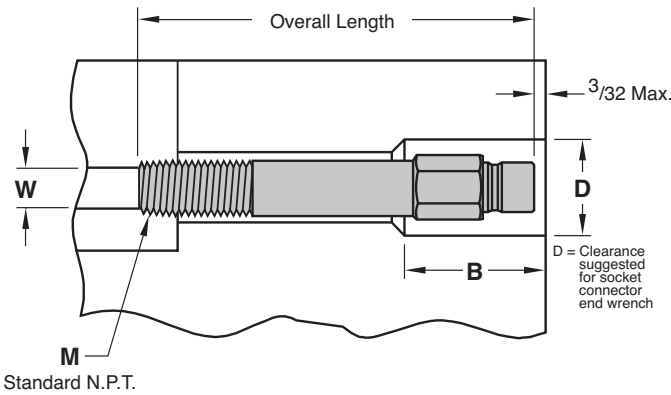
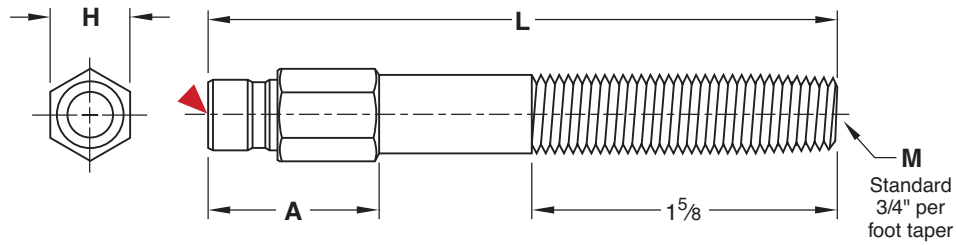
- Fits BSPT and BSPP threads.
- Identification ring present on bottom of plugs.

**M** Brass and Alloy Steel

Pipe Thread	Brass Catalog Number	Steel Catalog Number	Stainless Catalog Number	Height (in mm)
1/16-28 BSPT	BR06-BSP	ST06-BSP	SS06-BSP	7
1/8-28 BSPT	BR12-BSP	ST12-BSP	SS12-BSP	8
1/4-19 BSPT	BR25-BSP	ST25-BSP	SS25-BSP	10
3/8-19 BSPT	BR37-BSP	ST37-BSP	SS37-BSP	10
1/2-14 BSPT	BR50-BSP	ST50-BSP	SS50-BSP	10
3/4-14 BSPT	BR75-BSP	ST75-BSP	SS75-BSP	13
1-11 BSPT	BR100-BSP	-	-	14
1 1/4-11 BSPT	BR125-BSP	-	-	16



# EXTENSION PLUGS



**M** Brass ▶ CAD insertion point

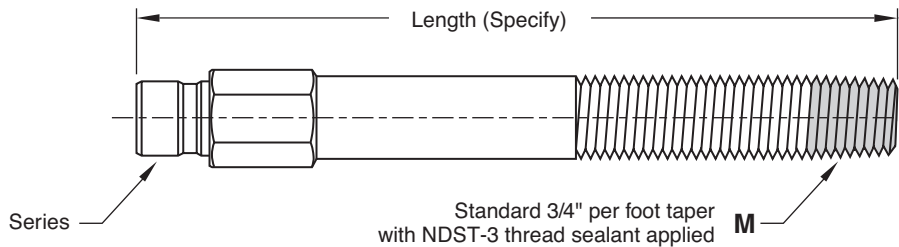
Extension Series	M Pipe Thread	D	B	W (Ref)
250	1/16	.75	1.00	1/4
251	1/8	.87	1.25	5/16
252	1/4	1.00	1.50	7/16
253	3/8	1.12	1.50	9/16
350	1/16	1.00	1.25	1/4
351	1/8	1.00	1.25	5/16
352	1/4	1.00	1.50	7/16
353	3/8	1.12	1.50	9/16
354	1/2	1.50	1.75	11/16
553	3/8	1.37	1.62	9/16
554	1/2	1.50	1.75	11/16

## Alternative configurations and materials available:

- Stainless Steel Extension Plugs are also available. Specify "-SS" at the end of the catalog number. Ex. 252L5.5-SS or 353L4-SS
- Extension Plugs can be obtained made to BSPT specs. The threads are BSPT, and all other dimensions are inch nominal per the chart on page E-22. To order, specify "-BSP" at the end of the catalog number. Ex. 252L5.5-BSP
- ND ST-3 Thread Sealant can be applied to any Extension Plug. To order, specify "-ST" at the end of the catalog number. Ex. 252L5.5-ST
- Note: Standard Series Extension Plugs are shown on page E-22. Keyed Connect Extension Plugs are shown on page E-23.



## CUT-TO-LENGTH EXTENSION PLUGS



Extension Plugs can be ordered cut to length, in any quantity. All Extension Plugs cut to length have sealant applied to the tapered end for convenience.

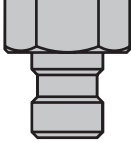
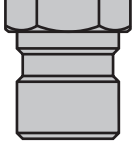
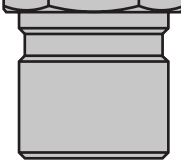
To order, specify series and NPT prefix with required length. Ex. 352L6.53

# EXTENSION PLUGS

## STANDARD SERIES



- Use with standard Socket Connectors shown on page E-25 only.

<b>200 Series</b> 1/4" Hole 					<b>300 Series</b> 3/8" Hole 					<b>500 Series</b> 1/2" Hole 				
CATALOG NUMBER	L Length	M NPT	H Hex Size	A	CATALOG NUMBER	L Length	M NPT	H Hex Size	A	CATALOG NUMBER	L Length	M NPT	H Hex Size	A
<b>1/16" PIPE EXTENSIONS</b>														
<b>250L2.5</b>	2.5	1/16	.37	.68	<b>350L2.5</b>	2.5	1/16	.56	.87	AVAILABLE ON REQUEST				
<b>250L4</b>	4.0	1/16	.37	.81	<b>350L4</b>	4.0	1/16	.56	1.00					
<b>250L5.5</b>	5.5	1/16	.37	.81	<b>350L5.5</b>	5.5	1/16	.56	1.00					
<b>250L7</b>	7.0	1/16	.37	.81	<b>350L7</b>	7.0	1/16	.56	1.00					
<b>1/8" PIPE EXTENSIONS</b>														
<b>251L2.5</b>	2.5	1/8	.43	.68	<b>351L2.5</b>	2.5	1/8	.56	.87	AVAILABLE ON REQUEST				
<b>251L4</b>	4.0	1/8	.43	1.00	<b>351L4</b>	4.0	1/8	.56	1.00					
<b>251L5.5</b>	5.5	1/8	.43	1.00	<b>351L5.5</b>	5.5	1/8	.56	1.00					
<b>251L7</b>	7.0	1/8	.43	1.00	<b>351L7</b>	7.0	1/8	.56	1.00					
<b>251L8.5</b>	8.5	1/8	.43	1.00	<b>351L8.5</b>	8.5	1/8	.56	1.00					
<b>251L10</b>	10.0	1/8	.43	1.00	<b>351L10</b>	10.0	1/8	.56	1.00					
<b>251L11.5</b>	11.5	1/8	.43	1.00	<b>351L11.5</b>	11.5	1/8	.56	1.00					
<b>251L13</b>	13.0	1/8	.43	1.00	<b>351L13</b>	13.0	1/8	.56	1.00					
<b>1/4" PIPE EXTENSIONS</b>														
<b>252L2.5</b>	2.5	1/4	.56	.87	<b>352L2.5</b>	2.5	1/4	.56	.87	AVAILABLE ON REQUEST				
<b>252L4</b>	4.0	1/4	.56	1.25	<b>352L4</b>	4.0	1/4	.56	1.25					
<b>252L5.5</b>	5.5	1/4	.56	1.25	<b>352L5.5</b>	5.5	1/4	.56	1.25					
<b>252L7</b>	7.0	1/4	.56	1.25	<b>352L7</b>	7.0	1/4	.56	1.25					
<b>252L8.5</b>	8.5	1/4	.56	1.25	<b>352L8.5</b>	8.5	1/4	.56	1.25					
<b>252L10</b>	10.0	1/4	.56	1.25	<b>352L10</b>	10.0	1/4	.56	1.25					
<b>252L11.5</b>	11.5	1/4	.56	1.25	<b>352L11.5</b>	11.5	1/4	.56	1.25					
<b>252L13</b>	13.0	1/4	.56	1.25	<b>352L13</b>	13.0	1/4	.56	1.25					
<b>3/8" PIPE EXTENSIONS</b>														
<b>253L2.5</b>	2.5	3/8	.68	1.00	<b>353L2.5</b>	2.5	3/8	.68	1.00	<b>553L2.5</b>	2.5	3/8	.81	1.12
<b>253L4</b>	4.0	3/8	.68	1.25	<b>353L4</b>	4.0	3/8	.68	1.25	<b>553L4</b>	4.0	3/8	.81	1.37
<b>253L5.5</b>	5.5	3/8	.68	1.25	<b>353L5.5</b>	5.5	3/8	.68	1.25	<b>553L5.5</b>	5.5	3/8	.81	1.37
<b>253L7</b>	7.0	3/8	.68	1.25	<b>353L7</b>	7.0	3/8	.68	1.25	<b>553L7</b>	7.0	3/8	.81	1.37
<b>253L8.5</b>	8.5	3/8	.68	1.25	<b>353L8.5</b>	8.5	3/8	.68	1.25	<b>553L8.5</b>	8.5	3/8	.81	1.37
<b>253L10</b>	10.0	3/8	.68	1.25	<b>353L10</b>	10.0	3/8	.68	1.25	<b>553L10</b>	10.0	3/8	.81	1.37
<b>253L11.5</b>	11.5	3/8	.68	1.25	<b>353L11.5</b>	11.5	3/8	.68	1.25	<b>553L11.5</b>	11.5	3/8	.81	1.37
<b>253L13</b>	13.0	3/8	.68	1.25	<b>353L13</b>	13.0	3/8	.68	1.25	<b>553L13</b>	13.0	3/8	.81	1.37
<b>1/2" PIPE EXTENSIONS</b>														
AVAILABLE ON REQUEST					<b>354L2.5</b>	2.5	1/2	.87	1.12	<b>554L2.5</b>	2.5	1/2	.87	1.12
					<b>354L4</b>	4.0	1/2	.87	1.50	<b>554L4</b>	4.0	1/2	.87	1.50
					<b>354L5.5</b>	5.5	1/2	.87	1.50	<b>554L5.5</b>	5.5	1/2	.87	1.50
					<b>354L7</b>	7.0	1/2	.87	1.50	<b>554L7</b>	7.0	1/2	.87	1.50
					<b>354L8.5</b>	8.5	1/2	.87	1.50	<b>554L8.5</b>	8.5	1/2	.87	1.50
					<b>354L10</b>	10.0	1/2	.87	1.50	<b>554L10</b>	10.0	1/2	.87	1.50
					<b>354L11.5</b>	11.5	1/2	.87	1.50	<b>554L11.5</b>	11.5	1/2	.87	1.50
					<b>354L13</b>	13.0	1/2	.87	1.50	<b>554L13</b>	13.0	1/2	.87	1.50



- Eliminate in/out connection mistakes, using the keyed plugs for all inlets
- Use with Keyed Socket Connectors shown on page E-27 only.
- Perfect for die cast jet cooling applications



## EXTENSION PLUGS KEYED CONNECT SERIES

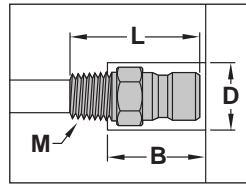
200 Series 1/4" Hole					300 Series 3/8" Hole					500 Series 1/2" Hole				
CATALOG NUMBER	L Length	M NPT	H Hex Size	A	CATALOG NUMBER	L Length	M NPT	H Hex Size	A	CATALOG NUMBER	L Length	M NPT	H Hex Size	A
<b>1/16" PIPE EXTENSIONS (KEYED)</b>														
250L2.5-K	2.5	1/16	.37	.68	350L2.5-K	2.5	1/16	.56	.87	AVAILABLE ON REQUEST				
250L4-K	4.0	1/16	.37	.81	350L4-K	4.0	1/16	.56	1.00					
250L5.5-K	5.5	1/16	.37	.81	350L5.5-K	5.5	1/16	.56	1.00					
250L7-K	7.0	1/16	.37	.81	350L7-K	7.0	1/16	.56	1.00					
<b>1/8" PIPE EXTENSIONS (KEYED)</b>														
251L2.5-K	2.5	1/8	.43	.68	351L2.5-K	2.5	1/8	.56	.87	AVAILABLE ON REQUEST				
251L4-K	4.0	1/8	.43	1.00	351L4-K	4.0	1/8	.56	1.00					
251L5.5-K	5.5	1/8	.43	1.00	351L5.5-K	5.5	1/8	.56	1.00					
251L7-K	7.0	1/8	.43	1.00	351L7-K	7.0	1/8	.56	1.00					
251L8.5-K	8.5	1/8	.43	1.00	351L8.5-K	8.5	1/8	.56	1.00					
251L10-K	10.0	1/8	.43	1.00	351L10-K	10.0	1/8	.56	1.00					
251L11.5-K	11.5	1/8	.43	1.00	351L11.5-K	11.5	1/8	.56	1.00					
251L13-K	13.0	1/8	.43	1.00	351L13-K	13.0	1/8	.56	1.00					
<b>1/4" PIPE EXTENSIONS (KEYED)</b>														
252L2.5-K	2.5	1/4	.56	.87	352L2.5-K	2.5	1/4	.56	.87	AVAILABLE ON REQUEST				
252L4-K	4.0	1/4	.56	1.25	352L4-K	4.0	1/4	.56	1.25					
252L5.5-K	5.5	1/4	.56	1.25	352L5.5-K	5.5	1/4	.56	1.25					
252L7-K	7.0	1/4	.56	1.25	352L7-K	7.0	1/4	.56	1.25					
252L8.5-K	8.5	1/4	.56	1.25	352L8.5-K	8.5	1/4	.56	1.25					
252L10-K	10.0	1/4	.56	1.25	352L10-K	10.0	1/4	.56	1.25					
252L11.5-K	11.5	1/4	.56	1.25	352L11.5-K	11.5	1/4	.56	1.25					
252L13-K	13.0	1/4	.56	1.25	352L13-K	13.0	1/4	.56	1.25					
<b>3/8" PIPE EXTENSIONS (KEYED)</b>														
253L2.5-K	2.5	3/8	.68	1.00	353L2.5-K	2.5	3/8	.68	1.00	553L2.5-K	2.5	3/8	.81	1.12
253L4-K	4.0	3/8	.68	1.25	353L4-K	4.0	3/8	.68	1.25	553L4-K	4.0	3/8	.81	1.37
253L5.5-K	5.5	3/8	.68	1.25	353L5.5-K	5.5	3/8	.68	1.25	553L5.5-K	5.5	3/8	.81	1.37
253L7-K	7.0	3/8	.68	1.25	353L7-K	7.0	3/8	.68	1.25	553L7-K	7.0	3/8	.81	1.37
253L8.5-K	8.5	3/8	.68	1.25	353L8.5-K	8.5	3/8	.68	1.25	553L8.5-K	8.5	3/8	.81	1.37
253L10-K	10.0	3/8	.68	1.25	353L10-K	10.0	3/8	.68	1.25	553L10-K	10.0	3/8	.81	1.37
253L11.5-K	11.5	3/8	.68	1.25	353L11.5-K	11.5	3/8	.68	1.25	553L11.5-K	11.5	3/8	.81	1.37
253L13-K	13.0	3/8	.68	1.25	353L13-K	13.0	3/8	.68	1.25	553L13-K	13.0	3/8	.81	1.37
<b>1/2" PIPE EXTENSIONS (KEYED)</b>														
AVAILABLE ON REQUEST					354L2.5-K	2.5	1/2	.87	1.12	554L2.5-K	2.5	1/2	.87	1.12
					354L4-K	4.0	1/2	.87	1.50	554L4-K	4.0	1/2	.87	1.50
					354L5.5-K	5.5	1/2	.87	1.50	554L5.5-K	5.5	1/2	.87	1.50
					354L7-K	7.0	1/2	.87	1.50	554L7-K	7.0	1/2	.87	1.50
					354L8.5-K	8.5	1/2	.87	1.50	554L8.5-K	8.5	1/2	.87	1.50
					354L10-K	10.0	1/2	.87	1.50	554L10-K	10.0	1/2	.87	1.50
					354L11.5-K	11.5	1/2	.87	1.50	554L11.5-K	11.5	1/2	.87	1.50
					354L13-K	13.0	1/2	.87	1.50	554L13-K	13.0	1/2	.87	1.50



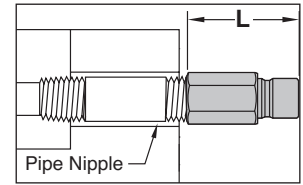
# CONNECTOR PLUGS

## STANDARD SERIES

Inch Standard



**M** Brass



**M** Brass

	MALE TYPE: INCH						FEMALE TYPE: INCH			
	CATALOG NUMBER	M NPT	Inner Diameter	D	B	L	CATALOG NUMBER	M NPT	Inner Diameter	L
<b>200 SERIES</b> (1/4" Hole)	250	1/16	3/16	.75	.75	.94	250F	1/16	1/4	.75
	251	1/8	1/4	.87	.75	.94	251F	1/8	1/4	1.00
	252	1/4	1/4	1.00	.94	1.13	252F	1/4	1/4	1.25
	253	3/8	1/4	1.12	.94	1.19	253F	3/8	1/4	1.16
<b>300 SERIES</b> (3/8" Hole)	351	1/8	1/4	1.00	1.00	1.20	351F	1/8	11/32	1.00
	352	1/4	3/8	1.00	1.09	1.34	352F	1/4	3/8	1.34
	353	3/8	3/8	1.12	1.13	1.38	353F	3/8	3/8	1.34
	354	1/2	3/8	1.50	1.25	1.59	354F	1/2	3/8	1.57
<b>500 SERIES</b> (1/2" Hole)	552	1/4	3/8	1.37	1.37	1.62	552F	1/4	7/16	1.25
	553	3/8	1/2	1.37	1.37	1.62	553F	3/8	9/16	1.37
	554	1/2	5/8	1.50	1.50	1.75	554F	1/2	5/8	1.75
	556	3/4	5/8	1.75	1.56	1.90	556F	3/4	5/8	1.75

Note: Use with Standard Series Socket Connectors sold on opposite page only.

### International Standard

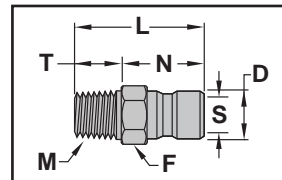
**M** Brass

**M** Brass

	MALE TYPE: BSPT								FEMALE TYPE: BSPT			
	CATALOG NUMBER	M	D	L	N	S	T	F	CATALOG NUMBER	M	Inner Diameter	L
<b>200 SERIES</b> (6.35MM Hole)	251-BSPT	1/8	9	24	15	6	9	11	251F-BSPT	1/8	6	25
	252-BSPT	1/4	9	29	17	6	12	14	252F-BSPT	1/4	6	33
<b>300 SERIES</b> (9.525MM Hole)	351-BSPT	1/8	13	30	20	9	10	14	351F-BSPT	1/8	8	25
	352-BSPT	1/4	13	34	21	9	13	14	352F-BSPT	1/4	8	34
	353-BSPT	3/8	13	35	21	9	14	17	353F-BSPT	3/8	8	34
<b>500 SERIES</b> (12.7MM Hole)	553-BSPT	3/8	20	41	27	14	14	21	553F-BSPT	3/8	14	35
	554-BSPT	1/2	20	43	24	16	19	22	554F-BSPT	1/2	15	45

**M** Brass

	MALE TYPE: METRIC							
	CATALOG NUMBER	M	D	L	N	S	T	F
<b>200 SERIES</b>	252-M10	M10	9	24	15	6	9	11



### Alternative configurations and materials available:

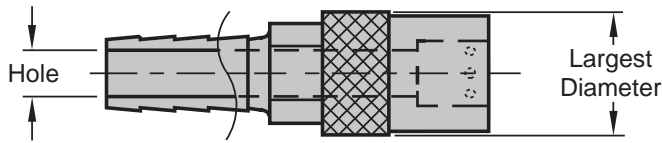
- For Connector Plugs manufactured from stainless steel, add an "-SS" to the end of the catalog number. Ex. 250-SS or 351-SS or 251-FSS
- Note: 552F and 556F are available in brass only.





# SOCKET CONNECTORS

## STANDARD SERIES



**M** Brass with Stainless Steel Bearings and Silicone Seals

▶ CAD insertion point

- Pressure to 200 psi
- Max temp = 400° F
- Use with standard Connector Plugs sold on opposite page or Extension Plugs sold on page E-22.

		200 SERIES (1/4" Hole)			300 SERIES (3/8" Hole)			500 SERIES (1/2" Hole)		
		CATALOG NUMBER	Hose ID	Largest Diam.	CATALOG NUMBER	Hose ID	Largest Diameter	CATALOG NUMBER	Hose ID	Largest Diameter
STRAIGHT		SC204	1/4	.71	SC306	3/8	.97	SC504	1/2	1.21
		SC205	5/16	.71	SC308	1/2	.97	SC506	3/4	1.21
		SC206	3/8	.71	-	-	-	-	-	-
90° STEM		SC214	1/4	.71	SC316	3/8	.97	SC514	1/2	1.21
		SC215	5/16	.71	SC318	1/2	.97	SC516	3/4	1.21
		SC216	3/8	.71	-	-	-	-	-	-
45° STEM		SC224	1/4	.71	SC326	3/8	.97	SC524	1/2	1.21
		SC225	5/16	.71	SC328	1/2	.97	SC526	3/4	1.21
		SC226	3/8	.71	-	-	-	-	-	-
Socket Body Only		CATALOG NUMBER	Thread		CATALOG NUMBER	Thread		CATALOG NUMBER	Thread	
		SC200B	1/8		SC300B	1/4		SC500B	1/2	
		SC200B-4	1/4		SC300B-4	3/8		-	-	
Replacement Seals: Silicone (Red)		SC200S			SC300S			SC500S		
Replacement Seals: Viton (Black)		SC200S-V			SC300S-V			SC500S-V		

### Alternative configurations and materials available:

- To order valved style Socket Connectors or Bodies, add a "-V" to the end of the catalog number. Ex. SC316-V
- To order Socket Connectors or Bodies with barbs for Push-Lok® hose, specify "-PL" at the end of the catalog number. Ex. SC326-PL or SC306-V-PL
- Note: Valved versions (-V or -V-PL) are not available in the 500 series.

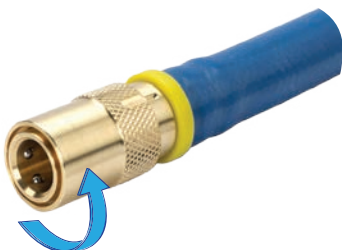
### STANDARD SERIES: LOCKING CONNECTORS

This system provides a positive locking connection to Extension or Connector Plugs. Connect and twist to lock the sleeve into place.

To order the locking version, specify -L as the suffix to the standard items in the chart above. Examples:

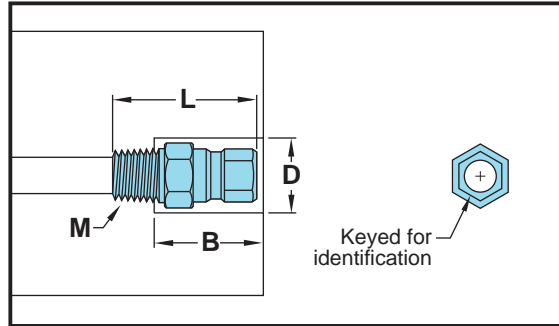
- SC205-L (Standard Barbs)
- SC300B-L (Body)
- SC326-PL-L (Push-Lok Barbs)

Note: Not available in the Valved versions.



# CONNECTOR PLUGS

## KEYED CONNECT SERIES

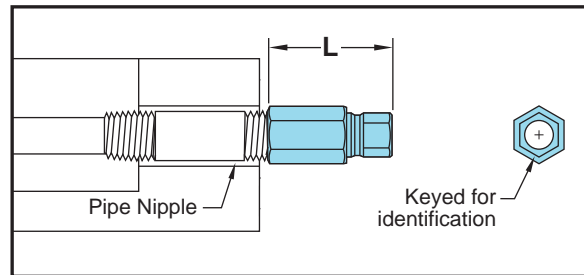


- Eliminate in/out connection mistakes, using the keyed plugs for all inlets
- Enables faster changeover
- Use with Keyed Socket Connectors as shown on opposite page only.

### Male Type: Inch Standard

**M** Brass

200 SERIES (1/4" Hole)						300 SERIES (3/8" Hole)						500 SERIES (1/2" Hole)					
CATALOG NUMBER	M NPT	Inner Diameter	D	B	L	CATALOG NUMBER	M NPT	Inner Diameter	D	B	L	CATALOG NUMBER	M NPT	Inner Diameter	D	B	L
250-K	1/16	3/16	.75	.75	.94	351-K	1/8	1/4	1.00	1.00	1.20	552-K	1/4	3/8	1.37	1.37	1.62
251-K	1/8	1/4	.87	.75	.94	352-K	1/4	3/8	1.00	1.09	1.34	553-K	3/8	1/2	1.37	1.37	1.62
252-K	1/4	1/4	1.00	.94	1.13	353-K	3/8	3/8	1.12	1.13	1.38	554-K	1/2	5/8	1.50	1.50	1.75
253-K	3/8	1/4	1.12	.94	1.19	354-K	1/2	3/8	1.50	1.25	1.59	556-K	3/4	5/8	1.75	1.56	1.90



- Eliminate in/out connection mistakes, using the keyed plugs for all inlets
- Enables faster changeover

### Female Type: Inch Standard

**M** Brass

200 SERIES (1/4" Hole)				300 SERIES (3/8" Hole)				500 SERIES (1/2" Hole)			
CATALOG NUMBER	M NPT	Inner Diameter	L	CATALOG NUMBER	M NPT	Inner Diameter	L	CATALOG NUMBER	M NPT	Inner Diameter	L
250F-K	1/16	1/4	1.00	351F-K	1/8	11/32	1.00	552F-K	1/4	7/16	1.25
251F-K	1/8	1/4	1.00	352F-K	1/4	3/8	1.00	553F-K	3/8	9/16	1.37
252F-K	1/4	1/4	1.25	353F-K	3/8	3/8	1.62	554F-K	1/2	5/8	1.75
253F-K	3/8	1/4	1.38	354F-K	1/2	3/8	1.75	556F-K	3/4	5/8	1.75

### Alternative configurations and materials available:

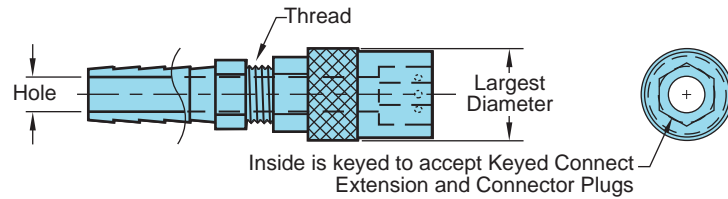
- For Connector Plugs manufactured from stainless steel, add an "-SS" to the end of the catalog number. Ex. 250-K-SS or 351F-K-SS  
Note: The 250F-K, 351F-K and all 500 Series Female Plugs are available in brass only.
- Contact Customer Service for metric options.
- Keyed connectors do not fit standard sockets.



# SOCKET CONNECTORS

## KEYED CONNECT SERIES

- Eliminate in/out connection mistakes, using the keyed plugs for all inlets
- Enables faster changeovers
- Pressure to 200 psi
- Max temp = 400° F
- Includes Blue Safety Clip
- Use with Keyed Connector Plugs sold on opposite page or Keyed Extension Plugs shown on page E-23.



**M** Brass with Stainless Steel Bearings and Silicone Seals

▶ CAD insertion point

		200 SERIES (1/4" Hole)			300 SERIES (3/8" Hole)			500 SERIES (1/2" Hole)		
		CATALOG NUMBER	Hose ID	Largest Diameter	CATALOG NUMBER	Hose ID	Largest Diameter	CATALOG NUMBER	Hose ID	Largest Diameter
S T R A I G H T		SC204-K	1/4	.71	SC306-K	3/8	.97	SC504-K	1/2	1.21
		SC205-K	5/16	.71	SC308-K	1/2	.97	SC506-K	3/4	1.21
		SC206-K	3/8	.71	-	-	-	-	-	-
90° S T E M		SC214-K	1/4	.71	SC316-K	3/8	.97	SC514-K	1/2	1.21
		SC215-K	5/16	.71	SC318-K	1/2	.97	SC516-K	3/4	1.21
		SC216-K	3/8	.71						
45° S T E M		SC224-K	1/4	.71	SC326-K	3/8	.97	SC524-K	1/2	1.21
		SC225-K	5/16	.71	SC328-K	1/2	.97	SC526-K	3/4	1.21
		SC226-K	3/8	.71	-	-	-	-	-	-
Socket Body Only		CATALOG NUMBER	Thread		CATALOG NUMBER	Thread		CATALOG NUMBER	Thread	
		SC200B-K	1/8		SC300B-K	1/4		SC500B-K	1/2	
		SC200B-4-K	1/4		SC300B-4-K	3/8				
Replacement Seals: Silicone (Red)		SC200S			SC300S			SC500S		
Replacement Seals: Viton (Black)		SC200S-V			SC300S-V			SC500S-V		

Note: 200 and 300 Series Straight Socket Connectors are manufactured from a single piece, not assembled as shown.

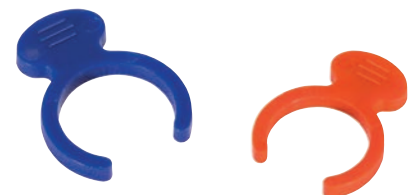
### Alternative configurations and materials available:

- To order Socket Connectors or Bodies with barbs for Push-Lok® hose, specify "-PL" before the -K within the catalog number.  
Ex. SC326-PL-K or SC306-PL-K

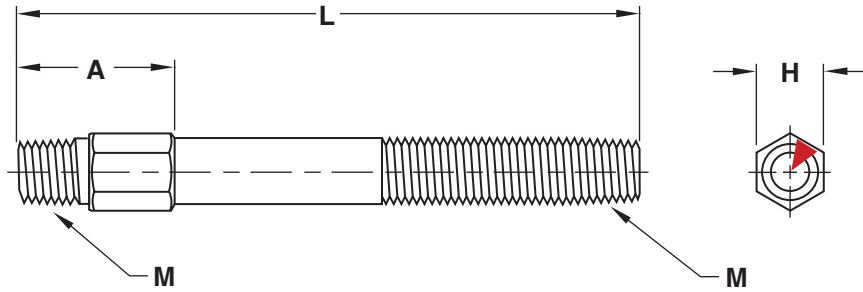
Note: Clips are designed for the Keyed Connect Series of Socket Connectors. They can be used on the standard or locking Socket Connectors but will be for color designation only.

CATALOG NUMBER	Color	Series
SC200-BL	Blue	200
SC300-BL		300
SC500-BL		500
SC200-R	Red	200
SC300-R		300
SC500-R		500

## SAFETY CLIPS



# ADJUSTABLE HEX NIPPLES



**M** Brass

CATALOG NUMBER	M Pipe NPT	A	H Hex Size	Available Overall Lengths (L)								
				2.5	4	5.5	7	8.5	10	11.5	13	
APN06	1/16	.68	3/8	•	•	•	•	•	•	•	•	•
APN12	1/8	.75	7/16	•	•	•	•	•	•	•	•	•
APN25	1/4	.87	9/16	•	•	•	•	•	•	•	•	•
APN37	3/8	1.00	11/16	•	•	•	•	•	•	•	•	•
APN50	1/2	1.37	7/8	•	•	•	•	•	•	•	•	•

▶ CAD insertion point

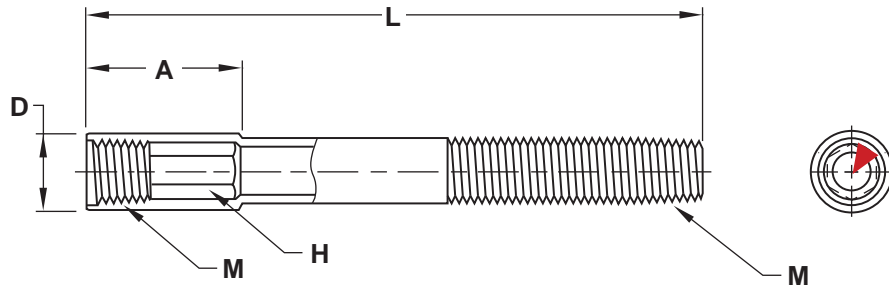
### To Order:

- Specify prefix and length. Ex APN50L11.5.

### Alternative configurations and materials available:

- For Hex Nipples manufactured from stainless steel, add an "-SS" to the end of the catalog number. Ex. APN25L7-SS or APN50L4-SS
- Hex Nipples can be ordered cut to any length, in any quantity. Specify the catalog number (for brass or stainless steel) with required length. Ex. APN25L6.25 or APN37L5.75-SS

# HEX KEY EXTENSION PIPES



**M** Brass

CATALOG NUMBER	M Pipe NPT	A	D	H Hex Size	Available Overall Lengths (L)				
					2.5	4	5.5	7	8.5
HKEPN12	1/8	.75	.50	1/4	•	•	•	•	•
HKEPN25	1/4	1.00	.69	3/8	•	•	•	•	•
HKEPN37	3/8	1.25	.81	1/2	•	•	•	•	•
HKEPN50	1/2	1.50	1.00	9/16	•	•	•	•	•

▶ CAD insertion point

### To Order:

- Specify prefix and length. Ex. HKEPN12L2.5

### Alternative configurations and materials available:

- Hex Key Extension Pipes can be ordered cut to any length in any quantity. Specify the catalog prefix with required length. Ex. HKEPN25L6.25

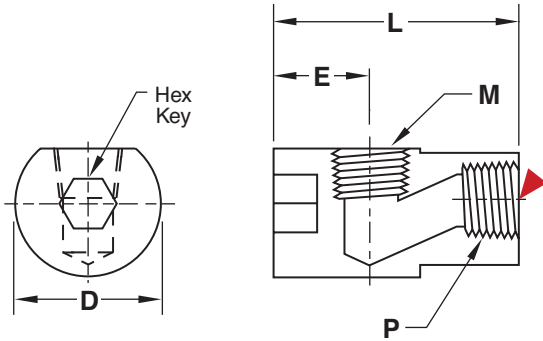


# HEX KEY ELBOWS



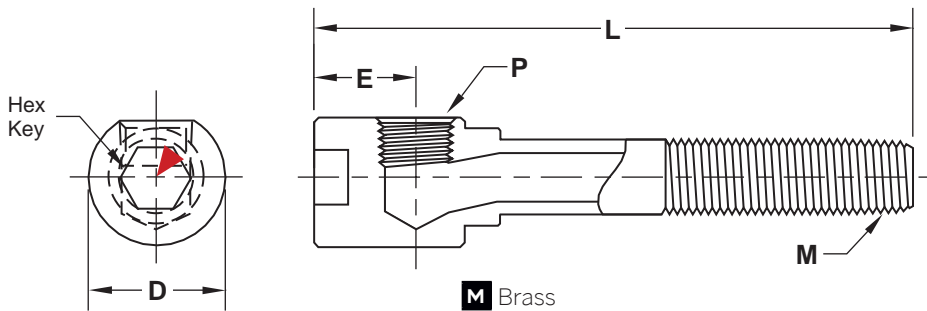
**M** Brass

▶ CAD insertion point



CATALOG NUMBER	M NPT	P NPT	Hex Key	L	D	E
HK1616	1/16	1/16	1/4	1.12	.552	.531
HK1818	1/8	1/8	5/16	1.25	.615	.580
HK1814	1/8	1/4	3/8	1.375	.860	.593
HK1414	1/4	1/4	3/8	1.50	.860	.660
HK3838	3/8	3/8	1/2	1.75	.985	.780
HK1438	1/4	3/8	1/2	1.625	.985	.712
HK1212	1/2	1/2	1/2	2.12	1.235	.940

# HEX KEY EXTENSION ELBOWS



**M** Brass

▶ CAD insertion point

### To Order:

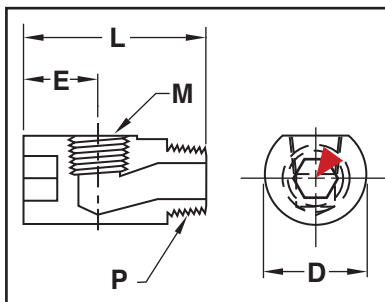
- Specify Prefix and length.  
Ex. HKEE1818L2.5 or HKEE1414L11.5
- Hex Key Extension Elbows can be ordered in any length in any quantity. Specify the catalog prefix with the required length. Ex. HKEE1414L3.75

CATALOG NUMBER	M Pipe NPT	P In/Out NPT	Hex Size	D	E	Available Overall Lengths (L)							
						2.5	4	5.5	7	8.5	10	11.5	13
HKEE1616	1/16	1/16	1/4	.552	.531	•	•	•	•	•	•	•	•
HKEE1818	1/8	1/8	5/16	.615	.580	•	•	•	•	•	•	•	•
HKEE1414	1/4	1/4	3/8	.860	.660	•	•	•	•	•	•	•	•
HKEE3838	3/8	3/8	1/2	.985	.780	•	•	•	•	•	•	•	•
HKEE1212	1/2	1/2	1/2	1.235	.940	•	•	•	•	•	•	•	•

# HEX KEY STREET ELBOWS

**M** Brass

▶ CAD insertion point



CATALOG NUMBER	M NPT	P NPT	Hex Size	L	D	E
HKL1616	1/16	1/16	1/4	1.156	.552	.531
HKL1618	1/16	1/8	5/16	1.218	.615	.531
HKL1818	1/8	1/8	5/16	1.312	.615	.580
HKL1814	1/8	1/4	3/8	1.500	.860	.593
HKL1414	1/4	1/4	3/8	1.625	.860	.660
HKL1438	1/4	3/8	1/2	1.625	.985	.712
HKL3838	3/8	3/8	1/2	1.750	.985	.780
HKL1212	1/2	1/2	1/2	2.250	1.235	.940



# PIPE NIPPLES



**M** Brass or Stainless Steel

Brass Catalog Number	Stainless Catalog Number	Pipe Size NPT	Close Overall Length	Available Overall Lengths (L)																
				Close*	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	7	8	9	10	11
BPN06	GPN06	1/16	5/8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BPN12	GPN12	1/8	3/4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BPN25	GPN25	1/4	7/8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BPN37	GPN37	3/8	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BPN50	GPN50	1/2	1-1/8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

\*Close is the shortest available nipple length.

### To Order:

- Specify Prefix and length. Ex. BPN37CLOSE or BPN12L3.5
- Pipe Nipples can be ordered cut to any length, in any quantity. To order, specify the prefix (BPN##) and required length. Ex. BPN37L5.25 or GPN12L2.25

# PUSH-LOK HOSE



**M** Synthetic Rubber Tube (Parker Series 801)

CATALOG NUMBER	Hose I.D.	Hose O.D.	Minimum Bend Radius (in)	Inches of Mercury
WJH25-	1/4	.50	2.5	28
WJH31-	5/16	.58	3	28
WJH37-	3/8	.63	3	28
WJH50-	1/2	.78	5	28
WJH62-	5/8	.91	6	15
WJH75-	3/4	1.03	7	15

Note: WJH31 is only available in Black (BA).

### Technical Specifications:

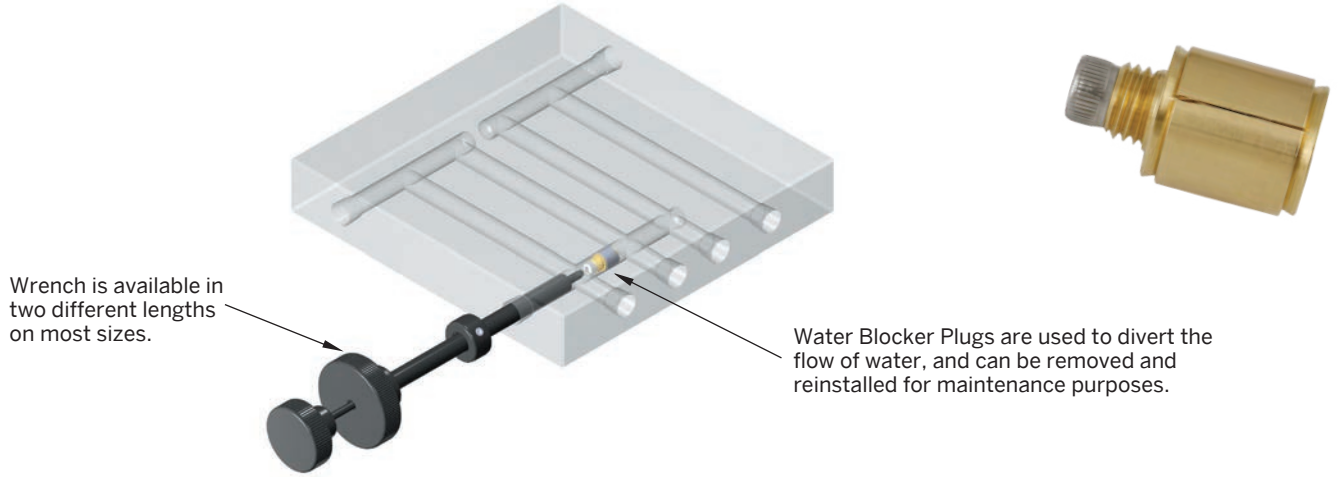
- Sold in 24" lengths.
- Max temperature with water: 190° F (90° C).
- Working pressure: 250 psi
- Burst pressure: 1000 psi

### To Order:

- Specify catalog number with the appropriate color suffix: Gray (GR), Black(BA), Blue (BL), Green (G), Yellow (Y), and Red (R). Ex. WJH50-Y
- For a 50' box, specify -B after the color. Ex. WJH37-Y-B
- Reels also available. Contact Customer Service for pricing.



# WATER BLOCKER™ PLUGS

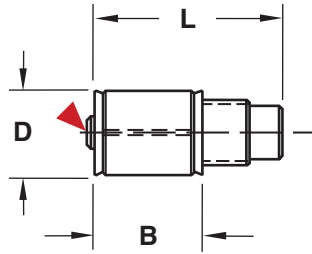


Wrench is available in two different lengths on most sizes.

Water Blocker Plugs are used to divert the flow of water, and can be removed and reinstalled for maintenance purposes.

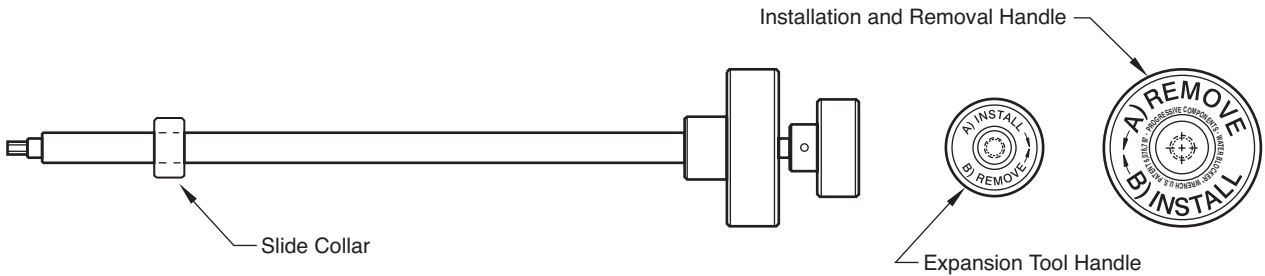
**M** Brass with Stainless Steel Screw      Maximum Pressure: 175 PSI

CATALOG NUMBER	D ±.005	B	L	Waterline Nominal	Waterline Diameter
<b>WB250</b>	.245	.36	.60	1/16 NPT	.250
<b>WB344</b>	.334	.41	.71	1/8 NPT	.344
<b>WB375</b>	.365	.41	.71	1/4 NPT	.375
<b>WB437</b>	.428	.43	.78	1/4 NPT	.437
<b>WB562</b>	.552	.57	.92	3/8 NPT	.562
<b>WB688</b>	.678	.64	1.06	1/2 NPT	.688



▶ CAD insertion point

## WRENCHES

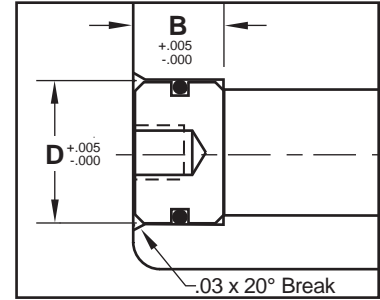
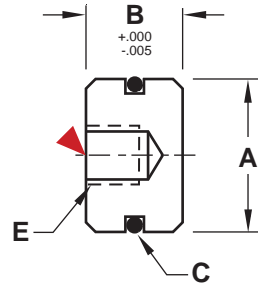
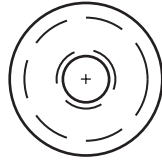


CATALOG NUMBER	Water Blocker	Overall Length
<b>WB25S24</b>	WB250	24"
<b>WBS12</b>	WB344, WB375	12"
<b>WBS24</b>	WB344, WB375	24"
<b>WBL12</b>	WB437-WB688	12"
<b>WBL24</b>	WB437-WB688	24"



# THREADLESS PLUGS

## PUSH-IN O-RING PLUGS



Threadless O-Ring Plugs are designed for inserts backed up by mold steel.

**M** Brass with Buna O-Rings Maximum temp: 250° F (120° C)

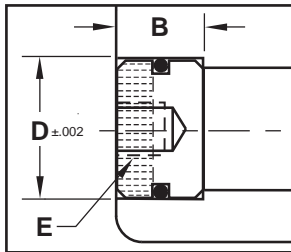
CATALOG NUMBER	A	B	C O-Ring	D Ream Size	E
TWP281	.273	.250	1/16	.281	#6-32
TWP375	.366	.312	1/16	.375	#10-32
TWP500	.494	.312	1/16	.500	#10-32
TWP625	.618	.437	3/32	.625	1/4-20
TWP750	.743	.500	3/32	.750	1/4-20
TWP1000	.990	.625	1/8	1.000	3/8-16
TWP1187	1.177	.625	1/8	1.187	3/8-16

▶ CAD insertion point

### Alternative configurations and materials available:

- For plugs with Viton O-rings (maximum temperature 400° F, 200° C) specify "-V" at the end of the catalog number. Ex. TWP500-V
- For stainless steel threadless plugs, specify "-SS" at the end of the catalog number. Ex. TWP500-SS or TWP281-SS-V for stainless plugs with Viton O-rings

## TAP-IN O-RING PLUGS



- Tap-In O-Ring Plugs do not require steel back up.
- Pressure to 200 psi

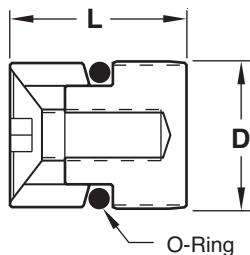
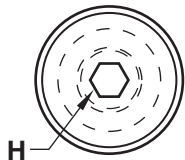
**M** Brass with Buna O-Rings

CATALOG NUMBER	Nominal Pipe Size	D Ream Diam.	B Depth +.005 / -.000	E
TAP281	1/16	.281	.312	#6-32
TAP375	1/8	.375	.312	#10-32
TAP500	1/4	.500	.375	1/4-20
TAP625	3/8	.625	.437	5/16-18
TAP750	1/2	.750	.500	5/16-18

### Alternative configurations and material available:

- For plugs with Viton O-rings (maximum temperature 400° F, 200° C) specify "-V" at the end of the catalog number. Ex. TAP375-V

## THREADLESS DIVERTING PLUGS



### Alternative configurations and material available:

- For plugs with Viton O-rings (maximum temperature 400° F, 200° C) specify "-V" at the end of the catalog number. Ex. TDP50-V or TDP50-OS-V

**M** Brass with Buna O-Rings Maximum pressure: 70 psi

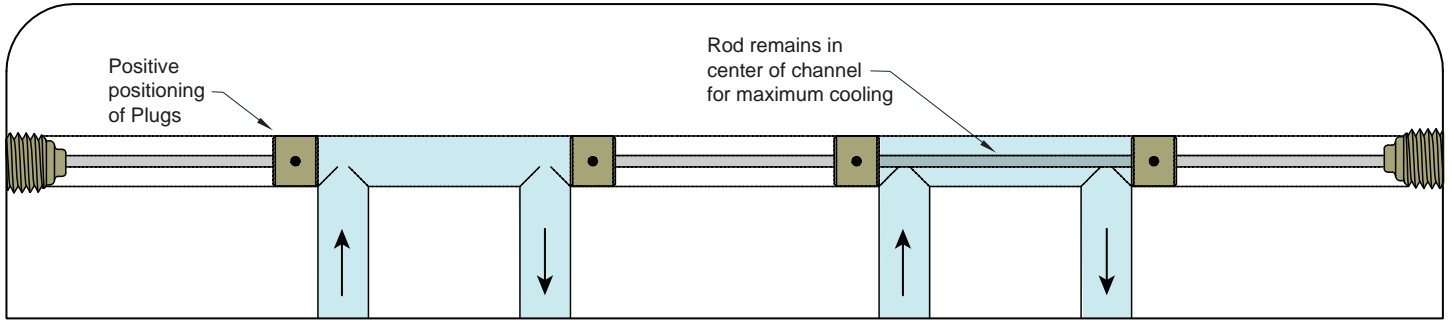
CATALOG NUMBER	Nominal Pipe Size	D Drill Size	H	L
TDP12	1/8	11/32	5/64	.50
TDP12-OS	1/8	23/64	5/64	.50
TDP25	1/4	7/16	1/8	.56
TDP25-OS	1/4	29/64	1/8	.56
TDP37	3/8	9/16	1/8	.62
TDP37-OS	3/8	37/64	1/8	.62
TDP50	1/2	11/16	1/8	.62
TDP50-OS	1/2	45/64	1/8	.62



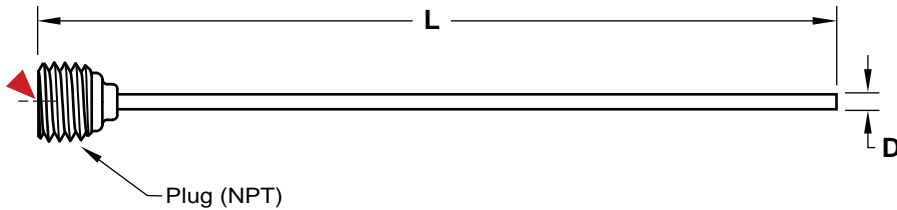


# DIVERTING RODS & PLUGS

Progressive Diverting Rods and Plugs allow for assembly to occur outside of the mold insert before installation.



## RODS



**M** Brass with Stainless Steel Rod

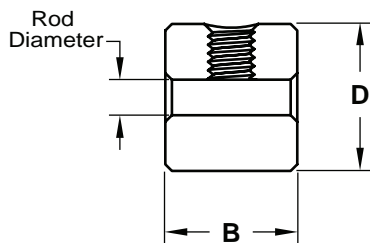
CATALOG NUMBER	Pipe Size NPT	L	D	Diverter Plugs Used
DR125	1/8	12	3/32	D125
DR250	1/4	18	1/8	D250
DR375	3/8	18	1/8	D375
DR500	1/2	24	3/16	D500
DR750	3/4	24	3/16	D750
DR1000	1	36	3/16	D1000

### Alternative configurations and material available:

- Rods are available with BSP threads. To order, specify -BSP to the end of the catalog number. Ex. DR250-BSP.
- Longer lengths and Diverting Rods cut to length are available.

Contact Customer Service for pricing and delivery on all options.

► CAD insertion point



## PLUGS

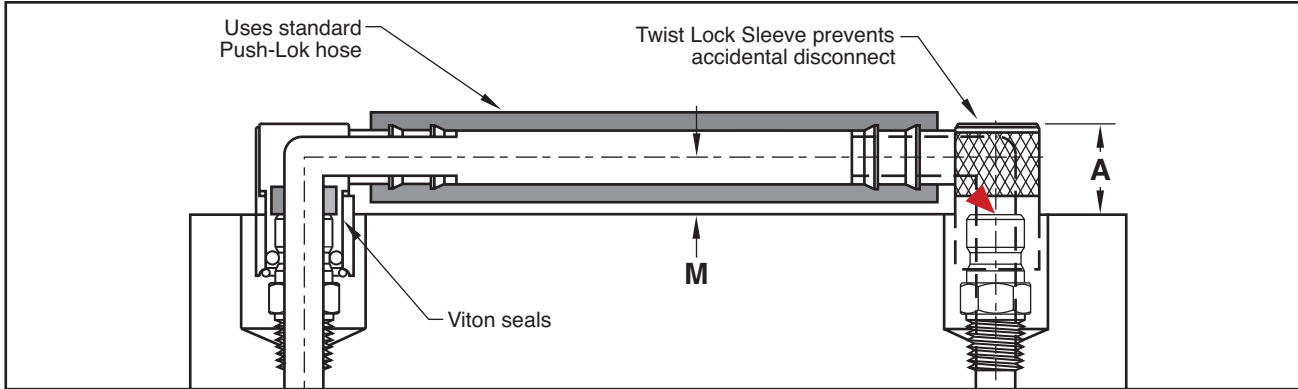
CATALOG NUMBER	For Pipe Size NPT	For Rod Diameter	D +0.000 -0.005	B
D125	1/8	3/32	.340	3/8
D250	1/4	1/8	.432	7/16
D375	3/8	1/8	.557	1/2
D500	1/2	3/16	.682	3/4
D750	3/4	3/16	.932	3/4
D1000	1	3/16	1.115	3/4



Includes locking screw.

# WATER JUMPERS

## PUSH-LOK® SERIES

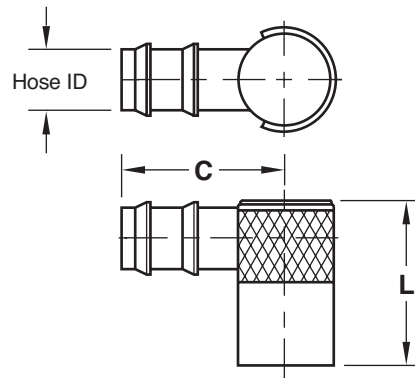
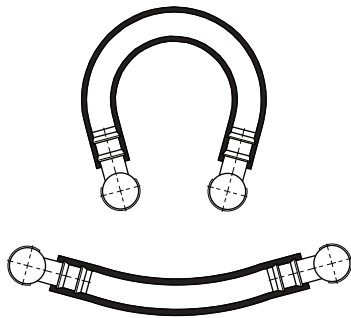


▶ CAD insertion point

**M** Brass and Stainless Steel

Maximum temp: 400° F (200° C)

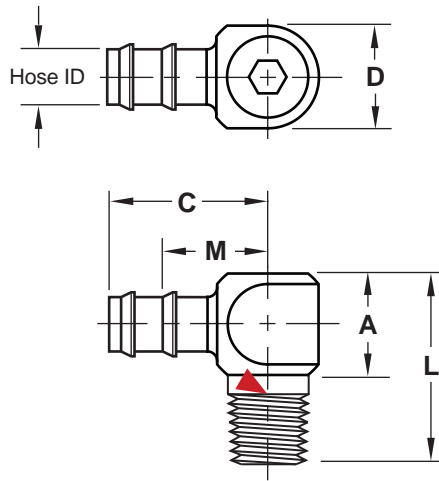
CATALOG NUMBER	Fits Plug Series Number	Hose I.D.	L	C	M	A
WJ200-25	200	1/4	1	1-1/4	3/8	5/8
WJ200-37	200	3/8	1	1-1/4	3/8	5/8
WJ300-37	300	3/8	1-7/16	1-9/16	1/2	7/8
WJ300-50	300	1/2	1-7/16	1-9/16	1/2	7/8
WJ500-50	500	1/2	2-1/8	1-7/8	7/8	1-3/8
WJ500-75	500	3/4	2-1/8	2	7/8	1-3/8





# WATER JUMPERS

## SWIVEL TYPE

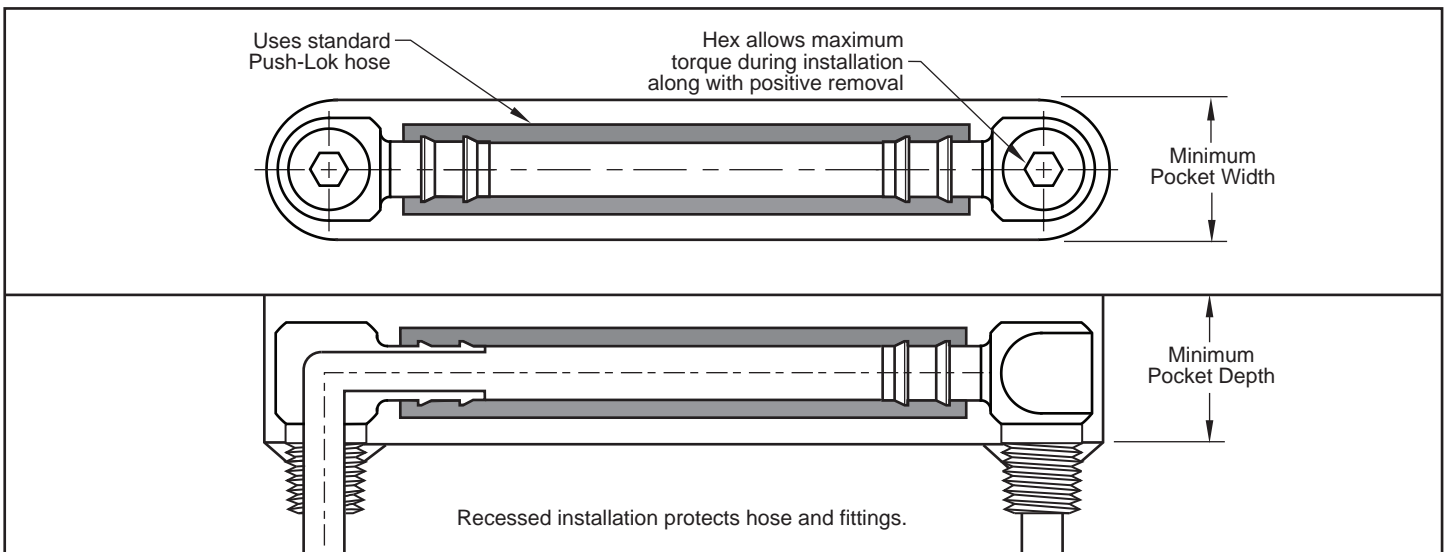


**M** Brass with internal Viton seals

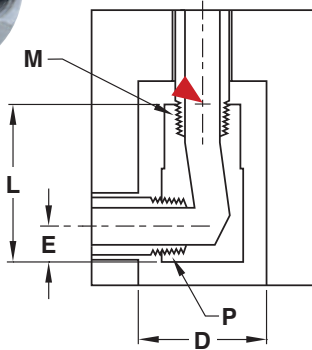
Maximum temp: 400° F (200° C)

CATALOG NUMBER	Pipe Size NPT	Hose I.D.	Hex Key Size	L	A	C	M	D	Min. Pocket Width	Min. Pocket Depth
WJ125L1.1	1/8	5/16	3/16	1-3/16	11/16	1	5/8	.660	11/16	1
WJ125L2.0	1/8	5/16	3/16	2	11/16	1	5/8	.660	11/16	1
WJ125L3.5	1/8	5/16	3/16	3-1/2	11/16	1	5/8	.660	11/16	1
WJ250L1.4	1/4	3/8	1/4	1-7/16	13/16	1-3/16	25/32	.840	7/8	1-3/16
WJ250L2.3	1/4	3/8	1/4	2-3/8	13/16	1-3/16	25/32	.840	7/8	1-3/16
WJ250L3.8	1/4	3/8	1/4	3-7/8	13/16	1-3/16	25/32	.840	7/8	1-3/16
WJ375L1.6	3/8	1/2	5/16	1-5/8	1	1-3/8	15/16	.980	1	1-3/8
WJ375L2.6	3/8	1/2	5/16	2-5/8	1	1-3/8	15/16	.980	1	1-3/8
WJ375L4.1	3/8	1/2	5/16	4-1/8	1	1-3/8	15/16	.980	1	1-3/8
WJ500L2.0	1/2	3/4	3/8	2	1-1/8	1-1/2	1-1/8	1.235	1-1/4	1-9/16
WJ500L2.0-50	1/2	1/2	3/8	2	1-1/8	1-1/2	1-1/8	1.235	1-1/4	1-9/16
WJ500L3.0	1/2	3/4	3/8	3	1-1/8	1-1/2	1-1/8	1.235	1-1/4	1-9/16
WJ500L3.0-50	1/2	1/2	3/8	3	1-1/8	1-1/2	1-1/8	1.235	1-1/4	1-9/16
WJ500L4.5	1/2	3/4	3/8	4-1/2	1-1/8	1-1/2	1-1/8	1.235	1-1/4	1-9/16
WJ500L4.5-50	1/2	1/2	3/8	4-1/2	1-1/8	1-1/2	1-1/8	1.235	1-1/4	1-9/16

▶ CAD insertion point



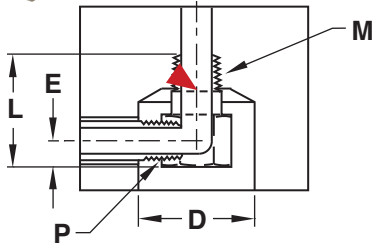
## HEX ELBOWS FEMALE



▶ CAD insertion point

CATALOG NUMBER ALLOY STEEL	CATALOG NUMBER BRASS	M NPT	P NPT	Hex Size	L	D	E
HEL1616	HELB1616	1/16	1/16	9/16	.81	1.00	.218
HEL1818	HELB1818	1/8	1/8	3/4	1.00	1.25	.281
HEL1414	HELB1414	1/4	1/4	7/8	1.37	1.37	.343
HEL3838	HELB3838	3/8	3/8	1	1.62	1.50	.500
HEL1212	HELB1212	1/2	1/2	1-1/4	1.87	1.87	.562
HEL3434	HELB3434	3/4	3/4	1-1/2	2.25	2.25	.625

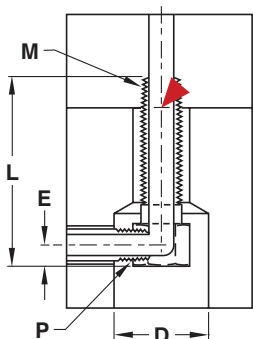
## HEX ELBOWS MALE



▶ CAD insertion point

CATALOG NUMBER ALLOY STEEL	CATALOG NUMBER BRASS	M NPT	P NPT	Hex Size	L	D	E
HEL1616M	HELB1616M	1/16	1/16	9/16	.81	1.00	.218
HEL1818M	HELB1818M	1/8	1/8	3/4	1.06	1.25	.281
HEL1814M	HELB1814M	1/8	1/4	3/4	1.06	1.25	.281
HEL1414M	HELB1414M	1/4	1/4	7/8	1.31	1.37	.343
HEL1438M	HELB1438M	1/4	3/8	7/8	1.31	1.37	.343
HEL3838M	HELB3838M	3/8	3/8	1	1.62	1.50	.437
HEL1212M	HELB1212M	1/2	1/2	1-1/4	2.00	1.87	.562
HEL7575M	HELB7575M	3/4	3/4	1-1/2	2.12	2.25	.625

## EXTENSION ELBOWS MALE



**M** Brass

▶ CAD insertion point

CATALOG NUMBER	M Pipe NPT	P In/Out NPT	Hex Size	D	E	Available Overall Lengths (L)							
						2.5	4	5.5	7	8.5	10	11.5	13
HELB1818	1/8	1/8	.75	1.25	.28	•	•	•	•	•	•	•	•
HELB1814	1/8	1/4	.75	1.25	.28	•	•	•	•	•	•	•	•
HELB1414	1/4	1/4	.87	1.37	.34	•	•	•	•	•	•	•	•
HELB1438	1/4	3/8	.875	1.37	.34	•	•	•	•	•	•	•	•
HELB3838	3/8	3/8	1.00	1.50	.50	•	•	•	•	•	•	•	•
HELB1212	1/2	1/2	1.25	1.75	.62	•	•	•	•	•	•	•	•

To Order: Specify Prefix and length. Ex. HELB1818L2.5 or HELB1414L11.5



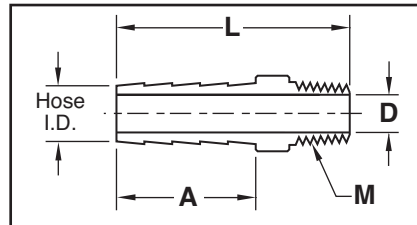
# FITTINGS

## MALE HOSE BARBS

**M** Brass

CATALOG NUMBER	M NPT	Hose I.D.	D	A	L
MB16-0	#10-32 UNF	1/16	.052	.45	.57
MB18-0	#10-32 UNF	1/8	.090	.56	.81
MB18-2	1/8	1/8	.093	.50	1.03
MB14-2	1/8	1/4	.187	.97	1.54
MB14-4	1/4	1/4	.187	.97	1.64
MB15-2	1/8	5/16	.250	.97	1.54
MB15-4	1/4	5/16	.250	.97	1.64
MB38-2	1/8	3/8	.281	.97	1.54
MB38-4	1/4	3/8	.281	.97	1.64
MB50-4	1/4	1/2	.375	.97	1.64
MB50-6	3/8	1/2	.375	.97	1.76
MB50-8	1/2	1/2	.375	.97	1.86
MB75-8	1/2	3/4	.562	.97	1.86
MB75-12	3/4	3/4	.562	.97	1.97

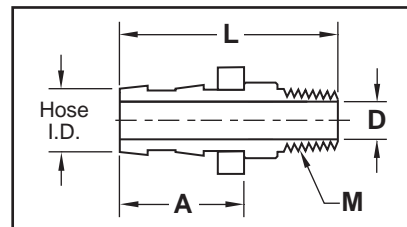
Note: MB16 and MB18 include Buna O-rings and clamps.



**M** Brass

## MALE PUSH-LOK HOSE BARBS

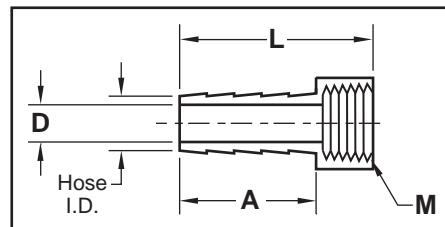
CATALOG NUMBER	M NPT	Hose I.D.	D	A	L
MB14-1-PL	1/16	1/4	.187	.97	1.69
MB14-2-PL	1/8	1/4	.187	.97	1.54
MB14-4-PL	1/4	1/4	.187	.97	1.64
MB38-2-PL	1/8	3/8	.281	.97	1.54
MB38-4-PL	1/4	3/8	.281	.97	1.64
MB38-6-PL	3/8	3/8	.281	.97	1.75
MB38-8-PL	1/2	3/8	.281	.97	1.97
MB50-4-PL	1/4	1/2	.375	.97	1.64
MB50-6-PL	3/8	1/2	.375	.97	1.76
MB50-8-PL	1/2	1/2	.375	.97	1.86
MB50-12-PL	3/4	1/2	.375	.97	1.97
MB75-8-PL	1/2	3/4	.562	.97	1.86
MB75-12-PL	3/4	3/4	.562	.97	1.97



**M** Brass

## FEMALE HOSE BARBS

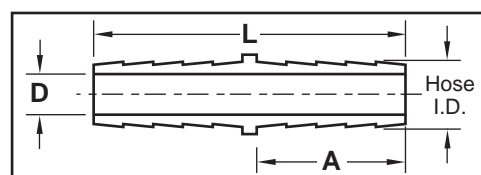
CATALOG NUMBER	M NPT	Hose I.D.	D	A	L
FB14-2	1/8	1/4	.187	.97	1.47
FB14-4	1/4	1/4	.187	.97	1.58
FB15-4	1/4	5/16	.250	.97	1.58
FB38-2	1/8	3/8	.281	.97	1.47
FB38-4	1/4	3/8	.281	.97	1.58
FB50-6	3/8	1/2	.375	.97	1.63
FB50-8	1/2	1/2	.375	.97	1.73



**M** Brass

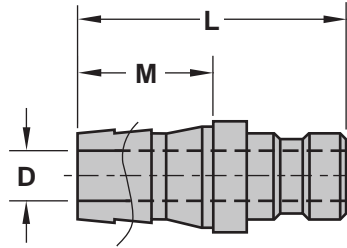
## HOSE SPLICERS

CATALOG NUMBER	Hose I.D.	D	A	L
HS14	1/4	.187	.97	2.00
HS38	3/8	.281	.97	2.00
HS50	1/2	.375	.97	2.00



# COMBINATION HOSE INSERTS

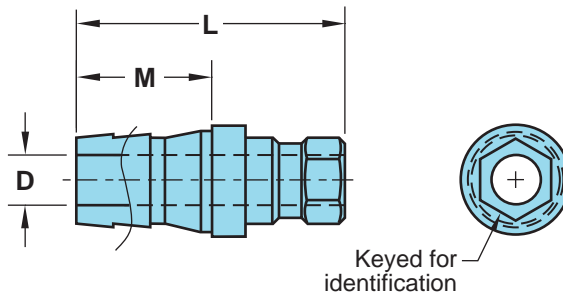
## STANDARD SERIES



**M** Brass

200 SERIES (1/4" Hole)					300 SERIES (3/8" Hole)					500 SERIES (1/2" Hole)				
CATALOG NUMBER	Hose I.D.	D	M	L	CATALOG NUMBER	Hose I.D.	D	M	L	CATALOG NUMBER	Hose I.D.	D	M	L
200-4	1/4	3/16	.875	1.37	300-4	1/4	3/16	.875	1.81	500-8	1/2	13/32	1.062	2.00
200-5	5/16	1/4	.875	1.37	300-5	5/16	1/4	.875	1.81	500-12	3/4	9/16	1.500	2.50
200-6	3/8	1/4	1.062	1.56	300-6	3/8	9/32	1.062	1.81					
200-8	1/2	1/4	1.062	1.56	300-8	1/2	11/32	1.062	1.81					

## KEYED CONNECT SERIES



**M** Brass

200 SERIES (1/4" Hole)					300 SERIES (3/8" Hole)					500 SERIES (1/2" Hole)				
CATALOG NUMBER	Hose I.D.	D	M	L	CATALOG NUMBER	Hose I.D.	D	M	L	CATALOG NUMBER	Hose I.D.	D	M	L
200-4-K	1/4	3/16	.875	1.37	300-6-K	3/8	9/32	1.062	1.81	500-8-K	1/2	13/32	1.062	2.00
200-6-K	3/8	1/4	1.062	1.56	300-8-K	1/2	11/32	1.062	1.81	500-12-K	3/4	9/16	1.500	2.50

Note: Keyed connectors do not fit standard connectors.



## COVER PLUGS

**M** Brass

CATALOG NUMBER	Fits Socket Series No.
CP200	200 (1/4")
CP300	300 (3/8")
CP500	500 (1/2")



## CLAMPS

CATALOG NUMBER	Hose O.D.
HC58	5/8
HC78	7/8
HC118	1-1/8



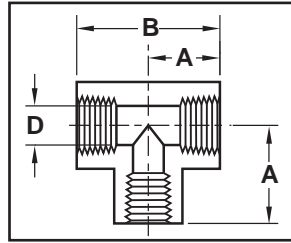
## SEALANT TAPE

CATALOG NUMBER	DESCRIPTION
TT250	1/4" x 520"
TT500	1/2" x 520"



# FITTINGS

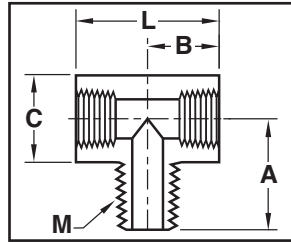
## TEES



**M** Brass

CATALOG NUMBER	M NPT	A	B	D
T18	1/8	.55	1.10	.328
T14	1/4	.78	1.56	.422
T38	3/8	.87	1.68	.562
T50	1/2	1.07	2.14	.687

## MALE TEES

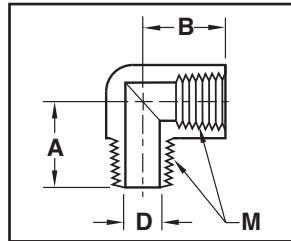


**M** Brass

CATALOG NUMBER	M NPT	A	B	C	L
MT10	#10-32 UNF	.500	.18	.38	.38
MT18	1/8	.66	.53	.56	1.06
MT14	1/4	.91	.76	.71	1.52
MT38	3/8	.97	.84	.81	1.68
MT50	1/2	1.26	1.09	1.00	2.18

Note: M10 includes O-ring.

## 90° STREET ELBOWS

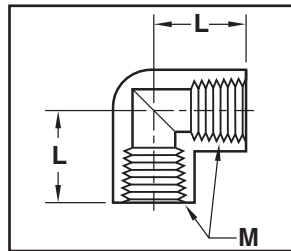


**M** Brass

CATALOG NUMBER	M NPT	A	B	D
ELS10	#10-32 UNF	.50	.18	.090
ELS18	1/8	.81	.56	.220
ELS14	1/4	.91	.45	.312
ELS38	3/8	.98	.54	.428
ELS50	1/2	1.25	1.03	.522

Note: ELS10 includes O-ring.

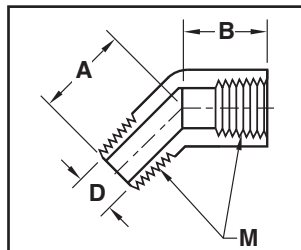
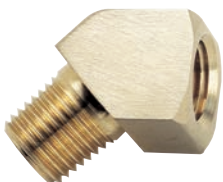
## 90° ELBOWS



**M** Brass

CATALOG NUMBER	M NPT	L
EL18	1/8	.55
EL14	1/4	.78
EL38	3/8	.84
EL50	1/2	1.09

## 45° STREET ELBOWS



**M** Brass

CATALOG NUMBER	M NPT	A	B	D
ELA18	1/8	.50	.38	.220
ELA14	1/4	.70	.54	.314
ELA38	3/8	.78	.54	.440
ELA50	1/2	1.00	.73	.562



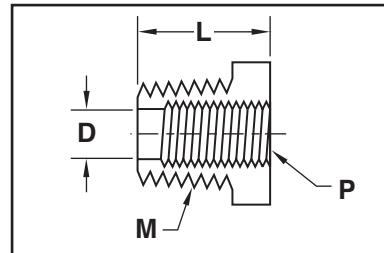


# FITTINGS

## REDUCING BUSHINGS

**M** Brass

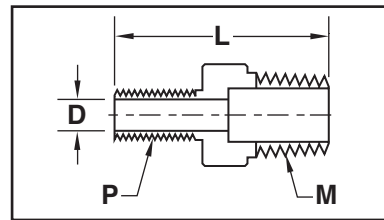
CATALOG NUMBER	M NPT	P NPT	L	D
RB18-0	1/8	#10-32 UNF	.56	.156
RB18-1	1/8	1/16	.56	.250
RB14-0	1/4	#10-32 UNF	.75	.156
RB14-2	1/4	1/8	.75	.328
RB38-4	3/8	1/4	.75	.422
RB50-6	1/2	3/8	1.00	.562



## MALE REDUCERS

**M** Brass

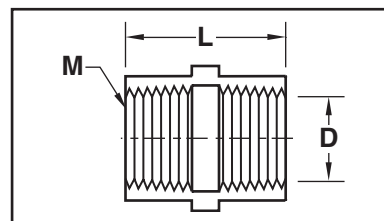
CATALOG NUMBER	M NPT	P NPT	L	D
MR18-1	1/8	1/16	1.19	.187
MR14-2	1/4	1/8	1.22	.220
MR38-4	3/8	1/4	1.41	.314
MR50-6	1/2	3/8	1.62	.440



## COUPLINGS

**M** Brass

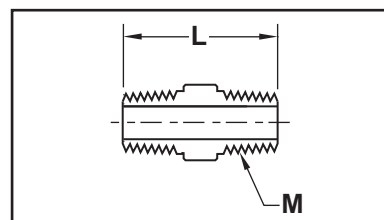
CATALOG NUMBER	M NPT	L	D
C18	1/8	.75	.328
C14	1/4	1.12	.422
C38	3/8	1.12	.562
C50	1/2	1.50	.688



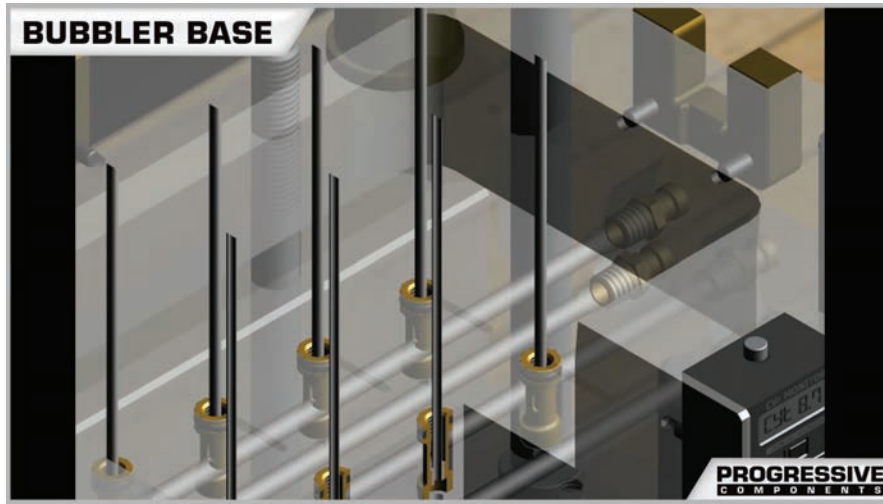
## HEX NIPPLES

**M** Brass

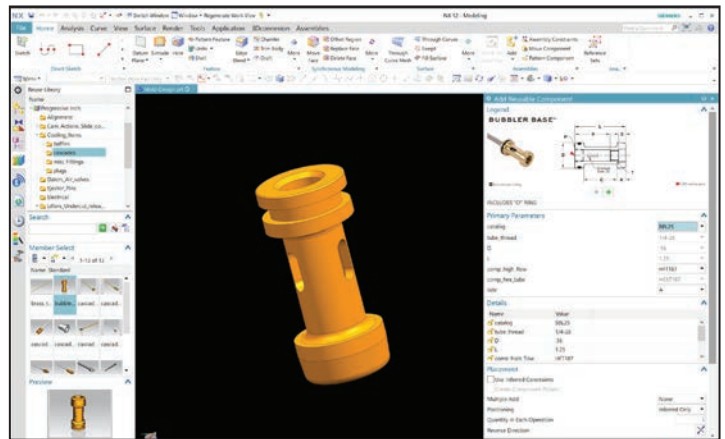
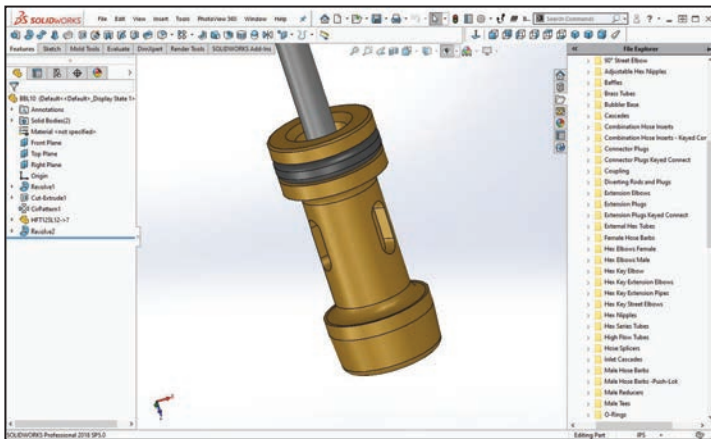
CATALOG NUMBER	M NPT	Hex Size	L
HN18	1/8	7/16	.969
HN14	1/4	9/16	1.375
HN38	3/8	11/16	1.437
HN50	1/2	7/8	1.813



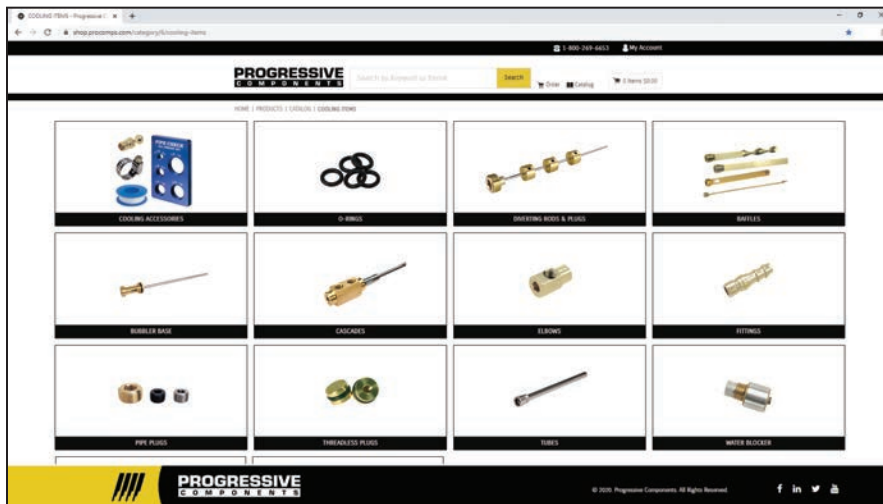
# ONLINE RESOURCES



When considering design options, numerous animations can be viewed at [procomps.com/animations](http://procomps.com/animations).



CAD geometry is available online as individual downloads or as part of the CADalog system. The seven formats include: IGES (.igs), ACIS (.sat), STEP (.step), Parasolid (.x\_t), Solidworks (.sldasm), NX (.prt) (Re-Use and MoldWizard) and Visi (.wkt).



Industry-leading web store expedites the purchasing process. Go to [shop.procomps.com](http://shop.procomps.com) for information and additional resources.



# MOLD MONITORING

## SECTION F



CVe Monitor®	CVe OnDemand®	CVe Live®	Remote Validation Kit
Prefix: CVe			
Page: F-1	Page: F-3	Page: F-4	Page: F-4



ProFile®	Asset Tags & Plates	CounterView®: S-Series	CounterView®: R-Series
	Prefix: AMTG, CVTG	Prefix: CVPL, CVIN, CVPLHT	Prefix: CVR-A, CVR-B
Page: F-6	Page: F-7	Page: F-8	Page: F-9



Insulator Blocks	System Cooling™	System Cooling™ Test Rig	MoldTrax
Prefix: CV, CVMM, CVRA	Prefix: SCM	Prefix: SCTR	
Page: F-10	Page: F-12	Page: F-15	Page: F-16





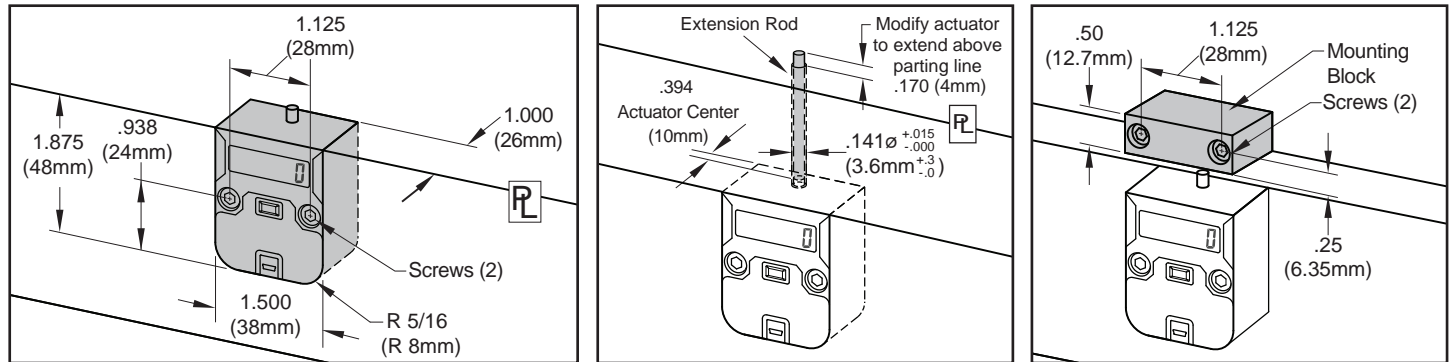
# CVE MONITOR®

Progressive's CVE Monitor tracks tool activity, allowing users to view data on the display or from comprehensive reports using OnDemand or the new CVE Live System. Features include:

- 7-digit LCD display with a push button to move through the display modes.
- 16GB flash drive for file storage.
- Replaceable battery.
- Water resistant with an ingress protection rating of IP58.
- Maximum temperature: 190° F (90° C). For heat protection, refer to the Insulators available on pages F-10 and F-11.
- Recommended mounting is on the stationary half of the mold.
- Dimensional compatibility with Progressive's mechanical CounterViews.
- Mini USB connectivity for data retrieval with cables sold separately.



## MOUNTING OPTIONS



CATALOG NUMBER	DESCRIPTION
CVE	CVe Monitor including #8-32 x 1" SHCS (2) and M4 x 25mm SHCS (2)

CATALOG NUMBER	DESCRIPTION
CVE-INT	Internal Extension Rod (8"/200mm)
CVE-EXT	External Mounting Block including #8-32 x 1" SHCS (2) and M4 x 25mm SHCS (2)

### How to Order:

- For installation below parting line (ie. rails as shown in the center graphic above), order (1) CVE and (1) CVE-INT.
- For installation outside of the mold (right graphic), order (1) CVE and (1) CVE-EXT.

## ON-MOLD DISPLAY MODES

Each device is provided at -25 cycles to allow for mold set up and initialization of the CVE Monitor. Once it reaches zero (0), all timers and data will reset on the monitor. During production, users can press the button on the front of the monitor and review the following information on the display:

### Cycle Count

Total cycles for the life of the mold is presented on the main screen.



### Efficiency Percentage

The percentage of time that the mold has been actively cycling vs being idle.



### Cycle Time

Since the first production cycle, cycle time for the life of the mold.



### Efficiency Percentage-Recent

The percentage of time the mold has been active in the past 500 cycles.



### Cycle Time-Recent

Cycle time for the past 500 cycles is shown in seconds.



### Cycle Count Reset

Press and hold button to reset separate counter to 0 for interim monitoring of cycles.



### Mold Temperature

View current temperature experienced by the monitor (°C) by pressing button twice.



### Flash Drive

Utilize the 16GB flash drive by connecting the CVE to a PC/Tablet with an industry-standard mini USB cable, sold on page F-2.





# CVE MONITOR®

## ON DEMAND ALERT MODES

Once data is initialized using the complimentary OnDemand software (from procomps.com/cve-ondemand) users can choose to be alerted to the following sets of conditions for the CVE Monitor.

### Preventive Maintenance

During initialization, Preventive Maintenance (PM) checkpoints are entered and saved onto the CVE Monitor. If a PM checkpoint is exceeded, the CVE Monitor enters the PM alert mode and displays both a wrench icon and PM Due as shown at right.



When a PM is performed and entered via OnDemand or by the in-mold actuation/button push combination, the next checkpoint for the PM will be written. If no PM is performed, the CVE Monitor will remain in PM alert mode until the user performs all PMs whose thresholds have been exceeded.

### Cycle Time

During initialization, the target cycle time can be written to the monitor using OnDemand. Any variation greater than 2% from the target will enter the alert mode and display the clock icon as shown at right. When the cycle time returns to within 2% of the target, the alert is removed.



### Efficiency

During initialization, the target efficiency can be written to the monitor using OnDemand. Any variation greater than 2% from the target will enter the alert mode and display the percentage (%) icon as shown at right. When the efficiency returns to within 2% of the target, the alert is removed.



### Low Battery

The CVE Monitor has a battery life of approximately 4 years in typical molding environments where temperatures are controlled. When the battery reaches a specified level, the display will show a battery icon as shown at right, and the replacement kit can be ordered separately below. This is the indication to replace the battery, which can be ordered by contacting Customer Service.



## RETROFITTING

Users can view additional data by double-clicking the button on the monitor:

### Retrofit CVE for CounterView Tools

During initialization, molders can start the cycle count with the tool's actual cycle count from an existing CounterView or known cycles from maintenance records. Once entered, the user can see the total cycles for the tool, which includes the count of the cycles from the counter and those run with the CVE Monitor.



In the graphic at right, the tool had 1,000,000 cycles on it originally, but ran 507,288 after the CVE Monitor was installed.



## CABLES AND CONNECTIVITY

Using a USB cable, users can connect the CVE Monitor to their computer or tablet and view data in OnDemand, outlining the reason for the report generation. Notes can be included and user information is recorded for historical reference. More details about OnDemand are on the following pages.



OnDemand Activity Log [Software Version 3.1.0/2.6.1/3.1.9]												
Cve Initialize Date	November 23, 2017	December 17, 2017										
Device ID	MIX1234	MIX1234										
Tool ID	85658	85658										
Blower Housing	Blower Housing	Blower Housing										
Part ID	ABT57	ABT57										
Program Name	Mocha	Mocha										
Customer	Crimson Fan	Crimson Fan										
Target Efficiency %	N/A	94%										
Target Cycle Time	N/A	7.5										
Initial PM Point	50000	50000										
Target PM Interval	100000	100000										
Cycles Prior to Cve Installation*	1000000	1000000										
QIS4 ID	N/A	ABT1										
ASSET ID	N/A	0356-5686										
Reason for connecting CVE Monitor												
Date/Time	Battery	Cycles	OD User	Conn. By	Company	Destination	REV	PM	REPL	GEN	REV#	Notes
October 4, 2018	OK	507,288	INJECT1	Blake Fitz	Injection Tech	Crimson@crimson.com	N	N	Y	N	N/A	Replaced damaged core pin in cavity 4
October 4, 2018	OK	506,534	INJECT1	Blake Fitz	Injection Tech	Crimson@crimson.com	N	N	Y	N	N/A	Data Pull
September 19, 2018	OK	491,274	INJECT1	Blake Fitz	Injection Tech	Crimson@crimson.com	N	N	Y	N	N/A	Pulled from production for mold operational issues. It is being sent for evaluation and rework
September 15, 2018	OK	482,567	MOLDHOU1	Chuck Louse	Mold House	Crimson@crimson.com	N	Y	N	N	N/A	Full PM Cavity #2 was shutdown
June 28, 2018	OK	364,001	MOLDHOU1	Chuck Louse	Mold House	Crimson@crimson.com	N	Y	N	N	N/A	Full PM
May 31, 2018	OK	314,856	MOLDHOU1	Chuck Louse	Mold House	Crimson@crimson.com	N	Y	N	N	N/A	Full PM
April 28, 2018	OK	260,002	MOLDHOU1	Chuck Louse	Mold House	Crimson@crimson.com	N	Y	N	N	N/A	Full PM Cavity #2 was shutdown
April 4, 2018	OK	211,563	MOLDHOU1	Chuck Louse	Mold House	Crimson@crimson.com	N	Y	N	N	N/A	Full PM
March 22, 2018	OK	193,268	INJECT1	Blake Fitz	Injection Tech	Crimson@crimson.com	N	N	Y	N	N/A	3 cavities are shutdown. Pulled for evaluation and repair
February 7, 2018	OK	106,235	MOLDHOU1	Chuck Louse	Mold House	Crimson@crimson.com	N	Y	N	N	N/A	Full PM
January 10, 2018	OK	58,725	MOLDHOU1	Chuck Louse	Mold House	Crimson@crimson.com	N	Y	N	N	N/A	Full PM
December 17, 2017	OK	9,265	MOLDHOU1	Chuck Louse	Mold House	Crimson@crimson.com	N	Y	N	N	N/A	Initial mold inspection. There is no wear or damage to mold following initial run. Targets are set. Mold is released for production
November 23, 2017	OK	0	MOLDHOU1	Chuck Louse	Mold House	Crimson@crimson.com	N	N	Y	N	N/A	Mold is completed and released for sampling

CATALOG NUMBER	DESCRIPTION
<b>CVEL-DATA9</b>	USB 2.0 to Type B Mini 9 Foot Long, Right-Angle Cable
<b>CVE-REPLKIT</b>	Battery Replacement Kit for the CVE Monitor.



# CVe ON DEMAND®

Drive comprehensive reporting using data from the CVe Monitor when running OnDemand software, available at no charge from [procomps.com/cve-ondemand](http://procomps.com/cve-ondemand). OnDemand software enables the user to generate Adobe Acrobat (.pdf), Excel (.xls), and encrypted (.enc) reports to share with customers and other colleagues with these metrics:

- A: When the CVe is initialized, users can identify their tool and align with the device serial number which is tracked on reports utilizing different field options.
- B: The target cycle times and efficiency percentages can be entered. OnDemand also supports ten languages: English, German, Mandarin, Spanish, French, Italian, Japanese, Korean, Portuguese and Thai. Reports, generated in the chosen language, compare actual values to targets, providing a quick view of any variances.
- C: Statistics are provided to show quantity of total cycles and inactivity for the life of the tool.
- D: Weekly sessions are presented graphically to show production efficiency levels.
- E: Weekly cycle time and maximum mold temperature tracking identifies tools with variances over the past year.
- F: The productivity portion of the report takes the target preventive maintenance (PM) points set by the molder and compares them to actual maintenance pulls.
- G: The Maintenance Tab has nine user-definable PM points. In addition, customers can perform maintenance without having their laptop or computer near the CVe Monitor. By holding down the button, cycling the monitor once, and releasing the button, an event will be recorded. This is then added to the OnDemand reports when run.

**CVe OnDemand - Screenshot 1 (A):** Shows tool configuration for Customer: Crimson Fan, Program Name: Mango, Asset ID: 235-5639-LN, and Tool ID: 8565B. Includes buttons for 'Get CVe Data' and 'Generate Report'.

**CVe OnDemand - Screenshot 2 (B):** Shows 'Target Data' section with fields for Target Efficiency (%): 94, Target Cycle Time: 7.5, Initial PM Point: 10000, and Target PM Interval: 50000. Includes buttons for 'Get CVe Data' and 'Generate Report'.

**CVe OnDemand - Screenshot 3 (C):** Shows 'Maintenance' tab with 'Maintenance Targets in Effect' table and 'Current Cycle Count: 3,950,041'. Includes buttons for 'Get CVe Data' and 'Add PM Requirement'.

**Device ID: MKX1234** | Program: Green | OEM ID: ABT1 | Asset ID: 354-1856 | Part ID: Blower Housing ABT57 | 04 Oct 2018

**Summary Metrics:**

- 94% Target Efficiency (%) | 7.5 Target Cycle Time
- 100% Since Last Report Efficiency % | 7.2 Since Last Report Cycle Time
- 94% Last Full Week Efficiency % | 7.4 Last Full Week Cycle Time
- 92% Life-To-Date Efficiency % | 8.5 Life-To-Date Cycle Time

**Efficiency (D):** Line chart showing Active Time, Idle Time, and Sleep Time over a 4-day period.

**Cycle Time (E):** Line chart showing Cycle Time (Active and Total) and Temperature over a 4-day period.

**Productivity (F):** Bar chart showing Cycles-Target vs Cycles-Actual, with categories for PM Target Exceeded, Maintenance Required, PM Performed, Repair, Revision, and General Query.

**Device ID: MQM4767** | Program Name: Mocha | OEM ID: ABT1 | Asset ID: 354-1856 | Part ID: Blower Housing ABT59 | 13-Sep-19

**Current Cycle Count: 63,467** | Cycles until In-Press Maintenance: 1,000 | Last In-Press Maintenance: 63,467 | Date of last In-Press Maintenance: 9/13/2019 9:44

**Previous 100 In-Press Maintenance Events:** Bar chart showing Maintenance On/Off over time.

**Historical In-Press Maintenance Summary (G):**

Trailing 5 Weeks	Trailing 5 weeks Overdue Maintenance	Life To Date	Life to Date Overdue Maintenance																																																																																																																																																								
<ul style="list-style-type: none"> <li>On-Time PM: 68 (90.7%)</li> <li>Overdue PM (&lt;10%): 2 (2.7%)</li> <li>Overdue PM (&gt;10%): 1 (1.6%)</li> </ul>	<table border="1"> <thead> <tr><th>Date</th><th>Due</th><th>Performed</th><th>Overdue</th></tr> </thead> <tbody> <tr><td>8/22/2019 3:36</td><td>51222</td><td>51416</td><td>194</td></tr> <tr><td>8/12/2019 0:07</td><td>44889</td><td>44887</td><td>179</td></tr> <tr><td>8/11/2019 0:00</td><td>61367</td><td>61534</td><td>177</td></tr> <tr><td>8/8/2019 16:04</td><td>41233</td><td>41401</td><td>168</td></tr> <tr><td>8/20/2019 0:00</td><td>58157</td><td>58267</td><td>140</td></tr> <tr><td>8/4/2019 15:07</td><td>57917</td><td>57156</td><td>139</td></tr> <tr><td>8/28/2019 21:21</td><td>54734</td><td>54844</td><td>110</td></tr> <tr><td>7/26/2019 4:23</td><td>28852</td><td>29652</td><td>100</td></tr> <tr><td>7/22/2019 19:40</td><td>27496</td><td>27598</td><td>100</td></tr> <tr><td>8/1/2019 22:19</td><td>33827</td><td>33736</td><td>99</td></tr> <tr><td>8/10/2019 0:00</td><td>44887</td><td>44884</td><td>97</td></tr> <tr><td>7/18/2019 19:48</td><td>24950</td><td>25047</td><td>97</td></tr> <tr><td>8/18/2019 18:43</td><td>47796</td><td>47891</td><td>95</td></tr> <tr><td>7/28/2019 15:28</td><td>35428</td><td>35263</td><td>85</td></tr> <tr><td>8/10/2019 15:14</td><td>56820</td><td>56817</td><td>88</td></tr> <tr><td>8/5/2019 7:12</td><td>37135</td><td>37222</td><td>87</td></tr> <tr><td>8/13/2019 0:00</td><td>63467</td><td>63467</td><td>80</td></tr> <tr><td>8/25/2019 12:28</td><td>53800</td><td>53878</td><td>78</td></tr> </tbody> </table>	Date	Due	Performed	Overdue	8/22/2019 3:36	51222	51416	194	8/12/2019 0:07	44889	44887	179	8/11/2019 0:00	61367	61534	177	8/8/2019 16:04	41233	41401	168	8/20/2019 0:00	58157	58267	140	8/4/2019 15:07	57917	57156	139	8/28/2019 21:21	54734	54844	110	7/26/2019 4:23	28852	29652	100	7/22/2019 19:40	27496	27598	100	8/1/2019 22:19	33827	33736	99	8/10/2019 0:00	44887	44884	97	7/18/2019 19:48	24950	25047	97	8/18/2019 18:43	47796	47891	95	7/28/2019 15:28	35428	35263	85	8/10/2019 15:14	56820	56817	88	8/5/2019 7:12	37135	37222	87	8/13/2019 0:00	63467	63467	80	8/25/2019 12:28	53800	53878	78	<ul style="list-style-type: none"> <li>On-Time PM: 1420 (96.1%)</li> <li>Overdue PM (&lt;10%): 40 (2.7%)</li> <li>Overdue PM (&gt;10%): 10 (0.7%)</li> </ul>	<table border="1"> <thead> <tr><th>Date</th><th>Due</th><th>Performed</th><th>Overdue</th></tr> </thead> <tbody> <tr><td>8/18/2019 10:19</td><td>45287</td><td>47015</td><td>1028</td></tr> <tr><td>8/15/2019 15:07</td><td>35428</td><td>32810</td><td>522</td></tr> <tr><td>8/22/2019 12:43</td><td>33827</td><td>34095</td><td>522</td></tr> <tr><td>5/9/2019 12:57</td><td>20335</td><td>20748</td><td>413</td></tr> <tr><td>2/27/2019 15:07</td><td>27504</td><td>27821</td><td>327</td></tr> <tr><td>7/17/2019 0:00</td><td>47796</td><td>48522</td><td>286</td></tr> <tr><td>9/26/2019 1:26</td><td>24950</td><td>25188</td><td>238</td></tr> <tr><td>8/11/2019 6:43</td><td>22594</td><td>22812</td><td>219</td></tr> <tr><td>8/22/2019 3:36</td><td>51222</td><td>51416</td><td>184</td></tr> <tr><td>1/31/2019 17:31</td><td>26121</td><td>26310</td><td>219</td></tr> <tr><td>8/12/2019 0:07</td><td>44888</td><td>44887</td><td>179</td></tr> <tr><td>8/11/2019 0:00</td><td>61367</td><td>61534</td><td>177</td></tr> <tr><td>8/8/2019 16:04</td><td>41233</td><td>41401</td><td>168</td></tr> <tr><td>7/30/2019 12:28</td><td>21138</td><td>21296</td><td>157</td></tr> <tr><td>8/8/2019 0:00</td><td>58157</td><td>58267</td><td>140</td></tr> <tr><td>8/4/2019 15:07</td><td>57917</td><td>57156</td><td>139</td></tr> <tr><td>8/28/2019 21:21</td><td>54734</td><td>54844</td><td>110</td></tr> <tr><td>7/26/2019 4:23</td><td>28852</td><td>29652</td><td>100</td></tr> </tbody> </table>	Date	Due	Performed	Overdue	8/18/2019 10:19	45287	47015	1028	8/15/2019 15:07	35428	32810	522	8/22/2019 12:43	33827	34095	522	5/9/2019 12:57	20335	20748	413	2/27/2019 15:07	27504	27821	327	7/17/2019 0:00	47796	48522	286	9/26/2019 1:26	24950	25188	238	8/11/2019 6:43	22594	22812	219	8/22/2019 3:36	51222	51416	184	1/31/2019 17:31	26121	26310	219	8/12/2019 0:07	44888	44887	179	8/11/2019 0:00	61367	61534	177	8/8/2019 16:04	41233	41401	168	7/30/2019 12:28	21138	21296	157	8/8/2019 0:00	58157	58267	140	8/4/2019 15:07	57917	57156	139	8/28/2019 21:21	54734	54844	110	7/26/2019 4:23	28852	29652	100
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## CVe LIVE®

For real-time monitoring of tools, Progressive provides hardware and website access for OEMs and molders utilizing the CVe Monitors.

### Features:

- Utilizes FCC and CE certified internal components.
- Press Modules act as a node on a network, reducing the distance required in the plant for data submission to the Gateway.
- Radio Frequency (RF) antennas are interference-free in typical molding environments.
- Designated website for data collection, reporting, and file storage.



## HARDWARE



### Press Module

- 1 per press connects to the CVe Monitor via cables
- Power supply (US/International) included
- Sends data to the Gateway continuously
- Serves as a node on the network for tools running with a CVe Monitor
- Includes (1) CVEL-DATA9 Cable

### Gateway

- 1 per facility collects data from all press modules installed via RF transmissions
- Accesses the internet via cellular technology
- Sends data to the customer's web portal every 15 minutes



## REMOTE VALIDATION

Using the CVe Live website interface, the Remote Validation Kit eliminates the need to travel to mold trials and qualifications to gather information. Real-time data is available by connecting the portable system to the CVe Monitor on the mold.

- Can be easily moved between sites as qualifications dictate.
- Reduces or eliminates travel to mold qualifications.
- Users can upload and share files or documents including mold validation data, part drawings, process sheets, and quality inspection reports with global access.
- Monitor critical KPIs without being onsite.
- Generate real-time graphs and reports.
- Includes all hardware, antennas, and cables in a sturdy case. CVe Monitors and Tablets are sold separately.

Contact Customer Service for a CVe Live or Remote Validation Kit quotation.







**CVe Live Website Features:**

- Secure access for OEMs and molders.
- The Tool Dashboard gives users information at either the enterprise or plant level and allows for drill down into specifics on each tool.
- A Press Dashboard provides an overview of the status of every press and the tools that are running within them.
- Users can mark favorites and also save searches for monitoring specific programs or suppliers.
- Graphs include cycle times, efficiencies, cavitation, production loss, and preventive maintenance.
- Plant exceptions screen shows any out-of-tolerance conditions.
- PM Function allows for user-defined PM intervals. Users can create or customize PM forms and checklists for a specific maintenance program.
- Work Order function allows users to create work orders for molds, machines, or other assets.
- OEE is calculated for the both the press and the tool. This allows tooling and manufacturing operations to have separate OEE calculations to distinguish between equipment and tooling issues.
- GPS tracking allows for users to view the location of all tools by scanning a QR code using a GPS-enabled device. This feature is ideal for managers that are tracking multiple facilities or global operations. (Asset Tags sold separately on page F-7.)
- Administration and security levels are controlled by the user, and access can be customized for various roles.
- The file cabinet system is designed to store reports, tool and part drawings, and set-up sheets and can be utilized by customers with the CVe Live access.
- Automated Data Exporter allows users to schedule data exports. Data will automatically download to a specified location, in Excel or JSON format, where it can then be imported to other in use systems.
- User-defined fields make customizing data simple for Tools, Presses, and Assets.

**CVe LIVE** - PPV Manufacturing - Welcome: Plastic West 2020

Dashboard | Tools | Presses | Alerts | Activity | Work Orders | Administration

**Alerts**

- 05-MAY-20 2:41 AM ID#020487 Efficiency lower than Target by 10% or more...
- 05-MAY-20 2:41 AM T-142 55405 SBC ELED BMS Viper Efficiency lower than Target by 5% to 10%
- 05-MAY-20 2:26 AM ID#004268 Upcoming - Level 1 Tool Maintenance
- 05-MAY-20 2:21 AM ID#000959 Upcoming - Level 1 Tool Maintenance
- 05-MAY-20 12:59 AM T-142 55405 SBC ELED BMS Viper Target Efficiency Alert Expired
- 04-MAY-20 8:01 PM T-376 LFT-HOUSING S7 RAPTOR Cycle Time lower than Target by 2% to 5%
- 04-MAY-20 4:34 PM T-142 55405 SBC ELED BMS Viper Downtime
- 04-MAY-20 3:59 PM T-376 LFT-HOUSING S7 RAPTOR OK - Level 1 Tool Maintenance
- 04-MAY-20 1:38 PM T-142 55405 SBC ELED BMS Viper Cycle Time lower than Target by 2% to 5%
- 04-MAY-20 8:01 AM Pz No. 1 Overhaul - Standard Press Maintenance

**PPX Manufacturing - Tools**

Tools | Presses

**Tool Overview** (Pie chart: 90% Running, 10% Down)

**Preventive Maintenance Status** (Pie chart: 70% Upcoming PM, 30% On Schedule)

**Cycle Time Status** (Pie chart: 60% Outside UL/L1, 40% Within Tolerance)

**OEE Status** (Pie chart: 70% Outside UL/L1, 30% Within Tolerance)

**Favorite Tools**

Tool ID	Part ID	Diagram	Customer	Press	Running	Cycle Time	Efficiency	OEE	PM Status
T-132	55405 SBC ELED BMS	Viper	Top Tier Production	T-23a.1	Green	Green	Green	Green	Green
T-388	TYC-16-H7	Raptor	Top Tier Production	Tr3a.02	Green	Green	Green	Green	Green
T-325	LFT-HOUSING S7	Raptor	Top Tier Production	Es_2a	Green	Green	Green	Green	Green
T-62	Snap-Top-#84	Viper	Top Tier Production	Es_3a.3	Green	Green	Green	Green	Green

**Activity**

- 05-MAY-20 2:43 AM ID#000055 Target OEE (90.0%) Replaced: 96.20
- 05-MAY-20 2:43 AM ID#00N4768 Target Efficiency Override Added: 95.0
- 05-MAY-20 2:43 AM ID#00N4768 Target Cycle Time Override Added: 6.0
- 05-MAY-20 2:43 AM ID#00N4768 Start Cycle Count Override Added: 0
- 05-MAY-20 2:43 AM ID#00N4768 Target Cycle Time Bounds Updated
- 05-MAY-20 2:43 AM ID#00N4768 Target Cycle Time Bounds Updated
- 05-MAY-20 2:43 AM ID#00N4768 Target OEE Baseline Added: 40.00
- 05-MAY-20 2:43 AM ID#00N4768 Target OEE Added: 73.00
- 05-MAY-20 2:43 AM ID#00N4768 Target Efficiency Override Added: 95.0
- 05-MAY-20 2:42 AM ID#000055 Target Cycle Time Override Added: 6.4
- 05-MAY-20 2:42 AM ID#000055 Target Efficiency Bounds Updated
- 05-MAY-20 2:42 AM ID#000055 Target Cycle Time Bounds Updated

**ID #OPQ7500** Remove from Favorites View 1 Open Work Order

Reject Downtime Work Order Parts Consumed Maintenance Cavitation

Tool Owner: Sontoya Mfg Engineer: Carol Knowles Cavitation: 16 of 16

OEM ID: SONT1 Processor: Starting Cycle Count: 0

Asset ID: A-7890-Y675 Tool Type: Hot Runner Last Cycle Count: 76,512

Tool Builder: Mold House Temperature: 66°C Cycles Until PM: -16,512

Location: PPX Manufacturing Firmware: 3.4.0.0 Last 50 Cycles Avg (s): 7.2

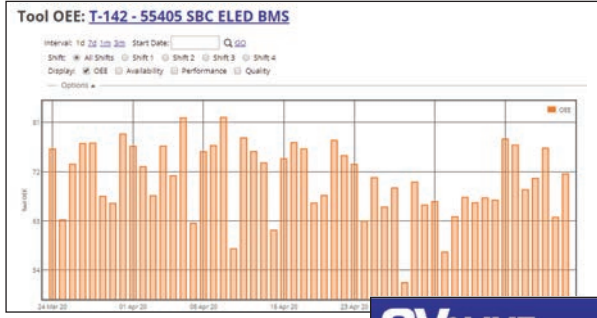
Last Connect: 2019-09-16 14:06:23 Rejects Today: 0 Downtime Today: 00:00

Tool ID: T-325\* Target Efficiency: 90.0 Alert Temp: 70 °C

Program Name: Mocha Target Cycle Time: 7.2

Part ID: 55405 SBC ELRD BMX Idle Threshold (s): 201

Customer: Sontoya Mfg Sleep Threshold (m): 360



**Reports**

- Tool Summary
- Tool Connection History
- Historical PM

**Logs**

- Activity
- Alerts
- Parts Consumed
- Work Orders

**File Cabinet** 9.97 GB free of 10 GB

- Press Documents
- Press PM Reports

**CVe LIVE** - All Plants - Welcome to CVe Live

Dashboard | Tools | Presses | Alerts | Activity | Work Orders | Administration

**Tools**

Select Via Search Select Via Saved Search Select devices below before you: Select one

Click column name to sort. Define default columns in SETTINGS.

TOOL ID	DEVICE ID	CURRENT COUNT	TARGET %	1 WEEK EFFICIENCY	24 HR EFFICIENCY	1 HR EFFICIENCY	1 WEEK CYCLE AVG	24 HR CYCLE AVG	1 HR CYCLE AVG	PRODUCTION BY SHIFT 1	PRODUCTION BY SHIFT 2	CYCLES PER MIN	NEXT PM NAME	LAST PM DATE	LAST PM LIFETIME	24 HR MAX TEMP
T-142*	OPQ2500	1,151,808	90.0	79.0	81.0	90.0	7.2	7.2	7.2	72,464	82,928	25,736	Level 1 Tool Maintenance	1,151,760	23-SEP-19	73.00
T-132	OPQ5500	57,281	90.0	91.0	86.0	100.0	10.3	9.8	7.4			856	Level 1 Tool Maintenance	48,137	26-AUG-19	86.00
T-388	OPQ5500	42,910	90.0	99.0	99.0	100.0	164.3	163.8	165.4	262	258	8,016	Level 1 Tool Maintenance	60,026	19-SEP-19	43.00
T-325*	OPQ7500	76,512	90.0	66.0	64.0	53.0	7.2	7.2	7.2			-16,512	Level 2 Tool Hot Runner Maintenance	62,166	26-AUG-19	73.00
T-376	OPQ3500	138,991	90.0	98.0	98.0	100.0	54.5	54.9	53.8	1,548	1,538	4,032	Level 1 Tool Maintenance	133,023	19-SEP-19	66.00
T-62	OPQ1500	896,897	90.0	90.0	87.0	92.0	10.4	10.4	10.4	29,552	29,192	-18,418	Level 1 Tool Maintenance	868,481	19-SEP-19	86.00

# PROFILE® ASSET MANAGEMENT SYSTEM

**A** General | PMs | Work Orders

**Mold Information**

Tool Owner: Craig Industries | Asset Class: Mold | Cavitation: 8  
 PRO ID: CRIN | Designer: J. Jones | Starting Cycle Count: 1  
 Asset ID: H-IM768-001 | Design Revision: C | Last Cycle Count: 161,868  
 Tool Builder: Acme Mold | Asset Type: Injection Mold | Cycles Until PM: 13,132  
 Purchased Loc.: Chicago | Tool Type: Stripper Plate | Tonnage Required: 500.0  
 Location: Miami, FL | Tooling Cost: 100,000.00 | Mold Weight: 9,000.0  
 Tool ID: T-0800 | Target Efficiency: 95.0  
 Program Name: Raptor | Target Cycle Time: 35  
 Part No.: F-22-0098  
 Part Name: Battery Case  
 Customer: Craig Industries | Counter/Monitor S/N: QV12953  
 Custom 1: 10000  
 Custom 2: 50000

**B** Documents

**C** Map | Satellite | Filter

The ProFile tracking system is a comprehensive solution for managing assets. The cloud-based system organizes assets and stores related documents and photos, while also logging GPS locations.

Several options of Asset Tags and Plates are offered on the following page.

- A** Different asset types require different types of data. Profile offers four asset classes (molds, dies, machines, equipment) with customizable asset types under each class. There are also several user defined fields to give users increased flexibility.
- B** Each asset page includes a filing cabinet to store critical documents associated with that asset. These documents can be easily accessed and shared by users with permissions. Users have 10GB of storage associated with their asset database.
- C** When logging in to ProFile via ProFile-System.com, the dashboard shows a breakdown of assets in the system by asset class. Clicking on any of the asset classes on the chart will drill down to the detailed listing. Also, the dashboard shows Preventive Maintenance status of assets for easy access to overdue PMs.
- D** See a complete list of all assets in one place or choose the tab for the asset class to filter by. All fields on the tool listing are sortable using the header fields.

**ProFile®**  
Asset Supply Tracking

Dashboard | Assets | Customers | Activity | Reports | Administration

**Dashboard**  
Welcome to the ProFile Asset Management System

**C**

**Assets**

Press: 2 | Mold: 1 | Equipment: 2 | Die: 3

**Preventive Maintenance**

Past Due: 3 | On Schedule: 7

**ProFile®**  
Asset Supply Tracking

Dashboard | **Assets** | Customers | Activity | Reports | Administration

**Assets**

All Assets | Molds | Dies | Machines | Equipment

**D**

**All Assets**

Unique AST #	Cust	Asset Class	Asset Type	Asset ID	Location	Customer	Tool Owner	PRO ID
AST00000008	Progressive	Mold	Blow Mold	BM-8976	Plant B	Jones Ind	Contour Molding	CONM
AST00000004	Progressive	Mold	Injection Mold	IM-186768-001	Miami, FL	Craig Industries	Craig Industries	CRIN
AST00000007	Progressive	Mold	Injection Mold	IM-1187-A	Austin, TX	Tech Industries	Acme Mold	ACME
AST00000005	Progressive	Die	Die Cast	D-2677	Plant 3	Tri Cast	Acme	ACMD
AST00000009	Progressive	Die	Die Cast	D-0980	Plant 4	Durable Products	Durable Products	DURP
AST00000006	Progressive	Die	Stamping	D-987	Building 1	Sky Products	Qwik Stamp	QKST

## Mobile Functionality and GPS

Scan the QR code on the Asset Tags or Plates on your mobile device to see a summary view of the assets. To see additional data, press the details button. Every time a QR code is scanned, the GPS location is pushed to the cloud and recorded on the asset page.

## Preventive Maintenance and Work Orders

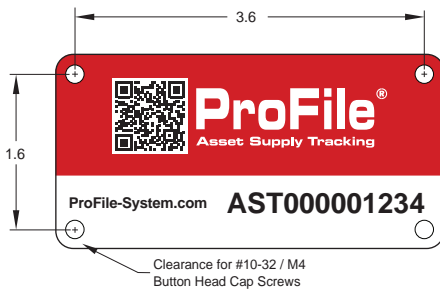
Users can create checklists and assign them to assets to view how many cycles or date assets are from requiring maintenance. To schedule maintenance or other activities, Work orders can be utilized to track unscheduled maintenance and repairs for assets.

For a demonstration or to set up an account for ProFile system access, contact Customer Service.





# PROFILE® ASSET TAGS AND PLATES



## SPECIFICATIONS: STANDARD TAGS

- Two sizes available for either ProFile or CVe Live database use.
- 8 mils thick aluminum, brushed finish.
- 3M 467 adhesive can be affixed to standard tool steel. Max temp 150°C (300°F)
- Serial number (AST prefix) is established by Progressive and aligns to customer-specific asset identification within ProFile-System.com.
- Small versions fit on CounterViews. Refer to page F-8.
- Minimum order quantity is 25 tags of any type and must be purchased in increments of 25.
- ProFile account required and established at time of purchase.

CATALOG NUMBER	SIZE	DESCRIPTION
AMTG-S24	4" x 2"	ProFile Asset Tag-Large
CVTG-S24	4" x 2"	CVe Live Asset Tag-Large
AMTG-S15	1.25" x .5"	ProFile Asset Tag-Small
CVTG-S15	1.25" x .5"	CVe Live Asset Tag-Small

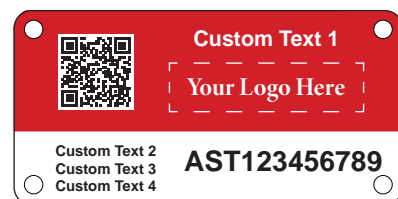
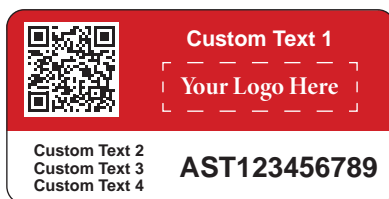
## SPECIFICATIONS: STANDARD PLATES

- Size: 4" x 2"
- 20 mils thick aluminum.
- Provides heat resistance for assets up to 315°C (600°F).
- Bolts to mold base/asset with included button head cap screws.
- Minimum order quantity is 25 plates and must be purchased in increments of 25.
- ProFile account required and established at time of purchase.

CATALOG NUMBER	SIZE	DESCRIPTION
AMTG-P24	4" x 2"	ProFile Asset Plate
CVTG-P24	4" x 2"	CVe Live Asset Plate

## CUSTOM TAG & PLATE ORDERING INFORMATION

- Specifications are same as standard Tags and Plates, shown above.
- Layout is as shown in the options below, but the color can be selected to match your company's logos. All custom Tags/Plates include the QR code and unique serial number. Additional text is optional with the locations shown below for the larger Tags and Plates.
- Minimum order quantity = 50 for 4x2" Plates and Tags; 100 for the 1.25 x .5" tags.
- Contact Customer Service for full specifications and file format requirements.
- Delivery for initial order is 3 weeks, including proof time.





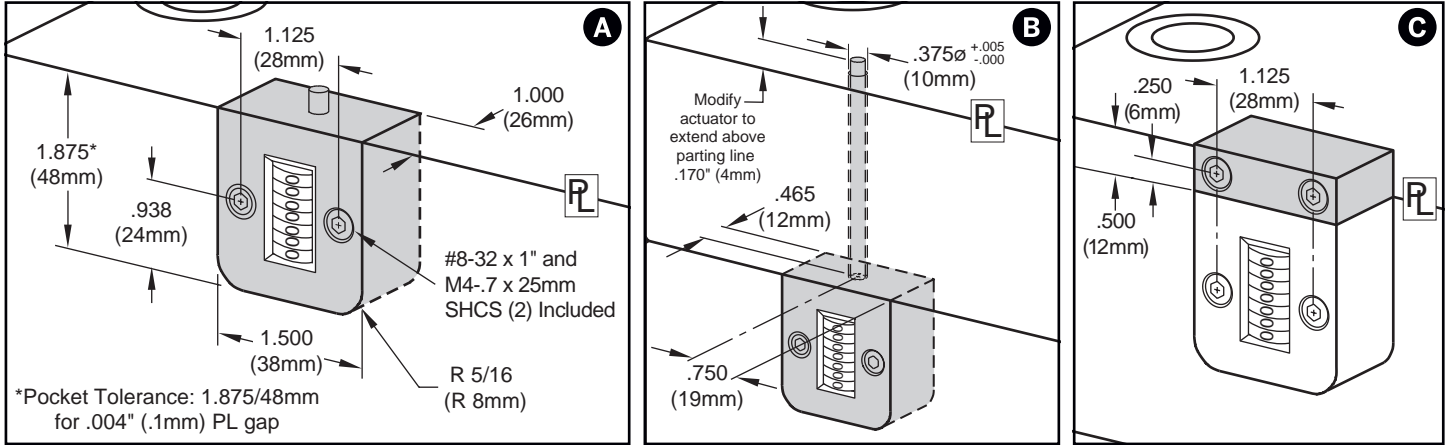
# COUNTERVIEW® S-SERIES



Progressive's CounterView positively monitors mold activity, validates process monitoring data, and assists mold maintenance procedures.

- Maximum operating temperatures:
  - 250° F (120° C) Standard CounterView
  - 375° F (190° C) High Temp CounterView
- Counter: Non-resettable mechanical, 7-digit
- Available for installation on the movable or stationary halves and with extensions.
- For heat protection, refer to the Insulators available on pages F-10 and F-11.

**M** Glass-filled Nylon housing



## MOUNTING OPTIONS

<b>Parting Line Mount</b>	<b>A</b>	Parting line mount makes unit easily visible to operator.
<b>Internal Extension Mount</b>	<b>B</b>	Machinable 8" (200mm) included extension rod allows installation in support plate or rail. Available with Standard CounterViews only.
<b>External Mount</b>	<b>C</b>	No pocket machining necessary. Designed specifically for retrofit applications. Order the Parting Line Mount and the CVE-EXT Block as shown below.

### Operator Side: Movable Half / B Side



CATALOG NUMBER	VERSION & MOUNTING STYLE
<b>CVPL-B</b>	Standard: Parting Line
<b>CVIN-B</b>	Standard: Internal Extension
<b>CVPLHT-B</b>	High Temp: Parting Line

Screws included.

### Operator Side: Stationary Half / A Side



CATALOG NUMBER	VERSION & MOUNTING STYLE
<b>CVPL-A</b>	Standard: Parting Line
<b>CVIN-A</b>	Standard: Internal Extension
<b>CVPLHT-A</b>	High Temp: Parting Line

Screws included.

Note: CounterViews can be ordered pre-set to a specific cycle count. Contact Customer Service for more information.

## ACCESSORIES



CATALOG NUMBER	DESCRIPTION
<b>CVE-EXT</b>	External Mounting Block including #8-32 x 1" (2) and M4 x 25mm screws (2)
<b>CVID</b>	ID Plate for CounterView



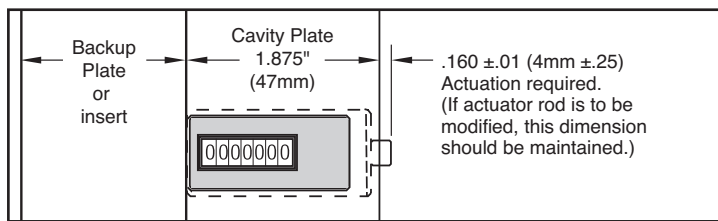
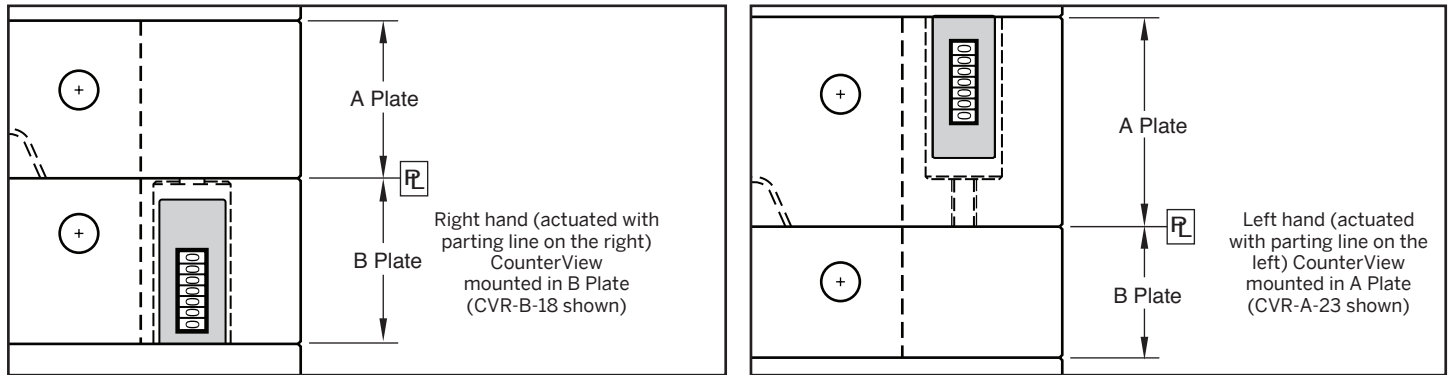
# COUNTERVIEW® R-SERIES

Progressive's CounterView positively monitors mold activity, validates process monitoring data, and assists mold maintenance procedure

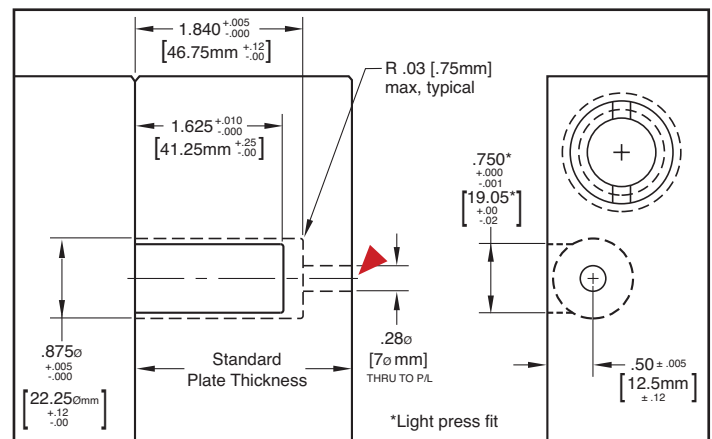
- Maximum operating temperature is 250 °F (120 °C). For heat protection, refer to the Insulators available on pages F-10 and F-11.
- Counter: Non-resettable mechanical, 7-digit



## M Glass-filled Nylon housing



The R-Series CounterView can be installed in the A or B plates with a minimum thickness of 1.875" (47mm). Larger plates utilize a threaded rod (included with each) that is pre-machined to the appropriate length for standard plate thicknesses to provide consistent actuation.



▶ CAD insertion point

### Operator Side: Movable Half / B Side



Inch Standard		Metric Standard	
CATALOG NUMBER	Nominal Plate Thickness	CATALOG NUMBER	Nominal Plate Thickness
CVR-B-18	1.875	CVR-B-56	56
CVR-B-23	2.375	CVR-B-66	66
CVR-B-28	2.875	CVR-B-76	76
CVR-B-33	3.375	CVR-B-96	96
CVR-B-38	3.875	CVR-B-116	116
CVR-B-43	4.375	CVR-B-196	196
CVR-B-83	8.375		

### Operator Side: Stationary Half / A Side

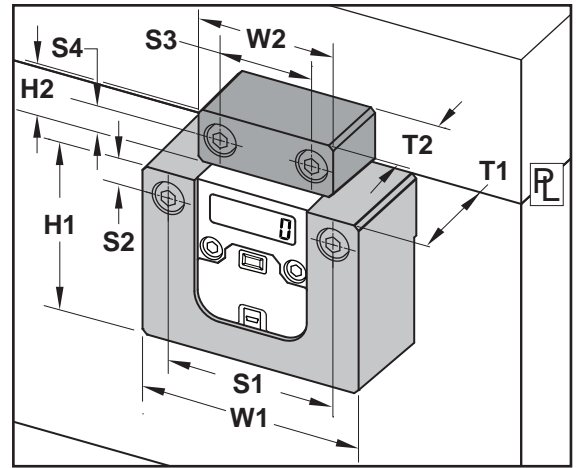


Inch Standard		Metric Standard	
CATALOG NUMBER	Nominal Plate Thickness	CATALOG NUMBER	Nominal Plate Thickness
CVR-A-18	1.875	CVR-A-56	56
CVR-A-23	2.375	CVR-A-66	66
CVR-A-28	2.875	CVR-A-76	76
CVR-A-33	3.375	CVR-A-96	96
CVR-A-38	3.875	CVR-A-116	116
CVR-A-43	4.375	CVR-A-196	196
CVR-A-83	8.375		

Each R-Series CounterView includes the actuator. All except CVR-B-18 and CVR-A-18 require attachment of the actuator rod to the threaded CounterView unit.

# INSULATOR BLOCKS

## EXTERNAL MOUNT



### Application Guidelines:

- Maximum temperature: 180°C/360°F.
- Installation can be on the cavity or core half of the tool. For use with CVe Live, mount to the stationary half for optimum cable routing.
- The Inch or Metric Insulator Block accepts the screws from the square CounterView sold on page F-8 or the CVe Monitor sold on page F-1.

**M** Durethan

CATALOG NUMBER	DESCRIPTION	HI	WI	TI	SI	S2	H2	W2	T2	S3	S4
CV-BLK	Inch version with screws: (2) 1/4-20 x 1-1/8 (Actuator) (2) 1/4-20 x 1-1/2 (Block)	2.37	3.00	1.37	2.250	.500	.75	2.00	1.00	1.000	.375
CVMM-BLK	Metric version with screws: (2) M6-1.0 x 30 (Actuator) (2) M6-1.0 x 40 (Block)	58.5	78	35	58	13	20	47	25	23	10

# INSULATOR BLOCK

## R-SERIES COUNTERVIEW ATTACHMENT BLOCK



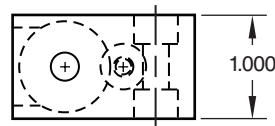
**M** A36 **S** Black Oxide

CATALOG NUMBER	DESCRIPTION
CVRA-100	CounterView Attachment Block Set

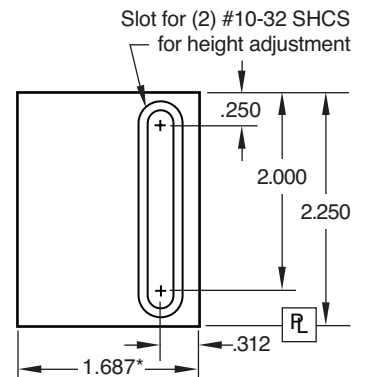
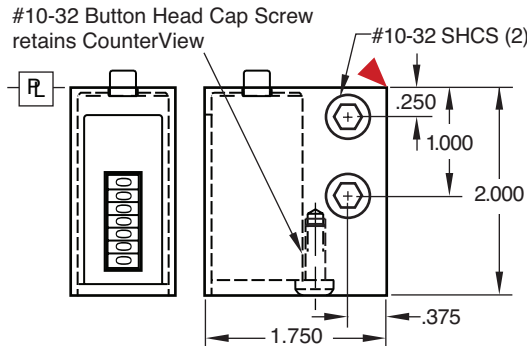
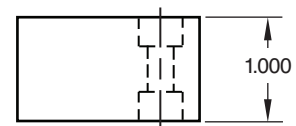
CAD insertion point

The CV Attachment Block set includes both blocks and mounting screws. R-Series CounterViews are sold separately on page F-9.

CounterView Block



Actuation Block



Note: The width of the Actuation Block is smaller by 1/16" to allow for clearance if the CounterView Block is recessed into the mold.

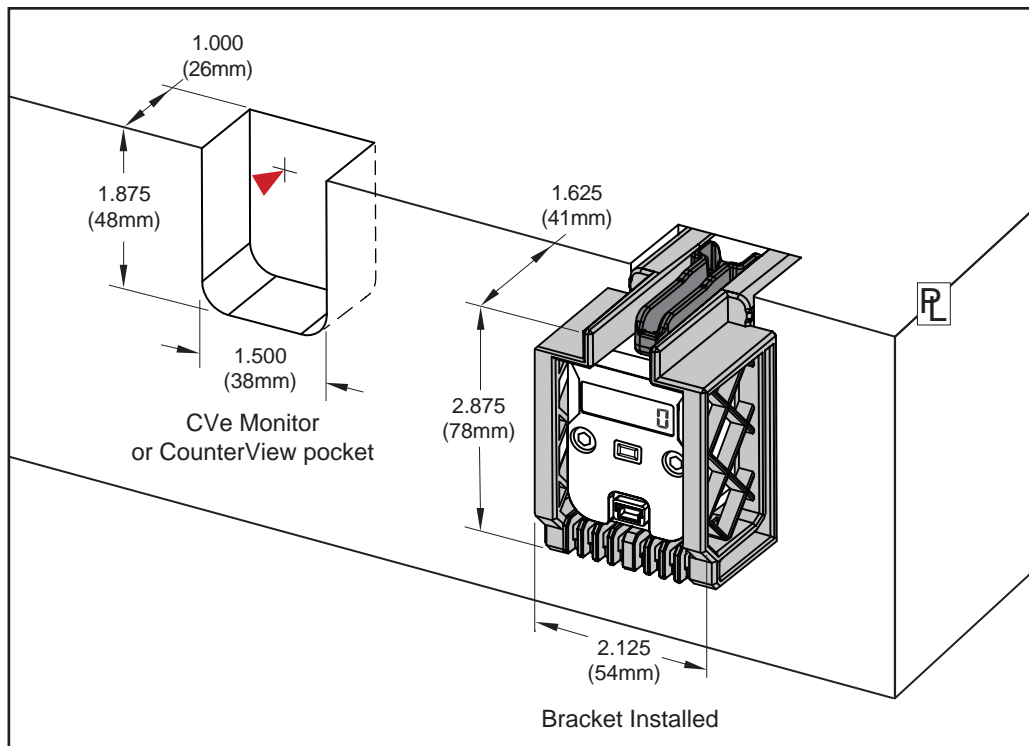


# INSULATOR BLOCKS

## RETROFIT BRACKET

Progressive's Insulator Bracket insulates the CVe Monitor or CounterView in high heat applications, installing within existing pockets without any modification to the mold's cavity half or core half.

- Maximum temperature: 210°C/410°F



▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
CV-BRACKET	Inch version with screws: (2) #8-32 x 1.5
CVMM-BRACKET	Metric version with screws: (2) M4-.7 x 35mm

### Application Guidelines:

- The Inch or Metric Insulator Block assembly sits in the pocket as shown above, and utilizes the screws from the square CounterView sold on page F-8 or the CVe Monitor sold on page F-1.
- The Bracket can be installed on the cavity or core half of the tool. For use with CVe Live, mount to the stationary half for optimal cable routing.
- The CVe Monitor or CounterView are actuated via a Striker which is attached to the Insulator Bracket as a single unit. No preload adjustment is required.

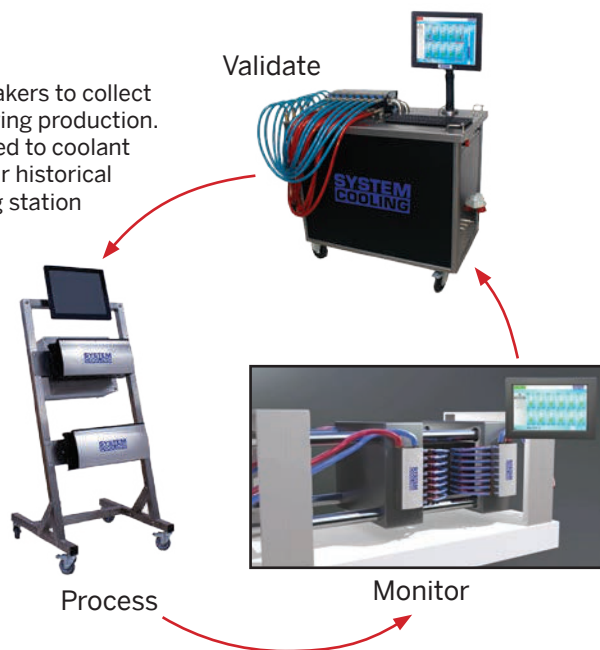


# SYSTEM COOLING™

System Cooling is a suite of products that allows injection molders and mold makers to collect and view data on the cooling lines within a mold and the cooling parameters during production. Molders utilizing the process monitoring system can view and collect data related to coolant flow, temperature, and pressure with information recorded and time stamped for historical tracking. Mold makers and tool room managers can utilize the Test Rig, a testing station that analyzes the mold for flow capacity, leaks, and optimal process set points.

### Benefits:

- Allows for troubleshooting of quality inconsistencies.
- Alarms when process deviations are detected, reducing scrap.
- Reduces setup errors by the detection of flow constraints due to closed valves or dead-headed circuits.
- Identifies flow deviations from long-term corrosion build up, blockages, or equipment faults.
- Identifies temperature deviations and fluctuations from cycle time changes, unauthorized adjustments, or equipment faults.
- Validations certify that molds are production-ready.
- Aids in scheduling maintenance intervals base off past analysis and historical data, while also providing reporting capabilities.



## SYSTEM COOLING™ PROCESS MONITORING MANIFOLDS

The instrumented manifold takes the place of traditional distribution manifolds on molding machines. Its compact form and stainless steel construction grants versatility in a variety of applications from harsh environments to space-limited configurations and clean rooms. The flow sensors operate on the vortex flow principle without any moving parts. Manifolds can be mounted to the molding machine or a separate cart.

### Manifolds monitor:

- Supply temperature
- Supply pressure
- Return temperature by zone
- Flow by zone
- Return pressure

### Additional features include:

- Main supply and return ports on both top and bottom of manifold provide flexibility.
- No moving parts and large unrestricted flow path.
- Color-coded ball valves and 300 series connectors installed.



### Ordering Information

ZONES	FLOW RANGE	MAX TEMPERATURE	CATALOG NUMBER
4	.25-5.25 GPM / 1-20 LPM	200° F / 95° C	SCM-4-1-SS
		250° F / 120° C	SCM-4-1-SS-HT
	.5-10.5 GPM / 2-40 LPM	200° F / 95° C	SCM-4-2-SS
		250° F / 120° C	SCM-4-2-SS-HT
8	.25-5.25 GPM / 1-20 LPM	200° F / 95° C	SCM-8-1-SS
		250° F / 120° C	SCM-8-1-SS-HT
	.5-10.5 GPM / 2-40 LPM	200° F / 95° C	SCM-8-2-SS
		250° F / 120° C	SCM-8-2-SS-HT
12	.25-5.25 GPM / 1-20 LPM	200° F / 95° C	SCM-12-1-SS
		250° F / 120° C	SCM-12-1-SS-HT
	.5-10.5 GPM / 2-40 LPM	200° F / 95° C	SCM-12-2-SS
		250° F / 120° C	SCM-12-2-SS-HT



*Flow and temperature are measured in each zone individually.*

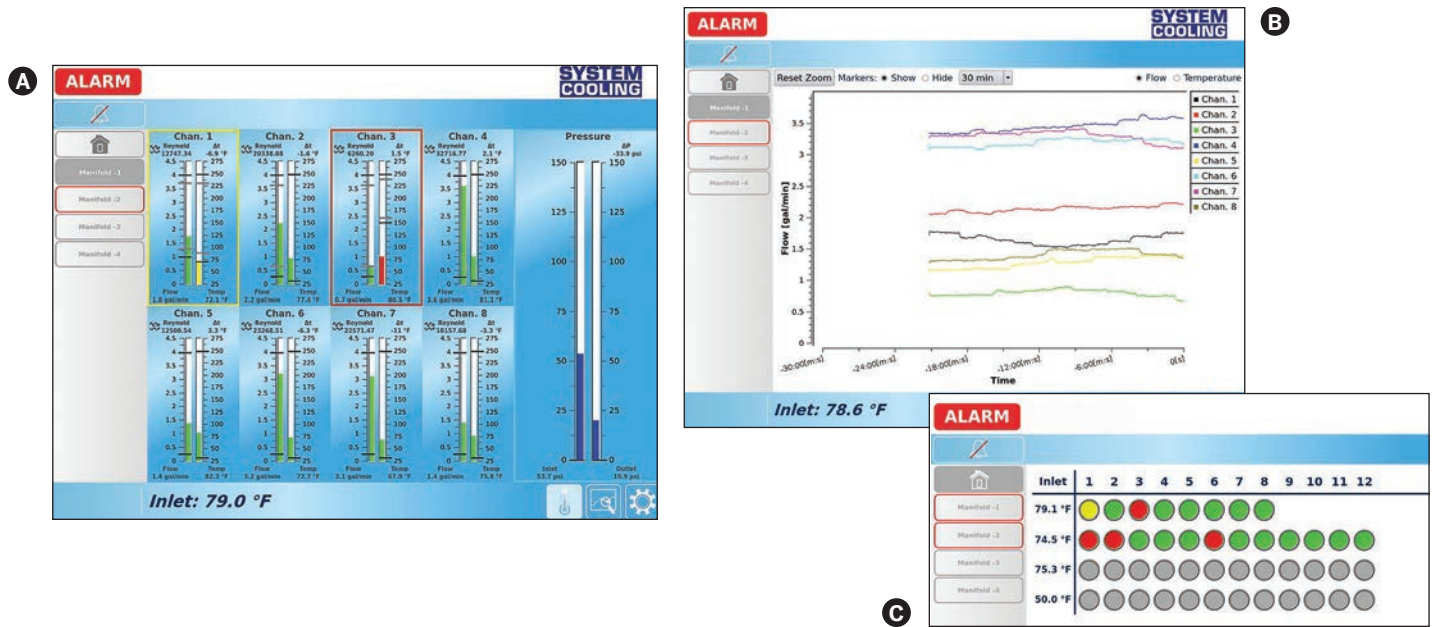
Monitoring system consists of Manifolds and required electronics. Please contact Customer Service for system information and quotes.



# SYSTEM COOLING™ SOFTWARE

The System Cooling software interface is easy to use with only five screens to navigate. The system provides real-time information, historical data, and profiles (mold ID, circuit names, and data thresholds) for mold management:

- A Information Display**
  - Temperature deltas between supply and return are calculated per zone.
  - Reynolds numbers are calculated per zone, and laminar, transitional, or turbulent status is displayed.
  - Alarms are activated per monitored parameter based on the profiles of the molds.
- B Historical Data**
  - Graphs present data for the most recent two hours of production.
  - Data can be exported via USB or by network connection for viewing in Excel or additional systems.
- C System Overview**
  - The status of the entire system, all zones of all manifolds, can be viewed at a glance.



## MOUNTING

The System Cooling Monitoring System can either be permanently installed on a molding machine or mounted to a mobile cart as shown on the following page.

When mounted to a machine, the System Cooling I/O module, included with every system, can communicate to external devices such as the molding machine, part diverters, stack lights, and data networks.

- Alarm or warning state can switch molding machine to semi-auto or manual mode.
- Part diverters can automatically separate nonconforming parts.
- Illuminate stack lights for visibility to technicians.
- Data markers from the molding machine, typically at the beginning of each cycle, can be accepted and overlaid on the data.
- Machine idle state input signals the system to suppress alarm output during alarm state.

The system is also VNC capable, eliminating the need for a touchscreen controller. The interface can be accessed via VNC from a smartphone, laptop, or the machine controller.

Note: Molding presses must be verified for compatibility.



## SYSTEM COOLING™ PORTABLE CART

As an alternative to permanently dedicating System Cooling to a press, the system can be mounted to a mobile cart.

Applications that can benefit from a mobile cart include:

- Troubleshooting
- Process development for new molds.
- Ad-hoc projects and validation efforts.

On the standard carts, one or two manifolds can be mounted utilizing the item numbers below. Custom configurations are also available by contacting Customer Service.



### Ordering Information

CATALOG NUMBER	TYPE
SCP-CART8	Portable Cart for 8-zone Manifolds
SCP-CART12	Portable Cart for 12-zone Manifolds

### SYSTEM SPECIFICATIONS

Contact [tech@procomps.com](mailto:tech@procomps.com) for additional specifications or questions.

MANIFOLD SPECIFICATIONS	
Manifold Feed Ports	1" BSPP
Circuit Ports	3/8 (-1) or 1/2 (-2) NPT
Regulation	Color-Coded Ball Valves
Connections	300 Series Quick Connectors
Maximum Pressure	145 PSI
Maximum Temperature	200° F / 95° C (Std) 250° F / 120° C (High Temp)
Flow Sensor Type	Vortex
Accuracy-Flow	1.5% fs
Accuracy-Temperature	+/- 1.5% fs
Resolution-Temperature	0.9°F/0.5°C
Response Time	< 1 s
Seals	EPDM

SOFTWARE & ELECTRONICS SPECIFICATIONS	
Display	15.6" Touch Screen
Communication Ports	Ethernet / USB
Communication system	ASCII (USB)/HTML/SSH (optional)/VNC
Supported Protocols	USB Serial / TCP / IP
Machine Controller Integration	VNC
Maximum Supported Manifolds	8 Manifolds / 96 Zones
Display Units	°C, LPM, Bar / °F, GPM, PSI
Alarm Units	User Defined
Warning Limits	10% of alarm limits (optional)
Alarm & Warning Output	N/C and N/O Dry Contacts
Marker Input	24 VDC Galvanically Isolated
Idle Input	24 VDC Galvanically Isolated
Power Supply	12-24 VDC



# SYSTEM COOLING™ TEST RIG

The Test Rig analyzes molds to validate, maintain, and optimize processes. The Rig runs flow capacity and pressure leak tests, and the premium version also determines optimal cooling process parameters. Reports are generated from the results and can be sent, saved, or printed. The Test Rig is a standalone test station equipped with a water reservoir, pump, 8-zone manifold, and unique control system and offered with three different models for customer applications.

## New Molds

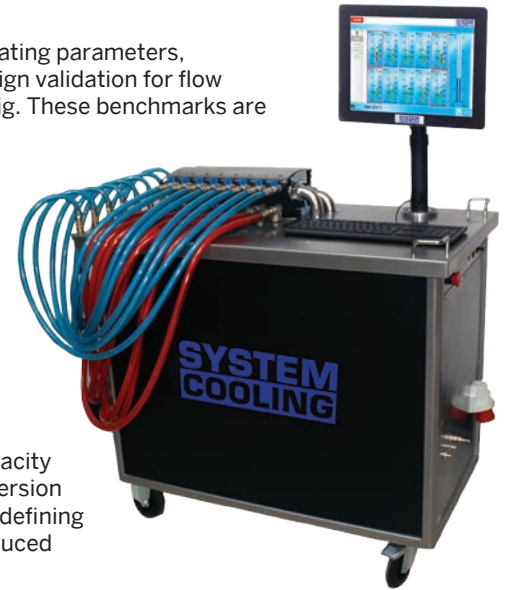
Mold makers are able to provide new tools to the customer complete with a report of operating parameters, including data relating to the cooling circuits in the mold. Traceable documentation of design validation for flow capacity under simulated production conditions and leak testing is provided by the Test Rig. These benchmarks are vital for any quality assurance process and establish a baseline for future comparisons.

## Mold Maintenance

Mold cooling circuits need to be maintained regularly to remove scale and rust to ensure maximum productivity. With the Test Rig, the cooling channels can be analyzed and tested easily. The pressure can be precisely controlled by the variable output pump through the user interface to simulate the production environment. Each report can be compared against the baseline values to determine required maintenance and establish maintenance intervals for future service. The test results certify that a mold has regained flow capacity values and is in ready to run condition before being sent back to production.

## Process Optimization

The cooling circuit flow capability at a given supply pressure is determined by the flow capacity test. The additional optimization executed by the extended flow test within the premium version determines the minimum required supply pressure to achieve maximum flow. This aids in defining process parameters to conserve central cooling supply capacity, potentially leading to reduced energy consumption.



## Ordering Information

CATALOG NUMBER	FLOW RANGE
SCTR-1-*	8 Zone Test Rig - .25-4 GPM / 1/15 LPM
SCTR-2-*	8 Zone Test Rig - .5-10.5 GPM / 2-40 LPM

Specify the Test Rig catalog number above followed by the model suffix shown at right. Ex: SCTR-2-M will be the Test Rig Premium Model with the higher flow range.

MODEL TYPE	FEATURES
<b>Test Rig (-B)</b>	<ul style="list-style-type: none"> <li>Flow capacity and leak tests</li> <li>Plug and play, ready for testing</li> <li>Ports for data export or networking</li> </ul>
<b>Test Rig Plus (-P)</b>	Includes basic Test Rig features, plus: <ul style="list-style-type: none"> <li>Advanced software with extended flow optimization test.</li> <li>Built-in WiFi router capable of sending reports directly to a printer</li> </ul>
<b>Test Rig Premium (-M)</b>	Includes the same features as the Plus model and adds: <ul style="list-style-type: none"> <li>Automatic water change system</li> </ul>

TEST RIG SPECIFICATIONS	
<b>Zones</b>	8
<b>Regulation</b>	Color Coded Ball Valves
<b>Connections</b>	300 Series Quick Connectors
<b>Flow Sensor Type</b>	Vortex
<b>Accuracy - Flow</b>	1.5% fs
<b>Max Total Flow</b>	32 GPM / 120 LPM
<b>Max Pump Pressure</b>	85 PSI
<b>Max Rated Pressure</b>	145 PSI
<b>Seals</b>	EPDM
<b>Display Units</b>	°C, LPM, Bar / °F, GPM, PSI
<b>Ports</b>	Ethernet and USB
<b>Power Requirements</b>	480v 60Hz 5A

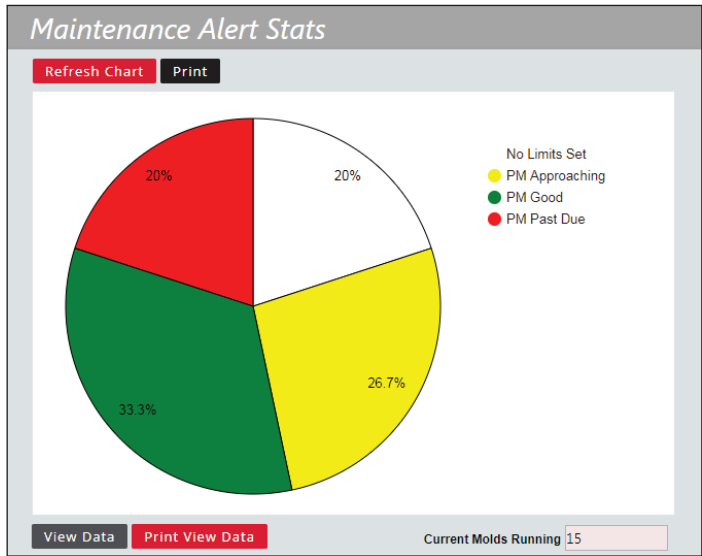


# MOLDTRAX™

## MOLD MAINTENANCE SOFTWARE

### MTWEB Features Include:

- Now completely accessible from anywhere in the world as a mobile-friendly, secure, web-based system.
- A Mold Performance “Dashboard” is now available from the main screen that shows the ongoing ratio of Scheduled vs. Unscheduled mold stops and also Top Mold Tooling costs and part quality defects
- Tracking all costs associated with individual or grouped molds, products, or mold frame styles.
- Comes preloaded with industry mold maintenance terms and explanations/descriptions in several important fields that can be edited/customized as the user requires.
- Many standard reports, specifically created for mold and maintenance tracking and cost analysis by entering your date range and selecting a report.
- Creates a baseline of data to set targets and goals and to measure continuous improvement.
- Includes a new Maintenance Efficiency report for repair technician training.
- Contact database allows for entries of customers, vendors, and employees for easy accessibility.



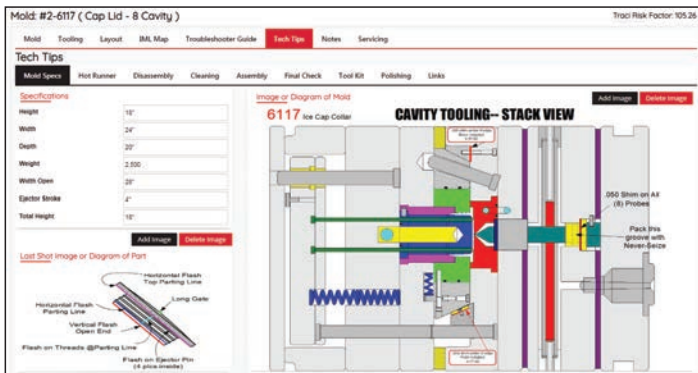
- MoldTrax New PM Alert report shows what molds are running and proximity to a PM based on cycle counts that may be entered manually or electronically from many other systems.
- Link to images, video's and other external documentation instantly.
- All screens have been enlarged and many include Zoom windows with rich (customizable) text.



The Maintenance Tracking Section displays mold production run dates and times, press number and stop reasons, along with mold configuration changeovers.

#	Type	Description	Part#	Detail#	Vendor	Cost	Parts on Hand	Reorder Level	#Ordered	Date Ordered	#Received	Add Item
1	Cavity	CAVITY PROTECTED, H.H. (DUB)	0750003	-01	Teising R. Lin	\$2,500	15	5				Add Item
2	Cavity	CAVITY PROTECTED, H.H. (DUB)	0750003	-02	Teising R. Lin	\$425	8	5				Add Item
3	Cavity	CAVITY PROTECTED, H.H. (DUB)	0750003	-03	Teising R. Lin	\$425	8	5				Add Item
4	Cavity	CAVITY PROTECTED, H.H. (DUB)	0750003	-04	Teising R. Lin	\$425	8	5				Add Item

An Inventory Monitoring feature has been added to allow the user to see how many components are left in stock, reorder amounts, and dates. Links can be added for quick ordering from your favorite component supplier. An Inventory Report may be run to monitor inventory and check the balance on hand of all components, in all molds.



The Tech Tips section allows for critical bench procedures, techniques and special tools required to be documented, organized and shared with toolroom employees to keep repairs consistent and safe.

- System Requirements:**
- Only needs a Browser (Chrome, Microsoft Edge recommended)

- MoldTrax Ordering Information:**
- To order a copy of MTWEB or the MTWEB Upgrade, please call MoldTrax LLC at 1-419-281-0790 or email Steve@MoldTrax.com.



# CAM ACTIONS

## SLIDE COMPONENTS

### SECTION G



CamAction 100 Series	CamAction 200 Series	CamAction 250 Series	CamAction 300/350 Series
Prefix: CA, CAMM	Prefix: CA, CAMM	Prefix: CA	Prefix: CA, CAMM
Page: G-2	Page: G-3	Page: G-6	Page: G-8



CamAction 400 Series	Slide Retainers	SRT Bases & Bushings	Angle Pin
Prefix: CA	Prefix: SRT, SRTM	Prefix: SRTBA, SRTBU	Prefix: AP
Page: G-13	Page: G-15	Page: G-17	Page: G-18



Slide Retainer: Urethane	Wear Plates	Bronze Wear Plates	L- GIB
Prefix: RET	Prefix: WP	Prefix: WP	Prefix: LGIB
Page: G-18	Page: G-19	Page: G-20	Page: G-20







# CAM ACTION® ASSEMBLIES SELECTION GUIDE

Progressive's CamActions provide easy installation for molding and releasing details. Several sizes and travel configurations are available.

- Advanced materials and treatments for long-lasting production.
- Inserts and pins available in all series.
- For application assistance, please contact tech@procomps.com.



## Inch Standard

TRAVEL	OVERALL ASSEMBLY SIZES	CATALOG NUMBER	CAMACTION SERIES	PAGE NUMBER
.160"	1.00" X 1.25" X 1.00" H	CA-100	100 Series	G-2
.230"	1.00" X 1.25" X 1.50" H	CA-200	200 Series	G-3
.230"	1.00" X 1.25" X 4.12" H	CA-200L*		
.150"	.50" X .75" X 1.25" H	CA-250-15	250 Series	G-6
.310"	.80" X 1.38" X 1.75" H	CA-250-31		
.500"	1.25" X 2.00" X 2.75" H	CA-250-50	300 Series	G-8
.250"	1.50" X 2.25" X 2.25" H	CA-300		
.250"	1.50" X 2.25" X 5.79" H	CA-300L*		
.750"	1.50" X 2.63" X 2.63" H	CA-350	350 Series	G-10
1.000"	3.00" X 4.00" X 4.44" H	CA-400	400 Series	G-13

L= Longer Driver or Lock to extend below parting line.

## Metric Standard

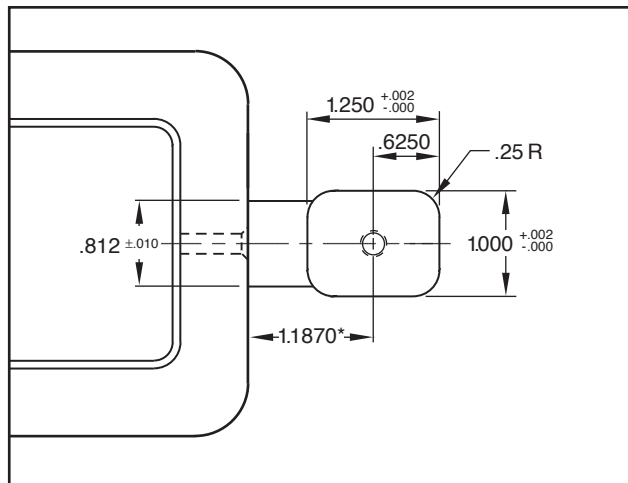
TRAVEL	OVERALL ASSEMBLY SIZES	CATALOG NUMBER	CAMACTION SERIES	PAGE NUMBER
4mm	26 X 32 X 25.4 H	CAMM-100	100 Series	G-2
5.8mm	26 X 32 X 38.1 H	CAMM-200	200 Series	G-3
5.8mm	26 X 32 X 103.2 H	CAMM-200L*		
4mm	12 X 20 X 32 H	CAMM-250-4	250 Series	G-6
8mm	20 X 34 X 47 H	CAMM-250-8		
12mm	32 X 50 X 68 H	CAMM-250-12		
6.35mm	40 X 60 X 57.7 H	CAMM-300	300 Series	G-9
6.35mm	40 X 60 X 147.4 H	CAMM-300L*		
18mm	40 X 64 X 66.5 H	CAMM-350	350 Series	G-11

L= Longer Driver or Lock to extend below parting line.

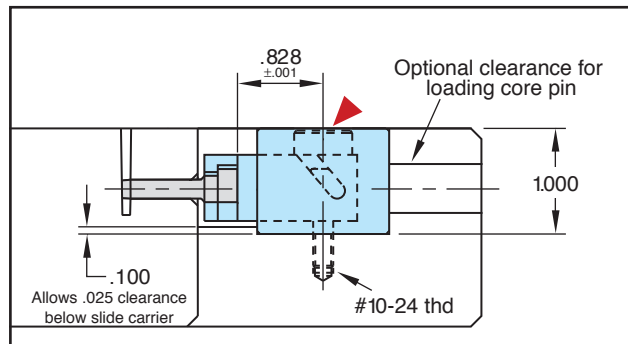
# CAM ACTION® 100 SERIES



## Inch Standard

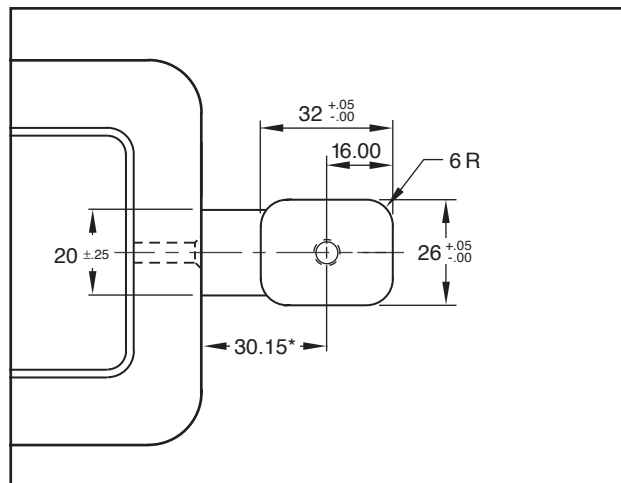


Note: When the core pin is not shutting off on the inner core wall, the distance from the edge of the insert should be 1.142 for the slide carrier to shut off against the core insert.

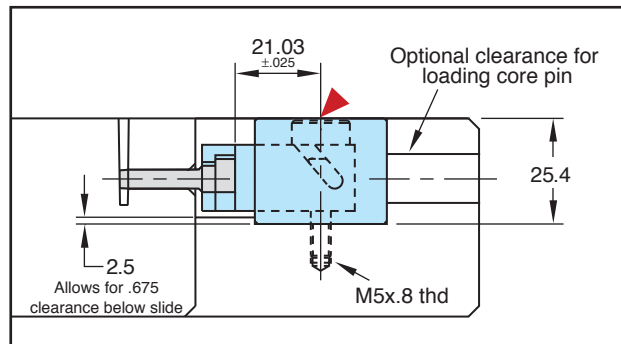


Note: .828 dimension must be maintained to avoid improper spring pre-load or damage to internal components.

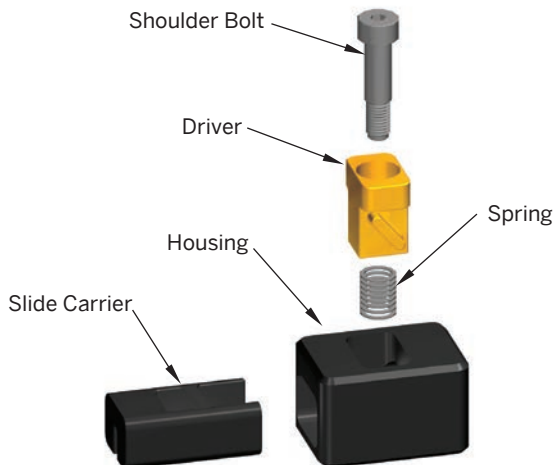
## Metric Standard



Note: When the core pin is not shutting off on the inner core wall, the distance from the edge of the insert should be 29.00 for the slide carrier to shut off against the core insert.



Note: 21.03 dimension must be maintained to avoid improper spring pre-load or damage to internal components.



Travel = .160" (4mm) ▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
CA-100	CamAction Unit
CAMM-100	Metric CamAction Unit

Note: Max operating temperature 300°F (150°C)

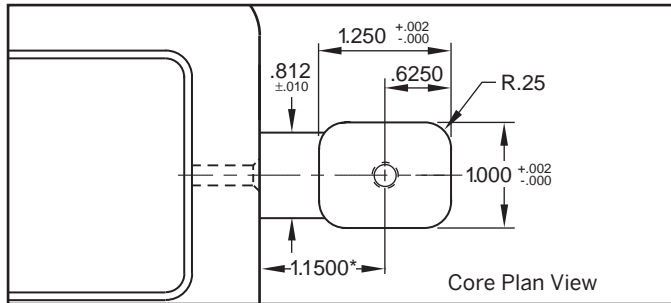
Replacement parts are available. Refer to the price list for catalog numbers and pricing.



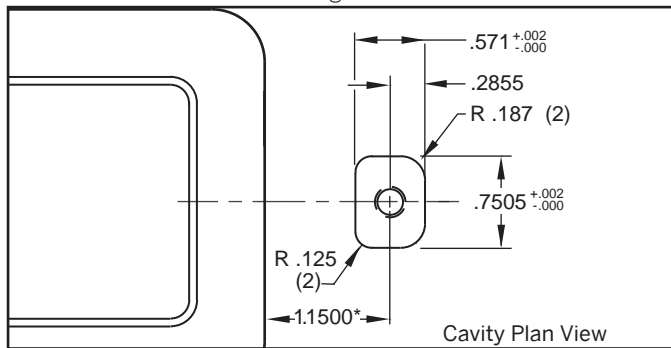
# CAM ACTION® 200 SERIES



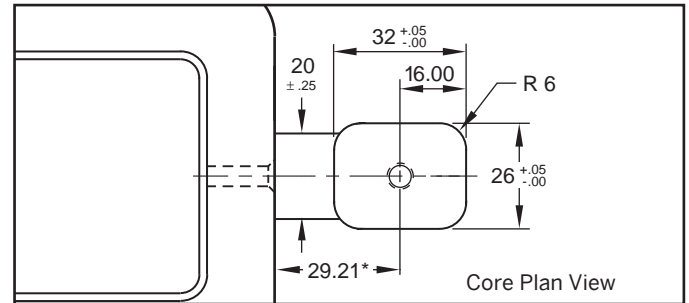
## Inch Standard



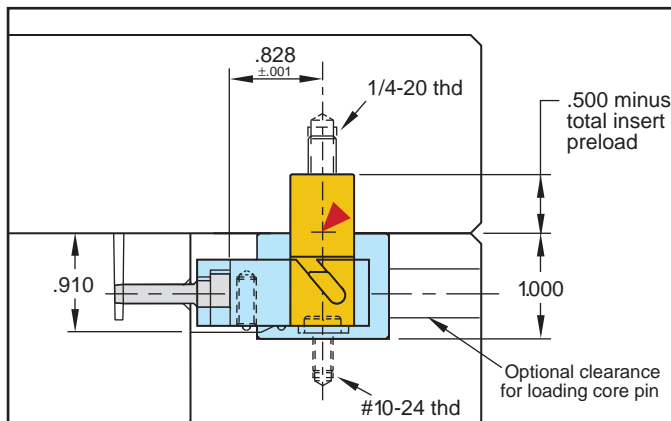
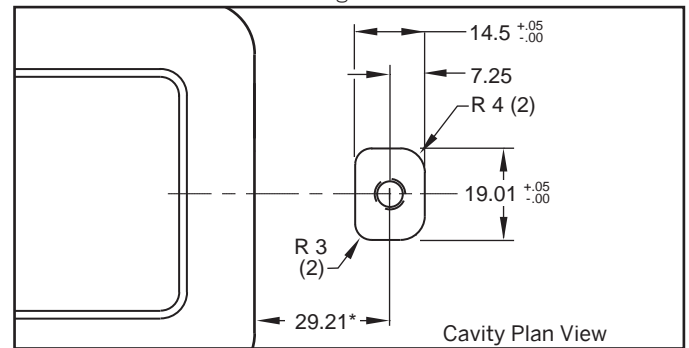
Note: When the core pin is not shutting off on the inner core wall, the distance from the edge of the insert should be 1.1425 for the slide carrier to shut off against the core insert.



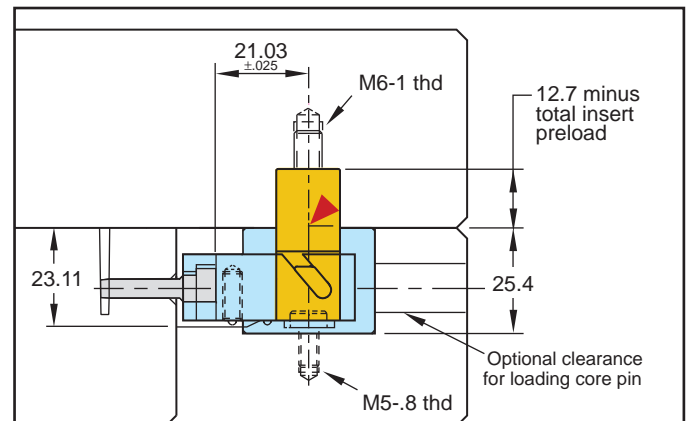
## Metric Standard



Note: When the core pin is not shutting off on the inner core wall, the distance from the edge of the insert should be 29.02 for the slide carrier to shut off against the core insert.



Note: .828 dimension must be maintained to ensure proper shut-off.



Note: 21.03 dimension must be maintained to ensure proper shut-off.

Travel = .230" (5.8mm)

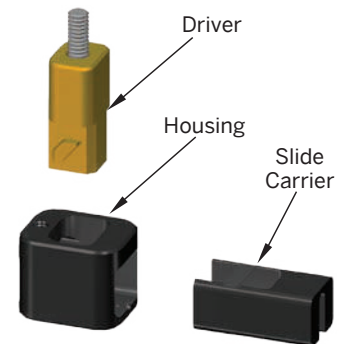
▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
CA-200	CamAction Unit-Standard Driver
CA-200L	CamAction Unit-Longer Driver
CAMM-200	Metric CamAction Unit-Standard Driver
CAMM-200L	Metric CamAction Unit-Longer Driver

Notes:

- Longer driver allows for extension below parting line up to 3" (76mm).
- Max operating temperature 500°F (260°C)

Replacement parts are available. Refer to the price list for catalog numbers and pricing.



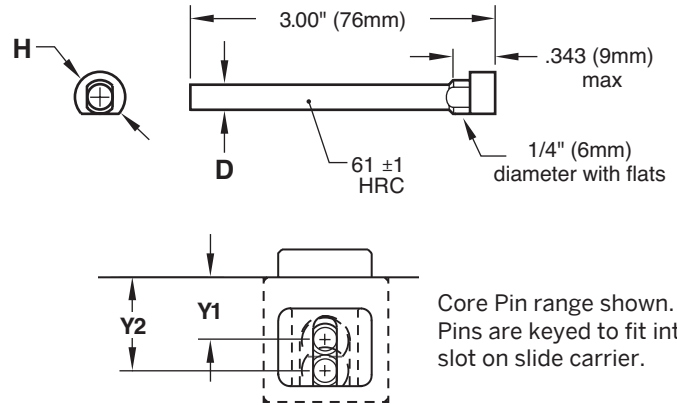
# CAM ACTION® ACCESSORIES

## 100/200 SERIES CORE PINS

**M** M-2 **H** 60-62 HRC **S** Chrome Plated

CATALOG NUMBER	D	H	Y1	Y2
<b>CAP1-187</b>	$\frac{.1872}{.1869}$	.37	.500	.750
<b>CAP1-375</b>	$\frac{.3747}{.3744}$	.37	.500	.688
<b>CAPMM-5</b>	$\frac{4.984 \text{ mm}}{4.992 \text{ mm}}$	9.5 mm	12.7 mm	19.05 mm
<b>CAPMM-10</b>	$\frac{9.985 \text{ mm}}{9.992 \text{ mm}}$	9.5 mm	12.7 mm	17.40 mm

For use with 100 and 200 Series CamActions.  
When using with the 100 Series, 2° draft per side (minimum) is required in the molding area.

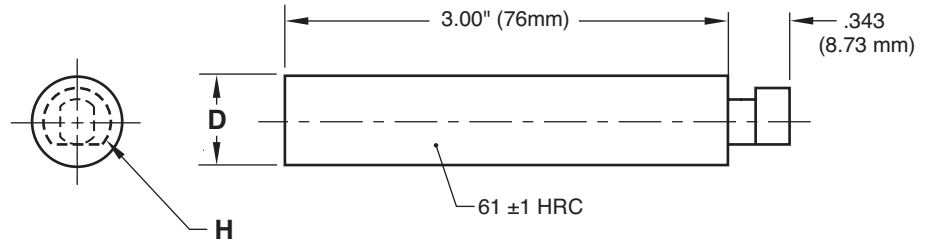


## 200 SERIES CORE PINS

**M** M-2 **H** 60-62 HRC **S** Chrome Plated

CATALOG NUMBER	D	H
<b>CAP2-500</b>	$\frac{.5001}{.5003}$	.37
<b>CAP2MM-13</b>	$\frac{13.002 \text{ mm}}{13.007 \text{ mm}}$	9.5 mm

For use with 200 Series CamActions only.

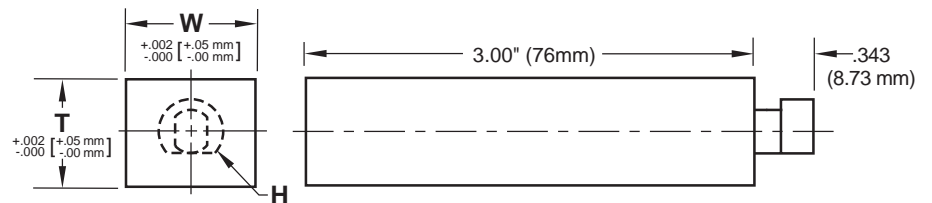


## 200 SERIES INSERTS

**M** P-20 Pre-Hard **S** Salt Bath Nitride

CATALOG NUMBER	T	W	H
<b>CSE2-62X75</b>	.625	.750	.37
<b>CSE2MM-16X19</b>	15.98 mm	19 mm	9.5 mm

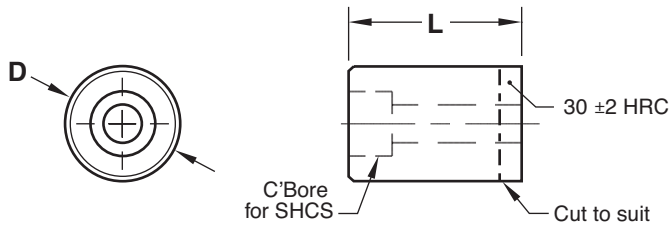
For use with 200 Series CamActions only.





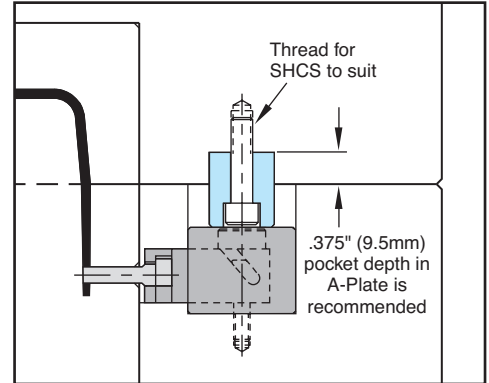
# CAM ACTION® ACCESSORIES

## "A" EXTENSION

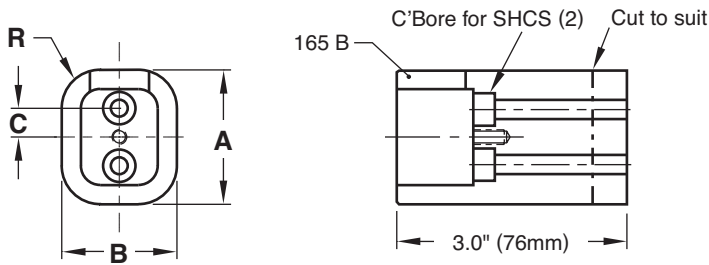


**M** 4140 **H** 28-32 HRC **S** Black Oxide

CATALOG NUMBER	D	L	SHCS
<b>CAE-100</b>	.750	1.125	1/4-20
<b>CAEMM-100</b>	19 mm	28 mm	M6-1

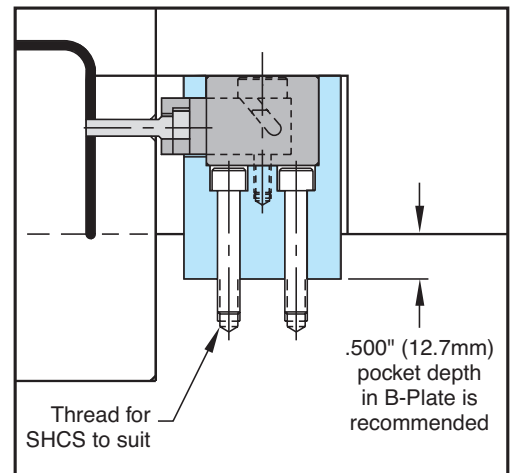


## "B" RISER



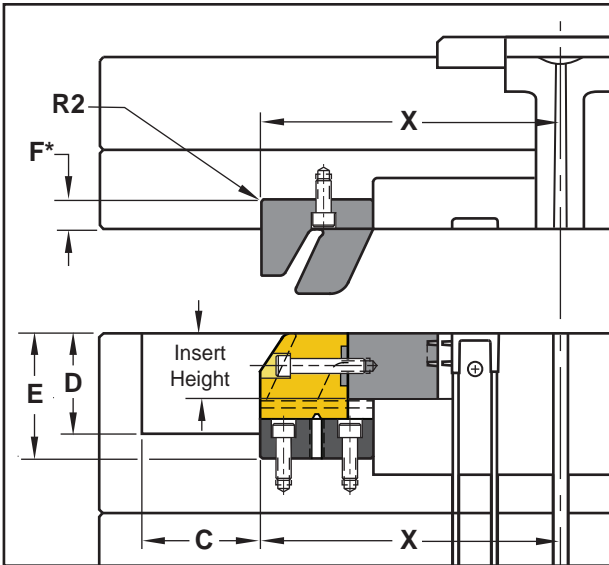
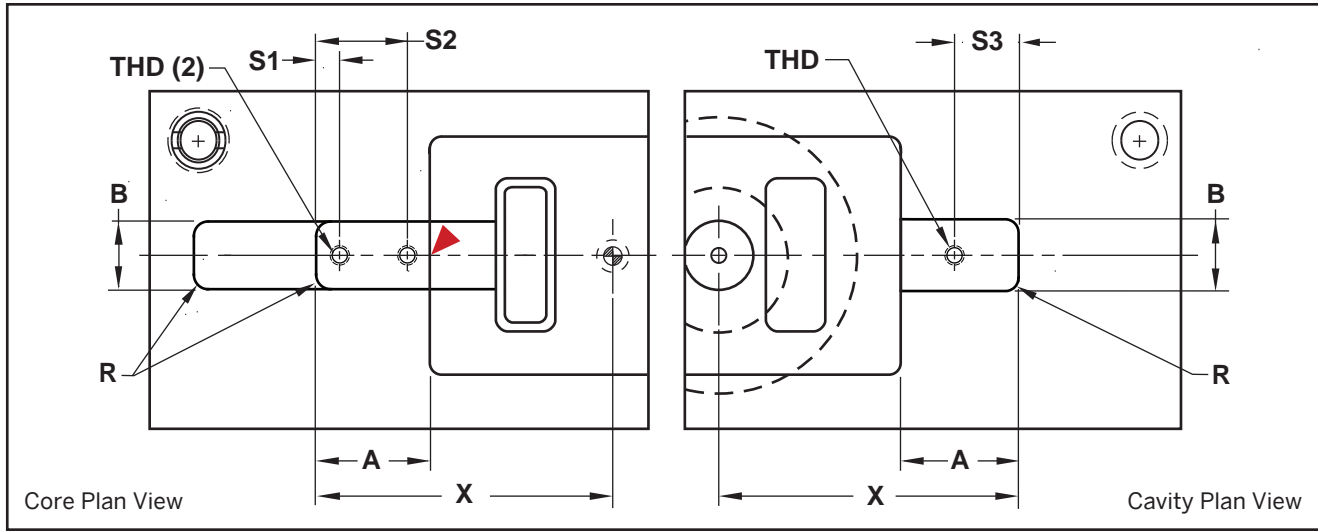
**M** AISI 4140 PH **H** 28-32 HRC **S** Black Oxide

CATALOG NUMBER	A	B	C	R	SHCS
<b>CBR-100</b>	1.750	1.500	.375	.50	1/4-20
<b>CBRMM-100</b>	44 mm	38 mm	10 mm	12.7 mm	M6-1



# CAM ACTION® 250 SERIES

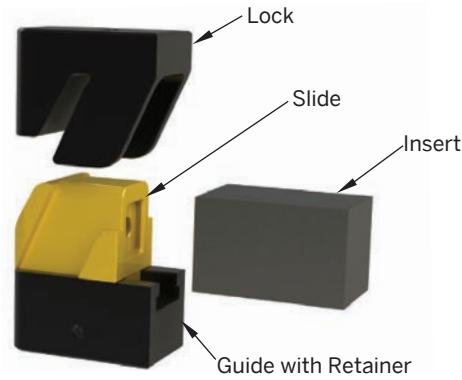
▶ CAD insertion point



\*Minus pre-load.

### Technical Information:

- Machine pockets from the common location "X" to the dimensions shown.
- Slide Retainers (SRT-10 or SRTM-04) are installed in the slides on the CA-250-50/CAMM-250-12. Ball Plungers retain the slide in the other sizes.
- Max operating temperature 425°F (220°C).
- Replacement parts are available. Refer to the price list for catalog numbers and pricing.



### Inch Standard

CATALOG NUMBER	TRAVEL	A Pocket	B Pocket	C Minimum Clearance	D Minimum Clearance	E Pocket	F Pocket	S1	S2	S3	R Pocket Radius	R2	THD Socket Head Cap Screws
CA-250-15	.15	.750	.500	.63	.60	.937	.313	.156	.594	.438	1/8	.03	#4-40 x 3/8
CA-250-31	.31	1.375	.800	1.03	1.03	1.375	.375	.313	1.063	.750	3/16	.03	#8-32 x 7/16
CA-250-50	.50	2.000	1.250	1.50	1.90	2.125	.625	.375	1.625	1.125	1/4	.04	1/4-20 x 5/8

### Metric Standard

CATALOG NUMBER	TRAVEL	A Pocket	B Pocket	C Minimum Clearance	D Minimum Clearance	E Pocket	F Pocket	S1	S2	S3	R	R2	THD Socket Head Cap Screws
CAMM-250-4	4	20	12	17	16	24	8	4	16	10	3	.4	M3-.5 x 10
CAMM-250-8	8	34	20	27	27	38	9	7	27	19	4	.4	M4-.7 x 12
CAMM-250-12	12	50	32	39	38	53	15	10	40	27	5	1.0	M6-1 x 18

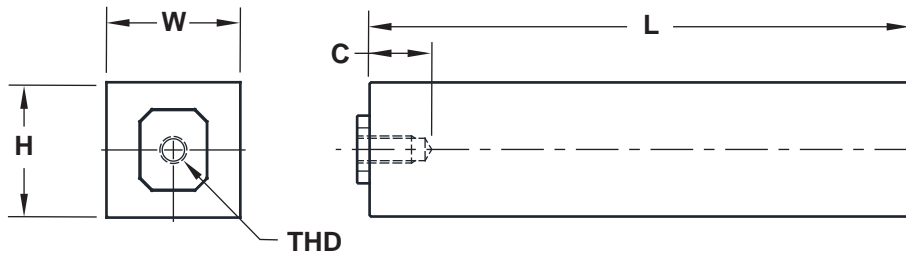
Screws (3) included.

Screws (3) included.



# CAM ACTION® ACCESSORIES

## 250 SERIES INSERTS



### Inch Standard

- M** DC53 / 1.2360    **H** 58-62 HRC
- M** H-13 / 1.2343    **H** 48-52 HRC

ASSEMBLY CATALOG NUMBER	DC53 / 1.2360 CATALOG NUMBER	H-13 / 1.2343 CATALOG NUMBER	W +0.00 -0.01	H +0.00 -0.01	L	C	THD SOCKET HEAD CAP SCREW
CA-250-15	<b>CSE25P-15L2</b>	<b>CSE25H-15L2</b>	.500	.374	2.250	3/8	#4-40 x 1/2
CA-250-31	<b>CSE25P-31L2.5</b>	<b>CSE25H-31L2.5</b>	.800	.749	2.500	1/2	#8-32 x 7/8
CA-250-50	<b>CSE25P-50L4</b>	<b>CSE25H-50L4</b>	1.250	1.249	4.000	3/4	1/4-20 x 1-1/4

Screw included.

### Metric Standard

- M** DC53 / 1.2360    **H** 58-62 HRC
- M** H-13 / 1.2343    **H** 48-52 HRC

ASSEMBLY CATALOG NUMBER	DC53 / 1.2360 CATALOG NUMBER	H-13 / 1.2343 CATALOG NUMBER	W +0.00 -0.03	H +0.00 -0.03	L	C	THD SOCKET HEAD CAP SCREW
CAMM-250-4	<b>CSE25MMP-4L60</b>	<b>CSE25MMH-4L60</b>	12	10	60	8	M3 -.5 x 12
CAMM-250-8	<b>CSE25MMP-8L80</b>	<b>CSE25MMH-8L80</b>	20	20	80	11	M4 -.7 x 22
CAMM-250-12	<b>CSE25MMP-12L100</b>	<b>CSE25MMH-12L100</b>	32	29	100	15	M5-.8 x 30

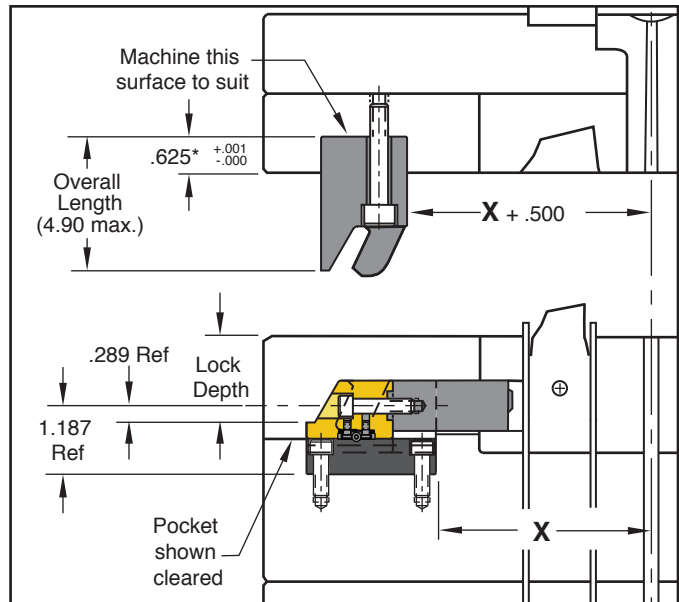
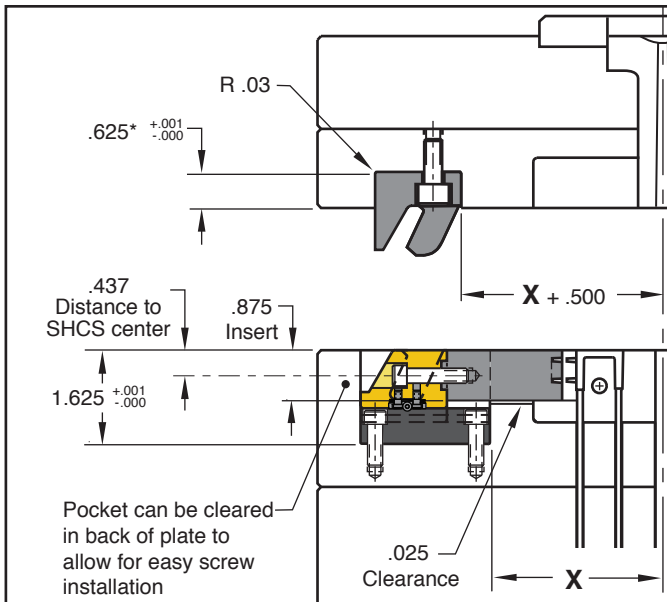
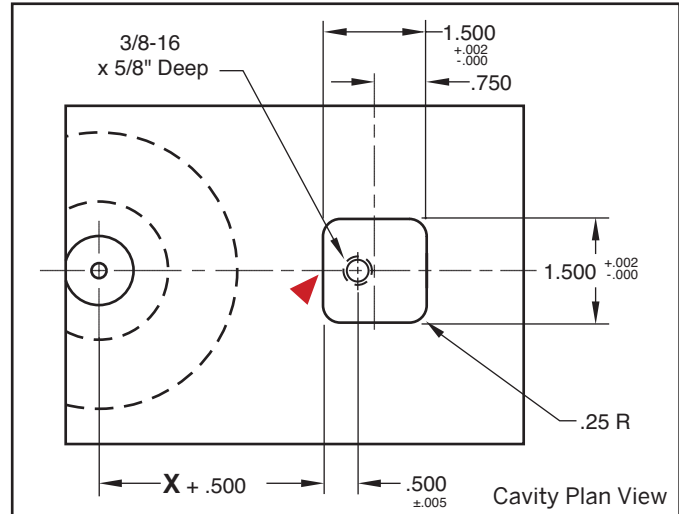
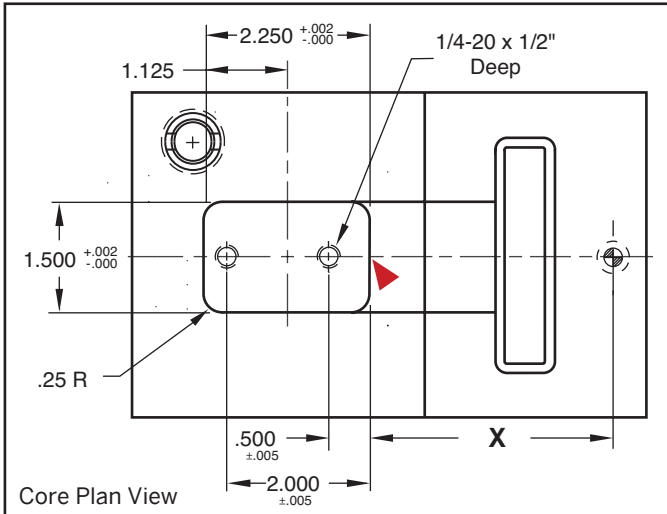
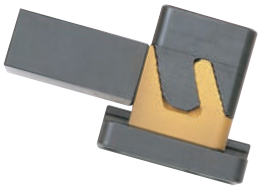
Screw included.





# CAM ACTION®

## 300 SERIES: INCH STANDARD



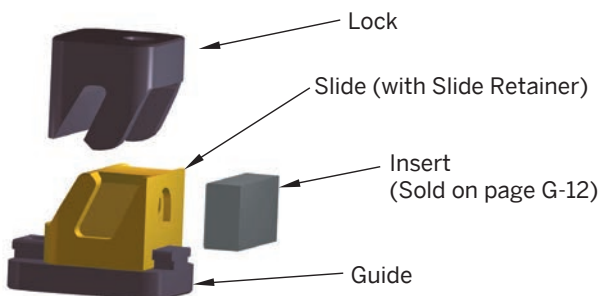
Travel = .250"

CAD insertion point

CATALOG NUMBER	DESCRIPTION
CA-300	CamAction Unit-Standard Lock
CA-300L	CamAction Unit-Longer Lock

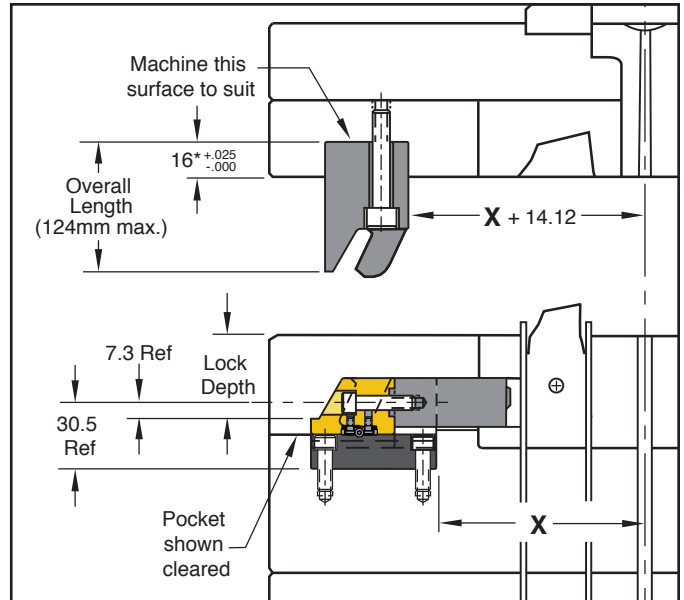
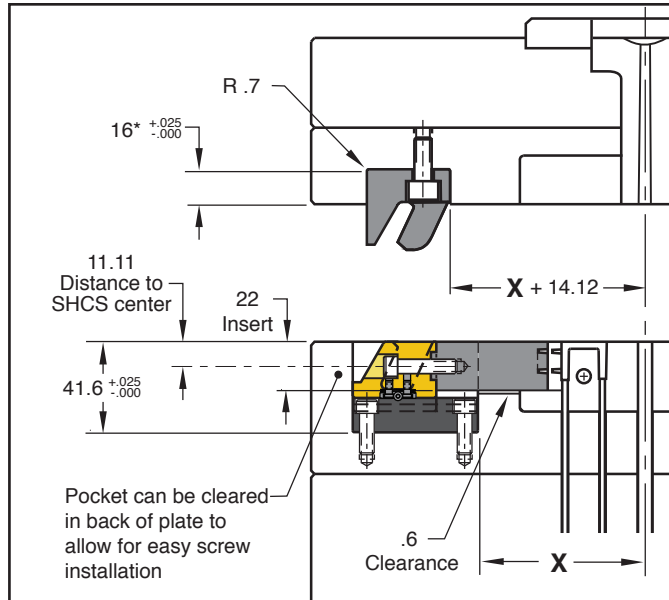
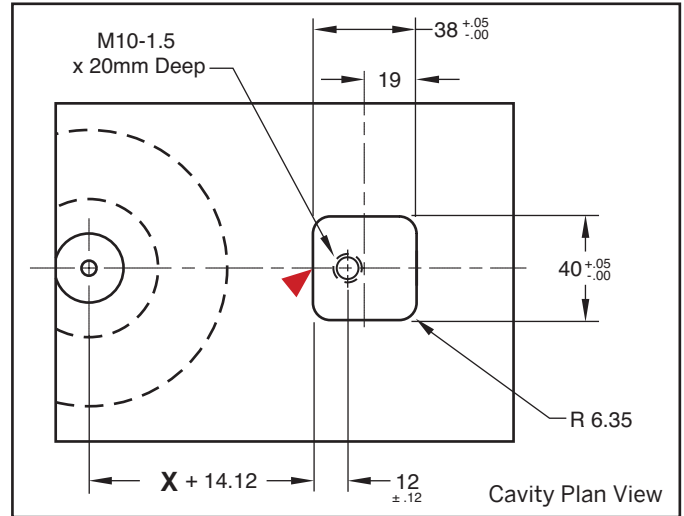
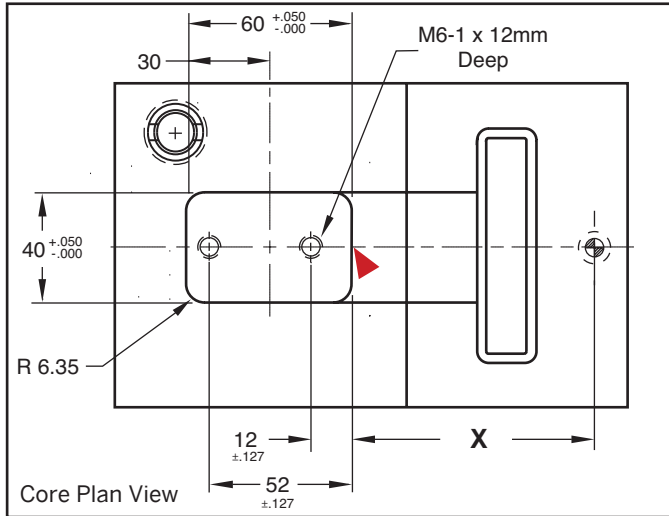
Notes:

- Each assembly includes SRT-10 Slide Retainer and (3) mounting screws. Individual replacement parts are available.
- Max operating temperature 425°F (220°C).
- Replacement parts are available. Refer to the price list for catalog numbers and pricing.

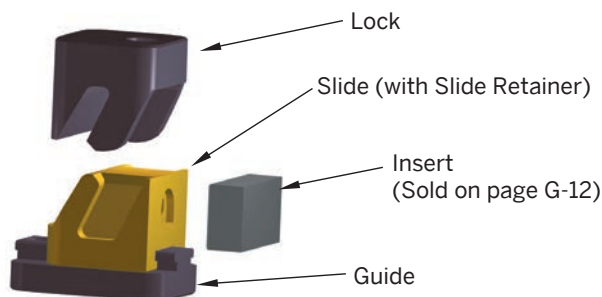




# CAM ACTION® 300 SERIES: METRIC STANDARD



\*Minus pre-load.



Travel = 6.35 mm

▶ CAD insertion point

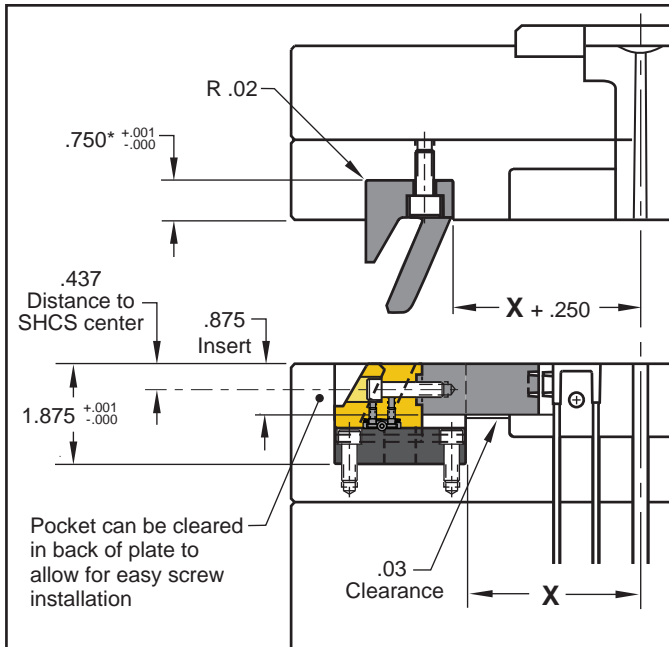
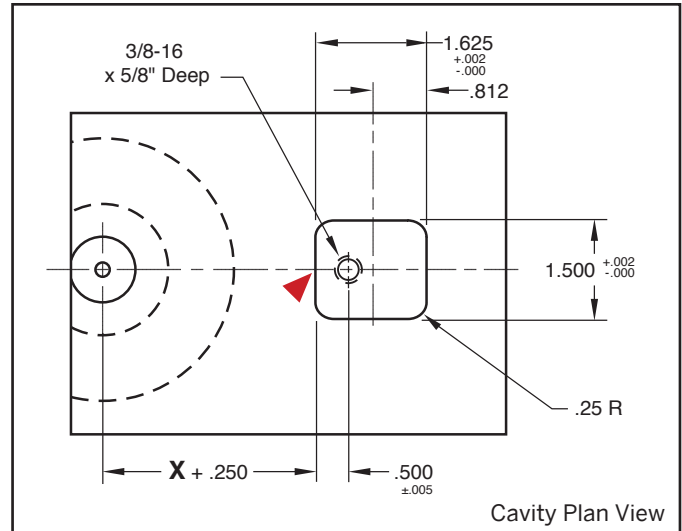
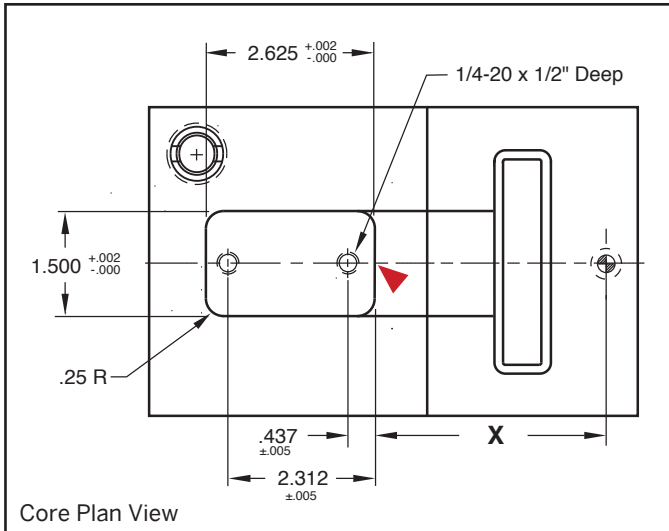
CATALOG NUMBER	DESCRIPTION
<b>CAMM-300</b>	Metric CamAction Unit-Standard Lock
<b>CAMM-300L</b>	Metric CamAction Unit-Longer Lock

Notes:

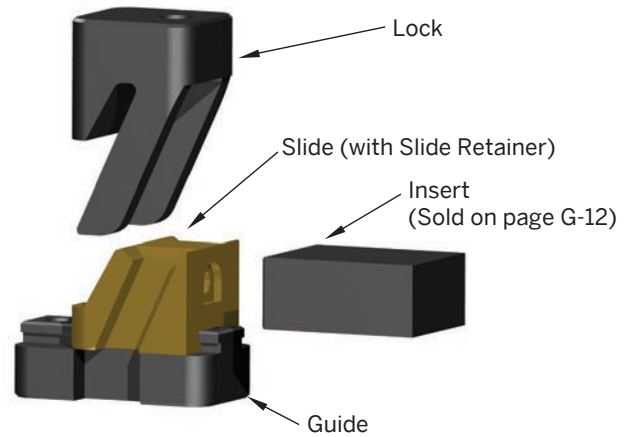
- Each assembly includes SRT-10 Slide Retainer and (3) mounting screws. Individual replacement parts are available.
- Max operating temperature 425°F (220°C).
- Replacement parts are available. Refer to the price list for catalog numbers and pricing.

# CAM ACTION®

## 350 SERIES: INCH STANDARD



\*Minus pre-load.



Travel = .750"

▶ CAD insertion point

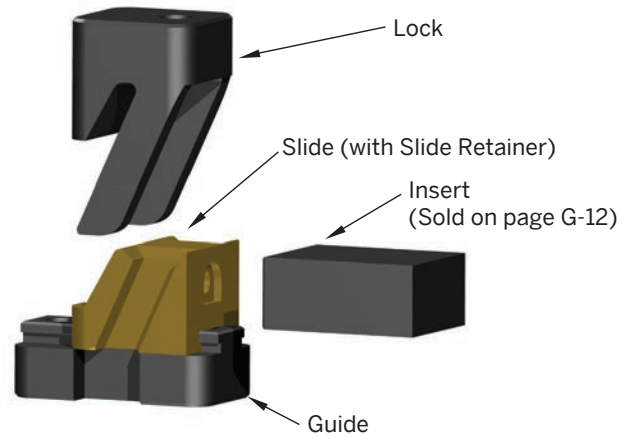
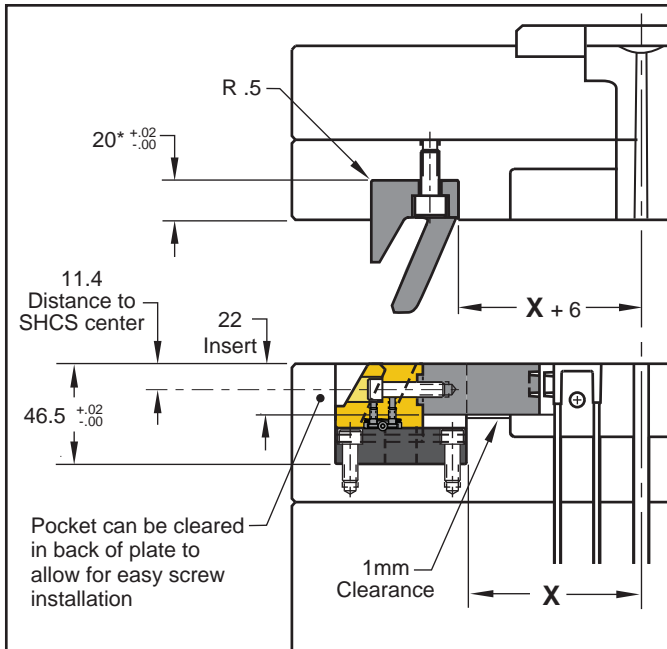
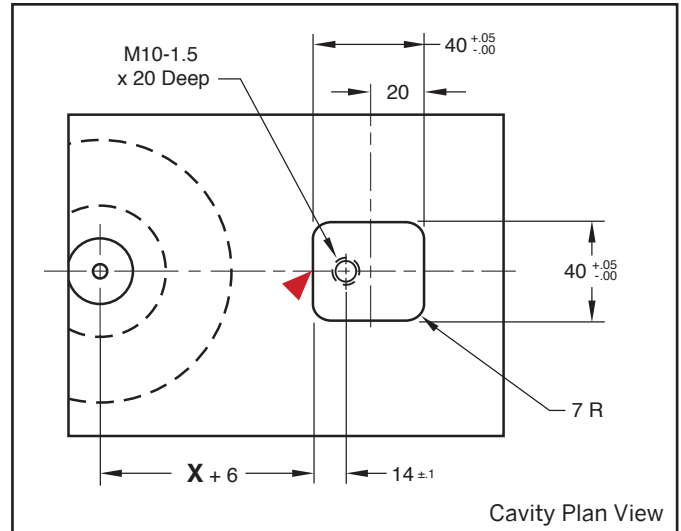
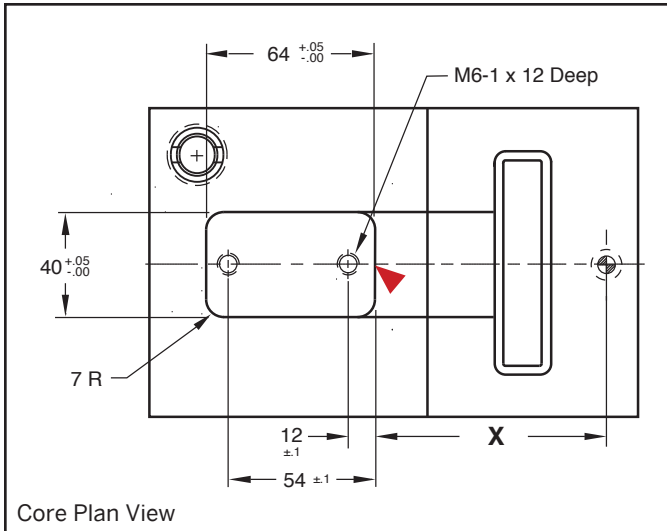
CATALOG NUMBER	DESCRIPTION
CA-350	CamAction Unit: 350 Series

Notes:

- Each assembly includes SRT-10 Slide Retainer and (3) mounting screws. Individual replacement parts are available.
- Max operating temperature 425°F (220°C).
- Replacement parts are available. Refer to the price list for catalog numbers and pricing.



# CAM ACTION® 350 SERIES: METRIC STANDARD



Travel = 18mm

▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
<b>CAMM-350</b>	CamAction Unit: 350 Series (Metric)

Notes:

- Each assembly includes SRT-10 Slide Retainer and (3) mounting screws. Individual replacement parts are available.
- Max operating temperature 425°F (220°C).
- Replacement parts are available. Refer to the price list for catalog numbers and pricing.

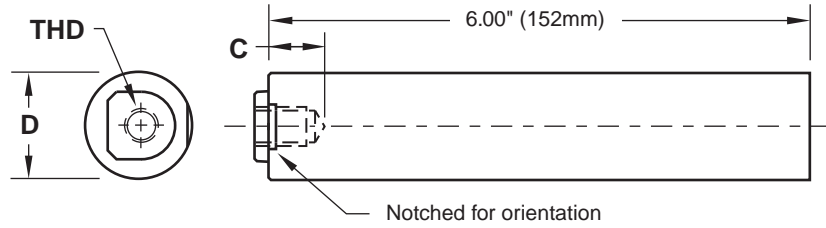
# CAM ACTION® ACCESSORIES

## 300 SERIES CORE PINS

**M** M-2 **H** 58-62 HRC **S** Chrome Plated

CATALOG NUMBER	D	THD Socket Head Cap Screw	C
CAP3-750	.7504 .7508	1/4-20 x 7/8	3/4
CAP3MM-19	19.009 mm 19.019 mm	M6-1 x 20	20 mm

Screw included.

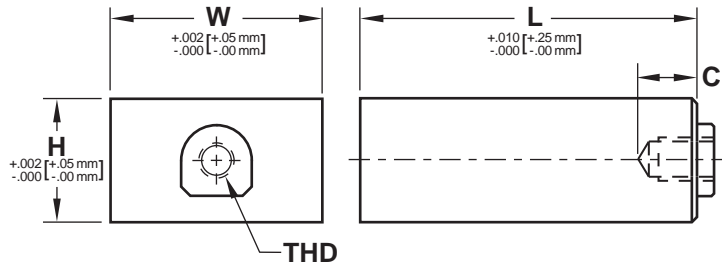


## 300 SERIES INSERTS

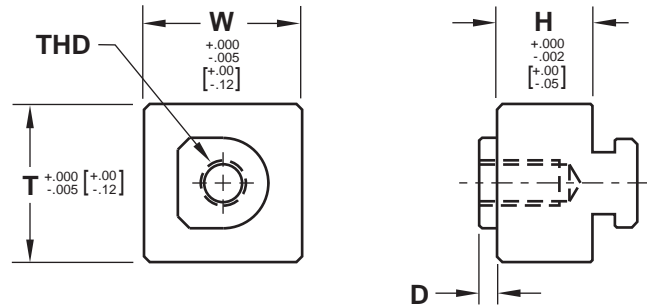
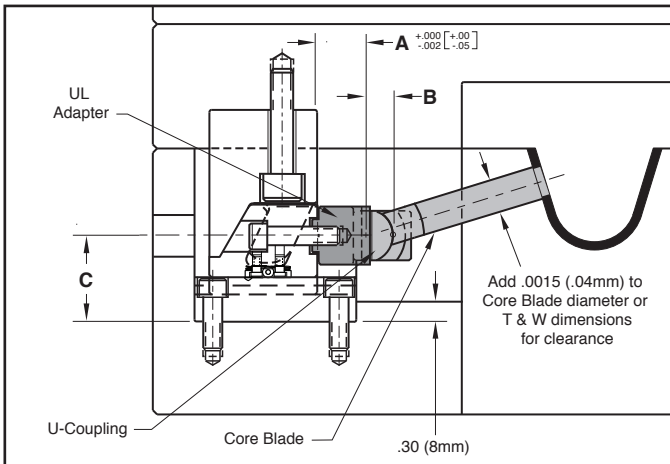
**M** P-20 Pre-Hard **S** Salt Bath Nitride

CATALOG NUMBER	H	W	L	THD Socket Head Cap Screw	W
CSE3-50	.875	1.500	.50	1/4-20 x 7/8	5/8
CSE3-200	.875	1.500	2.00	1/4-20 x 7/8	5/8
CSE3MM-12	22 mm	38 mm	12 mm	M6-1 x 20	15 mm
CSE3MM-50	22 mm	38 mm	50 mm	M6-1 x 20	15 mm

Screw included.



## 300 SERIES UL ADAPTERS



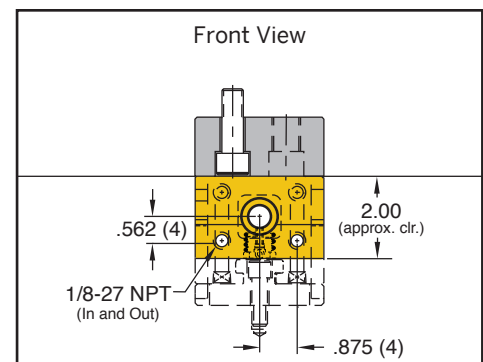
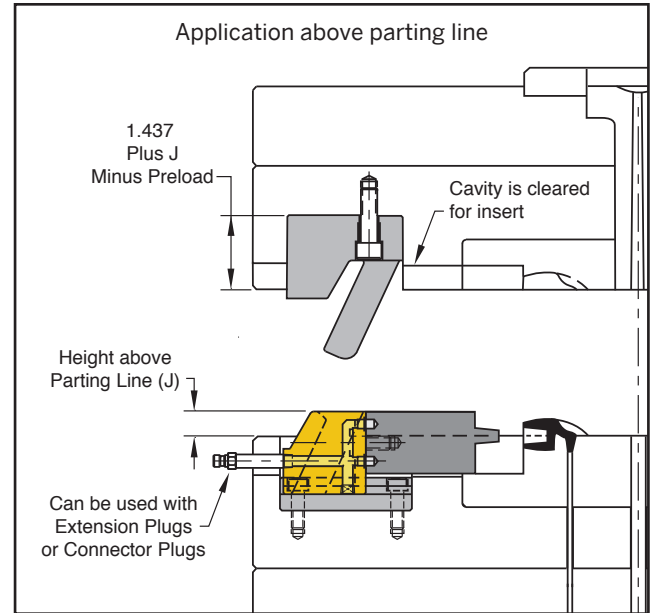
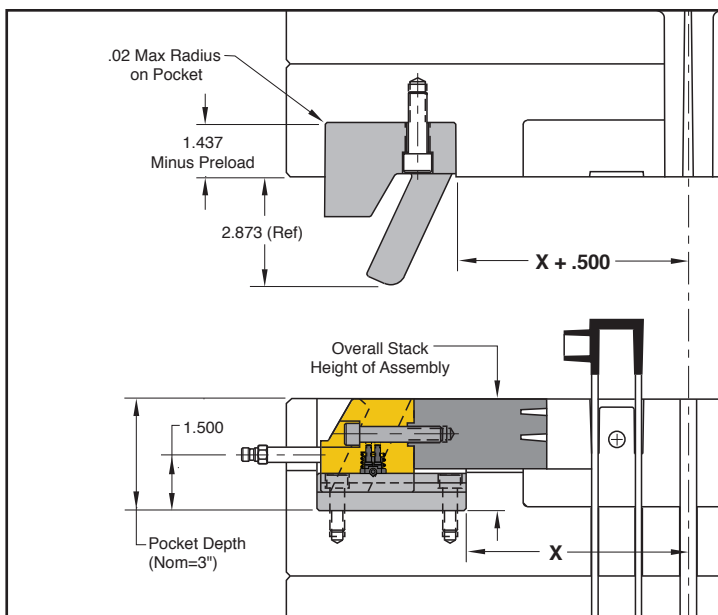
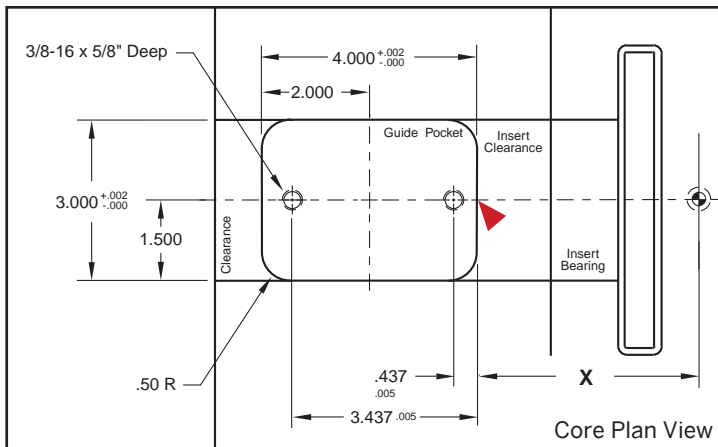
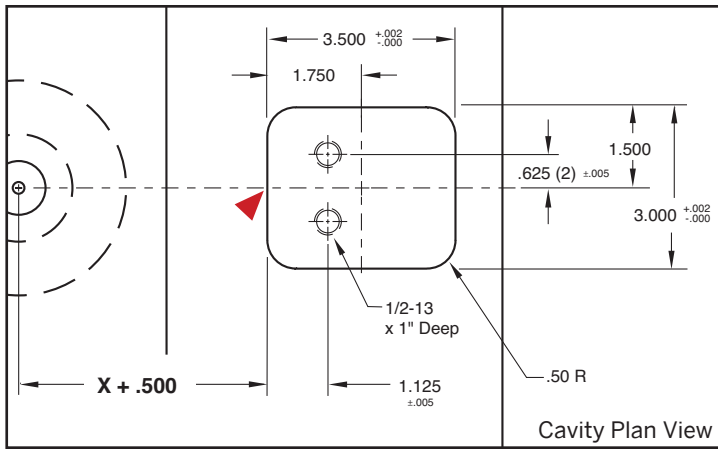
**M** 4140 **S** Salt Bath Nitride

CATALOG NUMBER	T	W	H	D	THD Socket Head Cap Screw	A	B	C	COMPATIBLE U-COUPLING
CTG-300	.875	.875	.563	.098	1/4-20 x 7/8	.75	.406	1.187	UCU87
CTGMM-300	23 mm	23 mm	6 mm	2.5 mm	M6-1 x 22	12 mm	10 mm	30.15 mm	UCMM22

Screw included. UniLifter Core Blades and U-Couplings are sold in section H.



# CAM ACTION® 400 SERIES



Each assembly includes an installed SRT-30 Slide Retainer, Threadless Waterline Plugs (2), O-Rings (2), and (4) mounting screws.

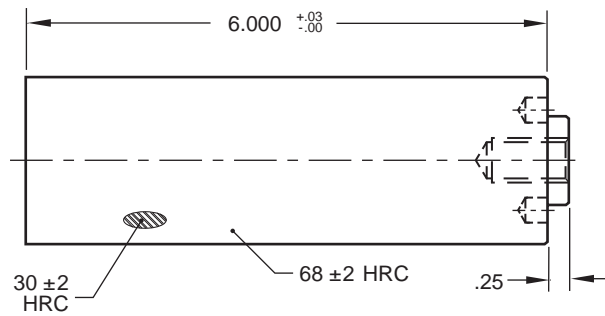
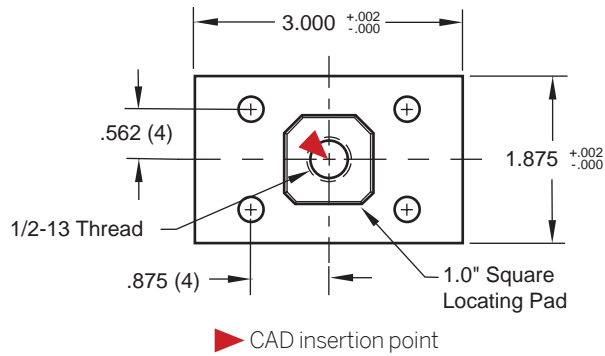
Travel = 1.00"

▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
CA-400	CamAction Unit with 1" Travel

# CAM ACTION® ACCESSORIES

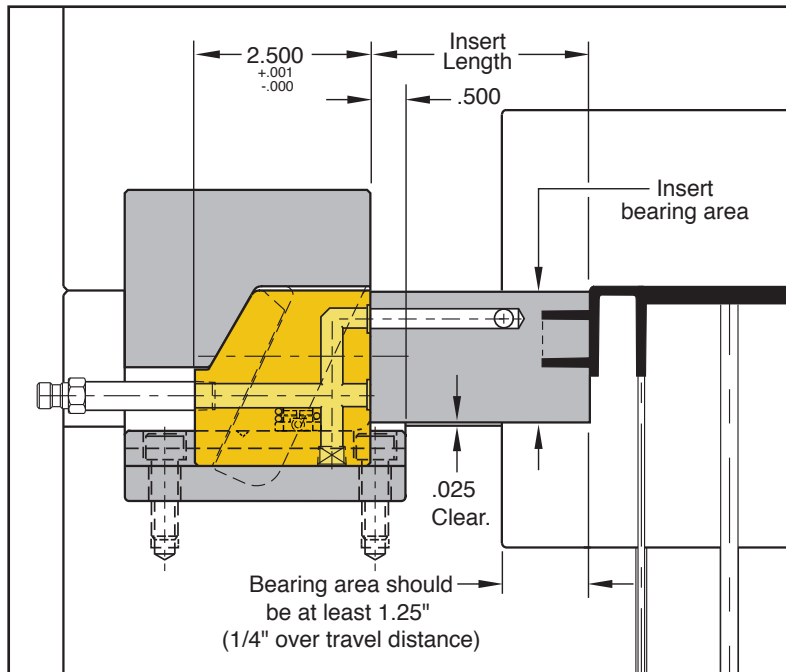
## 400 SERIES INSERTS



**M** P-20 Pre-Hard **S** Salt Bath Nitride (SBN)

CATALOG NUMBER	DESCRIPTION
<b>CSE4-18X30</b>	CA-400 Insert

1/2-13 x 1-3/4 socket head cap screw included.







# SLIDE RETAINERS



Progressive's SRT® Series Slide Retainers reliably hold from 2 to 80 pounds (1 to 36 kgs) each. This slide retention design now features color-coded springs to indicate force rating. This compact design allows for installation in a mold base or wear plates.

Optional cleats may be selected or the V-Groove for roller retention may be machined in the bottom of the slide as shown on opposing page.



## Inch Standard

Roller: **M** M-2 **H** 60-62 HRC **S** Titanium Nitride Coated 80 HRC

SLIDE RETAINER								CLEAT				
SLIDE RETAINER CATALOG NUMBER	Max Weight Per Unit (lbs)	ØD +.005 -.000	L ±.001	S ±.002	T Screws (2)	E Minimum Thread Depth	Color	CLEAT CATALOG NUMBER	G ±.001	C ±.002	H Screws (2)	J Minimum Thread Depth
SRT-02	2	.625	.160	.155	#4-48	.075	GRN	SRTC-10	.250	.190	#6-32	.250
SRT-04	4						BLU					
SRT-10	10						RED					
SRT-20	20	.750	.500	.150	#8-32	.190	GRN	SRTC-30	.250	.250	#6-32	.250
SRT-30	30						BLU					
SRT-50	50	.875	.750	.150	#8-32	.245	RED	SRTC-80	.250	.300	#6-32	.250
SRT-80	80						YEL					
SRT-40	40	1.125	.856	.205	1/4-20	.480	BLU	SRTC-75	.250	.400	#6-32	.250
SRT-60	60						RED					
SRT-75	75						YEL					

Cleats sold separately.

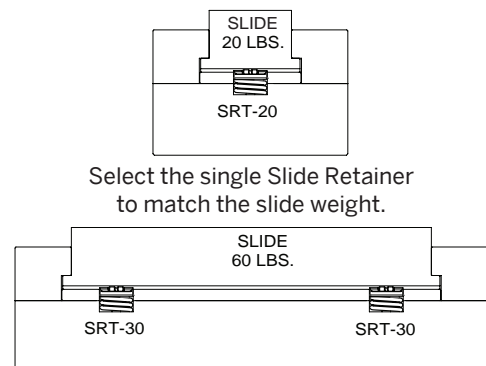
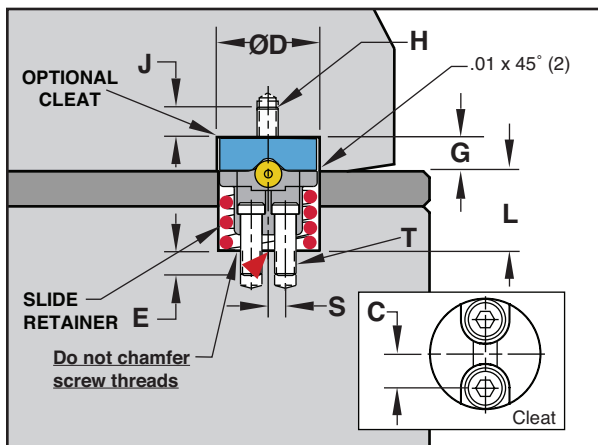


## Metric Standard

Roller: **M** M-2 **H** 60-62 HRC **S** Titanium Nitride Coated 80 HRC

SLIDE RETAINER								CLEAT				
SLIDE RETAINER CATALOG NUMBER	Max Weight Per Unit (kgs)	ØD +.1 -.0	L ±.025	S ±.05	T Screws (2)	E Minimum Thread Depth	Color	CLEAT CATALOG NUMBER	G ±.025	C ±.05	H Screws (2)	J Minimum Thread Depth
SRTM-01	1	15.9	4.06	3.95	M3 - .5	1.9	GRN	SRTMC-04	6.35	4.85	M3 - .5	6.35
SRTM-02	2						BLU					
SRTM-04	4						RED					
SRTM-09	9	19.1	12.70	3.80	M4 - .7	4.8	GRN	SRTMC-13	6.35	6.35	M3 - .5	6.35
SRTM-13	13						BLU					
SRTM-22	22	22.3	19.05	3.80	M4 - .7	6.2	RED	SRTMC-36	6.35	7.60	M3 - .5	6.35
SRTM-36	36						YEL					
SRTM-18	18	28.2	21.75	5.20	M6 - 1.0	12.0	BLU	SRTMC-34	6.35	10.50	M3 - .5	6.35
SRTM-28	28						RED					
SRTM-34	34						YEL					

Cleats sold separately.



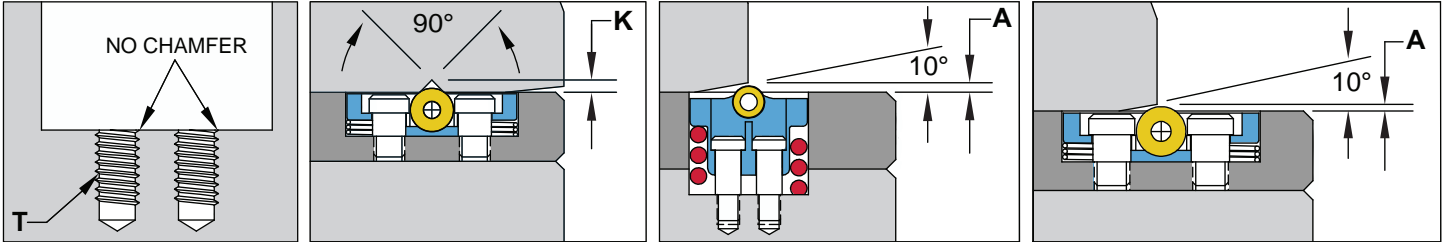
Select the single Slide Retainer to match the slide weight.

Or add the force of multiple Slide Retainers to match the slide weight.

# SRT DESIGN GUIDELINES

## Technical Information:

- Maximum operating temperature is 425° F (220° C).
- Match total Slide Retainers Spring force to slide weight; excess spring force could induce wear.
- Do not chamfer screw threads.
- Machine 10° lead-in on all slides to aid in assembly once the SRT is installed.
- Optional Bases and Bushings shown on the following page allow for installation in plates made from materials such as aluminum, copper, and bronze and contain the screw/thread installation.



RETAINER CATALOG NUMBER	T Thread (2)	Tap Class Required	K V-Groove	A 10° Angle Lead - In
SRT-02	#4-48	2B GH2	.041"	.02"
SRT-04				
SRT-10				
SRT-20	#8-32	2B GH3	.078"	.04"
SRT-30				
SRT-50	#8-32	2B GH3	.078"	.05"
SRT-80				
SRT-40	1/4-20	2B GH3	.102"	.07"
SRT-60				
SRT-75				
SRTM-01	M3 - .5	6H D3	1 mm	.50 mm
SRTM-02				
SRTM-04				
SRTM-09	M4 - .7	6H D4	2 mm	1.00 mm
SRTM-13				
SRTM-22	M4 - .7	6H D4	2 mm	1.27 mm
SRTM-36				
SRTM-18	M6 - 1.0	6H D4	2.6 mm	1.85 mm
SRTM-28				
SRTM-34				



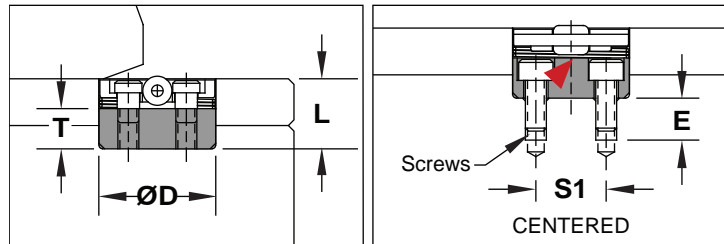


# SLIDE RETAINERS BASES & BUSHINGS

For installation in aluminum or other materials, the SRT Bases and Bushings can expedite installation of the Slide Retainers.

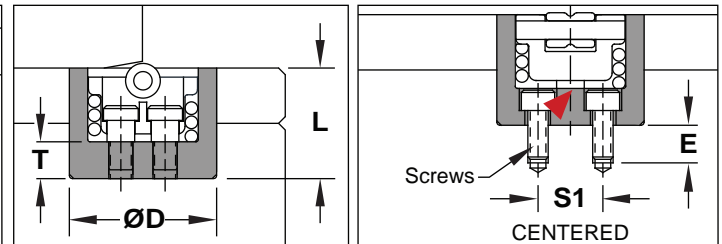


## SRT BASES



SRT Bases enable the Slide Retainer to be installed in a hardened plate when mold base steel is aluminum, for example. (SRTBA-10 shown in graphics.)

## SRT BUSHINGS



SRT Bushings accept the standard Slide Retainer to allow for installation in soft materials (aluminum, copper bronze, etc.) Also, the SRT Bushing can provide hardened guidance against wear rather than bearing on a bronze wear plate. (SRTBU-30 shown in graphics.)

### Inch Standard

Base: **M** D-2 **H** 58-60 HRC

Bushing: **M** D-2 **H** 58-60 HRC

CATALOG NUMBER	ØD +.005 -.000	L ±.001	SI ±.005	T	E REF	Screws (2)	USE WITH	CATALOG NUMBER	ØD +.001 -.000	L +.002 -.000	SI ±.005	T	E REF	Screws (2)
SRTBA-10	.625	.375	.375	.215	.220	#4-40 x .31	SRT-02	SRTBU-10	.875	.375	.375	.215	.220	#4-40 x .31
							SRT-04							
							SRT-10							
SRTBA-30	.750	.750	.440	.250	.280	#6-32 x .37	SRT-20	SRTBU-30	1.000	.750	.440	.250	.280	#6-32 x .37
							SRT-30							
SRTBA-80	.875	1.000	.500	.250	.280	#6-32 x .37	SRT-50	SRTBU-80	1.125	1.000	.500	.250	.280	#6-32 x .37
							SRT-80							
SRTBA-75	1.125	1.300	.625	.443	.380	#10-32 x 50	SRT-40	SRTBU-75	1.500	1.300	.625	.443	.380	#10-32 x 50
							SRT-60							
							SRT-75							

### Metric Standard

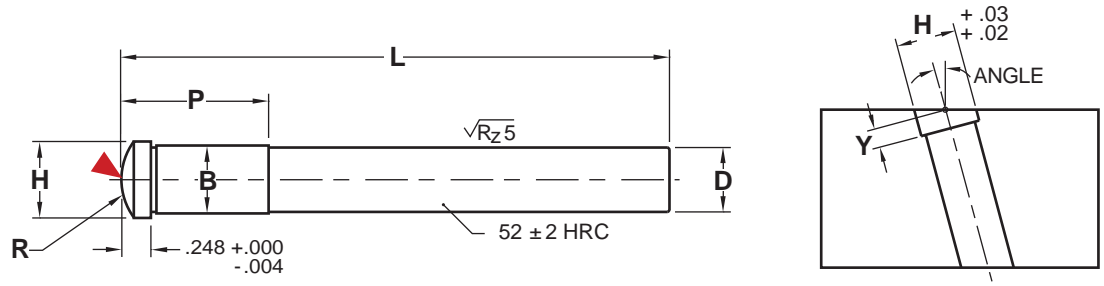
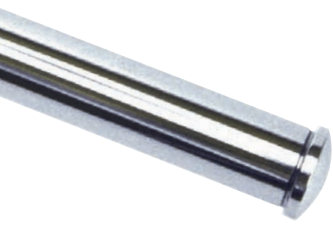
Base: **M** D-2 **H** 58-60 HRC

Bushing: **M** D-2 **H** 58-60 HRC

CATALOG NUMBER	ØD +.1 -.0	L ±.03	SI ±.1	T	E REF	Screws (2)	USE WITH	CATALOG NUMBER	ØD +.03 -.00	L +.05 -.00	SI ±.1	T	E REF	Screws (2)
SRTMBA-04	15.9	9.56	8.0	5.50	5.30	M2.5-.45 x 8	SRTM-01	SRTMBU-04	22.3	9.50	8.0	5.44	5.35	M2.5-.45 x 8
							SRTM-02							
							SRTM-04							
SRTMBA-13	19.1	19.05	11.0	6.35	4.95	M3-.5 x 8	SRTM-09	SRTMBU-13	25.4	19.10	11.0	6.35	4.95	M3-.5 x 8
							SRTM-13							
SRTMBA-36	22.3	25.40	13.0	6.35	4.95	M3-.5 x 8	SRTM-22	SRTMBU-36	28.5	25.40	13.0	6.35	4.95	M3-.5 x 8
							SRTM-36							
SRTMBA-34	28.2	33.00	16.0	11.25	9.90	M5-.8 x 12	SRTM-18	SRTMBU-34	37.0	33.00	16.0	11.25	9.90	M5-.8 x 12
							SRTM-28							
							SRTM-34							

▶ CAD insertion point

# ANGLE PINS



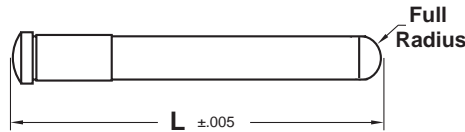
**M** 8620 **H** Surface: 50-54 HRC

CAD insertion point

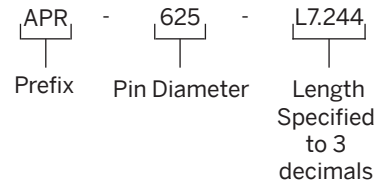
Nominal Diameter	CATALOG NUMBER	D +0.000 -.0005	L +.125 -.000	B +0.0005 -.0000	H +0.000 -.010	R Head Radius	P Press Fit Length	Angle	Y Depth
3/8	AP375L6	.374	6	.376	.500	.375	.87	10°	.258
	AP375L10		10				1.37	15°	.265
			20°				.276		
1/2	AP500L6	.499	6	.501	.625	.500	.87	10°	.260
	AP500L10		10				1.37	15°	.270
			20°				.284		
5/8	AP625L6	.624	6	.626	.750	.625	.87	10°	.262
	AP625L10		10				1.37	15°	.274
			20°				.292		
3/4	AP750L10	.749	10	.751	.875	.750	1.37	10°	.264
	AP750L14		14					15°	.278
			20°					.300	
								25°	.329

### Alternative configurations available:

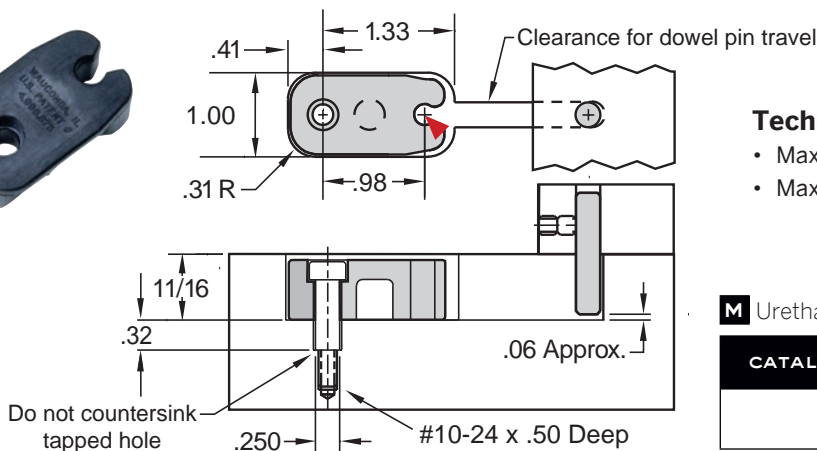
- Full radius option can be ordered by specifying the APR prefix as outlined at right. Example: APR500L6.500 (no dashes/spaces) is an Angle Pin with a 1/2" diameter machined to 6.5" long with a full radius. P will be 1.37" per table above.



### Angle Pins Special Order



# URETHANE RETAINERS



### Technical Details

- Maximum slide weight for retainer weight: 25 lbs.
- Maximum operating temperature is 150° F (65° C).

**M** Urethane

CAD insertion point

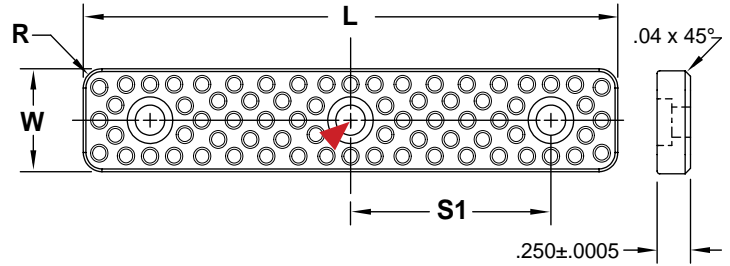
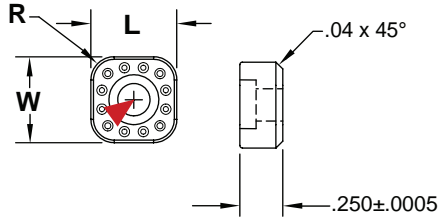
CATALOG NUMBER	DESCRIPTION
RET-1	Retainer, 1/4 x 3/4" Shoulder Bolt, 1/4ø x 1-1/4" Dowel Pin



# WEAR PLATES

Progressive's Wear Plates enable moldmakers to select off-the-shelf standard sizes versus manufacturing in-house. Wear Plates leverage the long lasting Z-Series proprietary treatments and particle rings for lubrication retention.

- Standardized "plug and play" design ready to install.
- Place multiple sizes in a series as needed.
- Low Head Cap Screws included.



**M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

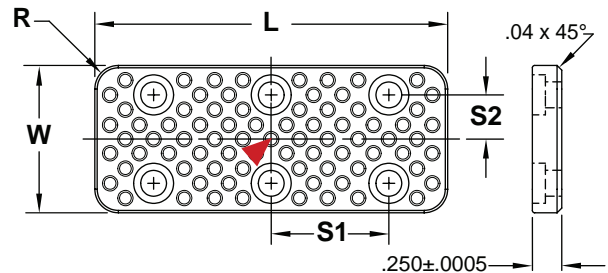
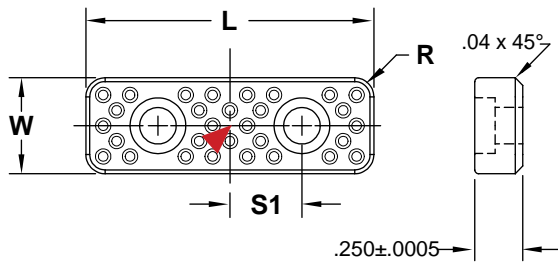
CATALOG NUMBER	W +.000 -.005	L +.000 -.005	R Pocket Radius	LHCS (1)
WP050X050	.500	.500	.125	#8-32 x .38

▶ CAD insertion point

**M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

CATALOG NUMBER	W +.000 -.005	L +.000 -.005	S1 ±.005	R Pocket Radius	LHCS (3)
WP050X250	.500	2.500	.875	.094	#8-32 x .38
WP050X350		3.500	1.375		
WP075X400	.750	4.000	1.500	.125	#10-32 x .38
WP075X600		6.000	2.500		

▶ CAD insertion point



**M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

CATALOG NUMBER	W +.000 -.005	L +.000 -.005	S1 ±.005	R Pocket Radius	LHCS (2)
WP050X150	.500	1.500	.375	.094	#8-32 x .38
WP075X200	.750	2.000	.500	.125	#10-32 x .38

▶ CAD insertion point

**M** H-13 **H** Core: 42-48 HRC, Surface: 70 HRC **S** Salt Bath Nitride

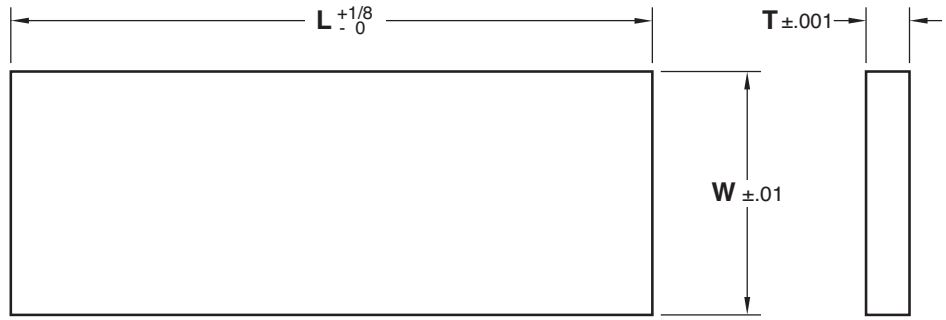
CATALOG NUMBER	W +.000 -.005	L +.000 -.005	S1 ±.005	S2 ±.005	R Pocket Radius	LHCS (6)
WP125X300	1.250	3.000	1.00	.375	.187	#10-32 x .38
WP125X500	1.250	5.000	2.00	.375		
WP125X800	1.250	8.000	3.50	.375		
WP200X600	2.000	6.000	2.50	.625		
WP200X800	2.000	8.000	3.50	.625		
WP250X600	2.500	6.000	2.50	.750		
WP300X600	3.000					

▶ CAD insertion point



Wear Plates can be cut as long as the edges have radii.

# BRONZE WEAR PLATES

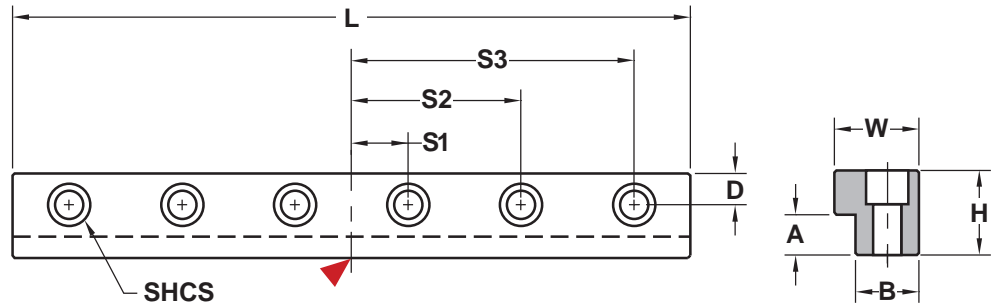


**M** CA954 Solide Bronze **H** 170 Brinell

T	W	L=4"	L=5"	L=6"	L=8"	L=10"	L=12"
1/4	1.000	WP25X1X4	WP25X1X5	WP25X1X6	WP25X1X8	WP25X1X10	WP25X1X12
	1.500	WP25X1.5X4	WP25X1.5X5	WP25X1.5X6	WP25X1.5X8	WP25X1.5X10	WP25X1.5X12
	2.000	WP25X2X4	WP25X2X5	WP25X2X6	WP25X2X8	WP25X2X10	WP25X2X12
	2.500	WP25X2.5X4	WP25X2.5X5	WP25X2.5X6	WP25X2.5X8	WP25X2.5X10	WP25X2.5X12
	3.000	WP25X3X4	WP25X3X5	WP25X3X6	WP25X3X8	WP25X3X10	WP25X3X12
	4.000	WP25X4X4	WP25X4X5	WP25X4X6	WP25X4X8	WP25X4X10	WP25X4X12
3/8	1.000	WP37X1X4	WP37X1X5	WP37X1X6	WP37X1X8	WP37X1X10	WP37X1X12
	1.500	WP37X1.5X4	WP37X1.5X5	WP37X1.5X6	WP37X1.5X8	WP37X1.5X10	WP37X1.5X12
	2.000	WP37X2X4	WP37X2X5	WP37X2X6	WP37X2X8	WP37X2X10	WP37X2X12
	2.500	WP37X2.5X4	WP37X2.5X5	WP37X2.5X6	WP37X2.5X8	WP37X2.5X10	WP37X2.5X12
	3.000	WP37X3X4	WP37X3X5	WP37X3X6	WP37X3X8	WP37X3X10	WP37X3X12
	4.000	WP37X4X4	WP37X4X5	WP37X4X6	WP37X4X8	WP37X4X10	WP37X4X12

Other materials and graphite plug configurations available upon request. Call Customer Service for pricing and delivery.

# L-GIBS



**M** CA954 Solide Bronze **H** 170 Brinell

CAD insertion point

CATALOG NUMBER	W +.002 -.000	L +.125 -.000	H ±.005	A +.002 -.000	B +.002 -.000	# Screw Holes	SHCS	S1	S2	S3	D
LGIB75L5.25	.750	5.25	.750	.312	.563	3	1/4	1.625	—	—	.281
LGIB75L8.75	.750	8.75	.750	.312	.563	4	1/4	1.000	3.375	—	.281
LGIB100L6	1.000	6.00	.750	.375	.750	4	5/16	.750	2.250	—	.375
LGIB100L10	1.000	10.00	.750	.375	.750	4	5/16	1.250	3.750	—	.375
LGIB125L6	1.250	6.00	.875	.500	.875	4	3/8	.750	2.250	—	.438
LGIB125L10	1.250	10.00	.875	.500	.875	4	3/8	1.250	3.750	—	.438
LGIB150L9	1.500	9.00	1.250	.750	1.000	4	3/8	1.125	3.375	—	.500
LGIB150L15	1.500	15.00	1.250	.750	1.000	6	3/8	1.250	3.750	6.250	.500

Available with or without screw counterbores. To order undrilled L-Gibs, specify "N" at the end of the catalog number. Example: LGIB150L9N.



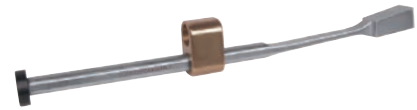
# LIFTERS

## UNDERCUT RELEASE

### SECTION H



UniLifter System	Versa-Lifter System	Spherical Bushings
Prefix: CB, UC, TG	Prefix: UGV, SGV, CBV	Prefix: LSB
Page: H-1	Page: H-5	Page: H-7



Lifter Guides	Modulifter System	FlexiCore System
Prefix: LG, LHK	Prefix: MLB, MLC, MLR, MLH	Prefix: FCA, FCR, FCDA
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Lifter Blades & Cores
Prefix: LBA, LCA
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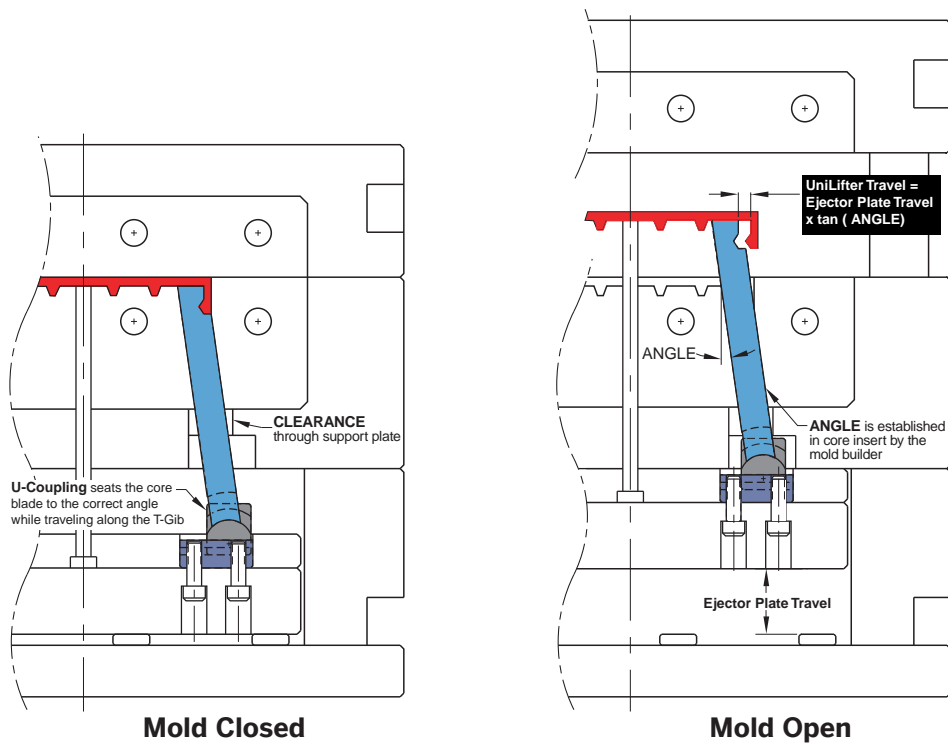




# UNILIFTER® UNDERCUT RELEASE SYSTEM



The UniLifter undercut release system incorporates a three piece set: Core Blade, U-Coupling, and T-Gib.



### Application Guidelines:

- Typical angle is 5-10°, though users report success at greater angles with guides installed. Contact Engineering for application review.
- Guided Ejection is recommended, and if there is less than half of the Core Blade bearing in the insert, lifter guide plates should be added.
- Recommended clearance is .001"-.0015" (.025-.038 mm) where permissible.
- Core insert material should be at least 10 HRC higher in hardness than the Core Blade, and for maximum longevity consider coatings or treatments for increased lubricity or hardness.
- Locking angles can be designed to accept molding pressure, and non-standard sizes or pre-roughed Core Blades can be provided by accessing [www.procomps.com](http://www.procomps.com).

# MINILIFTER® SERIES

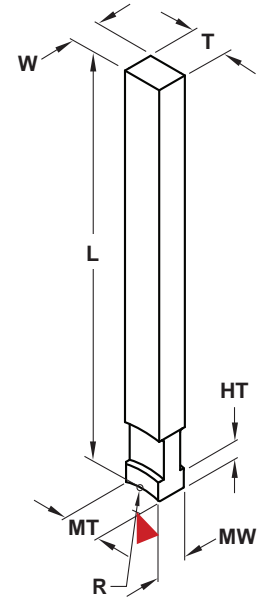
## Flat Core Blades - Inch Standard M H-13 H 38-42 HRC

MW	R	HT	CATALOG NUMBER	T +.000 -.001	W +.000 -.001	L +.06 -.00	MT MIN. THK.
.250	.250	.156	CBS37X25L8	.385	.260	8	.25
			CBS50X25L8	.510	.260	8	.31
			CBS75X37L8	.760	.385	8	.31

M H-13 H 48-50 HRC  
M DC53 H 58-60 HRC

## Flat Core Blades - Metric Standard

MW	R	HT	H-13 MATERIAL CATALOG NUMBER	DC53 MATERIAL CATALOG NUMBER	T -.005 -.015	W -.005 -.015	L +2 +1	MT MIN. THK.
6	12	4	CBMMH6X6L200	CBMMP6X6L200	6.00	6.00	200	6
			CBMMH6X10L200	CBMMP6X10L200	6.00	10.00		
			CBMMH8X6L200	CBMMP8X6L200	8.00	6.00		
			CBMMH8X8L200	CBMMP8X8L200	8.00	8.00		
			CBMMH10X8L200	CBMMP10X8L200	10.00	8.00		



▶ CAD insertion point

## Round Core Blades - Inch Standard M H-13 H 38-42 HRC

MW	R	HT	CATALOG NUMBER	D +.000 -.001	L +.06 -.00	MT MIN. THK.
.250	.250	.156	CBS43DL8	.437	8	.31

M H-13 H 48-50 HRC  
M DC53 H 58-60 HRC

## Round Core Blades - Metric Standard

MW	R	HT	H-13 MATERIAL CATALOG NUMBER	DC53 MATERIAL CATALOG NUMBER	D -.005 -.014	L +2 -0	MT MIN. THK.
6	12	4	CBMMH8DL200	CBMMP8DL200	8.00	200	6

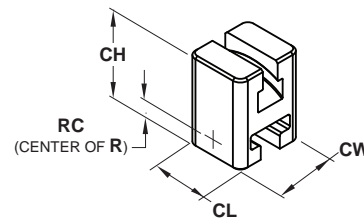


## U-Couplings - Inch Standard M H-13 H Salt Bath Nitride

R	RC	CATALOG NUMBER	CW	CL	CH
.250	.125	UCM50	.50	.44	.62

## U-Coupling - Metric Standard M H-13 H Salt Bath Nitride

R	RC	CATALOG NUMBER	CW	CL	CH
12	2	UCMM16	16	14	21



## T-Gibs - Inch Standard M H-13 H 28-32 S Salt Bath Nitride

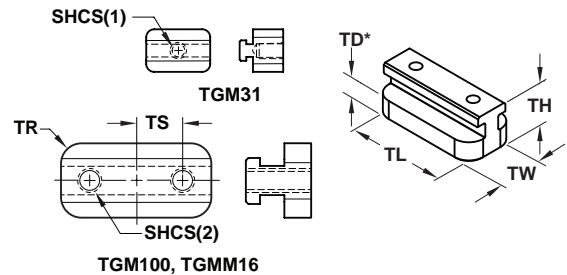
TW +.000 -.001	TH +.010 -.000	TD* +.010 -.000	TR	SHCS (INCLUDED)	CATALOG NUMBER	TS	TL +.000 -.010	TRAVEL ALLOWED
.500	.500	.344	.093	#10-32x1	TGM31	-	.750	.312
					TGM100	.500	1.50	1.000

\*TD Includes fitting stock for final adjustments.

## T-Gib - Metric Standard M H-13 H 28-32 S Salt Bath Nitride

TW +.00 -.05	TH +.25 -.00	TD* +.25 -.00	TR	SHCS (INCLUDED)	CATALOG NUMBER	TS	TL +.00 -.10	TRAVEL ALLOWED
16	13	6	2.5	M4-.7x20	TGMM16	10	33	18

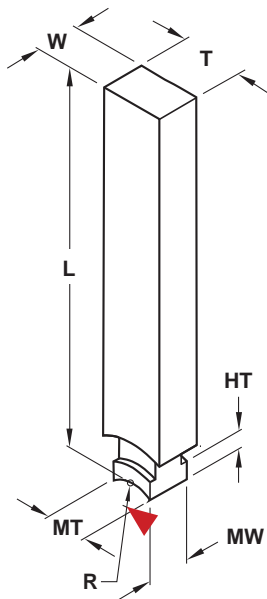
\*TD Includes fitting stock for final adjustments.



For core blades in different materials or mold-ready sizes refer to templates in section X.



# UNILIFTER® SERIES



▶ CAD insertion point

The UniLifter Series (MW=.500) is also available in aluminum bronze in 14" and 18" lengths only. To order, replace "CBS" with "CBA" in the catalog number as shown: CBA50X50L14.

**M** H-13 **H** 38-42 HRC

## Flat Core Blades - Inch Standard

MW	R	HT	CATALOG NUMBER	T +.000 -.001	W +.000 -.001	L +.06 -.00	MT MIN. THK.
.500	.406	.187	CBS50X50L8	.510	.510	8	.49
			CBS50X50L14	.510	.510	14	.49
			CBS50X100L8	.510	1.010	8	.49
			CBS50X100L14	.510	1.010	14	.49
			CBS50X150L14	.510	1.510	14	.49
			CBS75X50L14	.760	.510	14	.62
			CBS75X150L8	.760	1.510	8	.62
			CBS75X150L14	.760	1.510	14	.62
			CBS100X50L8	1.010	.510	8	.62
			CBS100X50L14	1.010	.510	14	.62
			CBS150X50L8	1.510	.510	8	.62
			CBS150X50L14	1.510	.510	14	.62
			CBS150X75L8	1.510	.760	8	.62
			CBS150X75L14	1.510	.760	14	.62

**M** H-13 **H** 38-42 HRC

## Flat Core Blades - Metric Standard

MW	R	HT	CATALOG NUMBER	T +.000 -.025	W +.000 -.025	L +2 -0	MT MIN. THK.
10	10	5	CBMM10X10L250	10.25	10.25	250	10.0
			CBMM10X20L250	10.25	20.25	250	10.0
			CBMM15X15L250	15.25	15.25	250	15.0
			CBMM15X30L400	15.25	30.25	400	15.0
			CBMM20X10L250	20.25	10.25	250	15.0
			CBMM20X20L400	20.25	20.25	400	15.0
			CBMM30X15L400	30.25	15.25	400	15.0



**M** H-13 **H** 38-42 HRC

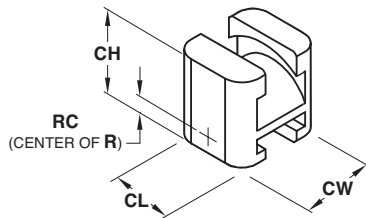
## Round Core Blades - Inch Standard

MW	R	HT	CATALOG NUMBER	D +.000 -.001	L +.06 -.00	MT MIN. THK.
.500	.406	.187	CBS75DL8	.750	8	.62
			CBS75DL14	.750	14	.62
			CBS75DL18	.750	18	.62

**M** H-13 **H** 38-42 HRC

## Round Core Blades - Metric Standard

MW	R	HT	CATALOG NUMBER	D +.000 -.025	L +2 -0	MT MIN. THK.
10	10	5	CBMM10DL250	10.00	250	10.0
			CBMM15DL250	15.00	250	10.0



**M** H-13 **H** Salt Bath Nitride

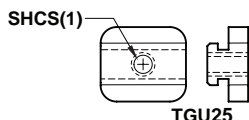
## U-Couplings - Inch Standard

R	RC	CATALOG NUMBER	CW	CL	CH
.406	.187	UCU87	.87	.75	.87

**M** H-13 **H** Salt Bath Nitride

## U-Couplings - Metric Standard

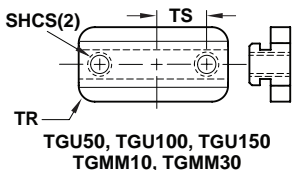
R	RC	CATALOG NUMBER	CW	CL	CH
10	6	UCMM22	22	18	25



**M** H-13 **H** 28-32 **S** Salt Bath Nitride

## T-Gibs - Inch Standard

TW +.000 -.001	TH +.010 -.000	TD* +.010 -.000	TR	SHCS (INCLUDED)	CATALOG NUMBER	TS	TL +.000 -.010	TRAVEL ALLOWED
.875	.468	.219	.187	1/4-20x3/4	TGU25	-	1.00	.250
					TGU50	.375	1.25	.500
					TGU100	.625	1.75	1.000
					TGU150	.750	2.25	1.500



**M** H-13 **H** 28-32 **S** Salt Bath Nitride

## T-Gibs - Metric Standard

TW +.000 -.025	TH +.25 -.00	TD* +.25 -.00	TR	SHCS (INCLUDED)	CATALOG NUMBER	TS	TL +.00 -.25	TRAVEL ALLOWED
22	13	6	5	M5-0.8 x 20	TGMM10	10	33	15
					TGMM30	15	52	34

\*TD Includes fitting stock for final adjustments.

For core blades in different materials or mold-ready sizes refer to templates in section X.

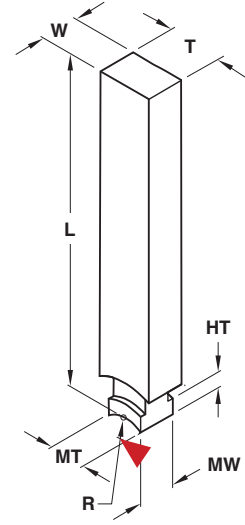
# UNILIFTER® XL SERIES

## Flat Core Blades - Inch Standard

**M** H-13 **H** 38-42 HRC

MW	R	HT	CATALOG NUMBER	T +.000 -.001	W +.000 -.001	L +.06 -.00	MT MIN. THK.
1.000	.875	.375	CBS100X100L10	1.010	1.010	10	1.00
			CBS100X100L18	1.010	1.010	18	1.00
			CBS100X150L10	1.010	1.510	10	1.00
			CBS100X150L18	1.010	1.510	18	1.00
			CBS150X100L10	1.510	1.010	10	1.00
			CBS150X100L18	1.510	1.010	18	1.00

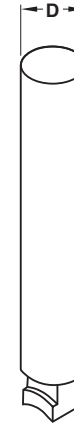
▶ CAD insertion point



## Round Core Blades - Inch Standard

**M** H-13 **H** 38-42 HRC

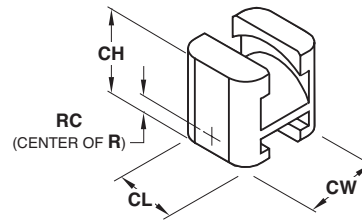
MW	R	HT	CATALOG NUMBER	D +.000 -.001	L +.06 -.00	MT MIN. THK.
1.000	.875	.375	CBS125DL10	1.250	10	1.00
			CBS125DL18	1.250	18	1.00



## U-Couplings - Inch Standard

**M** H-13 **H** Salt Bath Nitride

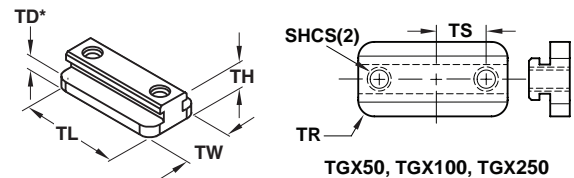
R	RC	CATALOG NUMBER	CW	CL	CH
.875	.125	UCX175	1.75	1.50	1.65



## T-Gibs - Inch Standard

**M** H-13 **H** 28-32 **S** Salt Bath Nitride

TW +.000 -.001	TH +.010 -.000	TD* +.010 -.000	TR	SHCS (INCLUDED)	CATALOG NUMBER	TS	TL +.000 -.010	TRAVEL ALLOWED
1.750	.615	.250	.312	3/8-16x1-1/4	TGX50	.625	2.00	.500
					TGX100	.875	2.50	1.000
					TGX250	1.375	4.00	2.500



\*TD Includes fitting stock for final adjustments.

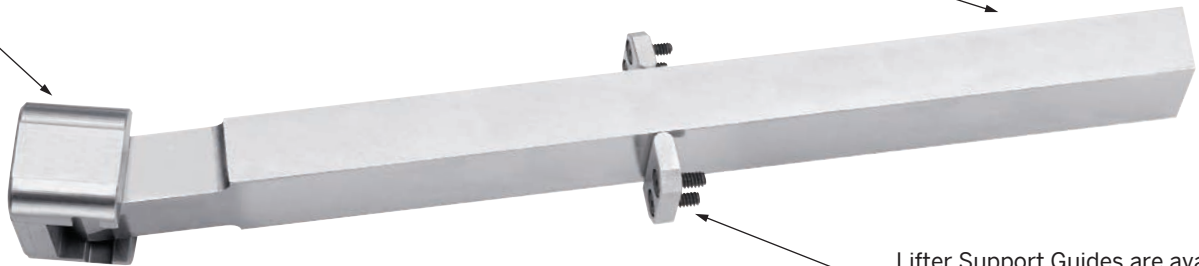
For core blades in different materials or mold-ready sizes refer to templates in section X.



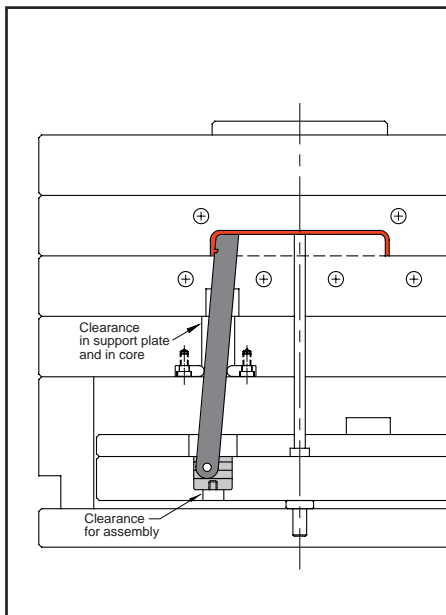
# VERSA-LIFTER™ UNDERCUT RELEASE SYSTEM

Gib Coupling retains the Core Blade and supports vertical movement.

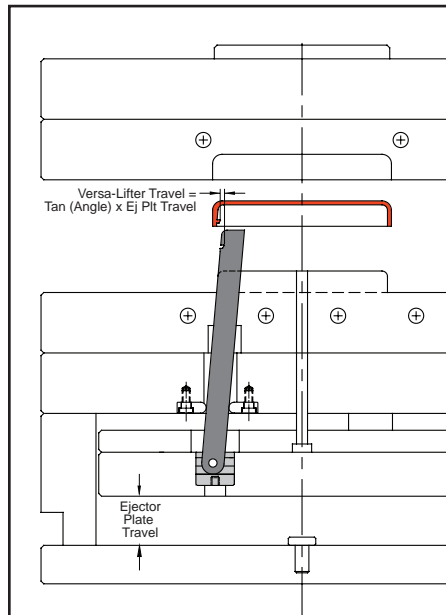
Core Blades are manufactured from A-10 material, ready for molding detail



Lifter Support Guides are available for when support plate alignment is required.



**Mold Closed**



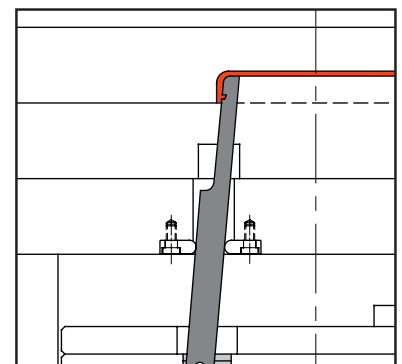
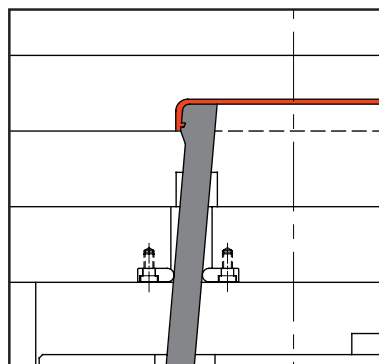
**Mold Open**

## Design Guidelines:

- Typical angles are 5-15°, but users have reported success at larger angles for unique applications with greater bearing, such as cavity side core pulls. Contact Engineering for an application review.
- Guided Ejection is required, and the Lifter Support Guides are recommended in all applications.
- Recommended total clearance is .001"-.0015" (.025-.038mm) where permissible.
- Core material should be at least 10 HRC different than the Core Blade material.
- Locking angles can be designed to counter molding pressure.
- Non-standard sizes or mold-ready Core Blades can be provided by sending a request to [tech@procomps.com](mailto:tech@procomps.com).

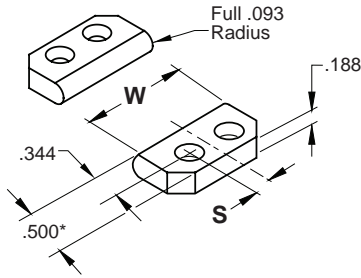
## Design Options:

- For positive return, a locking angle can be designed into the Core Blade as shown at right.
- In addition, if space is limited at parting line, the Core Blade can be stepped.



# VERSA-LIFTER™

## LIFTER SUPPORT GUIDES



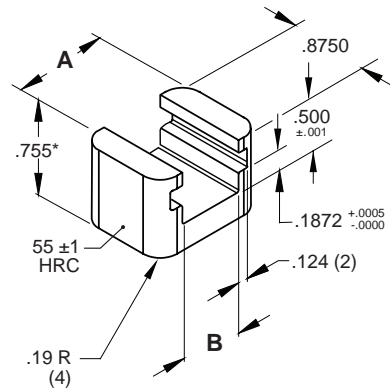
**M** S-7 **H** 54-56 HRC

CATALOG NUMBER	W	S
SGV43	.436	On Center
SGV62	.624	On Center
SGV87	.874	.187
SGV112	1.124	.312

Notes:

- \*Includes .005" fit stock on flat side.
- The Lifter Support Guides are sold in pairs.
- Four (4) #6-32 LHCS are included.

## GIB COUPLINGS



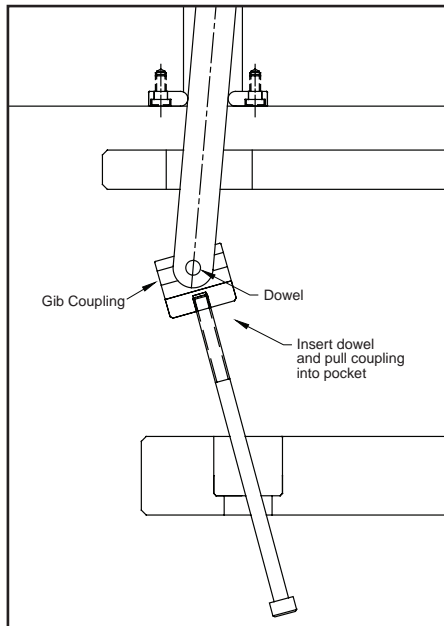
**M** S-7 **H** 54-56 HRC **S** Salt Bath Nitride

CATALOG NUMBER	A Central	B +.001 -.000	Compatible Core Blade Widths (W)
UGV68	.6860	.190	.1875 & .4375
UGV87	.8735	.377	.6250
UGV112	1.1235	.627	.8750
UGV137	1.3735	.877	1.1250

\* .005" stock is included on the bottom for fitting.

# VERSA-LIFTER™

## CORE BLADES



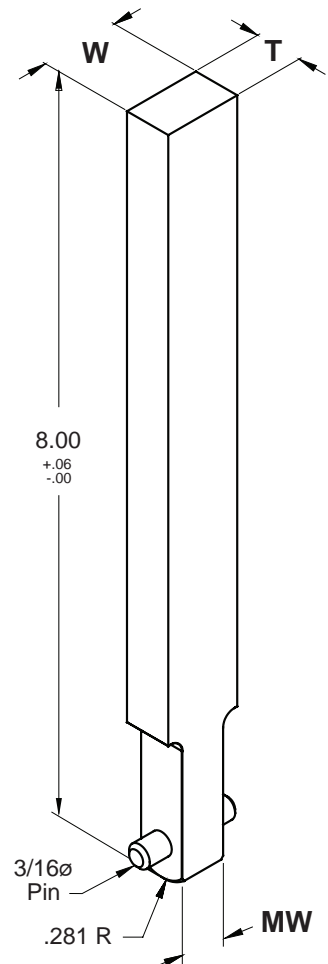
**M** Bohler K340 **H** 58-60 HRC

T +.0000 -.0003	CATALOG NUMBER	W +.0000 -.0003	MW +.000 -.001
.5000	CBV50X18L8	.1875	.188
	CBV50X43L8	.4375	.188
	CBV50X62L8	.6250	.375
	CBV50X87L8	.8750	.625
	CBV50X112L8	1.1250	.875

Pre-engineered pin is included.

### Assembly Guidelines:

- Assembly length cap screw (#10-32 x 4") is included with each lifter.
- Install the assembly screw in the Gib Coupling as shown.
- Connect the lifter pin and pull unit into pocket in ejector plate, removing the screw afterwards.

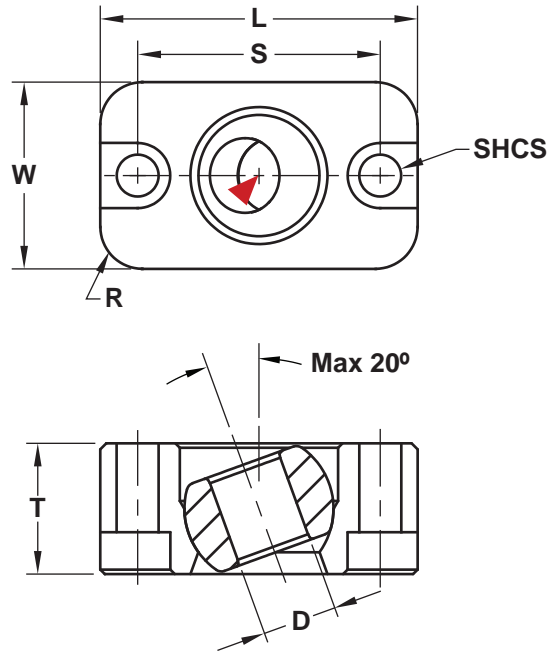
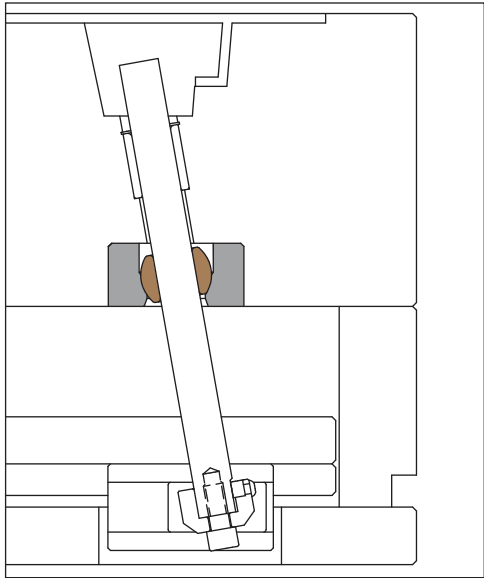






# LIFTER ACCESSORIES

## SPHERICAL BUSHINGS



### Design Notes:

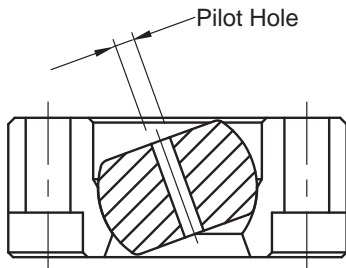
- Machine pocket with clearance on length and width.
- Tighten bolts after inserting lifter rod.

**M** Housing: 1045 18-22 HRC, Bushing: C86300 Bronze

▶ CAD insertion point

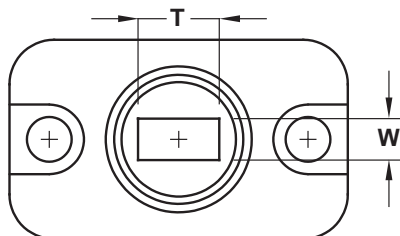
CATALOG NUMBER	D +.001 -.000	L +.000 -.002	W +.000 -.002	T +.000 -.002	S ±.005	R Pocket Radius	SHCS
LSB050	.5005	2.000	1.250	.875	1.500	.250	1/4-20 x 1.00"
LSB063	.6255	2.250	1.500	1.125	1.750	.250	1/4-20 x 1.25"
LSB075	.7505	2.625	1.750	1.375	2.125	.375	5/16-18 x 1.50"
LSB100	1.0005	2.875	2.125	1.500	2.375	.375	5/16-18 x 1.75"
LSB125	1.2505	4.000	2.750	2.000	3.250	.500	3/8-16 x 2.25"
LSB150	1.5005	4.250	3.000	2.375	3.500	.500	3/8-16 x 2.75"

Screws included.



### Blank Spherical Bushings

To order: Add a "-B" to the end of the part number. Ex: LSB100-B  
 Sizes 075-B and smaller have a .23 Pilot Hole.  
 Sizes 100-B and larger have a .47 Pilot Hole.

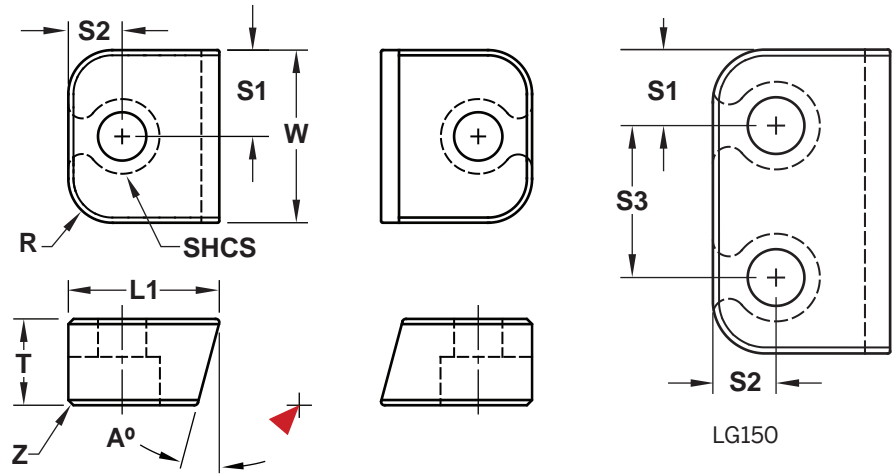


Use the blank bushing to cut alternative core blade sizes. See chart for recommended sizing.

Spherical Bushing Size	Lifter T x W (MAX)	UniLifter Size Chart
LSB050	1/2 X 1/2	CBS37X25, CBS50X25, CBS50X50, CBS43D, CBV50X18, CBV50X43, CBMM10D, CBMM10X10
LSB063	5/8 X 5/8	CBV50X62, CBMM15D, CBMM15X15
LSB075	3/4 X 3/4	CBS75X37, CBMM20X10, CBMM20X20
LSB100	1 X 1	CBS100X50, CBS100X100, CBS75D, CBV50X87
LSB125	1-1/4 X 1-1/4	CBS125D, CBV50X112, CBMM30X15
LSB150	1-1/2 X 1-1/2	CBS150X150, CBS150X75, CBS150X100

# LIFTER ACCESSORIES

## LIFTER GUIDES



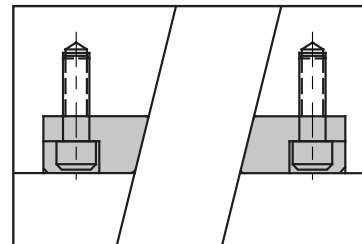
**M** 0-1 **H** 58-60 HRC **S** Black Oxide

CAD insertion point

W +.000 -.001	CATALOG NUMBER			T ± .015	L1	S1 ± .005	S2 ± .005	S3 ± .005	R Pocket Radius	Z Chamfer	SHCS
	A = 5°	A = 10°	A = 15°								
.375	LG37-5	LG37-10	LG37-15	.500	.500	.188	.188	--	.125	.02	#6-32 x 1/2"
.500	LG50-5	LG50-10	LG50-15		.750	.250	.250	--			
.750	LG75-5	LG75-10	LG75-15		.375	--	.187	.03	#10-32 x 3/4"		
1.000	LG100-5	LG100-10	LG100-15		.500	--	.250				
1.500	LG150-5	LG150-10	LG150-15		.875	.312	.750			.250	1/4-20 x 3/4"

Lifter Guides are sold in sets with Socket Head Cap Screws included.  
 LG150 items have 4 screws as shown in the locations below.

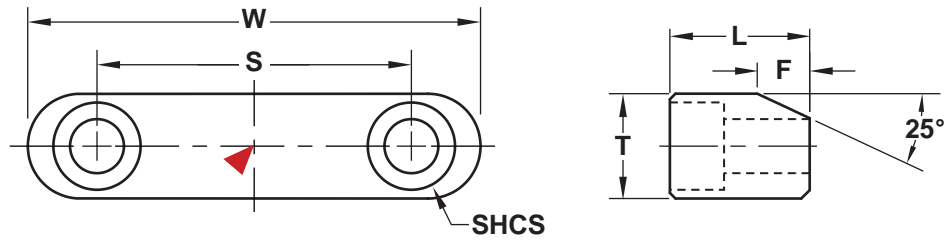
Size of Guide	Can Be Used with UniLifter Core Blade Size	Max Blade Width (For Other Systems)
LG37	37X25 50X25 75X37	.385
LG50	50X50 75X50 100X50 150X50	.510
LG75	150X75	.760
LG100	100x100 150x100	1.010
LG150	50X150 75X150 100X150	1.510





# LIFTER ACCESSORIES

## LIFTER HEAD KEY

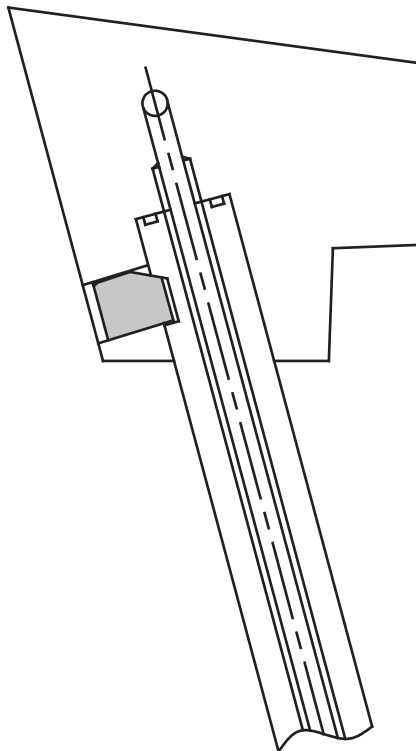


**M** 4140 **H** 28-32 HRC

CAD insertion point

NOMINAL ROD DIAMETER Ø	CATALOG NUMBER	W +0.00 -0.01	L ±.005	T +0.000 -0.005	F	S	SHCS
1/2	<b>LHK050</b>	1.370	.500	.375	.19	.875	#6-32 x 1/2
5/8	<b>LHK063</b>	1.495	.500	.375	.19	1.000	#6-32 x 1/2
3/4	<b>LHK075</b>	1.620	.500	.500	.19	1.125	#8-32 x 1/2
1	<b>LHK100</b>	1.870	.500	.500	.19	1.375	#8-32 x 1/2
1-1/4	<b>LHK125</b>	2.620	.750	.625	.25	2.000	1/4-20 x 7/8
1-1/2	<b>LHK150</b>	2.870	.750	.625	.25	2.250	1/4-20 x 7/8

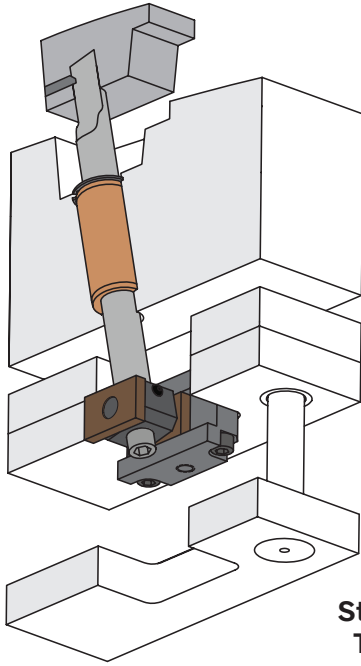
Screws included.



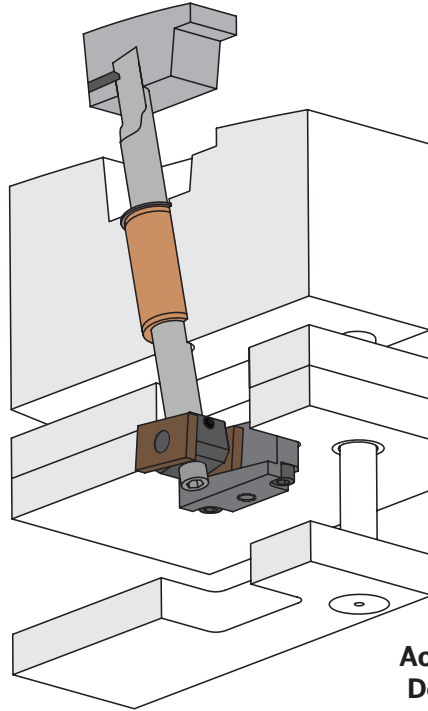
# MODULIFTER® UNDERCUT RELEASE SYSTEM

A standardized modular lifter assembly simplifies undercut release:

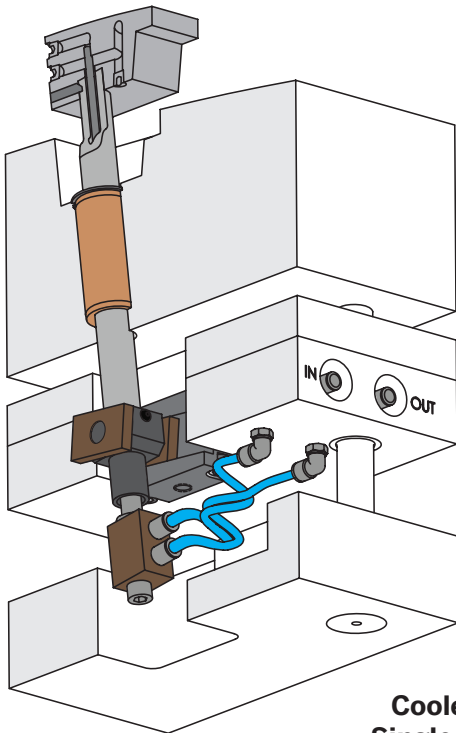
- Specialized design for accelerated and decelerated applications.
- Additional lifter cooling options and components available.



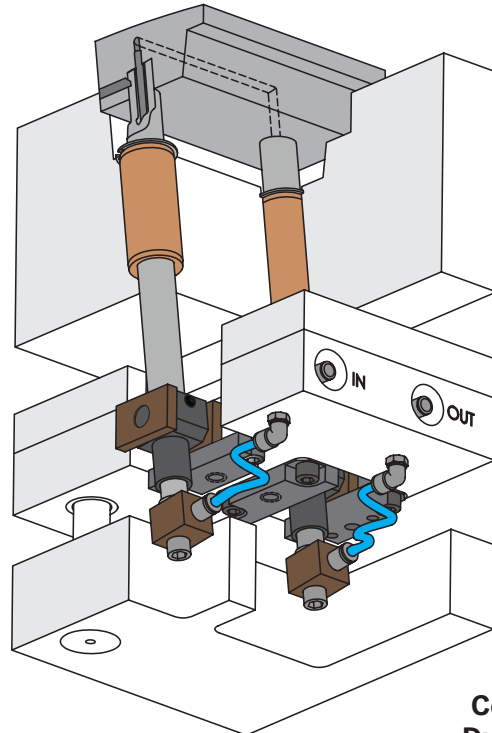
**Straight  
Travel**



**Accelerated/  
Decelerated  
Options**



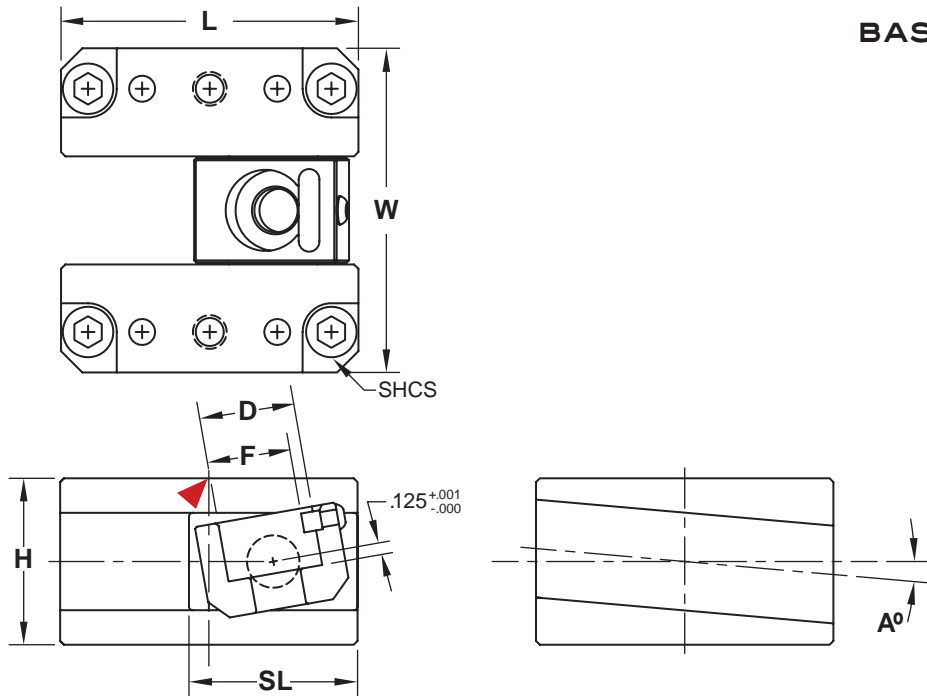
**Cooled:  
Single Rod  
In/Out**



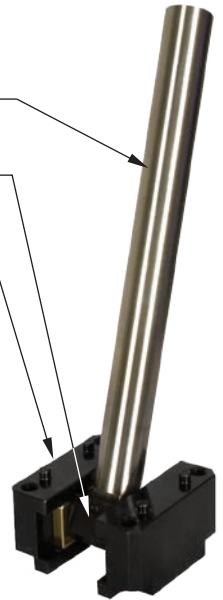
**Cooled:  
Dual Rod  
In/Out**



# MODULIFTER® BASE ASSEMBLY/LIFTER ROD



- Rod (sold separately)
- Base Assembly includes:
- Rod Coupling Assembly
  - Gibs (2)
  - Mounting Screws (4)
  - Dowels installed



## BASE ASSEMBLY

Gibs/Coupling: **M** 1045 **H** 28-32 HRC **S** Nitride Slides: **M** C86300 (Graphite Plugs if specified)

NOMINAL ROD DIAMETER Ø	CATALOG NUMBER			L +.000 -.015	W +.000 -.002	H +.000 -.001	D +.0003 -.0000	F +.0015 -.0000	SHCS	SL	TRAVEL (L-SL)
	A = 0°	A = 5°	A = 10°								
1/2	MLBA050	MLBA050-5	MLBA050-10	2.250	2.250	1.375	.5003	.4505	1/4-20 x 1-1/2	1.38	.87
5/8	MLBA063	MLBA063-5	MLBA063-10	2.625	2.500	1.375	.6253	.5905	1/4-20 x 1-1/2	1.57	1.06
3/4	MLBA075	MLBA075-5	MLBA075-10	2.750	3.000	1.750	.7503	.6905	5/16-18 x 2	1.57	1.18
1	MLBA100	MLBA100-5	MLBA100-10	3.125	3.250	1.750	1.0003	.8755	5/16-18 x 2	1.77	1.35
1-1/4	MLBA125	MLBA125-5	MLBA125-10	3.875	4.000	2.250	1.2503	1.1605	3/8-16 x 2-1/2	2.76	1.12
1-1/2	MLBA150	MLBA150-5	MLBA150-10	4.750	4.250	2.500	1.5003	1.4005	3/8-16 x 2-3/4	3.15	1.60

Notes:

- Includes (4) SHCS and (4) Dowels. For ModuLifter Base Assemblies with different Gib angles, contact tech@procomps.com.
- To order with Graphite Plugged Base, add GP to the part number as shown, Ex: MLBAGPxxx.



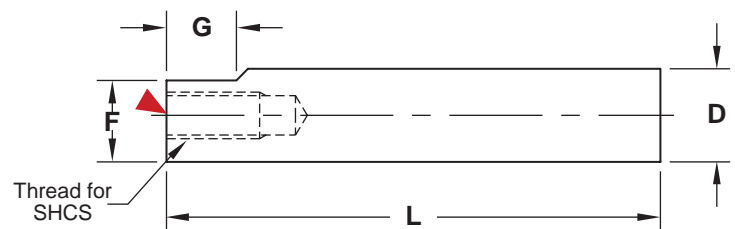
## LIFTER ROD

**M** 1045 **H** Core: 28-32 HRC, Surface: 56-58 HRC

D +.0000 -.0003	CATALOG NUMBER	L +.13 -.00	F +.000 -.001	G +.03 -.00	SHCS
.500	MLR050L14	14	.450	.50	1/4-20 x 5/8
.625	MLR063L14	14	.590	.56	5/16-18 x 3/4
.750	MLR075L16	16	.690	.68	3/8-16 x 7/8
1.000	MLR100L16	16	.875	.75	1/2-13 x 1
1.250	MLR125L18	18	1.160	.94	5/8-11 x 1-1/2
1.500	MLR150L18	18	1.400	1.00	5/8-11 x 1-1/2

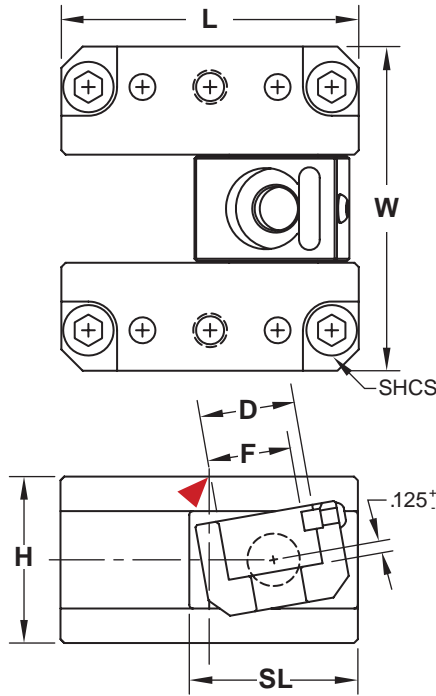
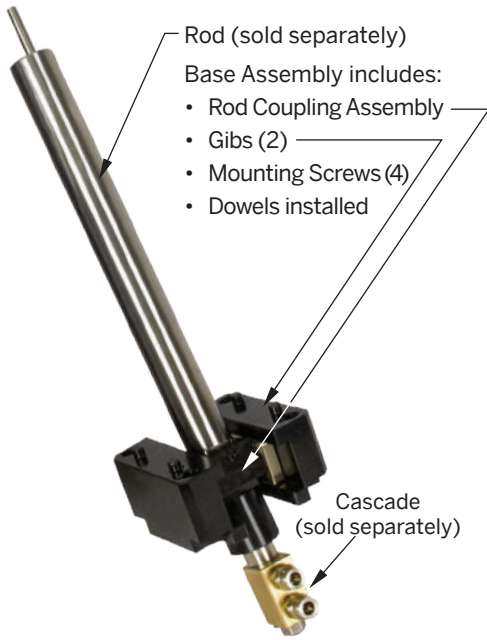
Notes:

- Includes (1) screw for installation.
- For additional Lifter Rod lengths, contact tech@procomps.com.

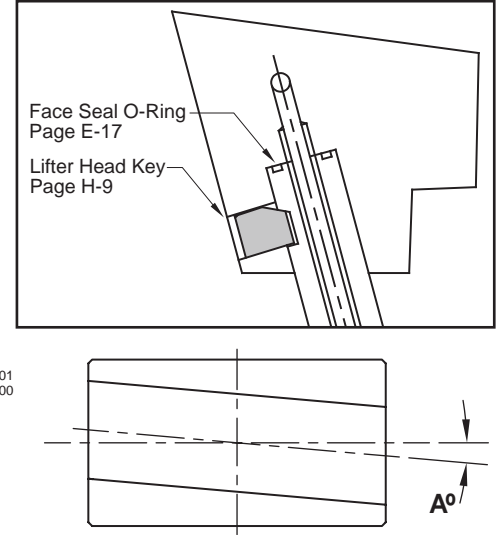


# MODULIFTER®

## COOLED BASE ASSEMBLY/LIFTER ROD



The ModuLifter Cooling Base Assemblies have three (3) options for varying water connections. Additional accessories are shown below.



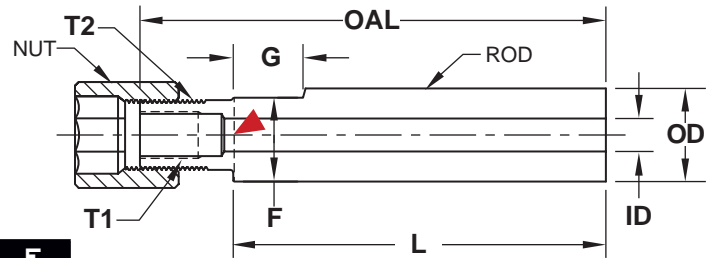
### COOLED BASE ASSEMBLY

Gibs/Coupling: **M** 1045 **H** 28-32 HRC **S** Nitride Slides: **M** C86300 (Graphite Plugs if specified) ▶ CAD insertion point

NOMINAL ROD DIAMETER	CATALOG NUMBER			L +0.000 -0.015	W +0.000 -0.002	H +0.000 -0.001	D +0.0003 -0.0000	F +0.0015 -0.0000	SHCS	SL	TRAVEL (L-SL)
	A = 0°	A = 5°	A = 10°								
5/8	MLCBA063	MLCBA063-5	MLCBA063-10	2.625	2.500	1.375	.6253	.5905	1/4-20 x 1-1/2	1.57	1.06
3/4	MLCBA075	MLCBA075-5	MLCBA075-10	2.750	3.000	1.750	.7503	.6905	5/16-18 x 2	1.57	1.18
1	MLCBA100	MLCBA100-5	MLCBA100-10	3.125	3.250	1.750	1.0003	.8755	5/16-18 x 2	1.77	1.35
1-1/4	MLCBA125	MLCBA125-5	MLCBA125-10	3.875	4.000	2.250	1.2503	1.1605	3/8-16 x 2-1/2	2.76	1.12
1-1/2	MLCBA150	MLCBA150-5	MLCBA150-10	4.750	4.250	2.500	1.5003	1.4005	3/8-16 x 2-3/4	3.15	1.60

- Notes:
- Includes (4) SHCS and (4) Dowels. For ModuLifter Base Assemblies with different Gib angles, contact tech@procomps.com.
  - To order with Graphite Plugged Base, add GP to the part number as shown, Ex. MLCBAGPxxx.

### COOLED LIFTER ROD



**M** 1045 **H** Core: 28-32 HRC, Surface: 56-58 HRC

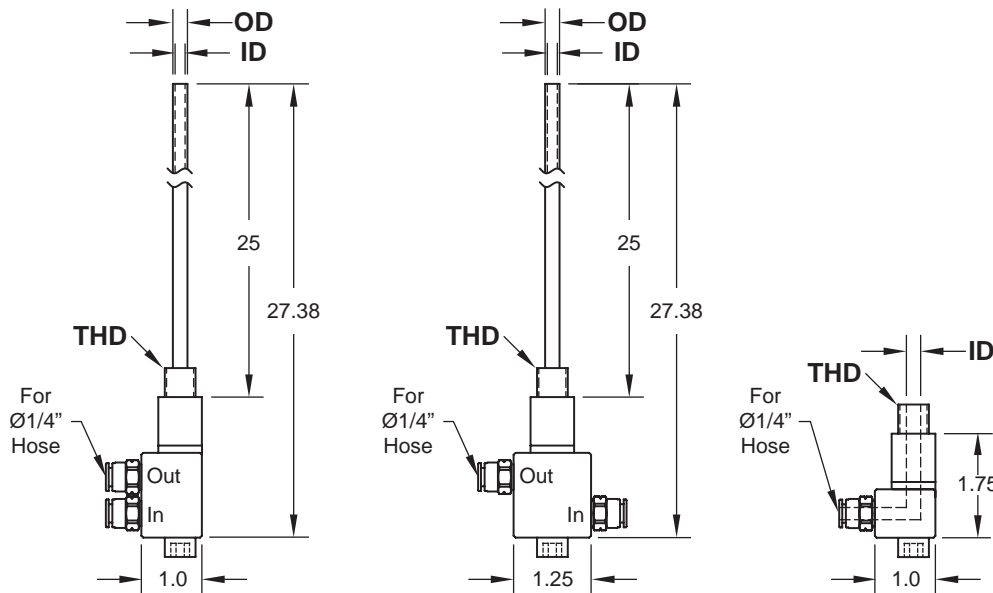
OD +0.0000 -0.0003	CATALOG NUMBER	ID	OAL	L +.13 -.00	T1 Internal Thread	T2 External Thread	G +.03 -.00	F +0.000 -0.001
.625	MLCR063L14	.250	14.75	14	5/16-24	1/2-20	.56	.590
.750	MLCR075L16	.250	16.88	16	5/16-24	1/2-20	.68	.690
1.000	MLCR100L16	.375	17.00	16	1/2-20	3/4-20	.75	.875
1.250	MLCR125L18	.375	19.25	18	1/2-20	7/8-20	.94	1.160
1.500	MLCR150L18	.375	19.38	18	1/2-20	7/8-20	1.00	1.400

▶ CAD insertion point

- Notes:
- Includes (1) Installation Nut. Replacement nuts are available; refer to the price list.
  - For additional Cooled Lifter Rod lengths, contact tech@procomps.com.



# MODULIFTER® COOLING CASCADES

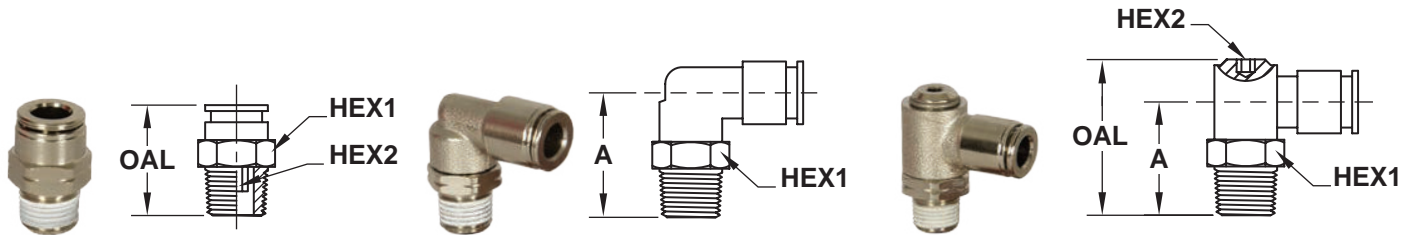


**M** C86300 and Stainless Steel. Fittings: Nickel Plated Brass.

Parallel (In & Out)			Series (In & Out)			Single (In Only)		THD	MAX TORQUE	NOMINAL ROD DIAMETER Ø
OD	ID	CATALOG NUMBER	OD	ID	CATALOG NUMBER	ID	CATALOG NUMBER			
.157	.12	MLCP16L25	.157	.12	MLCS16L25	.12	MLC12	5/16-24	75 in-lbs	5/8, 3/4
.236	.20	MLCP23L25	.236	.20	MLCS23L25	.20	MLC20	1/2-20	20 ft-lbs	1, 1-1/4, 1-1/2

Note: Straight Fittings included with Cooling Cascades.

## PUSH-TO-CONNECT HOSE FITTINGS



FITTING TYPE	CATALOG NUMBER	HOSE OD	THD (NPT)	HEX1	HEX2	A	OAL
Straight	MLFS25	1/4	1/8	1/2	5/32	—	.87
Elbow	MLFE25	1/4	1/8	1/2	—	.83	—
Banjo	MLFB25	1/4	1/8	9/16	1/8	.81	1.22

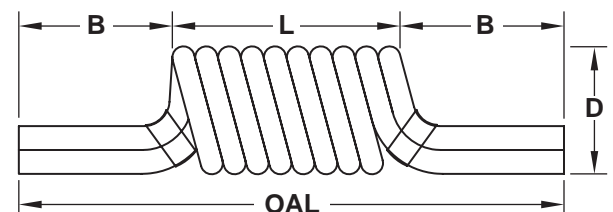
**M** Nickel Plated Brass with Sealant

Note: Maximum Operating Temperature 160° F.

## PUSH-TO-CONNECT SPIRAL AND STRAIGHT HOSES

**M** Polyurethane

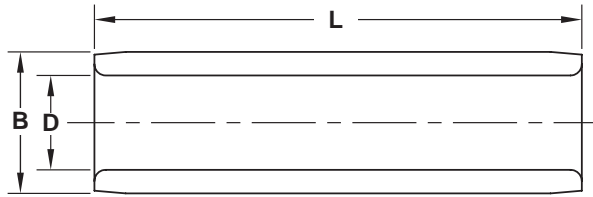
CATALOG NUMBER	HOSE OD	HOSE ID	TURNS	OAL	L	B	D
MLH25-5	1/4	5/32	5	10.5 in	2.5	4	1.5
MLH25-10	1/4	5/32	10	13.0 in	5.0	4	1.5
MLH25-25	1/4	5/32	Straight	25.0 ft	—	—	—



Note: Maximum Operating Temperature 160° F.

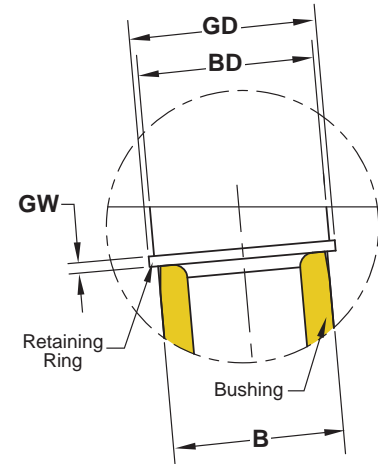


# MODULIFTER® LIFTER ROD BUSHING



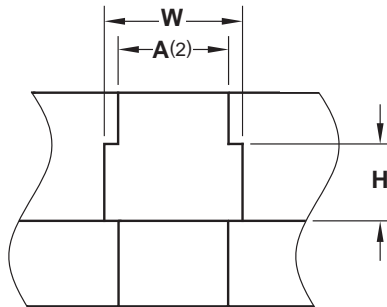
Bushings: **M** C95400    Retaining Ring: **M** Steel **S** Black Oxide

CATALOG NUMBER	D +.001 -.000	B +.0005 -.0000	L +.00 -.01	GD +.005 -.000	GW +.005 -.000	BD ±.002
MLBSH50L1.37	.5005	.750	1.375	.862	.046	.813
MLBSH63L1.37	.6255	.875	1.375	1.000	.046	.934
MLBSH75L3.37	.7505	1.125	3.375	1.262	.056	1.188
MLBSH100L4.37	1.0005	1.375	4.375	1.528	.056	1.438
MLBSH125L4.87	1.2505	1.625	4.875	1.792	.068	1.688
MLBSH150L5.87	1.5005	2.000	5.875	2.186	.086	2.063



Note: Includes (1) Retaining Ring. Replacement rings are available with pricing listed in the price list.

## ROD COUPLING ASSEMBLY PLATE MACHINING OPTION



Coupling: **M** 1045 **H** 28-32 HRC **S** Nitride

Slides: **M** C86300 (Graphite Plugs if specified)

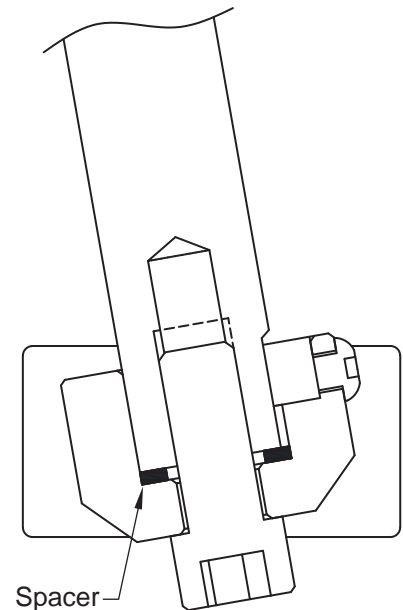
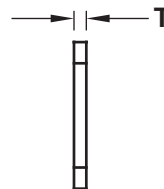
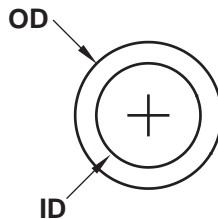
NOMINAL ROD DIA. Ø	CATALOG NUMBER		W +.002 -.000	H ±.001	A +.010 -.000
	Non-Cooled	Cooled			
1/2	RC050	—	1.187	.788	.66
5/8	RC063	RCC063	1.310	.788	.78
3/4	RC075	RCC075	1.500	.946	.97
1	RC100	RCC100	1.781	1.024	1.21
1-1/4	RC125	RCC125	2.375	1.340	1.64
1-1/2	RC150	RCC150	2.656	1.498	1.84

Note: To order slides with Graphite Plugs, add GP to the part number as shown, Ex: RCGP050 or RCCGP125.

## LIFTER ROD SPACER

**M** D-2 **H** 58-60 HRC

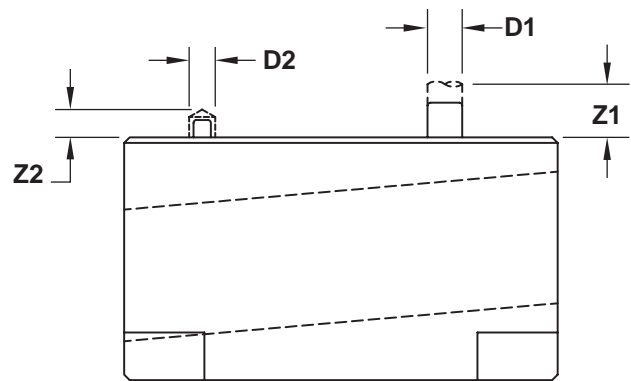
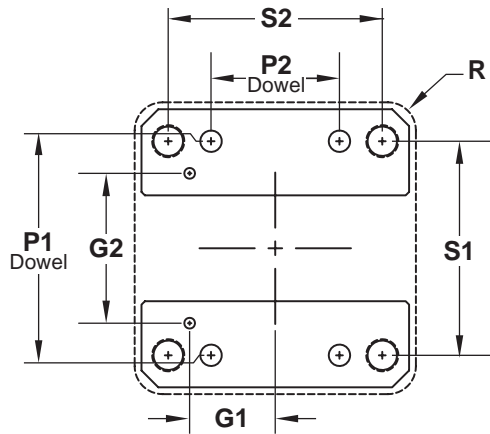
CATALOG NUMBER	OD +.00 -.01	ID +.000 -.005	T +.000 -.001
MLRS050	.500	.30	.063
MLRS063	.625	.53	
MLRS075	.750	.53	
MLRS100	1.000	.80	
MLRS125	1.250	.93	
MLRS150	1.500	.93	





# MODULIFTER®

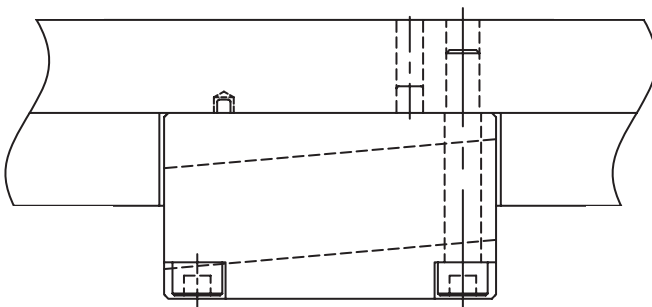
## INSTALLATION GUIDELINES FOR BASE ASSEMBLIES



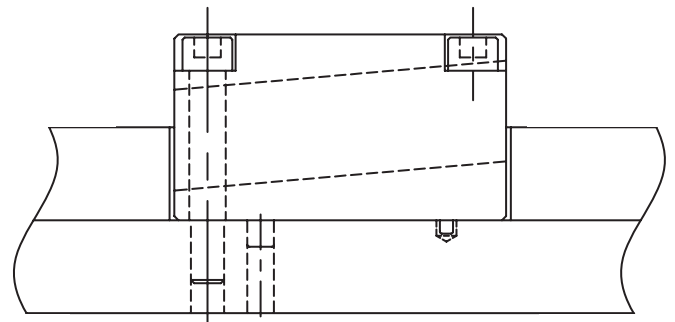
Installation Dimensions							
NOMINAL ROD DIAMETER Ø	S1 ±.005	S2 ±.005	P1 Dowel ±.0005	P2 Dowel ±.0005	R Pocket Max	D1 +.0005 -0.0000	Z1 +.03 -0.00
1/2	1.750	1.750	1.750	.750	.19	.2500	.28
5/8	2.000	2.000	2.000	1.000			
3/4	2.250	2.250	2.250	1.250			
1	2.500	2.500	2.500	1.500			
1-1/4	3.250	3.250	3.250	1.750	.25	.3750	.41
1-1/2	3.500	4.000	3.500	2.500			

Accel./Decel. Keying Dowel			
G1 ±.005	G2 ±.005	D2 Drill Ø	Z2 Drill Depth +.03/-0.00
.75	1.00	.125	.19
.75	1.25		
.75	1.50		
1.00	1.75	.188	.23
1.25	2.25		
1.50	2.50		

## INSTALLATION METHODS



Bottom Mount

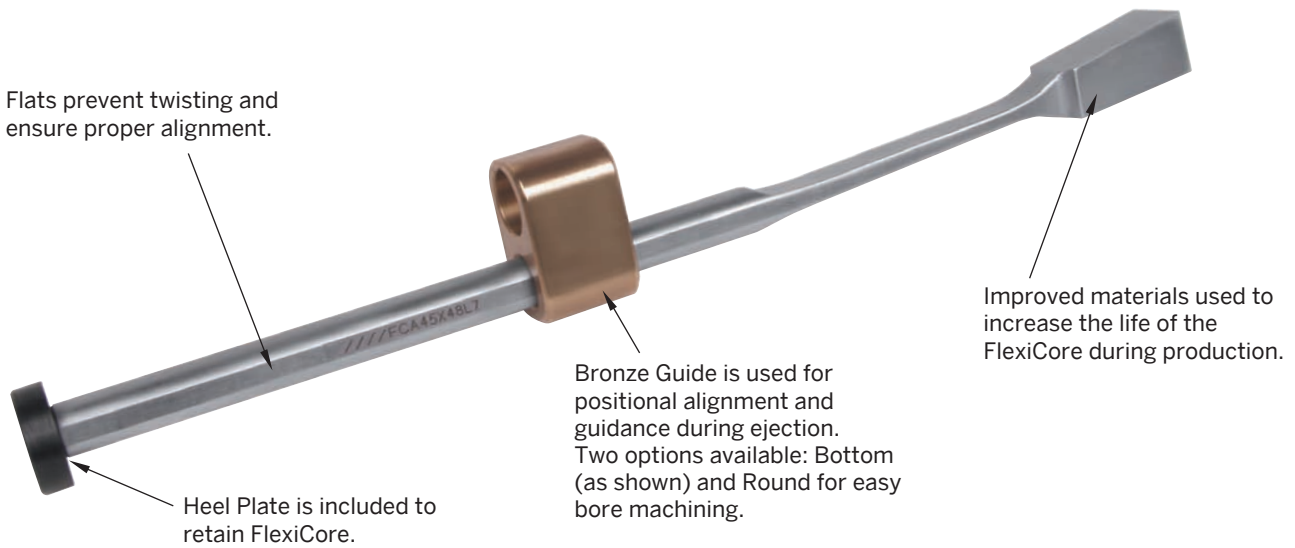


Top Mount

# FLEXICORE™

## UNDERCUT RELEASE SYSTEM

Flats prevent twisting and ensure proper alignment.

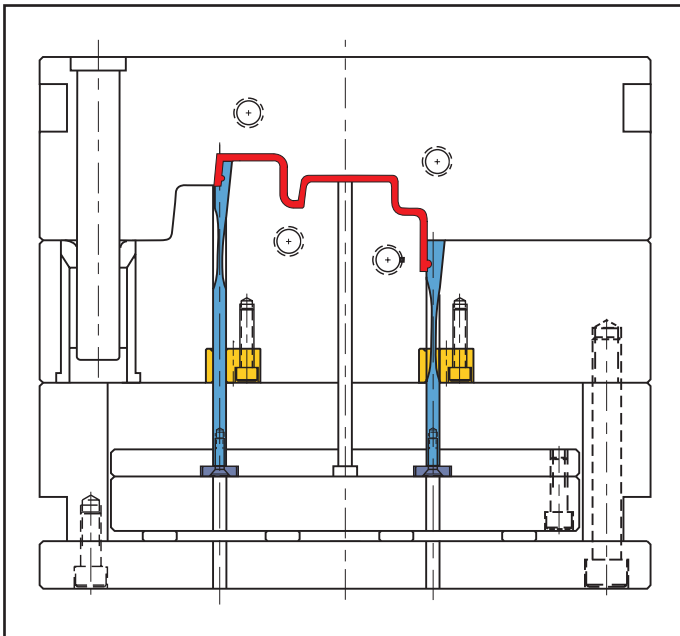


Heel Plate is included to retain FlexiCore.

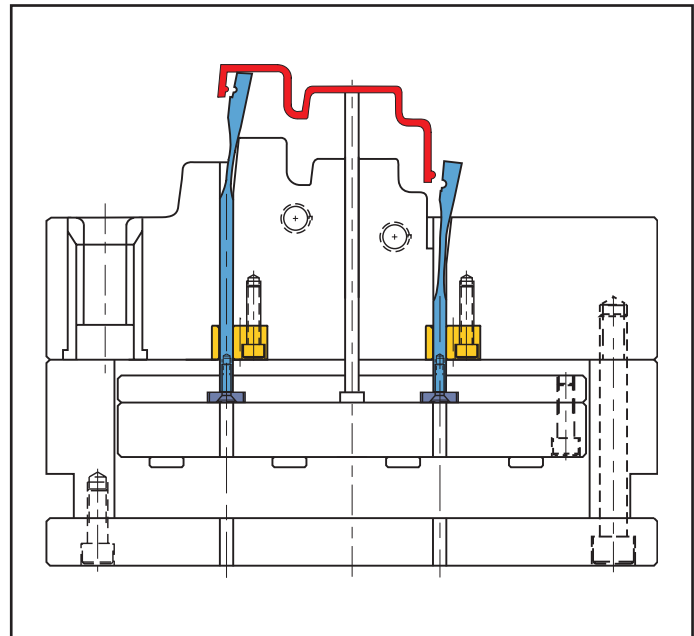
Bronze Guide is used for positional alignment and guidance during ejection. Two options available: Bottom (as shown) and Round for easy bore machining.

Improved materials used to increase the life of the FlexiCore during production.

FlexiCore Assembly includes: FlexiCore, Bronze Guide (Bottom or Round), Heel Plate, and Flat Head Cap Screw.



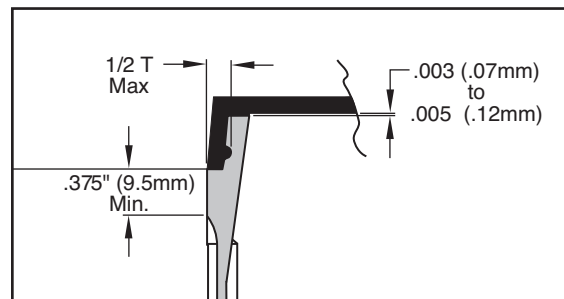
**Mold Closed**



**Mold Open**

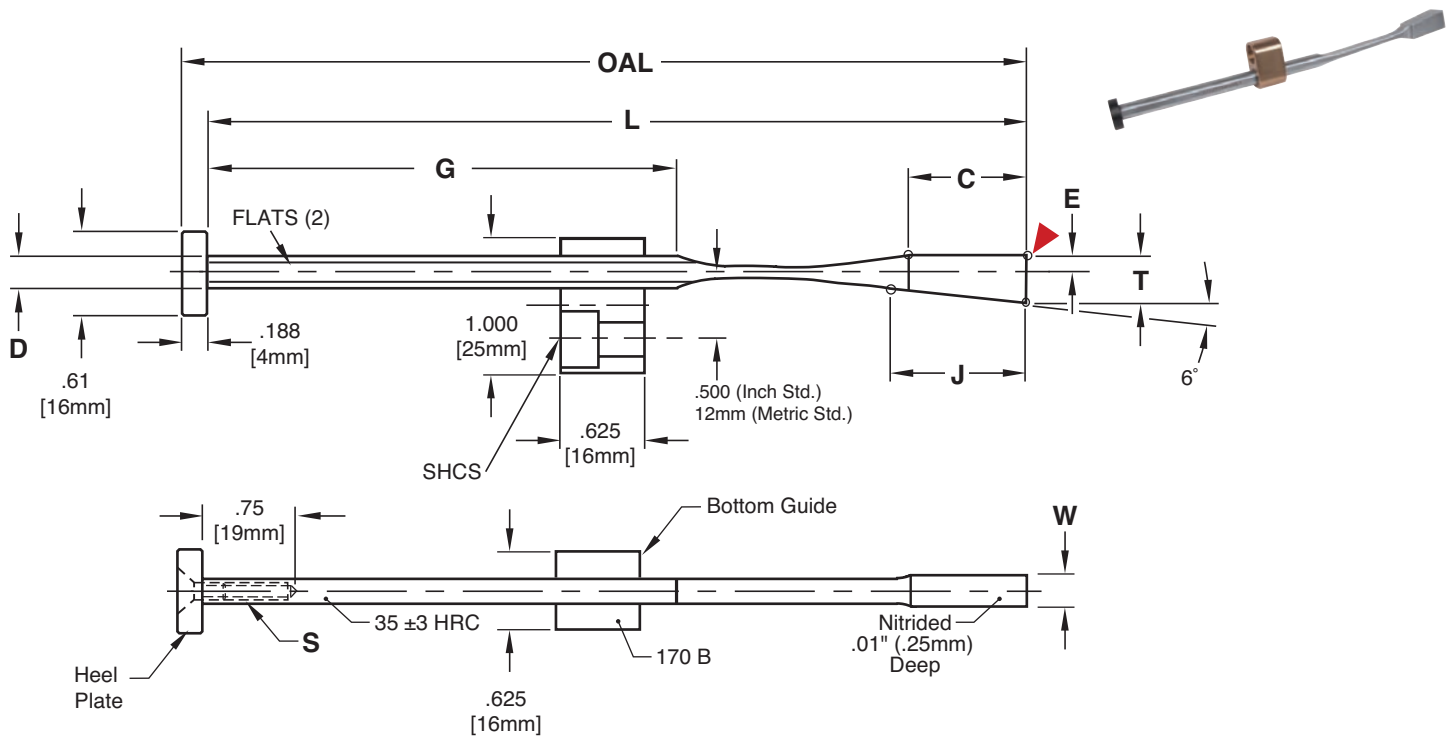
### Application Guidelines:

- The FlexiCore diameter (D) must be within the Guide prior to ejection as shown above.
- Only surface treatments applied at low temperatures such as Electroless Nickel-based or chromium deposition treatments are permitted.
- Maximum temperature is 250° F (125° C).
- Please contact [tech@procomps.com](mailto:tech@procomps.com) to review any designs if questions arise or if your application differs from the examples shown.



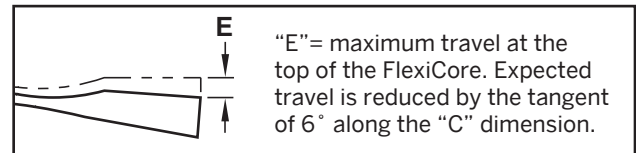


# FLEXICORE™ BOTTOM GUIDE ASSEMBLY



### Design Guidelines:

- The FlexiCore can be cut down and re-tapped to accommodate specific applications.



### Inch Standard

**M** FlexiCore: AISI 4340 with thin, dense Chromium treatment, Guide: CA954 Solid Bronze, Heel Plate: AISI 1018

▶ CAD insertion point

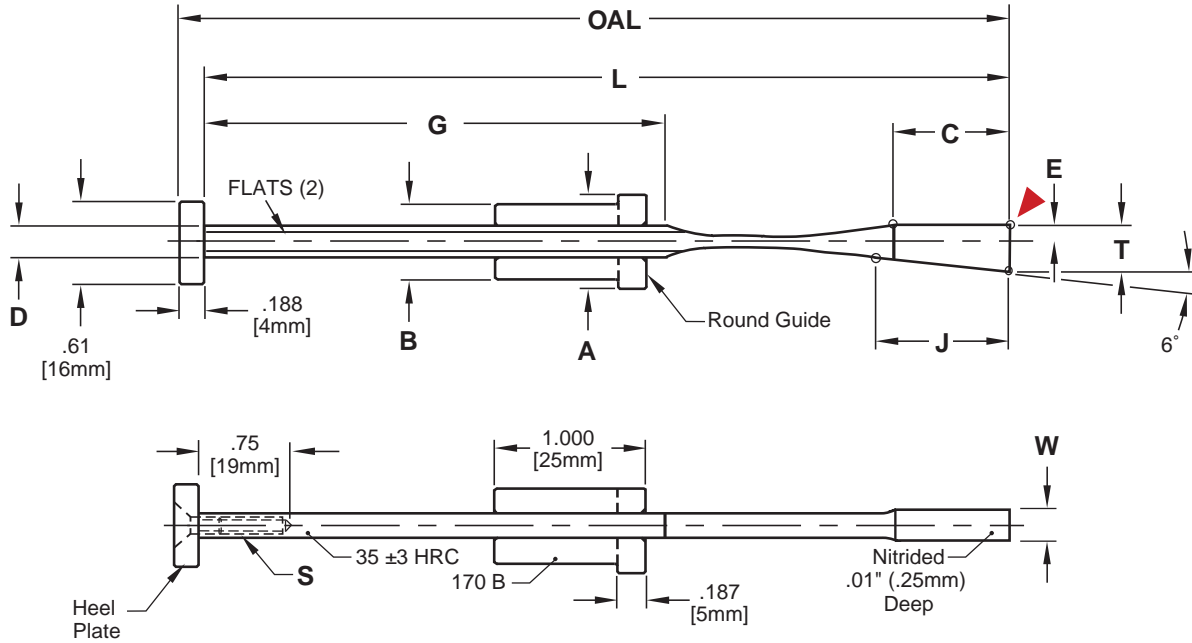
CATALOG NUMBER	T +.002 -.000	W +.002 -.000	L +.010 -.000	OAL REF	D +.000 -.001	C ± .015	E	G +.01 -.00	J	S (Included)	SHCS
FCA35X24L6	.354	.244	6.400	6.588	.234	.875	.137	3.49	.957	#8-32 x 3/8	1/4-20
FCA35X32L6	.354	.322	6.400	6.588	.250	.875	.137	3.48	.957	#8-32 x 3/8	1/4-20
FCA45X40L7	.453	.401	7.875	8.062	.312	1.000	.177	4.38	1.025	#10-24 x 1/2	1/4-20
FCA45X48L7	.453	.480	7.875	8.062	.312	1.000	.177	4.38	1.025	#10-24 x 1/2	1/4-20

### Metric Standard

CATALOG NUMBER	T +.05 -.00	W +.05 -.00	L +.25 -.00	OAL REF	D +.000 -.025	C ± .35	E	G +.25 -.00	J	S (Included)	SHCS
FCA9X6L160	9	6.2	162.5	166.5	5.94	22	3.5	88.6	24.3	M4-0.7 x 12	M6-1
FCA9X8L160	9	8.2	162.5	166.5	6.35	22	3.5	88.4	24.3	M4-0.7 x 12	M6-1
FCA11X10L200	11.5	10.2	200.0	204.0	7.92	26	4.5	111.2	26.0	M5-0.8 x 14	M6-1
FCA11X12L200	11.5	12.2	200.0	204.0	7.92	26	4.5	111.2	26.0	M5-0.8 x 14	M6-1
FCA12X14L200	12.5	14.2	200.0	204.0	7.92	30	4.5	107.2	28.5	M5-0.8 x 14	M6-1
FCA12X16L200	12.5	16.2	200.0	204.0	7.92	30	4.5	107.2	28.5	M5-0.8 x 14	M6-1

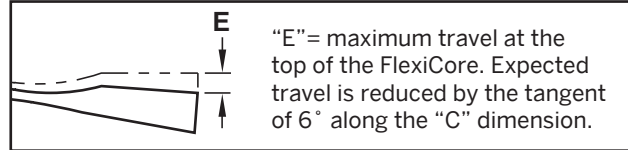
Assemblies include: FlexiCore, Bottom Guide, Heel Plate, and Flat Head Cap Screw.  
Assembly components also sold individually on page H-21.

# FLEXICORE™ ROUND GUIDE ASSEMBLY



### Design Guidelines:

- The FlexiCore can be cut down and re-tapped to accommodate specific applications.



### Inch Standard

**M** FlexiCore: AISI 4340 with thin, dense Chromium treatment, Guide: CA954 Solid Bronze, Heel Plate: AISI 1018

CATALOG NUMBER	T +.002 -.000	W +.002 -.000	L +.010 -.000	OAL REF	D +.000 -.001	C ± .015	E	G +.01 -.00	J	S (Included)	A	B
FCR35X24L6	.354	.244	6.400	6.588	.234	.875	.137	3.49	.957	#8-32 x 3/8	.625	.500
FCR35X32L6	.354	.322	6.400	6.588	.250	.875	.137	3.48	.957	#8-32 x 3/8	.625	.500
FCR45X40L7	.453	.401	7.875	8.062	.312	1.000	.177	4.38	1.025	#10-24 x 1/2	.750	.625
FCR45X48L7	.453	.480	7.875	8.062	.312	1.000	.177	4.38	1.025	#10-24 x 1/2	.750	.625

▶ CAD insertion point

### Metric Standard

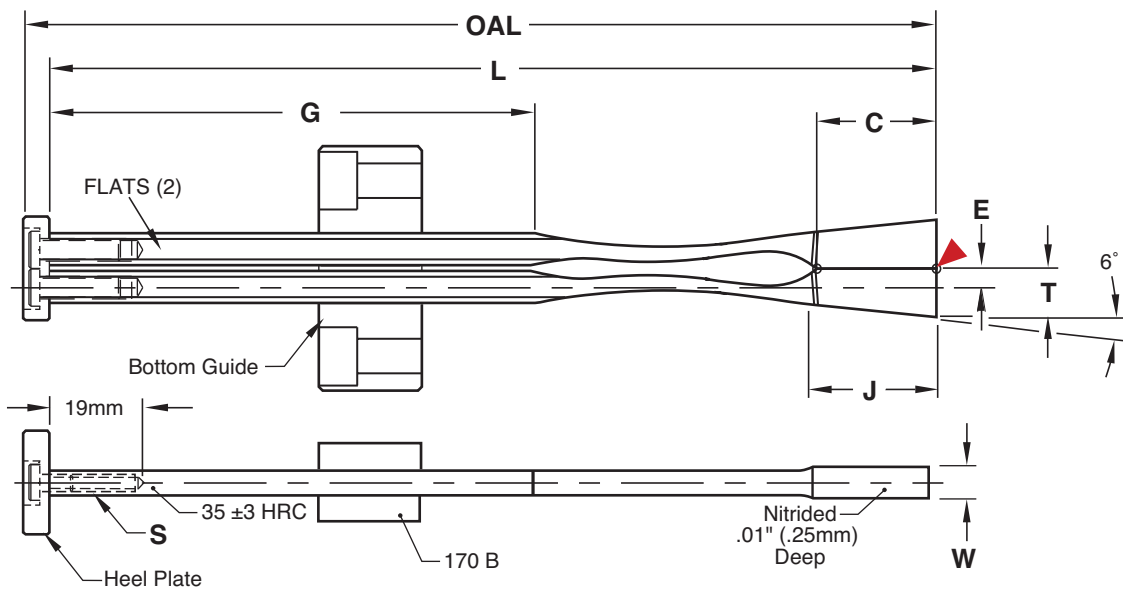
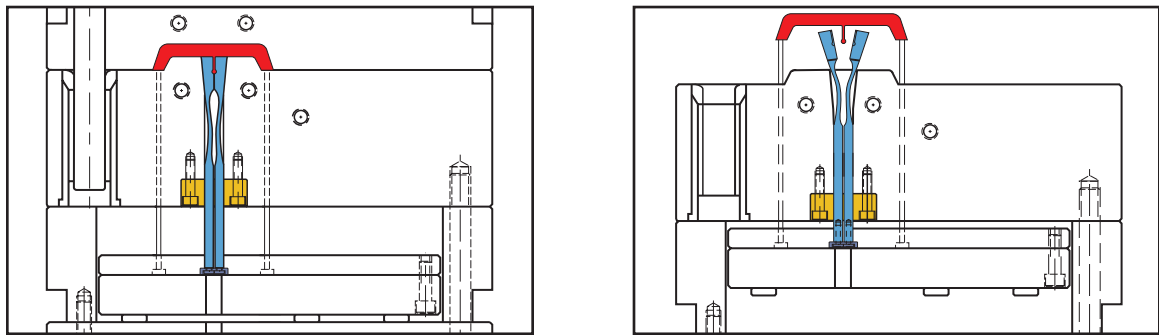
CATALOG NUMBER	T +.05 -.00	W +.05 -.00	L +.25 -.00	OAL REF	D +.000 -.025	C ± .35	E	G +.25 -.00	J	S (Included)	A	B
FCR9X6L160	9	6.2	162.5	166.5	5.94	22	3.5	88.6	24.3	M4-0.7 x 12	16	12
FCR9X8L160	9	8.2	162.5	166.5	6.35	22	3.5	88.4	24.3	M4-0.7 x 12	16	12
FCR11X10L200	11.5	10.2	200.0	204.0	7.92	26	4.5	111.2	26.0	M5-0.8 x 14	20	16
FCR11X12L200	11.5	12.2	200.0	204.0	7.92	26	4.5	111.2	26.0	M5-0.8 x 14	20	16
FCR12X14L200	12.5	14.2	200.0	204.0	7.92	30	4.5	107.2	28.5	M5-0.8 x 14	20	16
FCR12X16L200	12.5	16.2	200.0	204.0	7.92	30	4.5	107.2	28.5	M5-0.8 x 14	20	16

Assemblies include: FlexiCore, Round Guide, Heel plate, and Flat head Cap Screw.  
Assembly components also sold individually. Refer to page H-21 for information.



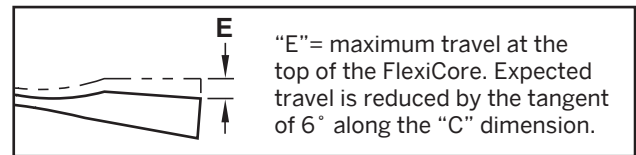
# FLEXICORE™ DOUBLE ACTUATION

The double action bottom guide allows for the FlexiCore System to be used to release boss details with undercuts. FlexiCore Double Assembly (FCDA) includes: two FlexiCores, one Bottom Guide, one Heel Plate, and two Low Head Cap Screws.



### Design Guidelines:

- The FlexiCore can be cut down and re-tapped to accommodate specific applications.



### Inch Standard

**M** FlexiCore: AISI 4340 with thin, dense Chromium treatment, Guide: CA954 Solid Bronze, Heel Plate: AISI 1018

CATALOG NUMBER	T +.002 -.000	W +.002 -.000	L +.010 -.000	OAL REF	D +.000 -.001	C ±.015	E .015	G +.01 -.00	J +.01 -.00	S (Included-2)
FCDA35X24L6	.354	.244	6.400	6.588	.234	.875	.137	3.49	.957	#8-32 x 3/8
FCDA45X48L7	.453	.480	7.875	8.062	.312	1.000	.177	4.38	1.025	#10-24 x 1/2

### Metric Standard

CATALOG NUMBER	T +.05 -.00	W +.05 -.00	L +.25 -.00	OAL REF	D +.000 -.025	C ±.035	E 015	G +.25 -.00	J +.01 -.00	S (Included-2)
FCDA9X6L160	9	6.2	162.5	166.5	5.94	22	3.5	88.6	24.3	M4-0.7 x 12
FCDA11X12L200	11.5	12.2	200.0	204.0	7.92	26	4.5	111.2	26.0	M5-0.8 x 14
FCDA12X14L200	12.5	14.2	200.0	204.0	7.92	30	4.5	107.2	28.5	M5-0.8 x 14
FCDA12X16L200	12.5	16.2	200.0	204.0	7.92	30	4.5	107.2	28.5	M5-0.8 x 14

▶ CAD insertion point

# FLEXICORE™ ACCESSORIES

## WEAR BLOCKS

### Inch Standard

**M** P-20 Pre-Hard **H** Nitrided .005" Deep

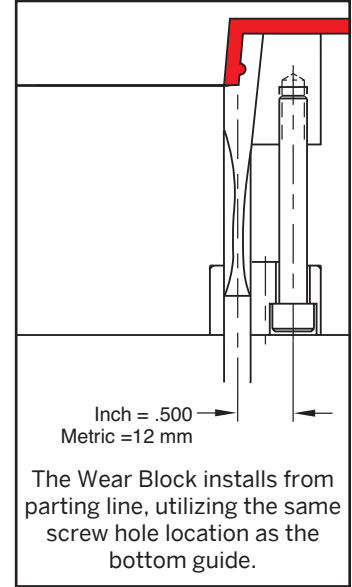
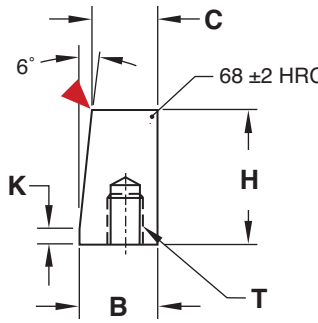
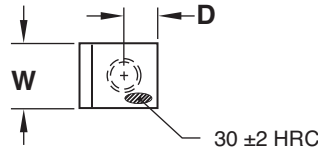
CATALOG NUMBER	W +.002 -.000	D ±.01	B +.001 -.000	C +.001 -.000	H	K	T Thread
FCWB-24	.244	.250	.626	.533	1.000	.115	#10-24
FCWB-32	.322	.250	.626	.533	1.000	.115	1/4-20
FCWB-40	.401	.250	.567	.474	1.000	.115	1/4-20
FCWB-48	.480	.250	.567	.474	1.000	.115	1/4-20

Note: FCWB-24 is designed for use with a 1/4Ø shoulder bolt.

### Metric Standard

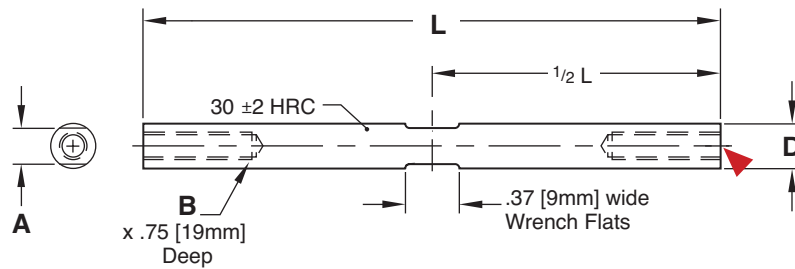
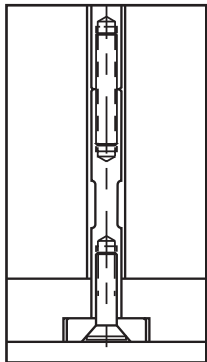
CATALOG NUMBER	W +.05 -.00	D ±.25	B +.025 -.000	C +.025 -.000	H	K	T Thread
FCWBM-6	6.2	7.2	15.9	13.55	25.4	2.9	M5-0.8
FCWBM-8	8.2	7.2	15.9	13.55	25.4	2.9	M6-1
FCWBM-10	10.2	7.2	14.4	12.05	25.4	2.9	M6-1
FCWBM-12	12.2	7.2	14.4	12.05	25.4	2.9	M6-1
FCWBM-14	14.2	8.0	15.2	12.11	33.2	3.5	M6-1
FCWBM-16	16.2	8.0	15.2	12.11	33.2	3.5	M6-1

▶ CAD insertion point



# FLEXICORE™ ACCESSORIES

## EXTENSIONS



### Inch Standard

**M** 4140 Pre-Hard

D +.000 -.005	B	A	L +.01 -.00	
			2"	4"
.232	#8-32	.187	FCX8L2	FCX8L4
.310	#10-24	.250	FCX10L2	FCX10L4

### Metric Standard

D +.00 -.12	B	A	L +.25 -.00	
			50MM	100MM
6	M4-7	4.8	FCXM4L50	FCXM4L100
8	M5-.8	6.3	FCXM5L50	FCXM5L100

Includes threaded stud for attachment to FlexiCore.

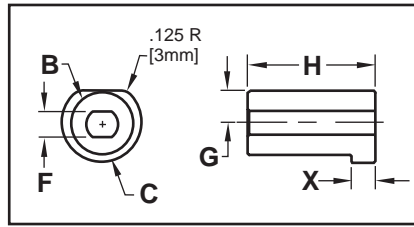
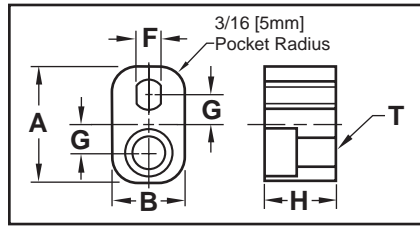
▶ CAD insertion point





# FLEXICORE™ ACCESSORIES

## REPLACEMENT GUIDES



### Inch/Metric Standard

**M** CA954 Solid Bronze

CATALOG NUMBER	A	B	H	F	G	T
<b>FCBG-24</b>	1.000	.625	.625	.190	.250	1/4-20
<b>FCBG-32</b>	1.000	.625	.625	.200	.250	1/4-20
<b>FCBG-40</b>	1.000	.625	.625	.290	.250	1/4-20
<b>FCBG-6</b>	25	16	16	4.8	6	M6-1
<b>FCBG-8</b>	25	16	16	5.0	6	M6-1
<b>FCBG-10</b>	25	16	16	7.3	6	M6-1

### Inch/Metric Standard

**M** CA954 Solid Bronze

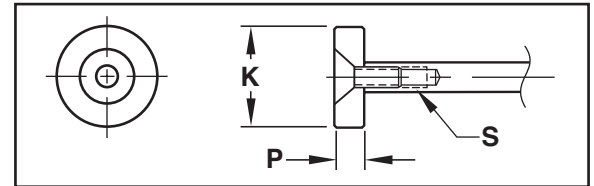
CATALOG NUMBER	B	C	H	F	X	G
<b>FCRG-24</b>	.5000	.625	1.000	.190	.187	.250
<b>FCRG-32</b>	.5000	.625	1.000	.200	.187	.250
<b>FCRG-40</b>	.6250	.750	1.000	.290	.187	.312
<b>FCRG-6</b>	12	16	25	4.8	5	6
<b>FCRG-8</b>	12	16	25	5.0	5	6
<b>FCRG-10</b>	16	20	25	7.3	5	8

### Inch/Metric Standard

**M** 4140 Pre-Hard **H** Black Oxided

CATALOG NUMBER	K	P	S (Included)
<b>FCHP-8</b>	.61	.188	#8-32 x 3/8
<b>FCHP-10</b>	.61	.188	#10-24 x 1/2
<b>FCHP-4</b>	16	4	M4-0.7 x 12
<b>FCHP-5</b>	16	4	M5-0.8 x 14

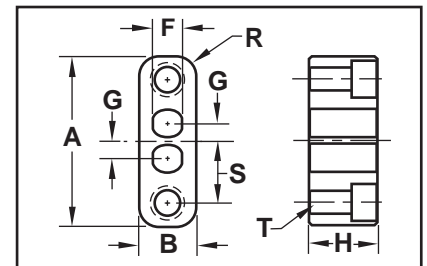
### REPLACEMENT HEEL PLATES



### Inch/Metric Standard

**M** CA954 Solid Bronze

CATALOG NUMBER	A	B	H	F	G	R	S	T
<b>FCDBG-24</b>	1.750	.625	.750	.190	.136	.218	.636	1/4-20
<b>FCDBG-48</b>	1.875	.625	.750	.290	.176	.218	.676	1/4-20
<b>FCDBG-6</b>	45	16	20	4.8	3.5	5	15.5	M6-1
<b>FCDBG-12</b>	48	16	20	7.3	4.5	5	16.5	M6-1

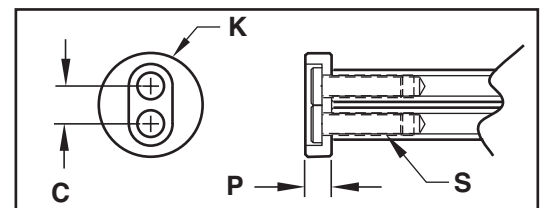


### Inch/Metric Standard

**M** 4140 Pre-Hard **H** Black Oxided

CATALOG NUMBER	C	K	P	S (Included)
<b>FCDHP-8</b>	.272	.750	.188	#8-32 x 3/8
<b>FCDHP-10</b>	.352	.875	.188	#10-24 x 1/2
<b>FCDHP-4</b>	7	20	6	M4-0.7 x 12
<b>FCDHP-5</b>	9	22	6	M5-0.8 x 14

### REPLACEMENT HEEL PLATES: DOUBLE ACTUATION



Screws included.

# LIFTER BLADES & CORES

## UNDERCUT RELEASE SYSTEM



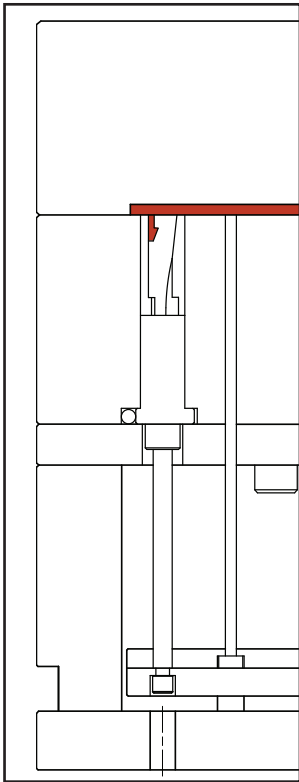
**Lifter Blades™**  
for details 1.8mm-4.2mm wide.



**Lifter Cores™**  
for details 6mm-12mm wide.

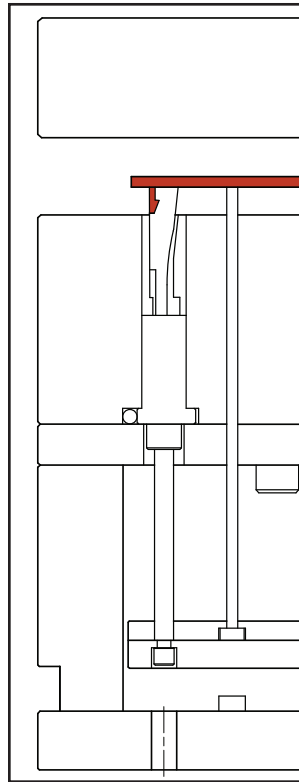
Lifter Blades and Cores offer unique advantages for undercut release:

- The “up, then over” motion assists part ejection, for addressing small parts prone to sticking to lifters.
- With the lifter traveling radially away from the undercut, the top of the blade can be flush with the core, requiring no standing pad on molded part that may interfere with snap function.
- Compact, no angled machining, with blades beginning as thin as .070” / 1.8mm.



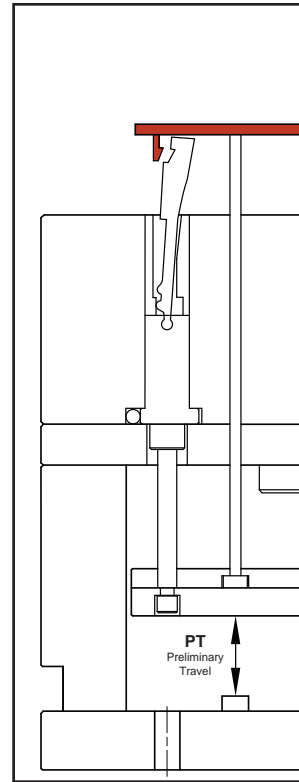
### Ejection Retracted

Lifter seated within bushing to prevent molding pressure movement.



### Initial Ejection

Ejector plates move forward 7mm with part remaining on lifter.

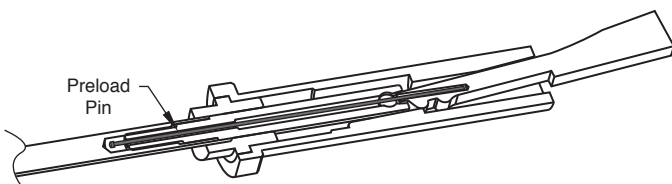


### Release Point

The Lifter is mechanically forced away from the undercut

### Preload Pin Use:

Use the provided preload pin to prevent the lifter from falling back on the part.

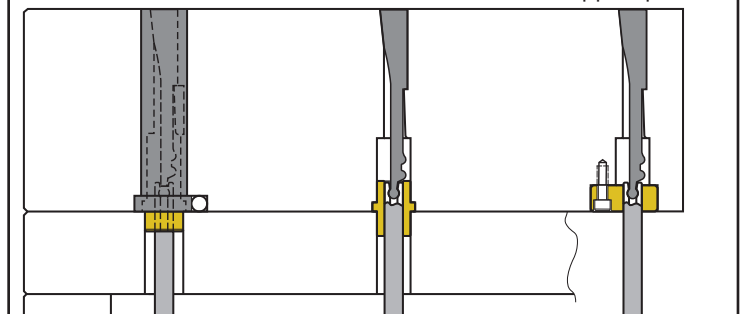


### Installation Options:

**Parting Line Bushing:**  
Reduces machining in the core half.

**Guide Bushing:**  
Best for applications when space is limited.

**Guide Plate:**  
Used when design does not require a support plate.



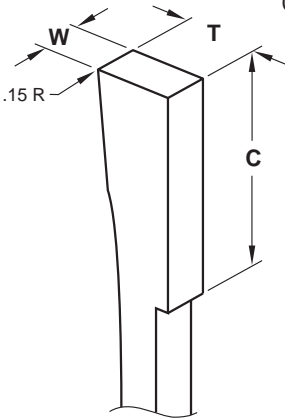
US Patent No 8,657,599 US Patent No 8,241,031  
ES Patent Nos. 2320504 and 2345697  
Other patents pending.



# LIFTER BLADES & CORES

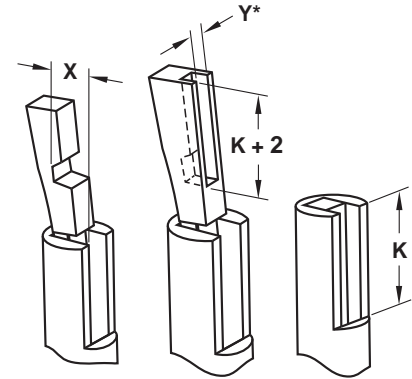
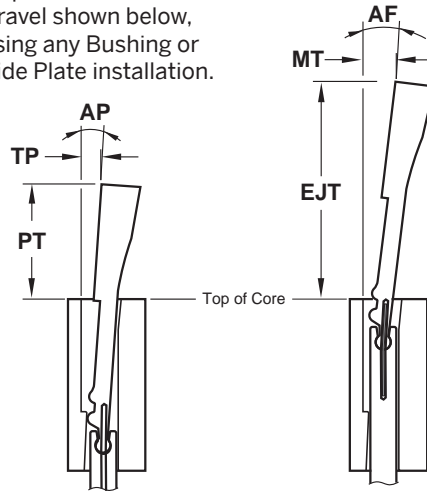
### Preliminary Travel

For mechanical activation, removal of the pin will achieve the travel shown below, using any Bushing or Guide Plate installation.



### Maximum Travel

With the preload pin installed, the lifter arcs away from the undercut.



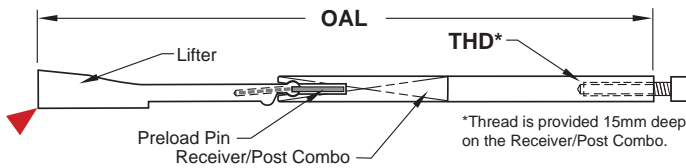
Machining guidelines shown above for all Lifter Assemblies when using the Parting Line Bushing or machining the detail in the core insert. Refer to the Undercut Limits in the chart below.

\*Note: On all Lifter Blades (LBA), the undercut must go through the Lifter; "Y" is not applicable.

	CATALOG NUMBER	T -.004 -.009	W -.004 -.009	C ±.005	OAL Ref	TP Horiz. Prelim Travel	PT Prelim Ejection Length	AP Prelim Travel Angle	MT Max. Travel	EJT Full Ejection Length	AF Full Ejection Angle	S Maximum Stroke for Removal	THD Thread Size	Undercut Limits		
														X	Y	K
BLADES	LBA08X018	8	1.8	20	162	3	17	4.0°	6	38	8°	50	M4	3.0	N/A	15
	LBA08X024	8	2.4	20	162	3	17	4.0°	6	38	8°	50	M4	3.0	N/A	15
	LBA08X032	8	3.2	20	162	3	17	4.0°	6	38	8°	50	M4	3.0	N/A	15
	LBA08X042	8	4.2	20	162	3	17	4.0°	6	38	8°	50	M4	3.0	N/A	15
CORES	LCA09X06	9	6	26	246	6	26	6.0°	9	56	9°	65	M4	3.5	4	21
	LCA10X08	10	8	26	246	6	26	6.0°	9	56	9°	65	M4	4.0	6	21
	LCA12X10	12	10	30	256	8	32	6.5°	10	66	8°	75	M5	5.0	8	25
	LCA12X12	12	12	30	256	8	32	6.5°	10	66	8°	75	M5	5.0	10	25

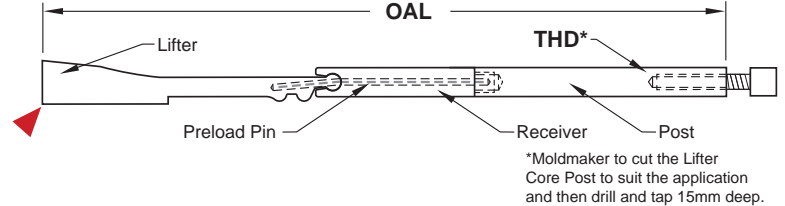
### Lifter Blade Assemblies:

Widths 1.8mm to 4.2mm



### Lifter Core Assemblies:

Widths 6mm to 12mm



▶ CAD insertion point

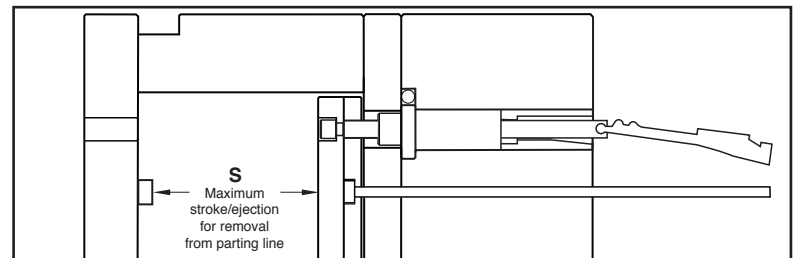
### Assembly Part Information:

PART NAME	MATERIAL/TREATMENT
Lifter	H-13, 50-52 HRC Nitride .25 Deep
Receiver	H-13, 50-52 HRC, Titanium Nitride
Post	P-20 Pre-Hard, Black Oxided
Preload Pin	M-2, 62-64 HRC

Note: On the Lifter Blade Assemblies (LBA), the Post and Receiver are a single piece, made from pre-hardened P-20 and TiN coated.

Replacement items are available. Contact Customer Service for pricing and delivery.

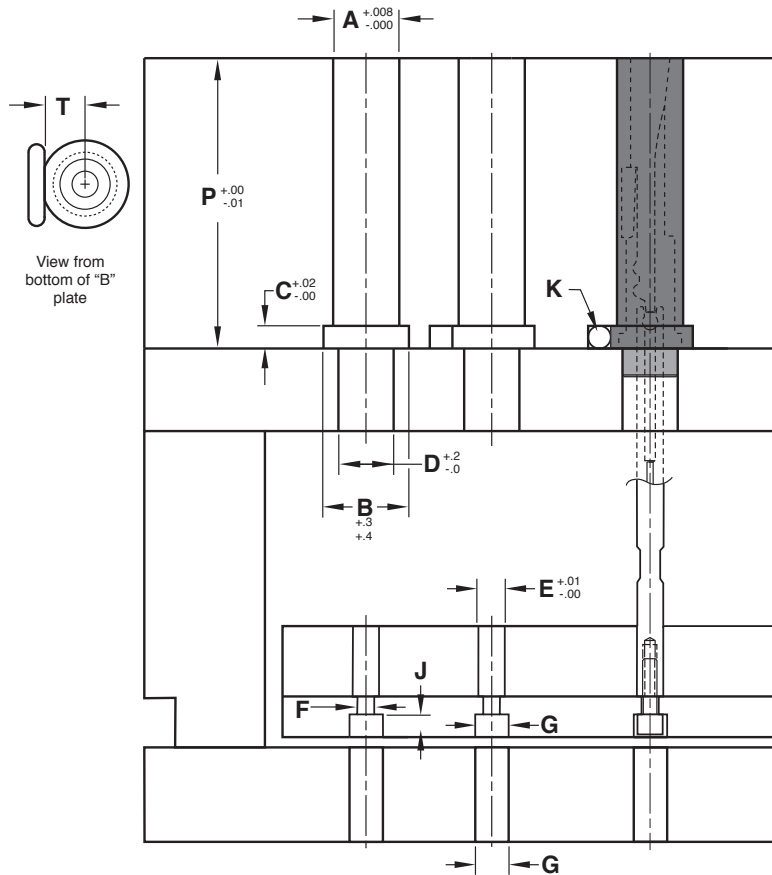
### Removability from Parting Line:



With ejector stops removed, the ejector plates can be moved forward to expose the Lifter Blade Assembly, and then the Lifter and the Preload Pin can slide sideways out of the Receiver/Post Combo. On the Lifter Cores, the Receiver can be unscrewed from the Post and then removed from parting line.

# LIFTER BLADES & CORES

## PARTING LINE BUSHING INSTALLATION

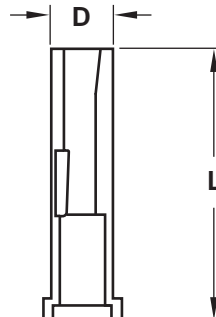


ASSEMBLY REF	A Diam.	B Diam.	C	D Diam.	E Diam.	F Diam.	G Diam.	J	K Dowel Size	T	P
LBA08X018	12	16	5	9.6	6	4.5	8	4.5	5	7	56
LBA08X024	12	16	5	9.6	6	4.5	8	4.5	5	7	56
LBA08X032	12	16	5	9.6	6	4.5	8	4.5	5	7	56
LBA08X042	12	16	5	9.6	6	4.5	8	4.5	5	7	56
LCA09X06	14	20	5	11	6	4.5	8	4.5	5	8.5	66
LCA10X08	16	22	5	13	6	4.5	8	4.5	5	9.5	66
LCA12X10	20	26	6	15	8	5.5	10	5.5	6	11	76
LCA12X12	20	26	6	15	8	5.5	10	5.5	6	11	76

## PARTING LINE BUSHINGS

### Features:

- Use of the Parting Line Bushing simplifies machining in the mold base.
- Each bushing assembly incorporates a wedge that creates a stop for the Lifter to avoid push back due to molding pressure.
- The Guide Bushing should be utilized with the Parting Line Bushings to locate and guide the Lifter Blade/Core Assembly in the support plate. The bushings, along with Guide Plates, are sold separately on page H-15.



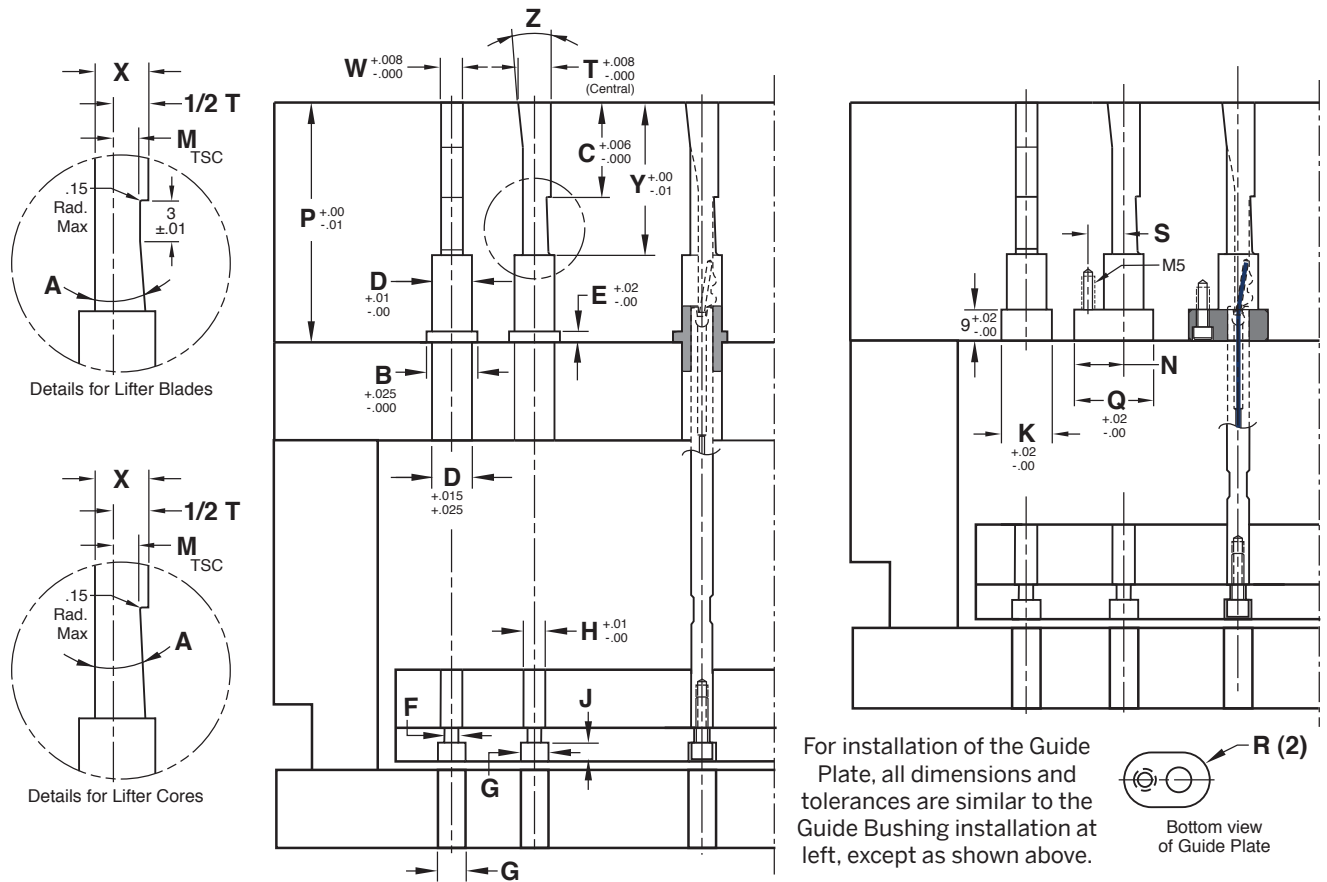
**M** A-2 **S** 58-60 HRC

CATALOG NUMBER	For Lifter Widths	D -.003 -.008	L ± .010
LBB018	1.8	12	56
LBB024	2.4	12	56
LBB032	3.2	12	56
LBB042	4.2	12	56
LCB06	6	14	66
LCB08	8	16	66
LCB10	10	20	76
LCB12	12	20	76



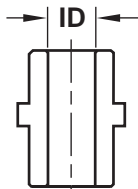
# LIFTER BLADES & CORES

## GUIDE BUSHING & GUIDE PLATE INSTALLATION



ASSEMBLY REF	T	W	X	C	Y	M	Z	A	D Diam.	B Diam.	E	F Diam.	G Diam.	H	J	K	N	Q	S	R	P
LBA08X018	8	1.8	7.3	20	28	3.1	5°	13.5°	9.6	12.8	3	4.5	8	6	4.5	12	18	24	12	6	56
LBA08X024	8	2.4	7.3	20	28	3.1	5°	13.5°	9.6	12.8	3	4.5	8	6	4.5	12	18	24	12	6	56
LBA08X032	8	3.2	7.3	20	28	3.1	5°	13.5°	9.6	12.8	3	4.5	8	6	4.5	12	18	24	12	6	56
LBA08X042	8	4.2	7.3	20	28	3.1	5°	13.5°	9.6	12.8	3	4.5	8	6	4.5	12	18	24	12	6	56
LCA09X06	9	6	7.7	26	46	3.3	6°	2°	11	14	3	4.5	8	6	4.5	14	18.5	26	12	7	66
LCA10X08	10	8	8.5	26	46	3.6	8°	2°	13	16	4	4.5	8	6	4.5	16	19.5	28	12	8	66
LCA12X10	12	10	10.1	30	55	4.2	8°	2°	15	20	4	5.5	10	8	5.5	18	20.5	30	13	9	76
LCA12X12	12	12	10.1	30	55	4.2	8°	2°	15	20	4	5.5	10	8	5.5	18	20.5	30	13	9	76

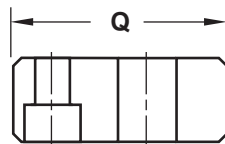
### GUIDE BUSHINGS



**M** CA954 Bronze **H** 170 Brinell

CATALOG NUMBER	For Lifter Widths	ID
LBGB0696	1.8-4.2	6
LCGB0611	6	6
LCGB0613	8	6
LCGB0817	10 & 12	8

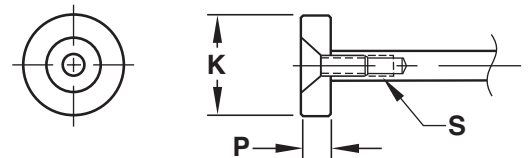
### GUIDE PLATES



**M** CA954 Bronze **H** 170 Brinell

CATALOG NUMBER	For Lifter Widths	Q
LBGP1212	1.8-4.2	24
LCGP1426	6	26
LCGP1628	8	28
LCGP1830	10 & 12	30

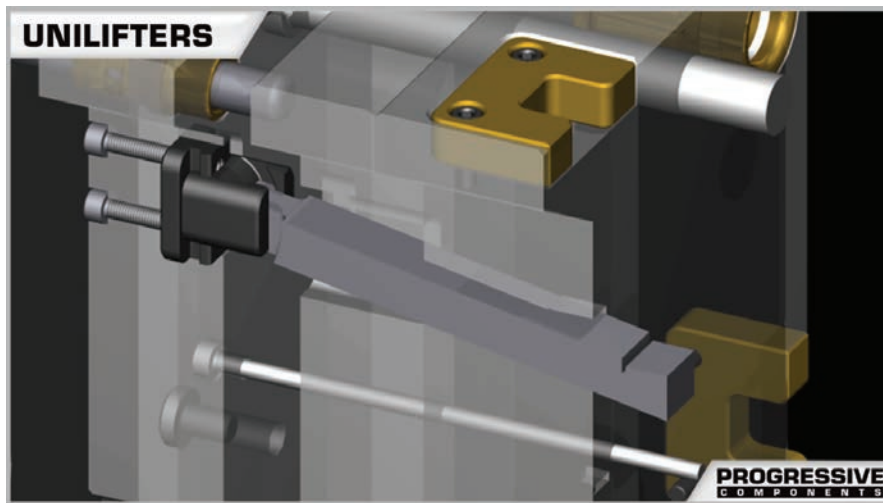
### ALTERNATIVE HEEL PLATES



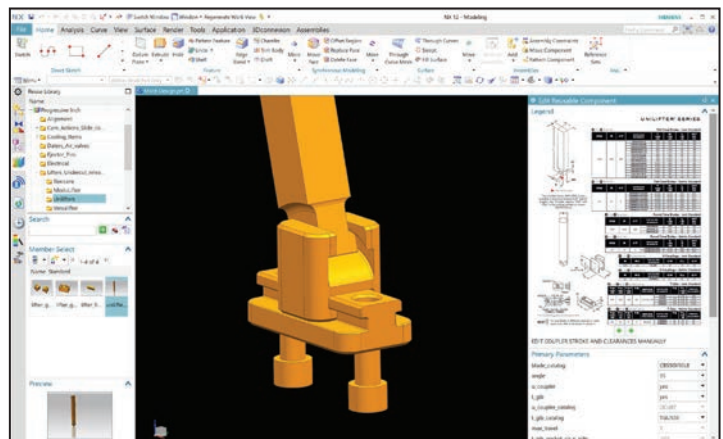
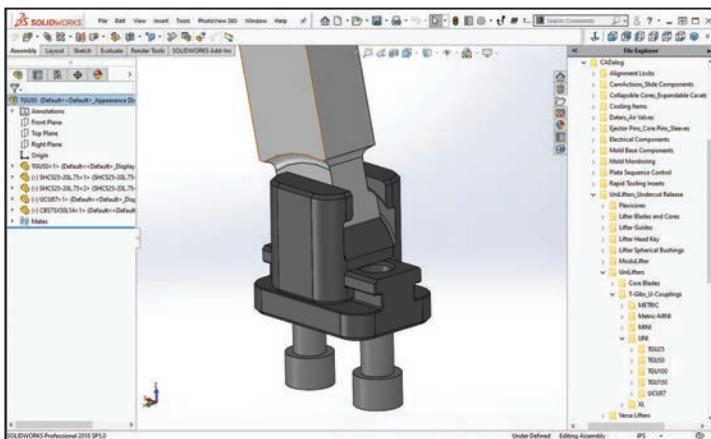
**M** 4140 Pre-Hard **S** Black Oxide

CATALOG NUMBER	K	P	S
FCHP-4	16	4	M4-0.7
FCHP-5	16	4	M5-0.8

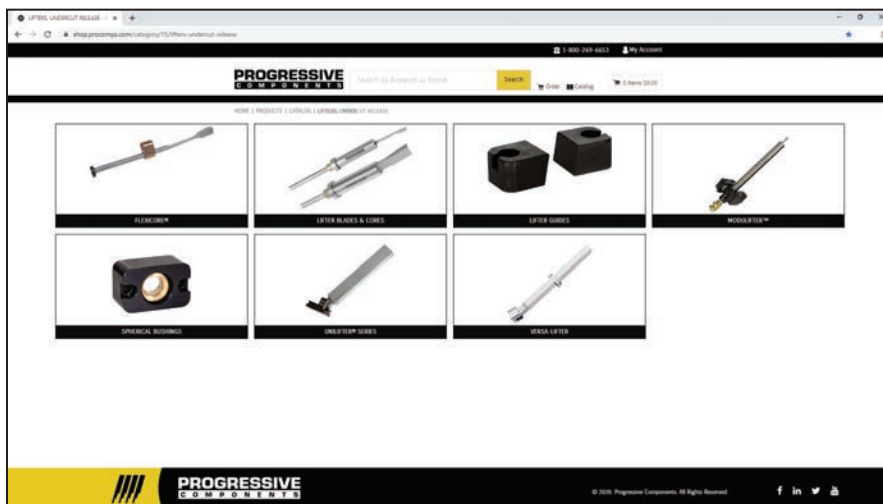
# ONLINE RESOURCES



When considering design options, numerous animations can be viewed at [procomps.com/animations](http://procomps.com/animations).



CAD geometry is available online as individual downloads or as part of the CADalog system. The seven formats include: IGES (.igs), ACIS (.sat), STEP (.step), Parasolid (.x\_t), Solidworks (.sldasm), NX (.prt) (Re-Use and MoldWizard) and Visi (.wvf).



Industry-leading web store expedites the purchasing process. Go to [shop.procomps.com](http://shop.procomps.com) for information and additional resources.



# COLLAPSIBLE CORES EXPANDABLE CAVITIES

## SECTION I



C-Cores: DT Series	DT Core Grinding Fixtures	DT Core Sub-10mm Series
Prefix: DT	Prefix: DTG	Prefix: S10
Page: I-1	Page: I-6	Page: I-7



C-Cores: RT Series	RT Core Grinding Rings	Expandable Cavities
Prefix: CC, CCM	Prefix: RTGR	Prefix: EXCAV
Page: I-9	Page: I-11	Page: I-12







# COLLAPSIBLE CORES

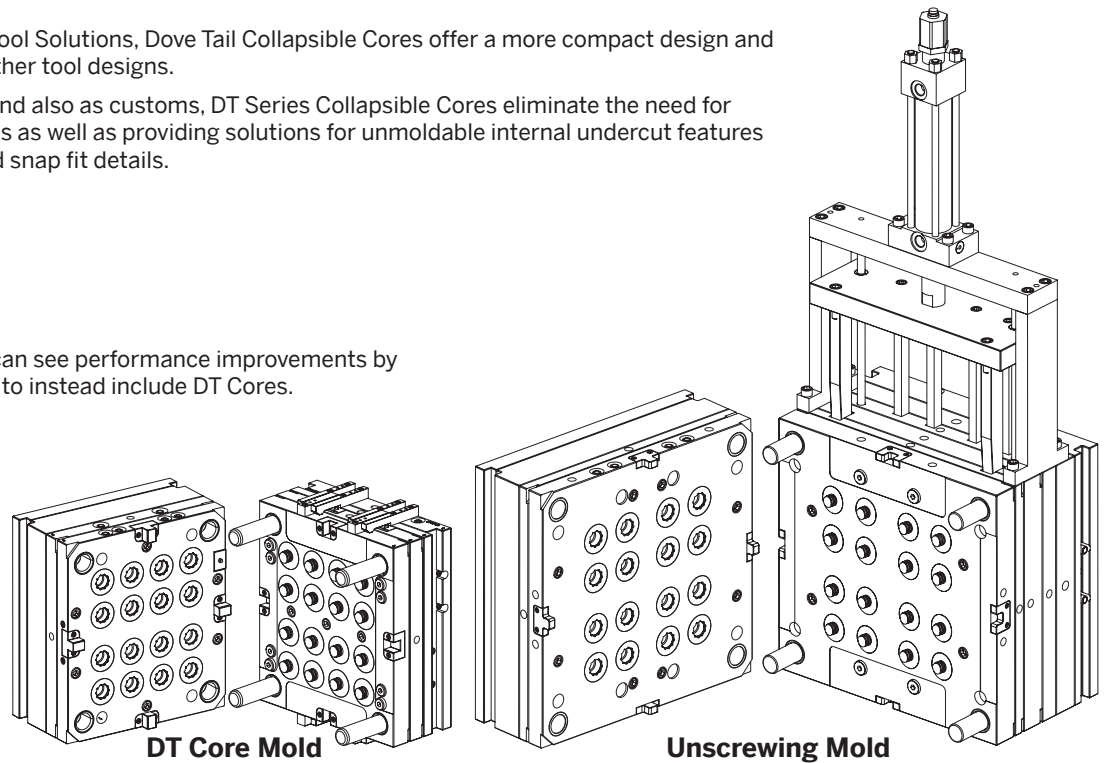
## DT SERIES

Through an alliance with Roehr Tool Solutions, Dove Tail Collapsible Cores offer a more compact design and simplified mold approach over other tool designs.

Available in four standard sizes and also as customs, DT Series Collapsible Cores eliminate the need for complex unscrewing mechanisms as well as providing solutions for unmoldable internal undercut features such as o-ring grooves, slots, and snap fit details.

DT Cores allow for:

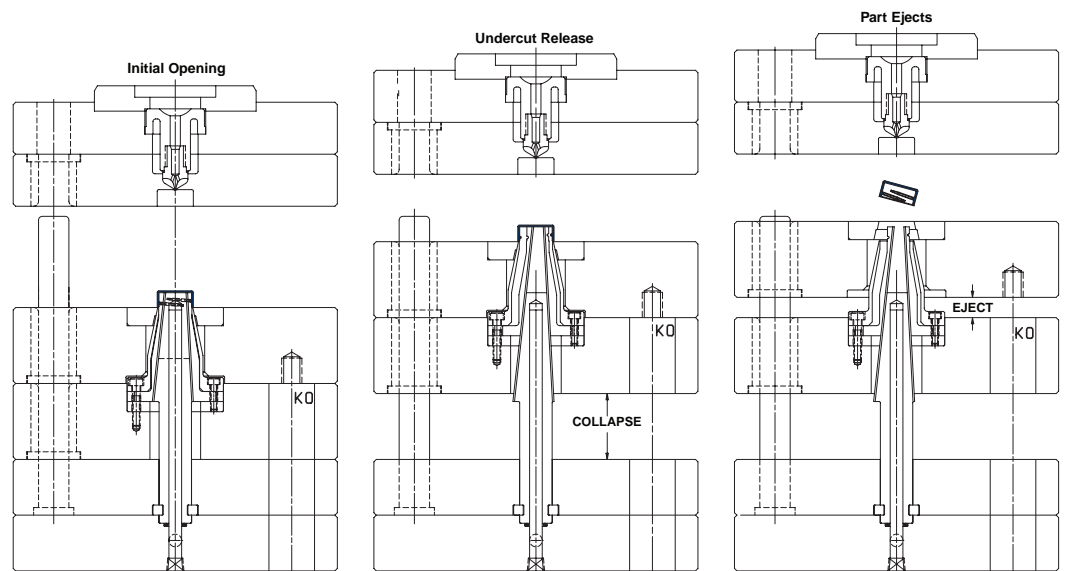
- Simplified, smaller molds
- Faster cycle times
- Improved part quality
- Reduced mold maintenance
- Existing unscrewing molds can see performance improvements by converting the movable half to instead include DT Cores.



The DT Collapsible Core is a positive, mechanically actuated collapsible core that eliminates complex gear and rack approaches, resulting in a simpler mold and a faster cycle time.

The maintenance advantage is dramatic due to a patented quick-lock feature that allows removal and servicing of the core unit while the mold is still in the press.

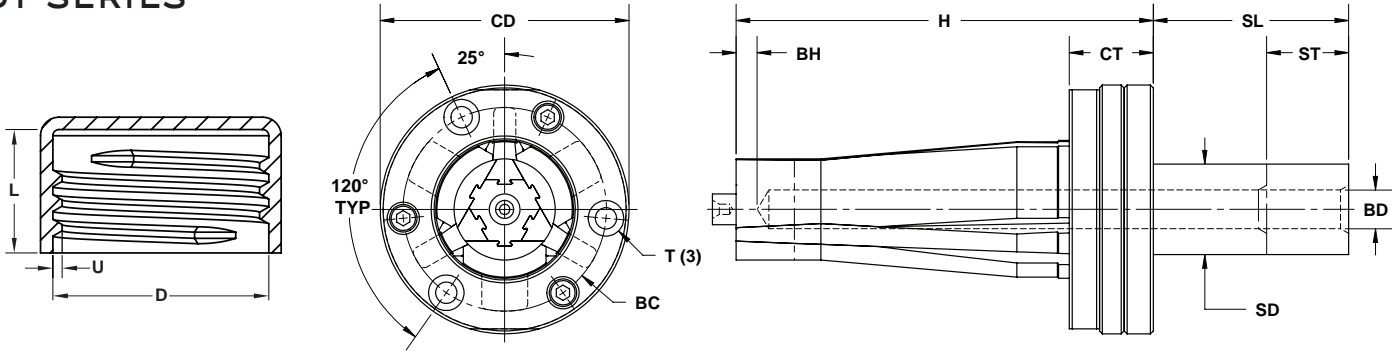
The DT Core's compact design allows for shorter stack height, tighter cavity spacing, and also creates opportunities for use in slides or on the stationary side of the mold.



DT Cores use a simple single stage collapse/eject sequence typically run by the machine KO.

# COLLAPSIBLE CORES

## DT SERIES



CATALOG NUMBER	D Maximum Outer Diameter	U Max Undercut	L Maximum Molding Length	ST Maximum Collapse Stroke	H Core Length	SD Shaft Diameter	BD Cooling Hole Diameter	BH Distance to Cooling Hole	SL Shaft Length	CD Carrier Diameter	CT Carrier Assembly Thickness	BC Mounting Screw Bolt Circle	T Mounting Screws (SHCS)
DT1010	10.00-10.99mm .394-.433in	.36mm .014in	7.5mm .295in	43.5mm 1.713in	87mm 3.425in	10.5mm .413in	3mm .1in	5mm .2in	58mm 2.283in	50mm 1.969in	21mm .827in	37mm 1.457in	M5 x 25
DT1111	11.00-11.99mm .433-.472in	.41mm .016in	8mm .315in	44.5mm 1.752in		12mm .472in	4mm .2in	5mm .2in	59mm 2.323in	52mm 2.047in	21mm .827in	38mm 1.496in	
DT1212	12.00-12.99mm .472-.511in	.46mm .018in	8.5mm .335in	45.5mm 1.791in	87mm 3.425in	14mm .551in	5mm .2in	5mm .2in	60mm 2.362in	54mm 2.126in	21mm .827in	41mm 1.614in	M5x25
DT1313	13.00-13.99mm .512-.551in	.51mm .020in	9mm .354in	46.5mm 1.831in		15.5mm .610in	6mm .2in	5mm .2in	62mm 2.441in	56mm 2.205in	21mm .827in	43mm 1.693in	
DT1414	14.00-14.99mm .551-.590in	.56mm .022in	9.5mm .374in	47mm 1.850in	87mm 3.425in	18mm .709in	8mm .3in	6mm .2in	61mm 2.402in	63mm 2.480in	24mm .945in	49mm 1.929in	M6x30
DT1515	15.00-15.99mm .591-.630in	.61mm .024in	10mm .394in	47.5mm 1.870in		22mm .866in	10mm .4in	6mm .2in	64mm 2.520in	69mm 2.717in	24mm .945in	55mm 2.165in	
DT1616	16.00-16.99mm .630-.669in	.66mm .026in	10.5mm .413in	48mm 1.890in	99mm 3.898in	28mm 1.102in	12mm .5in	6mm .2in	60mm 2.362in	77mm 3.031in	26mm 1.024in	63mm 2.480in	M6x30
DT1717	17.00-17.99mm .669-.708in	.71mm .028in	11mm .433in	48.5mm 1.909in		34mm 1.339in	14mm .6in	6mm .2in	64mm 2.520in	93mm 3.661in	27mm 1.063in	75mm 2.953in	
DT1819	18.00-19.99mm .709-.787in	.82mm .032in	12mm .472in	50mm 1.969in	129mm 5.079in	39mm 1.535in	17mm .7in	6mm .2in	65mm 2.559in	101mm 3.976in	32mm 1.260in	83mm 3.268in	M8x35
DT2021	20.00-21.99mm .787-.866in	.92mm .036in	12.5mm .492in	55mm 2.165in		151mm 6.339in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	
DT2224	22.00-24.99mm .866-.984in	1.04mm .041in	13mm .512in	59mm 2.323in	139mm 5.472in	42mm 1.654in	20mm .8in	6mm .2in	69mm 2.717in	110mm 4.331in	32mm 1.260in	90mm 3.543in	M8x35
DT2527	25.00-27.99mm .984-1.102in	1.20mm .047in	15mm .591in	66.5mm 2.618in		161mm 6.339in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	
DT2830	28.00-30.99mm 1.102-1.220in	1.36mm .053in	18mm .709in	71mm 2.795in	151mm 5.945in	42mm 1.654in	20mm .8in	6mm .2in	69mm 2.717in	110mm 4.331in	32mm 1.260in	90mm 3.543in	M8x35
DT3133	31.00-33.99mm 1.220-1.338in	1.50mm .059in	21mm .827in	78mm 3.071in		183mm 7.205in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	
DT3436	34.00-36.99mm 1.339-1.456in	1.73mm .068in	22mm .866in	79mm 3.110in	151mm 5.945in	42mm 1.654in	20mm .8in	6mm .2in	69mm 2.717in	110mm 4.331in	32mm 1.260in	90mm 3.543in	M8x35
DT3739	37.00-39.99mm 1.457-1.574in	1.88mm .074in	24mm .945in	85mm 3.346in		183mm 7.205in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	
DT4042	40.00-42.99mm 1.575-1.693in	2.06mm .081in	25mm .984in	86mm 3.386in	151mm 5.945in	42mm 1.654in	20mm .8in	6mm .2in	69mm 2.717in	110mm 4.331in	32mm 1.260in	90mm 3.543in	M8x35
DT4345	43.00-45.99mm 1.693-1.811in	2.24mm .088in	27mm 1.063in	93mm 3.661in		183mm 7.205in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	
DT4648	46.00-48.99mm 1.811-1.929in	2.42mm .095in	28mm 1.102in	94mm 3.701in	151mm 5.945in	42mm 1.654in	20mm .8in	6mm .2in	69mm 2.717in	110mm 4.331in	32mm 1.260in	90mm 3.543in	M8x35
DT4951	49.00-51.99mm 1.929-2.047in	2.57mm .101in	31mm 1.220in	99mm 3.898in		183mm 7.205in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	
DT5254	52.00-54.99mm 2.047-2.165in	2.77mm .109in	32mm 1.260in	100mm 3.937in	183mm 7.205in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	107mm 4.213in	M10x45
DT5557	55.00-57.99mm 2.165-2.283in	2.95mm .116in	34mm 1.339in	106mm 4.173in		183mm 7.205in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	
DT5860	58.00-60.99mm 2.283-2.401in	3.10mm .122in	36mm 1.417in	111mm 4.370in	183mm 7.205in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	107mm 4.213in	M10x45

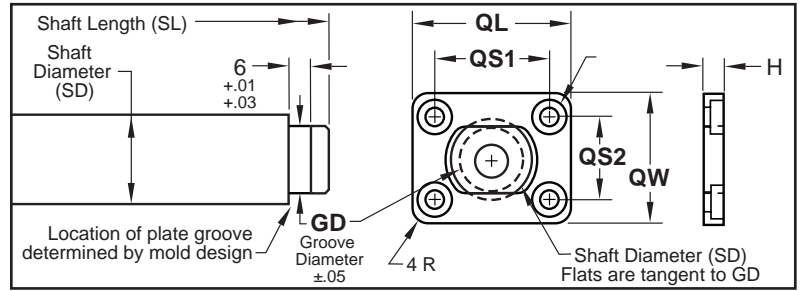
For sizes larger than 60mm, contact Roehr directly.



# COLLAPSIBLE CORES

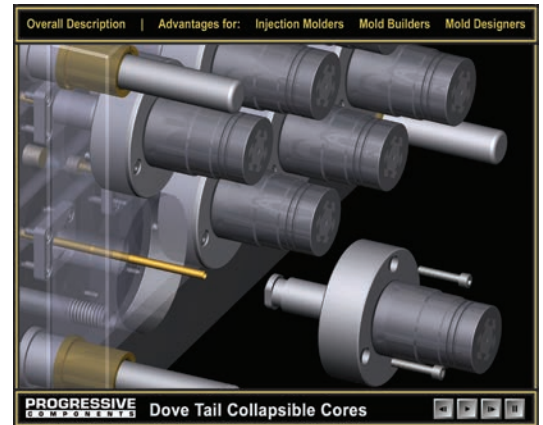
## DT SERIES QUICK LOCK PLATE

Utilizing the optional Quick Lock mounting configuration, the DT Core can be removed and serviced while the mold remains in the press. This feature allows for a higher cavitation percentage and lower maintenance costs than other tool design approaches.

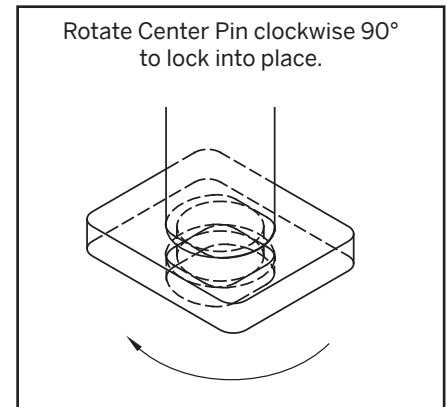
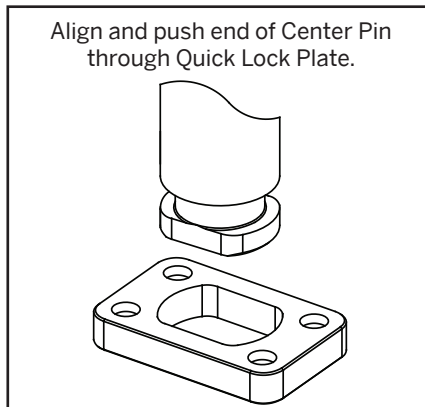
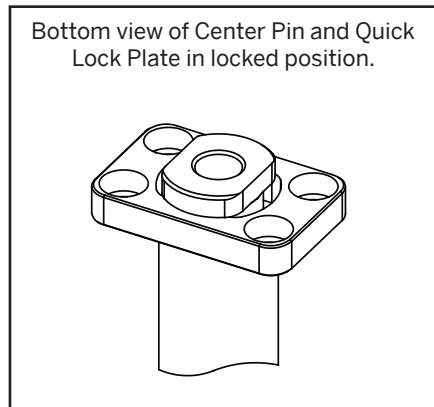


**M** A-2    **H** 54-57 HRC

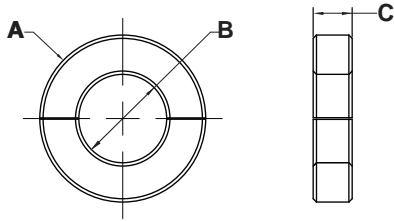
CATALOG NUMBER	GD	QL +0.00 -0.05	QW +0.00 -0.05	QS1	QS2	H	B Mounting Screws
DTQLP1011	7.43mm .93in	26.01mm 1.024in	18.01mm .709in	17.50mm .689in	9.50mm .374in	4mm .1575in	M3 LHCS
DTQLP1213	9.02mm .355in	27.99mm 1.102in	18.01mm .709in	19.51mm .768in	9.50mm .374in	4mm .1575in	M3 LHCS
DTQLP1415	9.81mm .386in	30mm 1.181in	19.99mm .787in	21.49mm .846in	11.51mm .453in	5mm .1969in	M3 SHCS
DTQLP1617	10.60mm .417in	32mm 1.260in	22mm .866in	23.50mm .925in	13.49mm .531in	5mm .1969in	M3 SHCS
DTQLP1821	12.99mm .511in	35mm 1.378in	24.99mm .984in	24.99mm .984in	15.01mm .591in	6mm .2362in	M4 SHCS
DTQLP2227	16.16mm .636in	38mm 1.496in	27.99mm 1.102in	27.99mm 1.102in	18.01mm .709in	6mm .2362in	M4 SHCS
DTQLP2833	21.72mm .855in	43.99mm 1.732in	32mm 1.260in	34.01mm 1.339in	22mm .866in	6mm .2362in	M4 SHCS
DTQLP3439	25.69mm 1.011in	51.99mm 2.047in	40.01mm 1.575in	40.01mm 1.575in	27.99mm 1.102in	8mm .3150in	M5 SHCS
DTQLP4045	30.45mm 1.199in	56.01mm 2.205in	43.99mm 1.732in	43.99mm 1.732in	32mm 1.260in	8mm .3150in	M5 SHCS
DTQLP4651	34.42mm 1.355in	57.99mm 2.283in	46mm 1.811in	46mm 1.811in	34.01mm 1.339in	8mm .3150in	M5 SHCS
DTQLP5260	39.18mm 1.543in	65.99mm 2.598in	54mm 2.126in	53.01mm 2.087in	41mm 1.614in	10mm .3937in	M6 SHCS
DTQLP18	12mm .472in	35mm 1.378in	22mm .866in	25mm .984in	12mm .472in	6mm .236in	M4 SHCS
DTQLP28	15mm .591in	38mm 1.496in	25mm .984in	28mm 1.102in	15mm .591in	6mm .236in	M4 SHCS
DTQLP38	19mm .748in	41mm 1.614in	31mm 1.220in	30mm 1.181in	20mm .787in	6mm .236in	M4 SHCS
DTQLP48	23mm .906in	44mm 1.732in	35mm 1.378in	34mm 1.339in	25mm .984in	6mm .236in	M4 SHCS



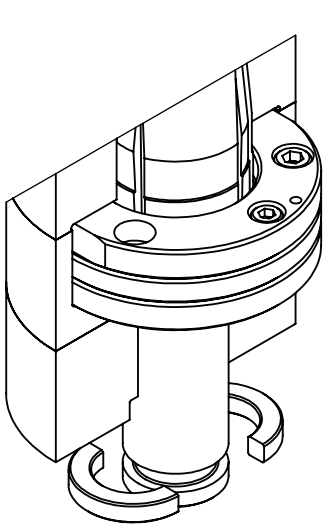
View the ability to remove a core from parting line at [www.procomps.com/demo](http://www.procomps.com/demo).



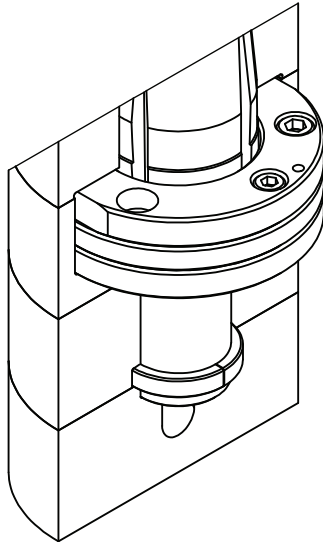
## COLLAPSIBLE CORES DT SERIES SPLIT RING



Utilizing the optional split ring allows for an alternative attachment method.



Assemble Core into Mold. Then collapse core to install split ring



Push Center pin forward to molding position and install back plate

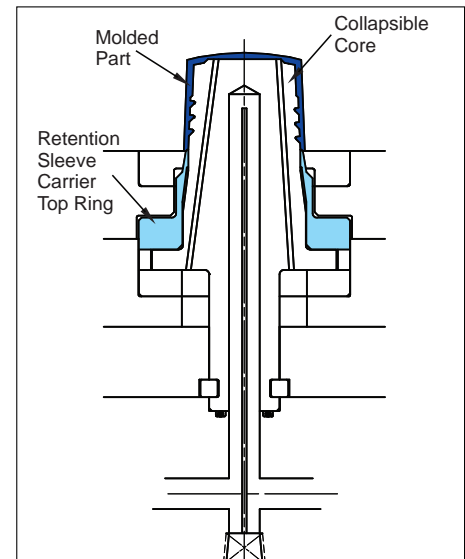
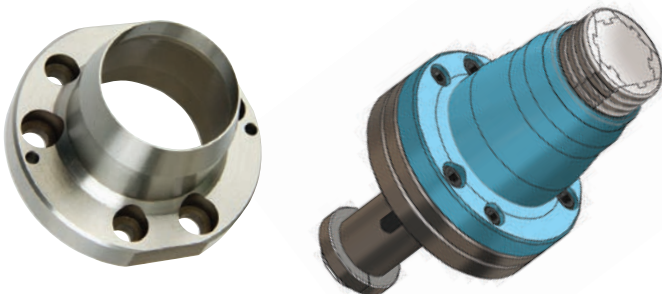
**M** A-2 **H** 54-57 HRC

CATALOG NUMBER	A Outer Diameter	B Inner Diameter	C Thickness
DTSR1011	16mm .63in	7.95mm .313in	3.99mm .157in
DTSR1213	17.53mm .69in	9.53mm .375in	3.99mm .157in
DTSR1415	20.32mm .80in	10.31mm .406in	5mm .197in
DTSR1617	21.08mm .83in	11.13mm .438in	5mm .197in
DTSR1821	25.40mm 1.00in	13.49mm .531in	5.99mm .236in
DTSR2227	28.70mm 1.13in	16.66mm .656in	5.99mm .236in
DTSR2833	34.29mm 1.35in	22.23mm .875in	5.99mm .236in
DTSR3439	42.16mm 1.66in	26.19mm 1.031in	8mm .315in
DTSR4045	46.99mm 1.85in	30.96mm 1.219in	8mm .315in
DTSR4651	50.80mm 2.00in	34.93mm 1.375in	8mm .315in
DTSR5260	59.69mm 2.35in	39.70mm 1.563in	9.98mm .393in
DTSR18	24.89mm .98in	12.70mm .500in	6.35mm .250in
DTSR28	27.94mm 1.10in	15.88mm .625in	6.35mm .250in
DTSR38	34.80mm 1.37in	20.62mm .812in	6.35mm .250in
DTSR48	37.59mm 1.48in	25.40mm 1.000in	6.35mm .250in

## COLLAPSIBLE CORES DT SERIES RETENTION SLEEVE

Retention Sleeves for DoveTail Collapsible Cores assure the position of the molded part during core collapse and part ejection.

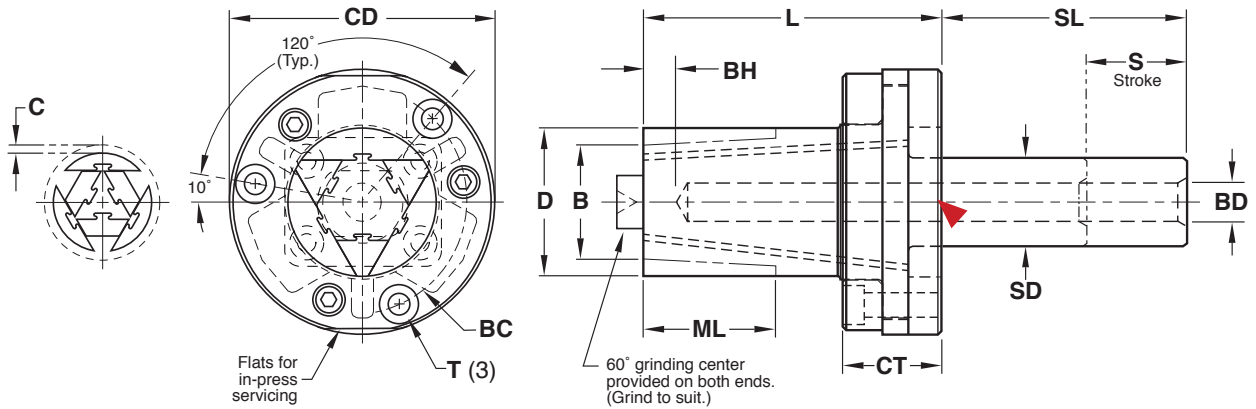
**M** D-2 **H** 60-62 HRC





# COLLAPSIBLE CORES

## DT SERIES



▶ CAD insertion point

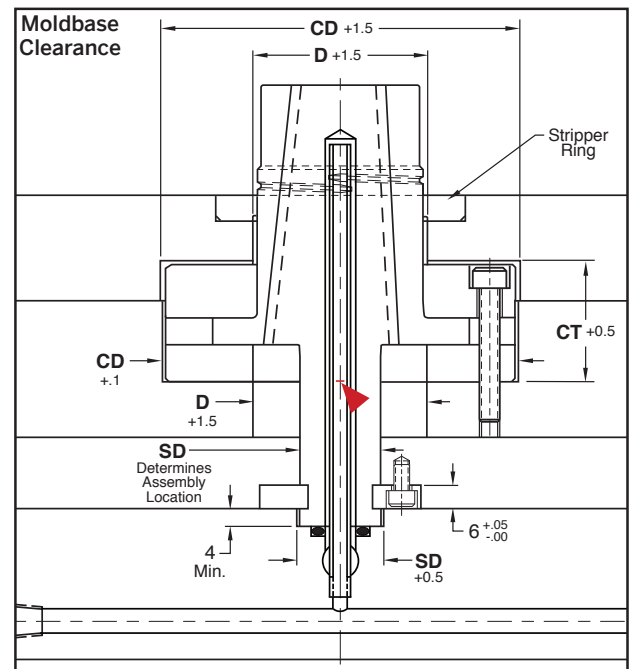
CATALOG NUMBER	D Maximum Outer Diameter	B Minimum Inner Diameter +3°/Side	ML Maximum Molding Length	C Maximum Collapse	CD Carrier Diameter +0.00 -0.05	CT Carrier Assembly Thickness ± 0.05	L Core Length +0.1 -0.0	SL Shaft Length	SD Shaft Diameter +0.00 -0.02	BD Cooling Hole Diameter	BH Distance to Cooling Hole	BC Mounting Screw Bolt Circle	T Mounting Screws	S Maximum Collapse Stroke
DT18	21mm .827in	17mm .669in	22mm .866in	1.1mm .043in	53mm 2.087in	21mm .827in	60mm 2.362in	60mm 2.362in	16mm .630in	6mm .236in	6mm .236in	40mm 1.575in	M5 x 25	34mm 1.339in
DT28	33mm 1.299in	25mm .984in	28mm 1.102in	1.6mm .063in	60mm 2.362in	22mm .866in	67mm 2.638in	60mm 2.362in	20mm .787in	8mm .315in	8mm .315in	47mm 1.850in	M5 x 25	38mm 1.496in
DT38	42mm 1.654in	33mm 1.299in	43mm 1.693in	2.1mm .083in	76mm 2.992in	28mm 1.102in	85mm 3.346in	60mm 2.362in	25mm .984in	10mm .394in	10mm .394in	60mm 2.362in	M6 x 35	54mm 2.126in
DT48	54mm 2.126in	42mm 1.654in	50mm 1.969in	2.4mm .094in	98mm 3.858in	37mm 1.457in	104mm 4.094in	70mm 2.756in	30mm 1.181in	12mm .472in	12mm .472in	78mm 3.071in	M8 x 40	62mm 2.441in

### Each Dove Tail Collapsible Core includes:

- DT Series Core/Pin/Carrier Assembly
- Split Ring
- All mounting screws

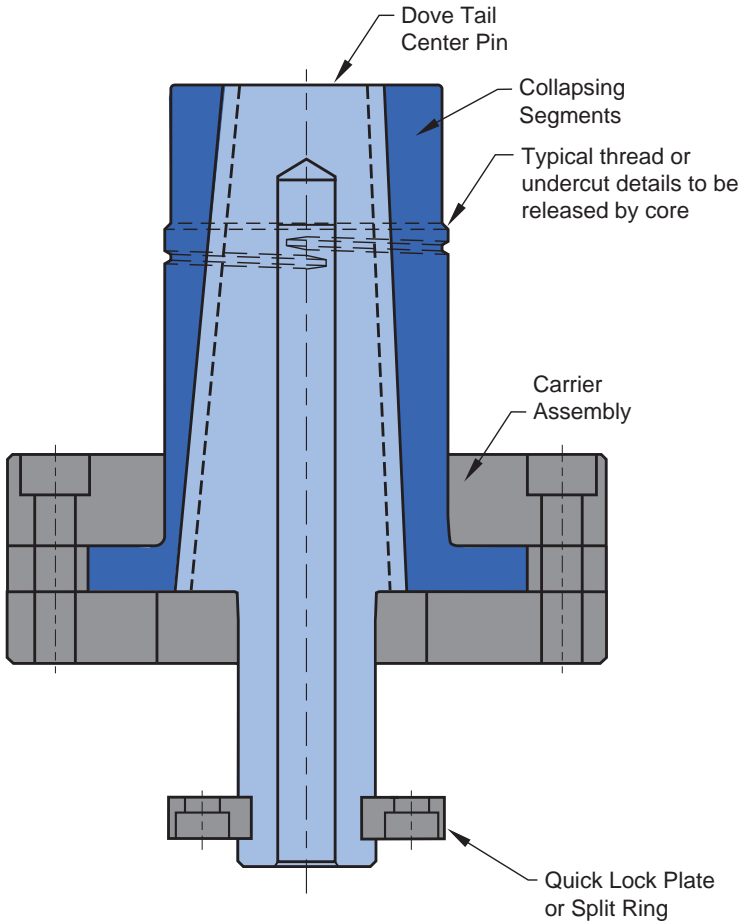
### Application Guidelines

- All standard DT Cores offer 360° molding of threads or other undercuts.
- Molded parts do not need to be closed at one end. They may be partially or completely open.
- In the chart above, the actual collapse is dependent upon the final major diameter ground onto DT core. Please email information@roehrtool.com for an application review prior to ordering the DT Cores.
- Stripper ring can be provided by moldmaker with either a tapered or straight fit, as shown in the machining guidelines at right.
- Parts with size requirements that fall outside of the standard sizes are available on a custom order basis.
- Roehr Tool can provide DT Cores with your thread and undercut details already machined. In addition, coatings and treatments may also be provided. Email your part drawing or application to information@roehrtool.com for a review.



# COLLAPSIBLE CORES

## DT SERIES OVERVIEW



### Collapsing Segments

**M** A-2    **H** 54-57 HRC

- Designed to mechanically collapse when the center pin is withdrawn.
- The fit between the segments is controlled to permit flash-free molding.

### Center Pin

**M** D-2    **H** 60-62 HRC

- Serves to expand the segments of the core to their molding position
- The pin may be flush to the core face.

### Carrier Assembly

**M** D-2    **H** 60-62 HRC

- Mounts DT Core assembly to the mold carrier plate.
- Provides guided and anti-rotational segment movement.

# GRINDING FIXTURES



**M** A-2    **H** 54-57 HRC    **S** Black Oxide

CATALOG NUMBER	CORE SIZE
<b>DTGF1011</b>	DT1011
<b>DTGF1213</b>	DT1213
<b>DTGF1415</b>	DT1415
<b>DTGF1617</b>	DT1617
<b>DTGF1821</b>	DT1821
<b>DTGF2227</b>	DT2227
<b>DTGF2833</b>	DT2833
<b>DTGF3439</b>	DT3439
<b>DTGF4045</b>	DT4045
<b>DTGF4651</b>	DT4651
<b>DTGF5260</b>	DT5260

CATALOG NUMBER	CORE SIZE
<b>DTGF18</b>	DT18
<b>DTGF28</b>	DT28
<b>DTGF38</b>	DT38
<b>DTGF48</b>	DT48



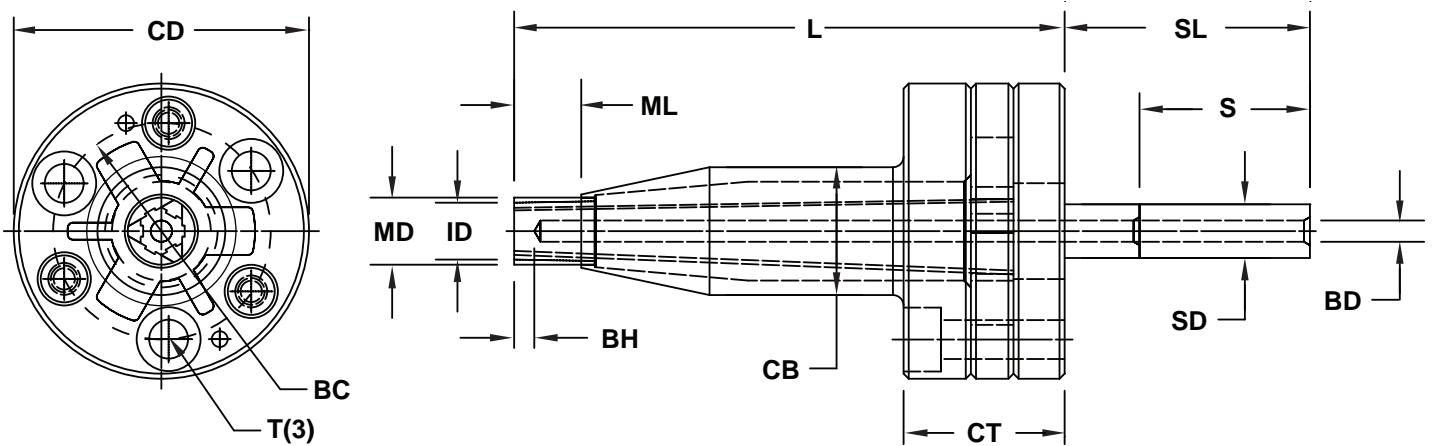


# COLLAPSIBLE CORES

## DT CORE SUB-IOMM SERIES

The Sub-10mm DT Cores make it possible to release very small threads and undercuts in molded caps, connectors and small medical applications.

- Allows molding of parts with 7-10mm ID.
- Quick Lock plates enable core removal from parting line.
- Simpler alternative to unscrewing molds.
- Reduces cycle time and maintenance requirements.

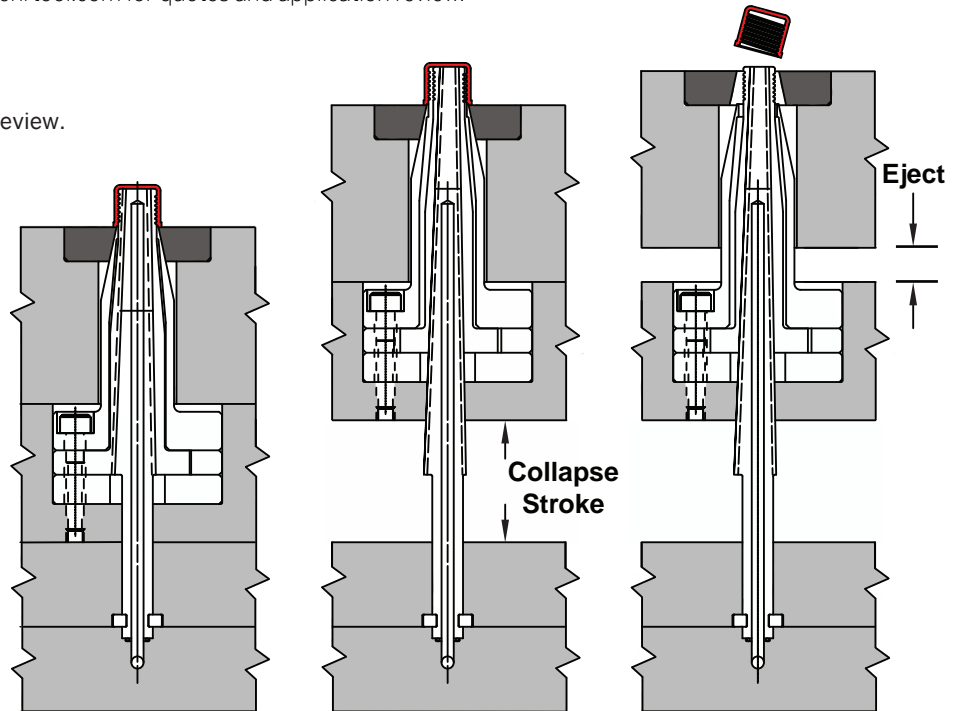
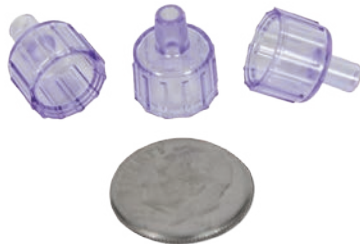


CATALOG NUMBER	MD Maximum Molding Diameter	ID Minimum Molding Diameter	ML Maximum Molding Length	UC Maximum Undercut	CD Carrier Assembly Diameter	CB Carrier Assembly Body	CT Carrier Assembly Thickness	L Length	SL Shaft Length	SD Shaft Diameter	S Maximum Collapse Stroke	BD Cooling Hole Diameter	BH Cooling Hole Height	BC Mounting Bolt Circle	T Mounting Bolt (3)
S10-Custom	10	7	10	.38	44	19	24	82	36	8	50	3	3	32	M5x25

NOTE: Submit part geometry to [information@roehrtool.com](mailto:information@roehrtool.com) for quotes and application review.

### Application Guidelines:

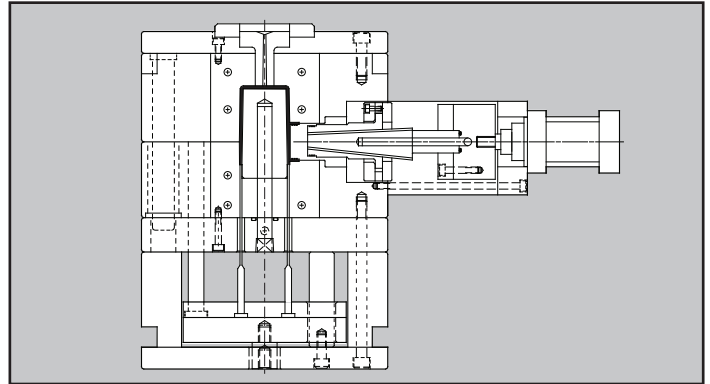
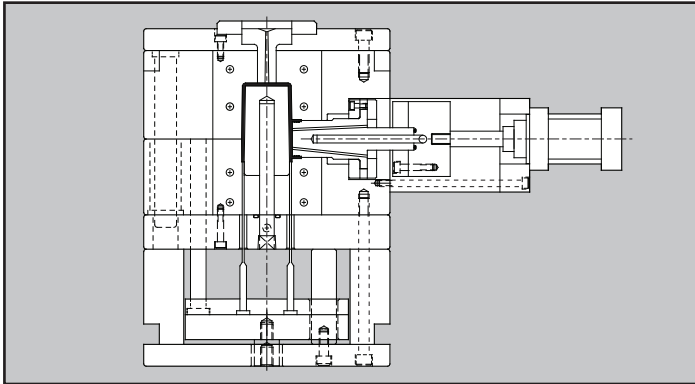
- Maximum undercut depth is determined by final molding diameter from application review.
- Collapse stroke is determined by undercut depth from application review.
- Cores are supplied complete with machined molding details.



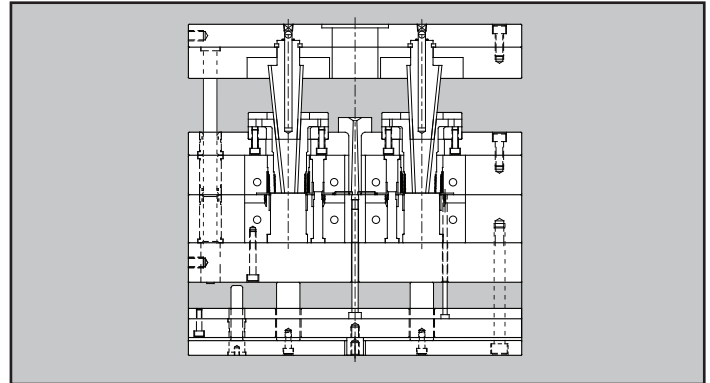
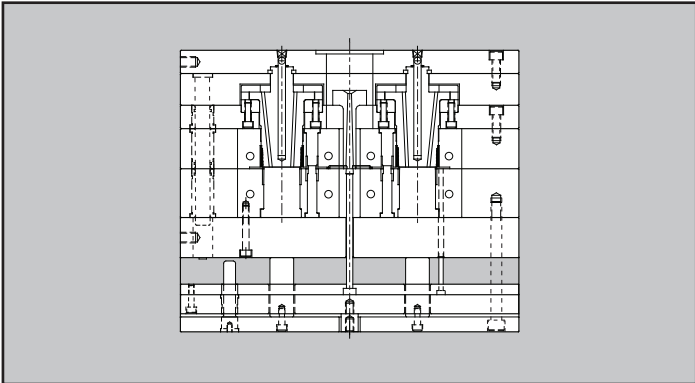
# COLLAPSIBLE CORES

## DT SERIES APPLICATIONS

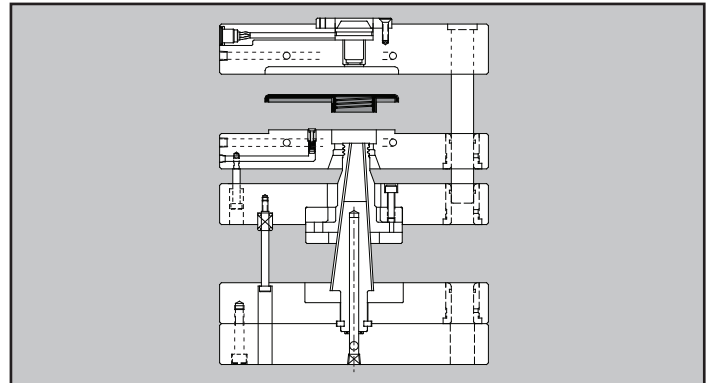
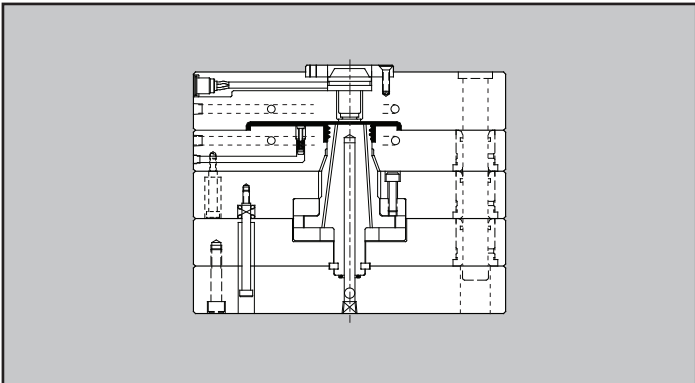
Side Action



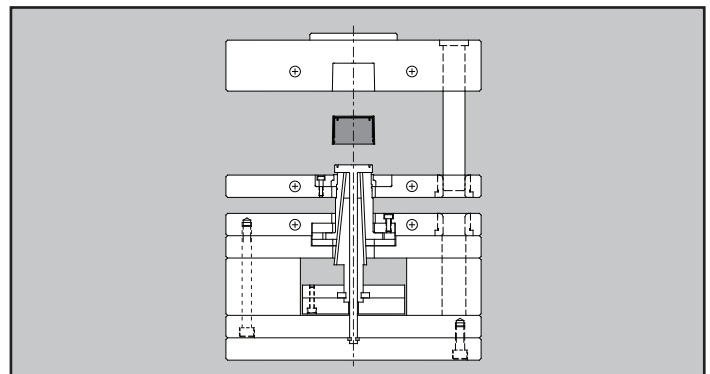
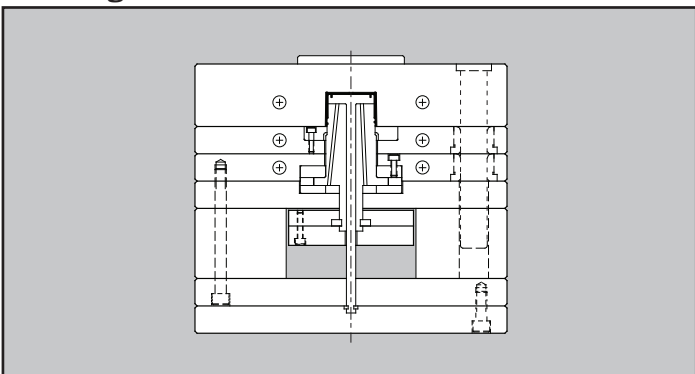
Cavity Side



Boss Detail



Seal Ring





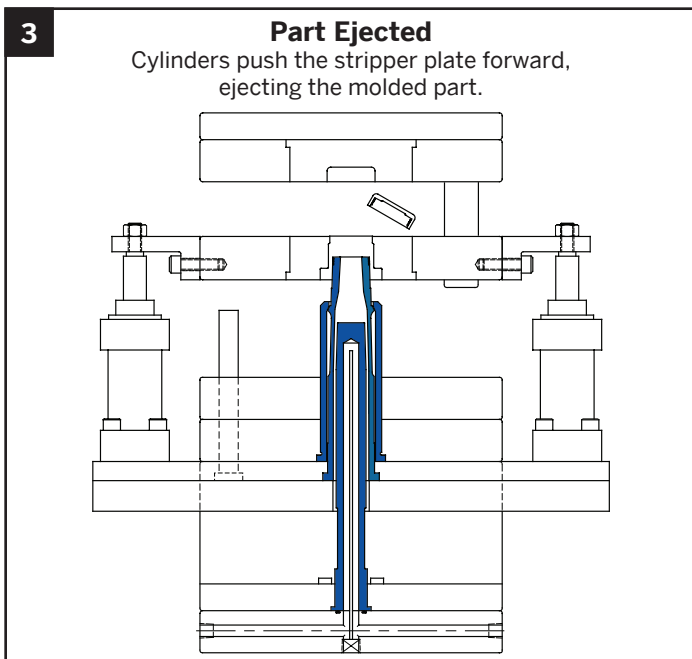
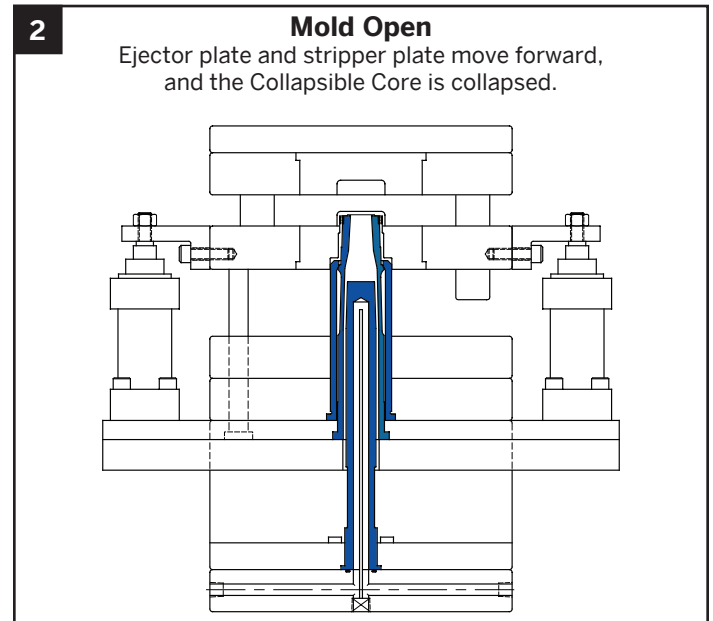
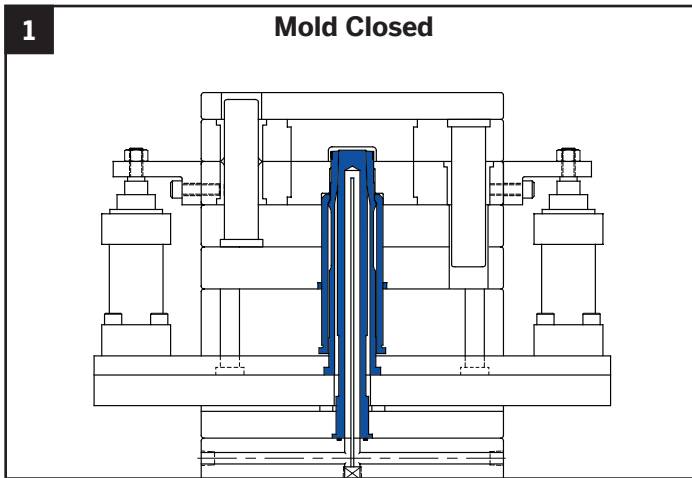
# COLLAPSIBLE CORES & MINICORES® RT SERIES

The RT Series Collapsible Cores are available in sizes to fit most inside detail applications. Whether molding threads or complex details, these cores can simplify design and production. Collapsible Cores allow for smaller molds to run faster cycles with less moving parts.

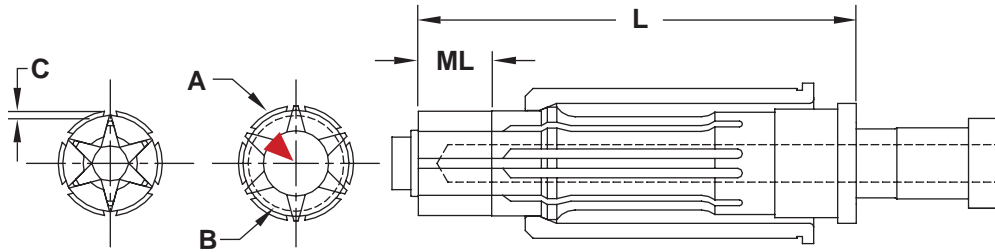
Standard sized Collapsible Cores (RT) and MiniCores (RT) are engineered and manufactured for Progressive Components through an alliance with Roehr Tool Solutions.

Made from premium tool steels and heat treated using proprietary heat treating methods.

Standard diameters range from 13mm to 105mm.



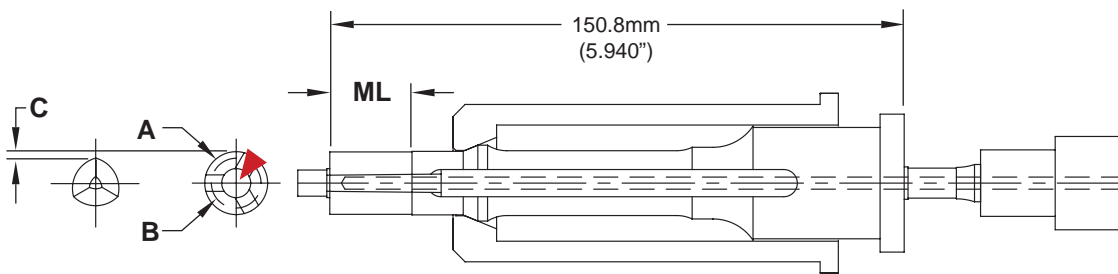
# COLLAPSIBLE CORES RT SERIES



▶ CAD insertion point

CATALOG NUMBER	A Maximum Outer Diameter		B Minimum Inner Diameter		Center Pin Diameter (At top of Collapsible Core)		ML Max. Molded Length (Including Mold Shut-Off)		C Collapse per Side at Top of Core** (Range Shown)			L Length of Collapsible Core		
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
CC-125-PC	.720	18.29	.620	15.75	.485	12.32	.800	20.32	.027	.69	.032	.81	5.605	142.37
CC-150-PC	.850	21.59	.700	17.78	.580	14.73	1.000	25.40	.037	.94	.042	1.07	6.615	168.02
CC-175-PC	.970	24.64	.760	19.30	.640	16.25	1.000	25.40	.043	1.09	.048	1.21	6.615	168.02
CC-200-PC	1.270	32.25	.910	23.11	.785	19.93	1.150	29.21	.043	1.09	.048	1.21	7.315	185.80
CC-250-PC	1.270	32.25	.910	23.11	.785	19.93	1.150	29.21	.043	1.09	.048	1.21	5.440	138.17
CC-202-PC	1.390	35.30	1.010	25.65	.885	22.47	1.150	29.21	.055	1.39	.064	1.62	7.315	185.80
CC-252-PC	1.390	35.30	1.010	25.65	.885	22.47	1.150	29.21	.055	1.39	.064	1.62	5.440	138.17
CC-302-PC	1.740	44.19	1.270	32.25	1.105	28.06	1.400	35.56	.068	1.72	.083	2.10	7.315	185.80
CC-352-PC	1.740	44.19	1.270	32.25	1.105	28.06	1.400	35.56	.068	1.72	.083	2.10	6.065	154.05
CC-402-PC	2.182	55.42	1.593	40.46	1.388	35.25	1.700	43.18	.090	2.28	.103	2.61	7.815	198.50
CC-502-PC	2.800	71.12	2.060	52.32	1.750	44.45	1.900	48.26	.115	2.92	.125	3.17	9.625	244.47
CC-602-PC	3.535	89.78	2.610	66.29	2.175	55.24	2.400	60.96	.140	3.55	.148	3.75	11.250	285.75
CC-652-PC	3.800	96.52	2.890	73.41	2.450	62.23	2.400	60.96	.150	3.81	.160	4.06	11.250	285.75
CC-702-PC	4.225	107.31	3.350	85.09	2.790	70.86	2.400	60.96	.165	4.19	.170	4.32	11.250	285.75

# MINICORES® RT SERIES



CATALOG NUMBER	For Closure Diameter Range	A Maximum Outer Diameter		B Minimum Inner Diameter		Center Pin Dia. (At top of Collapsible Core)		Width of (3) Non-Collapsing Center Pin Blades (At Top of Core)		ML Max. Molded Length (Including Mold Shut-Off)		C Collapse per Side at Top of Core	
		mm	Inch	mm	Inch	mm	Inch	mm	Inch	Inch	mm	Inch	mm
CCM-0001	13-16	.645	16.38	.425	10.80	.300	7.62	.170	4.32	.850	21.59	.052	1.32
CCM-0002	17-20	.805	20.45	.560	14.22	.420	10.67	.190	4.83	.850	21.59	.057	1.45
CCM-0003	21-24	.965	24.51	.710	18.03	.560	14.22	.200	5.08	1.000	25.40	.059	1.50

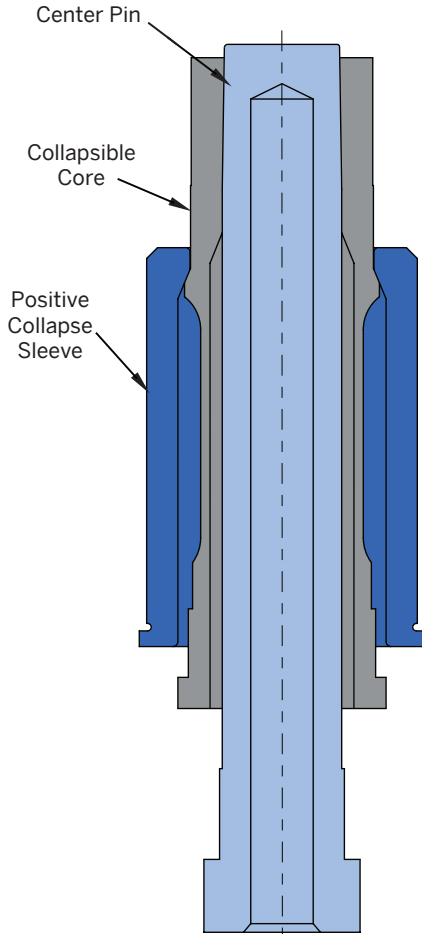


# COLLAPSIBLE CORES & MINICORES®

## RT SERIES

### Description of Components and Basic Operation

Both styles of the Collapsible Cores (Standard and MiniCores®) are three-part assemblies, designed for simplicity of installation, reliability in operation, and long life. The three parts include a Collapsible Core, a Positive Collapse Sleeve, and a Center Pin.



#### Collapsible Core

**M** A-2 **H** 54-57 HRC

- Designed to collapse independently when the center pin is withdrawn.
- The fit between segments is controlled to permit flash-free molding.

#### Positive Collapse Sleeve

**M** 52100 **H** 54-57 HRC

- Designed to function when the Collapsible Core fails to collapse independently. In normal operation, the PC Sleeve is not functioning. It is essential to have such a unit for maximum safety and reliability in automatic and semi-automatic operation.

#### Center Pin

**M** D-2 **H** 60-62 HRC

- Serves to expand the segments of the Collapsible Core to their molding position.
- The pin must protrude beyond the face of the collapsing core segments, and it must have a radius around its top edge to operate properly.

#### Application Guidelines

- Standard Collapsible Cores have a Max. OD ("A") of thread or configuration ranging from .720"(18.29mm) - 4.225" (107.31mm) and offer complete 360° thread or undercut geometry.
- MiniCores have a Max. OD of thread or configuration ranging from .645"(16.38mm) - .965"(24.51mm) and offer up to 70% full thread or undercut geometry. (Internal geometry is interrupted in three places to allow core segments to collapse.)
- Molded parts do not need to be closed at one end. They can be partially or completely open. Also, undercuts do not need to be continuous.
- Cores are capable of operating without benefit of lubrication, however, treating the Collapsible Core with an additional treatment for wear reduction or corrosion resistance is beneficial.
- Custom cores with size requirements that fall outside of the standard Collapsible Core and MiniCore ranges are available. In addition, finished cores with machined, EDM'd, or ground details can be supplied. Contact [information@roehrtool.com](mailto:information@roehrtool.com) for an application review and quotation.

## RT CORE GRINDING RINGS

Grinding Rings for Collapsible Cores securely hold the core segments in place against the center pin when grinding or EDM'ing details.

**M** Aluminum **H** Black Anodize

CATALOG NUMBER	CORE SIZE (PREFIX CC)
RTGR125	125
RTGR150	150/175
RTGR200	175/200/202/250/252
RTGR300	302/352
RTGR400	402
RTGR500	502
RTGR600	602
RTGR650	652
RTGR700	702



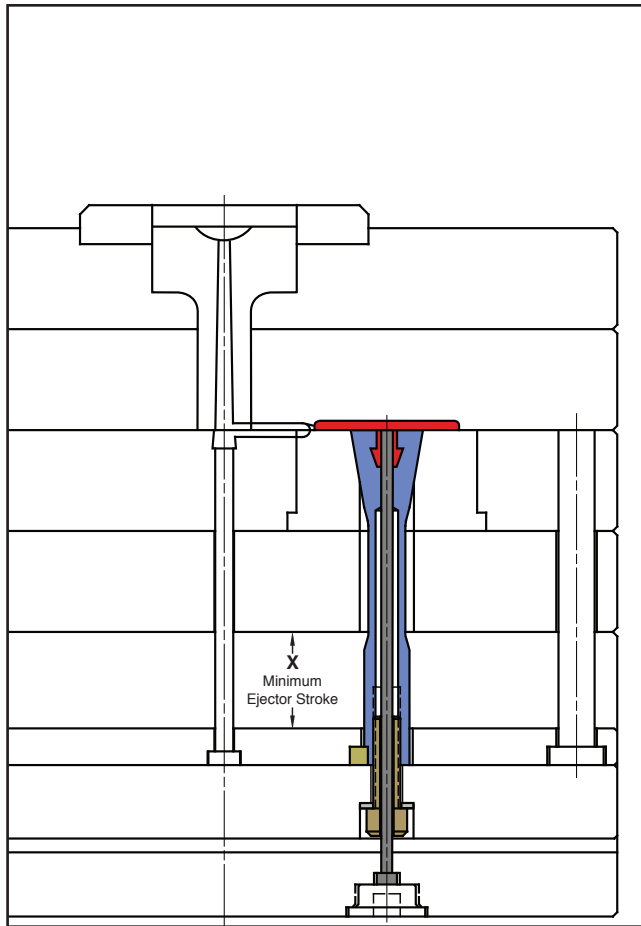
# EXPANDABLE CAVITIES

## EX-CAV<sup>®</sup> SYSTEM

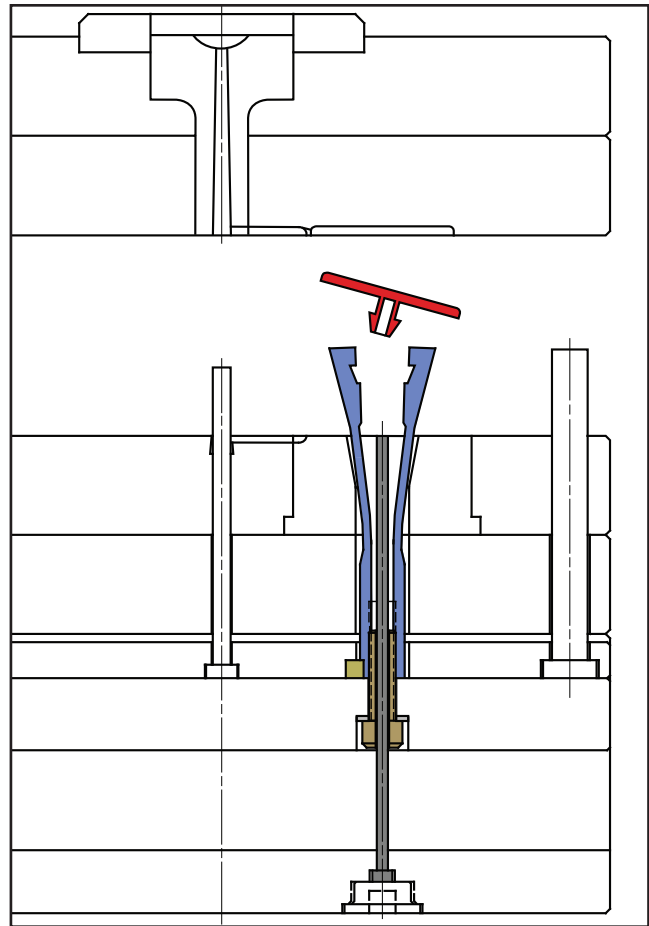


Expandable Cavities mold undercuts such as threads, dimples, and protrusions. The patented Ex-Cav design eliminates the engineering, maintenance, and machining required for side action mechanisms which results in smaller molds or higher mold cavitation.

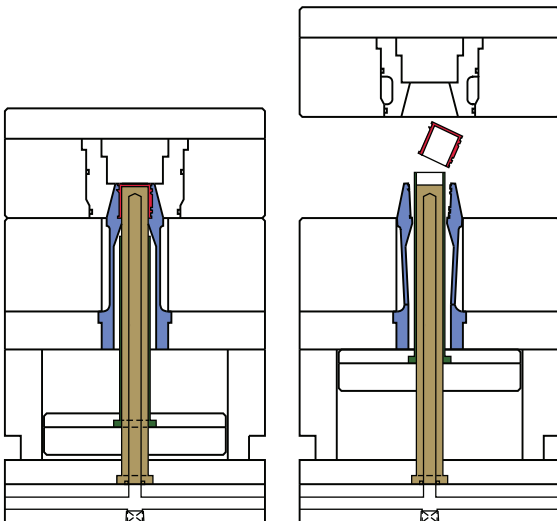
Standard sized Expandable Cavities (Ex-Cavs) are engineered and manufactured for Progressive Components through an alliance with Roehr Tool Solutions.



**Mold Closed**



**Mold Open**



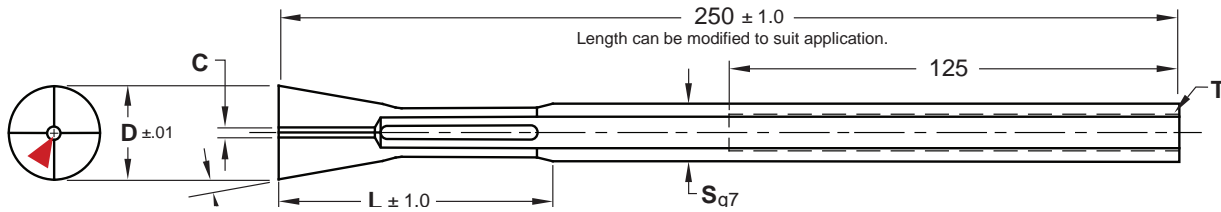
### Technical Information:

- Four sizes offered to satisfy a wide range of parts.
- The Ex-Cav expands along a conical shape, 10° per side.
- Manufactured from A-2, 54-57 HRC material for repeatable expansion. For optimal performance, the Ex-Cavs should ride against a hardened insert.
- Maximum temperature: 260° C / 500° F
- Expandable Cavities are capable of operating without lubrication.
- However, treating the Ex-Cav with an additional coating for wear reduction or corrosion resistance is beneficial.
- Ex-Cavs can be ordered with molding detail for a 'mold ready' component.
- Fixturing bushings for machining details in house are also available.
- Custom Ex-Cavs are available. Also, when an entire part is formed within the cavity, an A-Series Ex-Cav can be provided, shown at left.



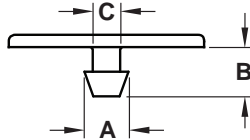
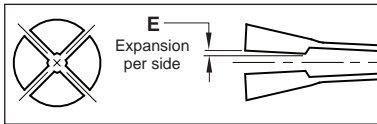
# EXPANDABLE CAVITIES

## EX-CAV® SYSTEM



**M** A-2 **H** 54-57 HRC

▶ CAD insertion point



CATALOG NUMBER	D Ex-Cav Diameter	A Maximum Part Diameter -10 per side	B Maximum Molding Length	C Minimum Part Inner Diameter	E Expansion Per Side	F Min. Wall Thickness	L	S Body Diameter	T Thread	X Minimum Ejection Stroke (Prev. page)
EXCAV20	20	14	13	2.5	1.6	3	59	14	M8	15
EXCAV26	26	18	20	3.5	2.5	4	76	16	M10	15
EXCAV38	38	30	27	4.0	3.0	4	89	27	M18	20
EXCAV50	50	40	39	5.5	3.5	5	101	34	M24	20

Mounting kits sold separately below.  
Ex-Cav sizes outside of this chart are available as customs.

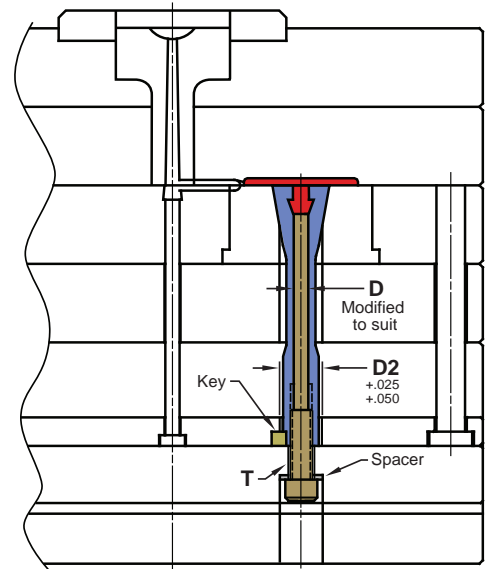
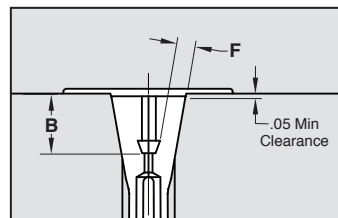
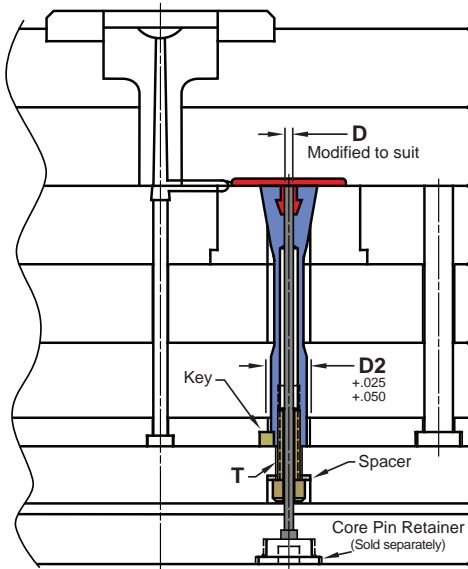
## MOUNTING KITS & MACHINING SPECS

### Hollow Bolt Mounting Kit Includes:

- Key (7 Thk. x 8 x 40)
- Hollowed Bolt
- Standard DIN H-13 Ejector Pin (400mm Long)
- Spacer

### Pin Bolt Mounting Kit Includes:

- Key (7 Thk. x 8 x 40)
- Threaded Bolt/Pin (H-13, 40-44 HRC, 280mm Long)
- Spacer



EX-CAV NUMBER	D Nominal Pin Diameter	T Bolt Size	Spacer Size (IDxODxThk)	D2	HOLLOW BOLT KIT NUMBER
EXCAV20	3.5	M8-1.25 x 40	8x22x4	14	EXC20BH
EXCAV26	4	M10-1.5 x 40	10x23x4	16	EXC26BH
EXCAV38	10	M18-2.5 x 50	19x33x6	27	EXC38BH
EXCAV50	14	M24-3 x 55	25x42x6	34	EXC50BH

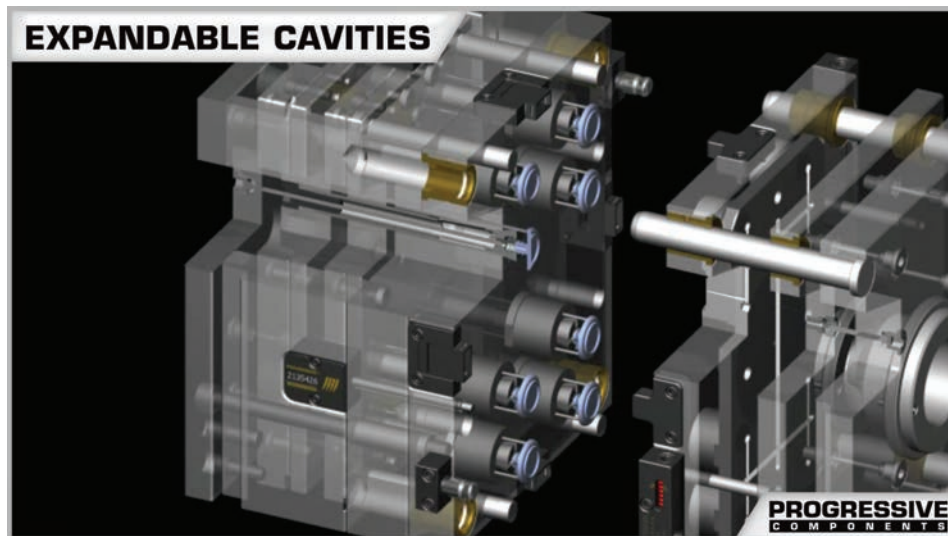
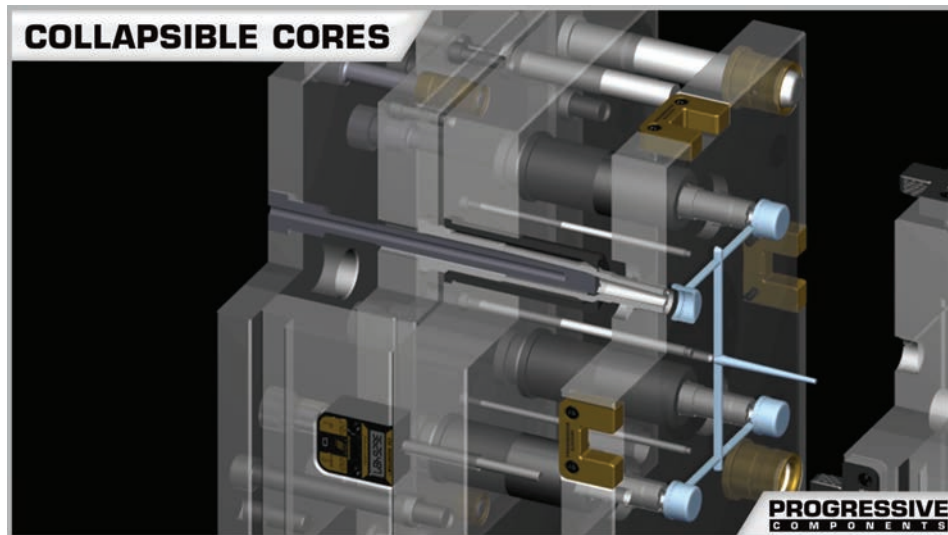
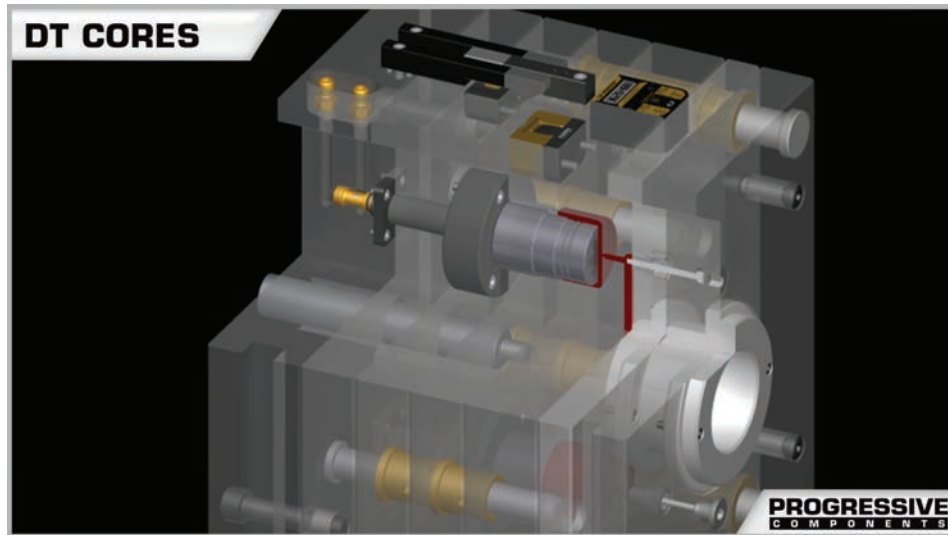
EX-CAV NUMBER	D Pin Diam. ± .05	T Bolt Thread	Spacer Size (IDxODxThk)	D2	PIN BOLT KIT NUMBER
EXCAV20	6.0	M8-1.25	8x22x4	14	EXC20BP
EXCAV26	7.7	M10-1.5	10x23x4	16	EXC26BP
EXCAV38	14.5	M18-2.5	19x33x6	27	EXC38BP
EXCAV50	19.8	M24-3	25x42x6	34	EXC50BP

Replacement DIN Ejector Pins are sold on page A-4.  
Core Pin Retainers are sold on pg A-19.

US Patent Nos. 5,387,389, 5,540,582,  
5,630,977, 8,038,433 and others pending



## ONLINE RESOURCES



When considering design options, numerous animations can be viewed at [procomps.com/animations](http://procomps.com/animations).



# PLATE SEQUENCE CONTROL

## SECTION J



Plate Locks	Internal Plate Locks	Friction Puller
Prefix: PLC, PLCLM, PLN	Prefix: PLN	Prefix: FP
Page: J-1	Page: J-5	Page: J-7



Roller Puller	StackKit System
Prefix: RPL	Prefix: SK
Page: J-8	Page: J-9



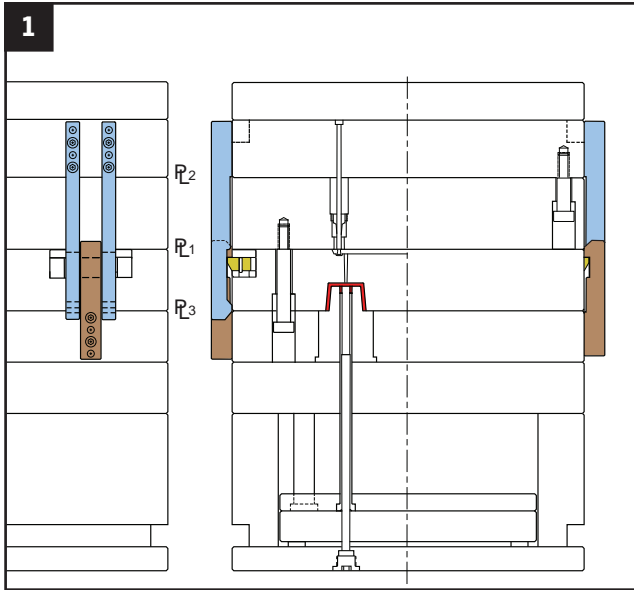


# PLATE LOCKS

## EXTERNAL CAM-DRIVEN SYSTEM

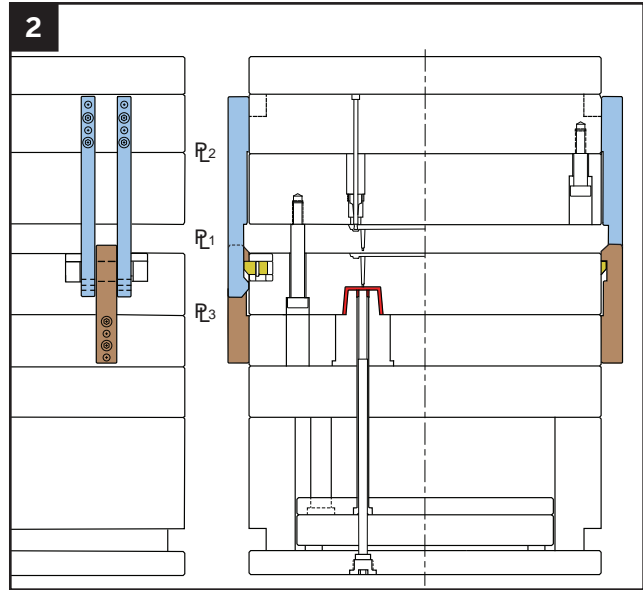
The Cam-Driven External Plate Locks allow for parting line sequencing via a versatile design with minimal machining for different applications, including:

- 3-Plate Sequencing
- Dual Ejection
- Stripper Plate Sequencing



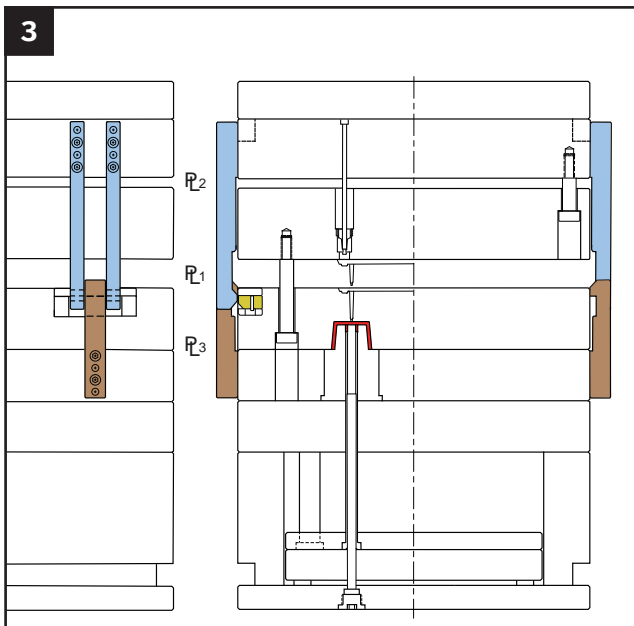
### Mold Closed: Lock Engaged

In this 3-plate application, three parting lines are utilized for ejecting the part and runner.



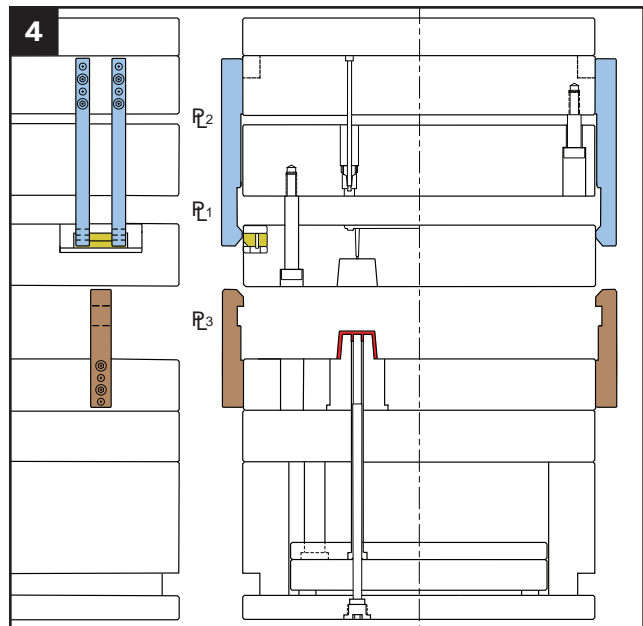
### First Parting Line Opens

The Puller Pin pulls the runner and breaks the gate, while parting line #3 is held closed by the Plate Lock.



### Stroke Continues

After stripper bolts crossing parting line #2 and #3 bottom out, the Wedge Block is fully disengaged from Latch Bar.



### Main Parting Line Opens

With both parting line stripper bolts bottomed out and the Latch Bar released, parting line #3 is free to open.

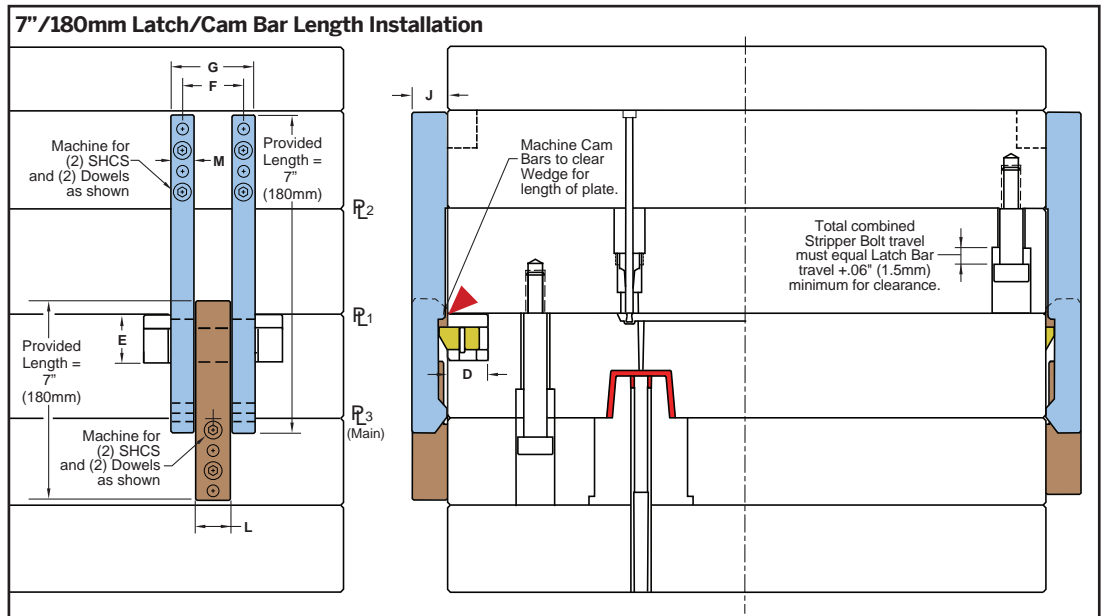
- The 7"/180mm assemblies are suggested for pulling 2,000 lbs (900kg) each and the 12"/300mm assemblies are suggested for pulling 3,000 lbs (1360 kg) each. Weight ratings may vary based on gate size, friction conditions, and velocity.
- On molds that are 12" wide or more, Progressive recommends four assemblies, two sets per side on the opposite ends of the mold.
- Using four assemblies of the -S version (to push plates) is recommended for plates 12" or greater in width.

# PLATE LOCKS

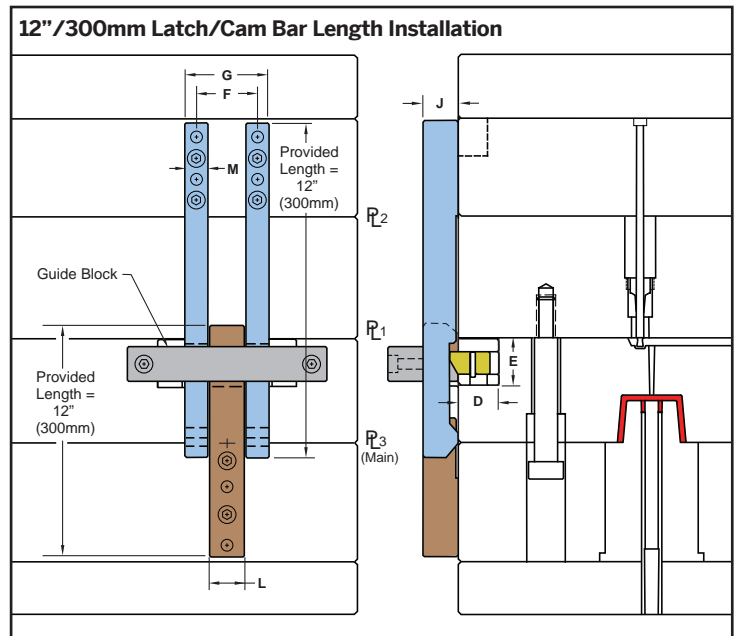
## 3-PLATE APPLICATION

### Design & Installation:

1. Determine Latch travel.
2. Determine Stripper Bolt travel, .06 minimum clearance past Latch release.
3. Determine the Cam Bar length by utilizing the gauge pin and timing diagram on the opposite page.
4. Machine the Latch Bar so that with the mold closed there is .001" clearance between the Wedge Block and Latch Bar as shown on in the timing diagram.
5. Machine (2) counterbores and (2) dowels for Latch and Cam Bar as shown. Two (2) dowels are recommended for proper alignment.
6. For all assemblies, the Wedge Block Assembly is installed according to the pocket dimensions below.
7. For the 12"/300mm assemblies, the Guide Block must be installed over the Latch and Cam Bars. The Guide Block will help to avoid deflection, causing latch timing issues, during production and can be purchased for optional use on the 7"/180mm assemblies. Screw size and locations are shown below, and it is suggested that location is on the center of the Wedge Block Assembly pocket, opposite the spring pressure.

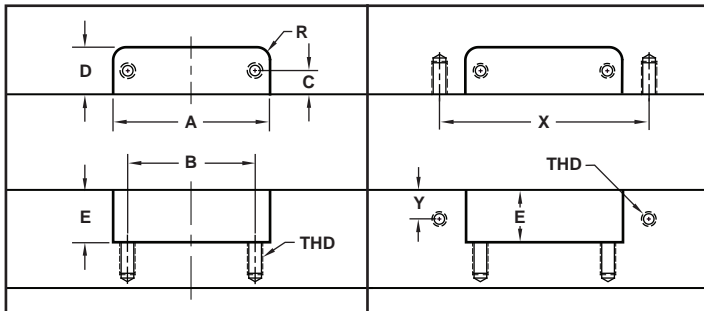


▶ CAD insertion point



Wedge Block Assembly Installation

Guide Block Installation



### Inch Standard

CATALOG NUMBER	A +.001 -.000	B ±.005	C ±.005	D +.001 -.000	E +.001 -.000	F ±.005	G Ref	J	L	M	R Pocket	X ±.005	Y ±.005	THD
PLC75-7	3.001	2.44	.45	.900	1.000	1.31	1.80	.750	.750	.500	.250	3.625	.500	1/4-20 x .50 Deep
PLC75-12														

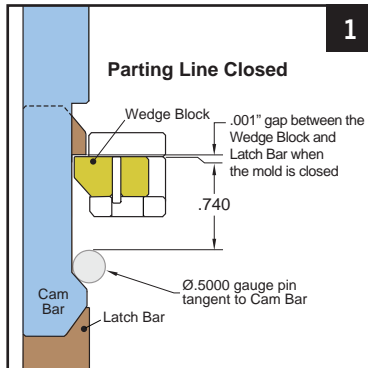
### Metric Standard

CATALOG NUMBER	A +.03 -.00	B ±.1	C ±.1	D +.03 -.00	E +.03 -.00	F ±.1	G Ref	J	L	M	R Pocket	X ±.1	Y ±.1	THD
PLCM20-180	80.02	64	12	24	27	35	49	20	20	14	7	92	13.5	M6-10 x 10mm Deep
PLCM20-300														

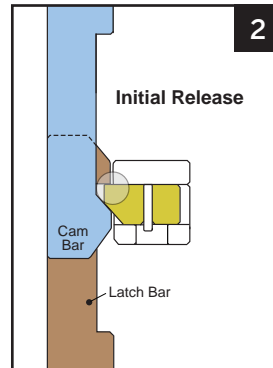


# PLATE LOCKS TIMING

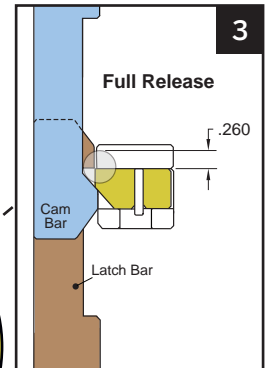
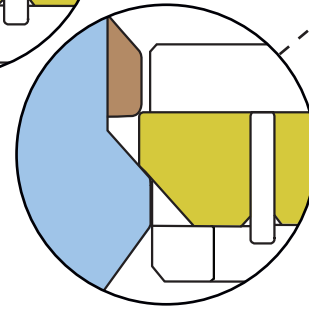
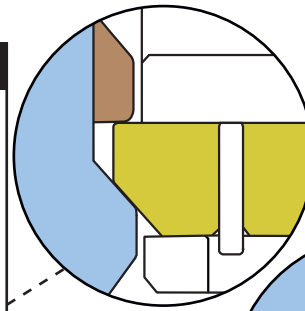
## For Cam Bar Release Point



The Latch Bar is set up for 1.0" of travel to full release.

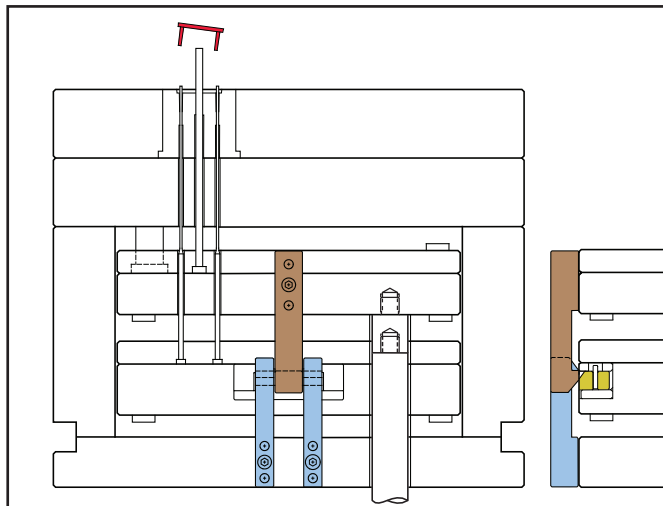


Once engaged, the Latch Bar starts to fall off the lead-in to the Wedge Block, allowing separation of parting line #3 to begin.



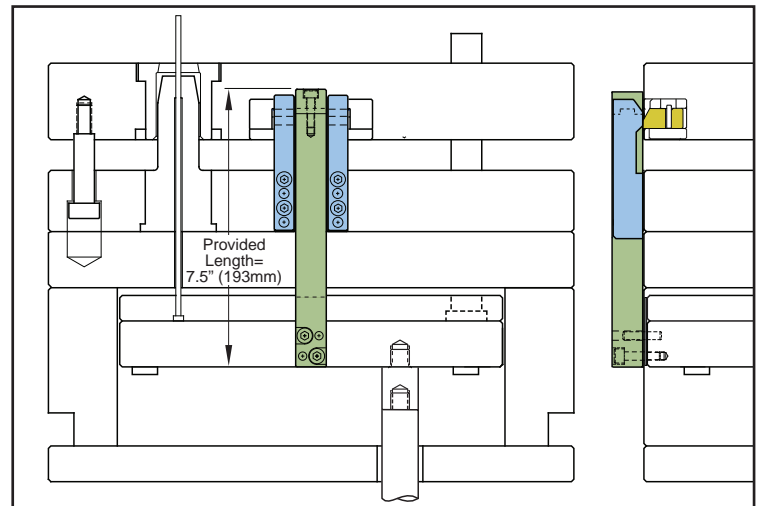
Latch Bar is disengaged from Wedge Block.

# PLATE LOCKS APPLICATIONS



## Dual Ejection

Plate Locks keep both ejector sets together until the release point. The Wedge Block Assembly would be installed in the bottom ejector plate, following the installation of all components.

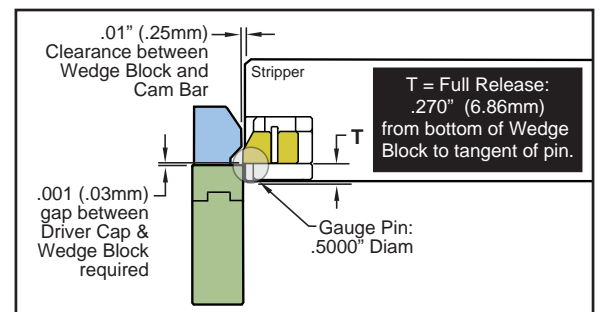


## Stripper Plate

The Drivers push the stripper plate forward until the parts are stripped from the core. The lock then releases, allowing the ejector pins to push the parts from the stripper plate.

## Stripper Plate Design & Installation Guidelines:

- Stripper plate applications can be utilized as shown above with the optional Stripper Plate Kit as sold on page J-4. The Latch Bar will be discarded and replaced with the Driver, Cap, and Spacer offered in the kit.
- All pocket and component machining is similar to the 3-plate application shown on page J-2 except for calculation of the "T" dimension for timing the release point according to the graphic at right.
- Use the Spacer as a template for machining the bolts/dowels on the Driver/Cap assembly.
- Attach the Spacer to the Driver, which will provide .03" / .75mm gap between the Driver and the mold to avoid interference.



# PLATE LOCKS

## EXTERNAL CAM-DRIVEN SYSTEM

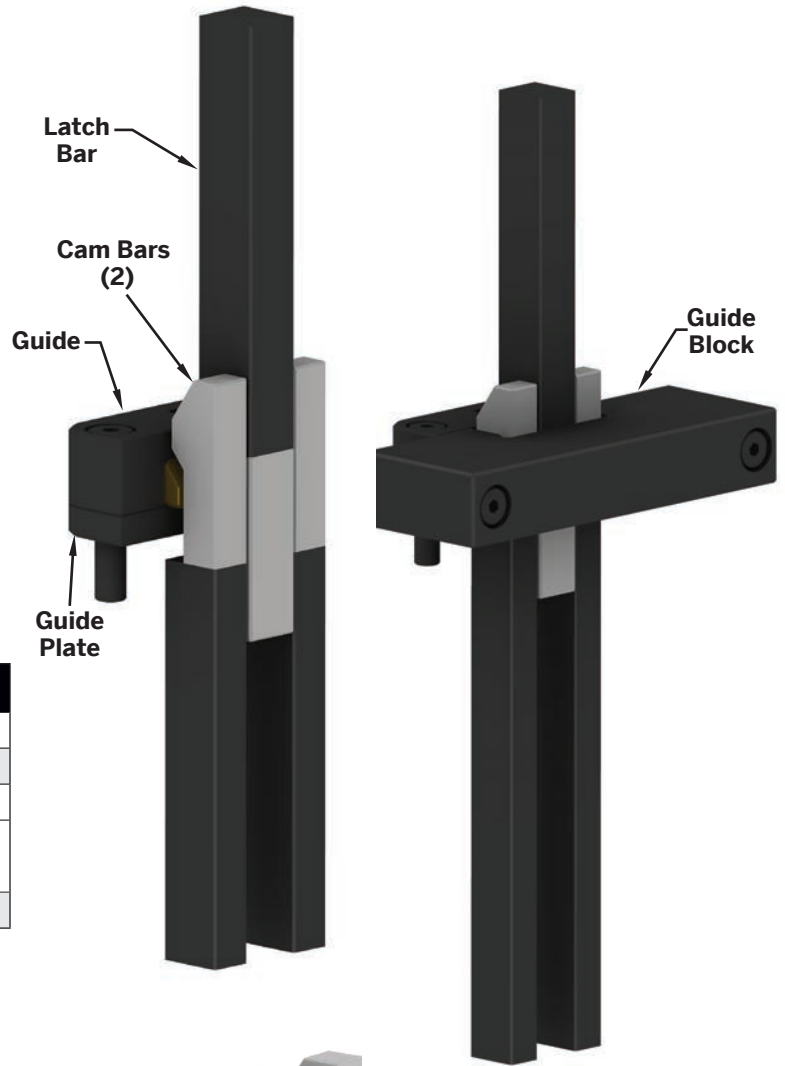
ASSEMBLY CATALOG NUMBER	LATCH/CAM BAR LENGTHS
PLC75-7	7.0
PLC75-12	12.0
PLCM20-180	180mm
PLCM20-300	300mm

### Assemblies include:

- All machined components listed below.
- Items within the Wedge Block Assembly:
  - Compression Springs (2)
  - 1/4-20 LHCS or M6-1.0 LHCS (2 per assembly)
  - 1/8 or 3mm Diameter Dowel Pin (1 per assembly)
- Screws within the Guide Block (12"/300mm assemblies)
  - 1/4-20 LHCS or M6-1.0 LHCS (2 per assembly)

PART NAME	MATERIAL/TREATMENT
Latch Bar	4340, 35-40 HRC, Nitride/Black Oxide
Cam Bars (2)	4340, 35-40 HRC, Nitride/Black Oxide
Wedge Block Assembly	Wedge Block: A-2, 58-60 HRC Titanium Nitride
	Guide & Guide Plate: H-13, 52-54 HRC Nitride/Black Oxide
Guide Block	H-13, 52-54 HRC, Nitride/Black Oxide

- The Guide Block may also be utilized on the 7"/180mm assemblies. To order, specify PLC75-GBA for inch standard and PLCM20-GBA for metric.



## STRIPPER PLATE KIT

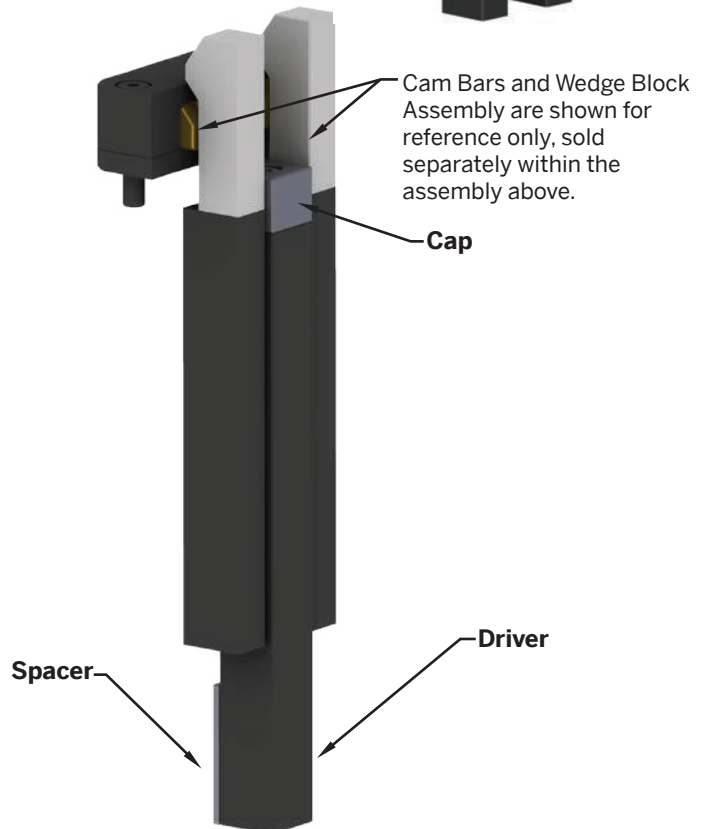
For stripper plate applications, purchase the appropriate metric or inch assembly from the top of the page and the matching kit below. The mold maker will discard the Latch Bar, replacing it with the Cap/Driver/Spacer shown at right.

CATALOG NUMBER	STANDARD
PLC75-S	Inch
PLCM20-S	Metric

### Assembly includes:

- All machined components listed below.
- (1) #10-32 x .75 or M5-.8 x 30mm SHCS

PART NAME	MATERIAL/TREATMENT
Cap	4340, 35-40 HRC, Nitride
Driver	4140, 28-35 HRC, Black Oxide
Spacer	303 Stainless Steel, 35-40 HRC



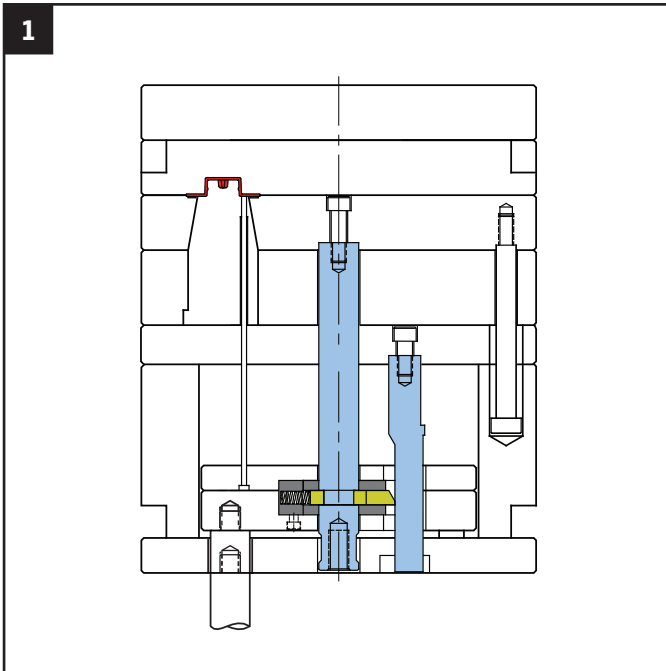
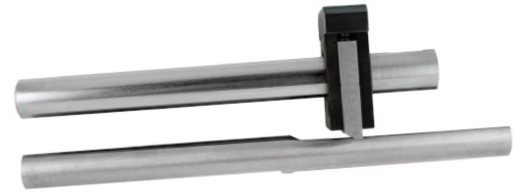




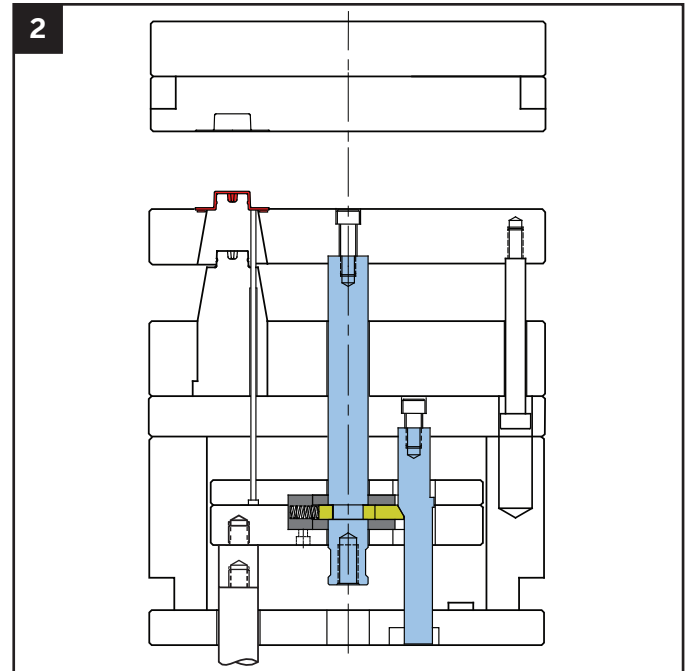
# PLATE LOCKS

## INTERNAL EJECTION SYSTEM

Internal Plate Locks provide a positive, mechanical method for locking and actuating plates in molds requiring multiple ejection actions. Optionally, using the press knock-out locations, the internal ejection system can be used to actuate the ejectors after the stripper plates.

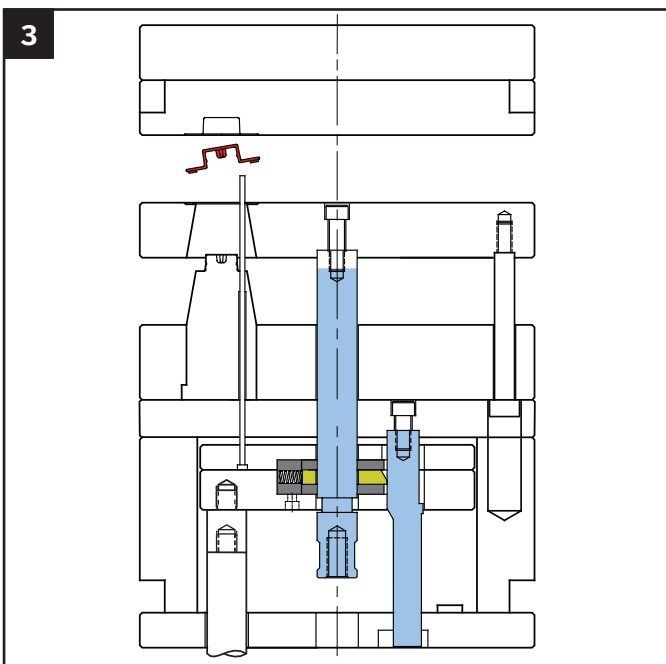


**Mold Closed**



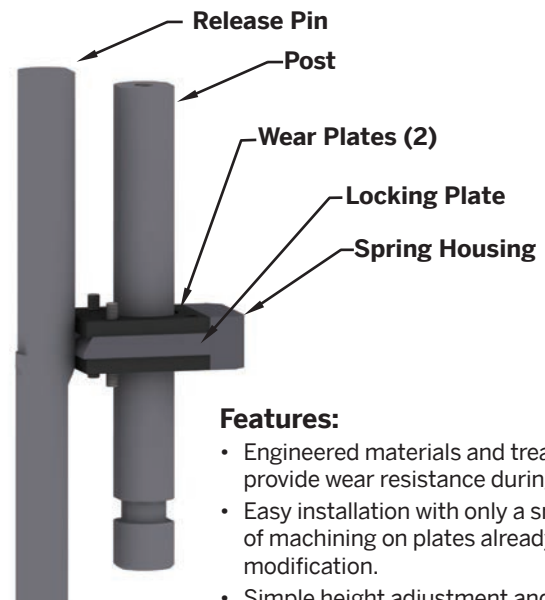
**Mold Open: Plate Strips Part From Core**

Lock begins to disengage and stripper and ejector plates move forward.



**Mold Open: Part Ejected From Plate**

With the stripper plate stopped, the ejector system continues and pushes the part from the plate.

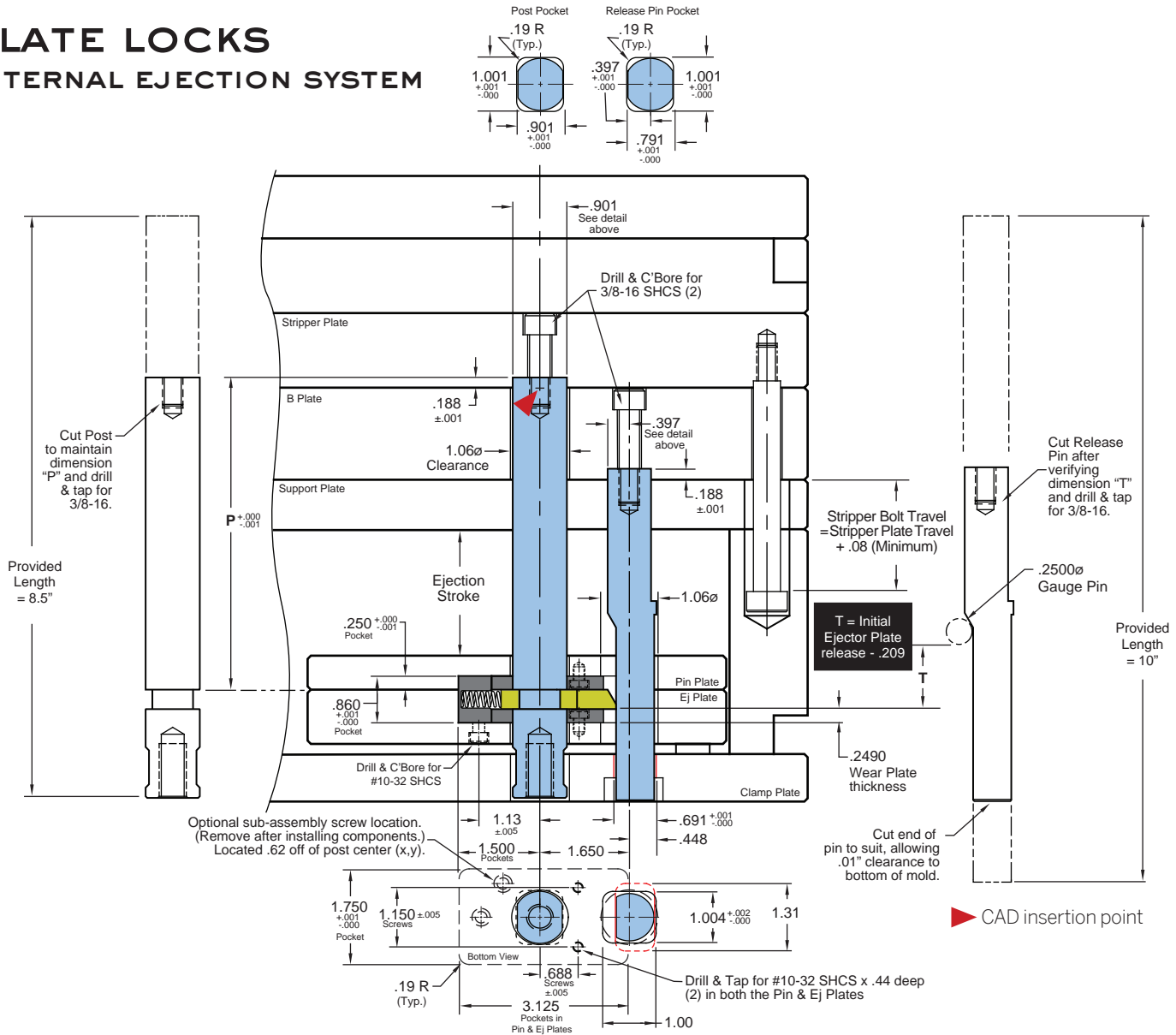


**Features:**

- Engineered materials and treatments provide wear resistance during production.
- Easy installation with only a small amount of machining on plates already requiring modification.
- Simple height adjustment and timing.
- Designed to re-engage when fully retracted.
- For activating large mold plates, multiple Internal Plate Locks can be installed.

# PLATE LOCKS

## INTERNAL EJECTION SYSTEM



CATALOG NUMBER	DESCRIPTION
PLN100	Internal Plate Lock Assembly

### Assembly includes:

- All five machined components listed at right.
- Compression Springs (2)
- #10-32 LHCS (4)

PART NAME	MATERIAL/TREATMENT
Locking Plate	A-2, 58-60 HRC
Wear Plate (2)	H-13 50-54 HRC, Nitrided, Black Oxide
Spring Housing	4140, 28-32 HRC
Release Pin	4340, 30-35 HRC, Nitrided
Post	4340, 30-35 HRC, Nitrided

### Design Guidelines:

- It is recommended that ejector rods or PKO extensions are tied into the pin plates and guided ejection is utilized.
- For small molds (12 x 20 max), one or two assemblies may be used. For molds larger than 12 x 20, four assemblies should be installed.
- On all designs, consider fastener and assembly access points and install the Plate Locks equal distances from center to ensure proper balance of the mold.
- Determine the Post length by verifying the distance in dimension "P" according to the information above. Cut, drill, and tap the Post to suit.
- By using a .250 diameter gauge pin tangent to the flat and the angle on the Release Pin, determine the release point "T" as shown above.
- Calculate the overall length of the Release Pin and then cut, drill, and tap.

### Installation Guidelines:

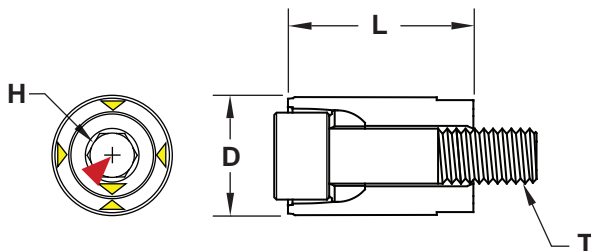
- Machine all pockets per the drawing above.
- Bolt the Release Pin and Post to the B-side plates.
- Ejector plates are then assembled with the Wear Plate, Locking Plate, and Spring Housing.
- Locking plate is retracted to allow for the temporary keeper screw installed. This allows the Locking Plate to pass over the Post and also have clearance to Release Pin.
- Ejector plates are to be installed onto guided ejector pins and placed in the proper location, lining up Locking Plate with relief in the Post.
- Finally, remove the temporary keeper screw, allowing the Locking Plate to snap into the relief within the Post.



# FRICTION PULLERS

## PARTING LINE SEQUENCE CONTROL

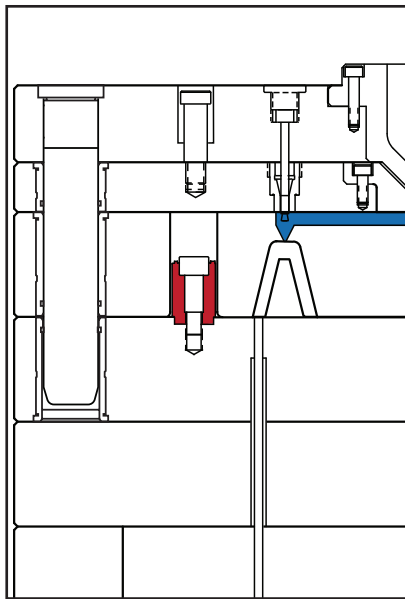
Progressive's Friction Pullers can be used to uniformly draw floating plates and inserts. Designed to replace shoulder bolts, the Friction Pullers initiate movement and utilize friction at a particular setting to release the plate when travel limits are reached.



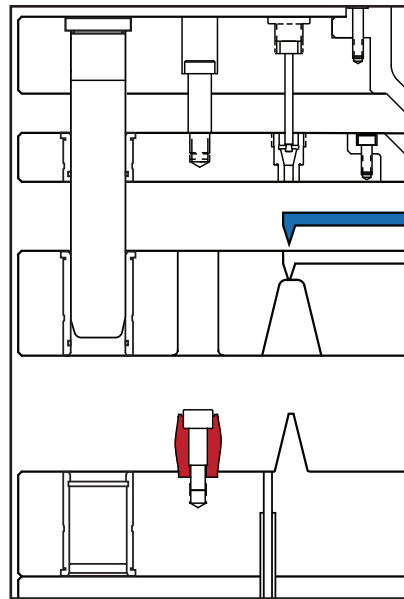
**M** Custom PPA Resin with 8620 Fastener

▶ CAD insertion point

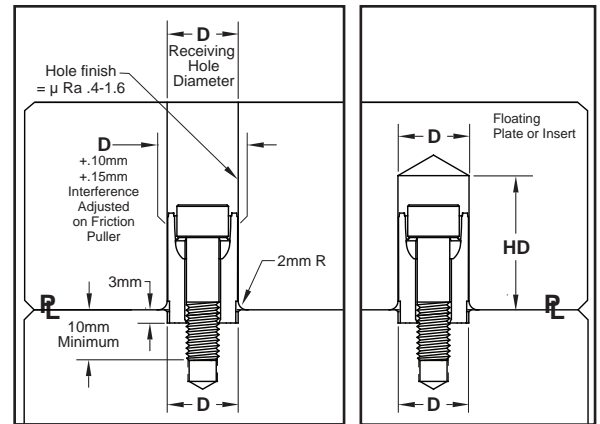
CATALOG NUMBER	D	L	T	H Hex	HD Hole Depth	Maximum Force (Each)
FP-10	10	17	M5-.8	3	20	32.5 kg (70 lbs)
FP-13	13	20	M6-1	4	23	62.5 kg (135 lbs)
FP-16	16	25	M8-1.25	5	30	150.0 kg (330 lbs)
FP-20	20	28	M10-1.5	6	32	212.5 kg (470 lbs)



**Mold Closed**



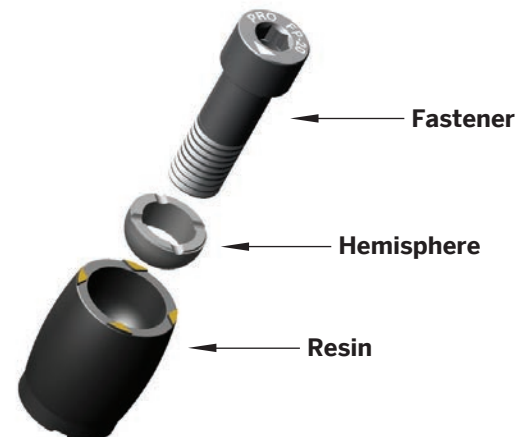
**Mold Open**



Recommended interference fit is .1 to .15mm larger than the receiving hole. To adjust the Friction Puller, rotate the screw clockwise and measure bulge to achieve the proper fit. Further adjustments can be performed with 1/4 turn increments, lining up the reference arrows on the fastener to the resin.

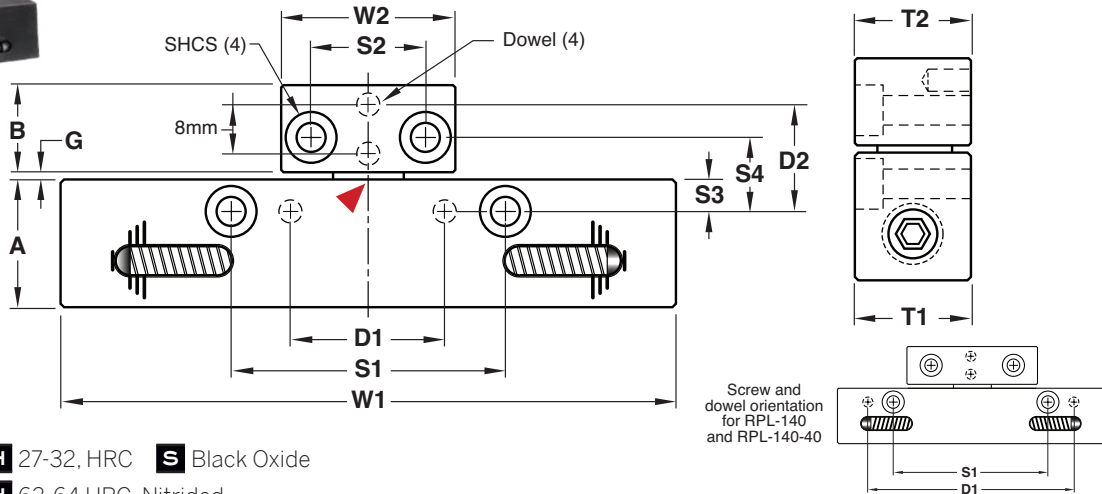
### Technical Information:

- For mold maintenance, before removing the mold from the press, rotate the screw counter-clockwise 3/4 turn. This will allow easy separation of plates.
- Maximum operating temperature is 300° F (150° C).
- Fastener includes Nylok® patch for secure installation.
- The hemisphere is plated for additional lubricity during adjustments.
- Friction Pullers are self-venting. Additional venting not required when using blind holes.
- Replacement items are available. Contact Customer Service for availability.



# ROLLER PULLERS™

## PARTING LINE SEQUENCE CONTROL

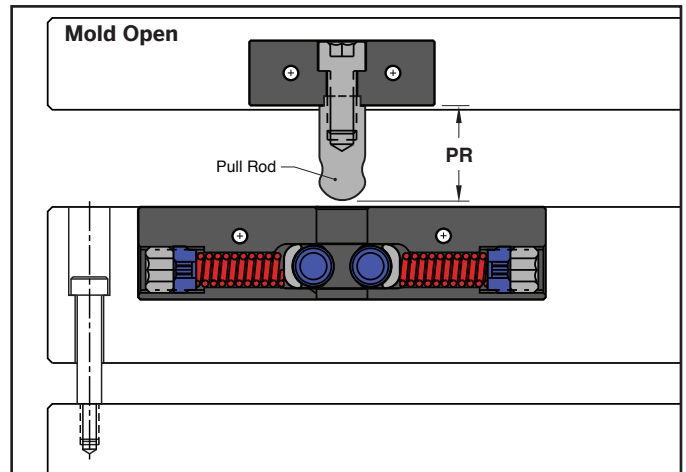
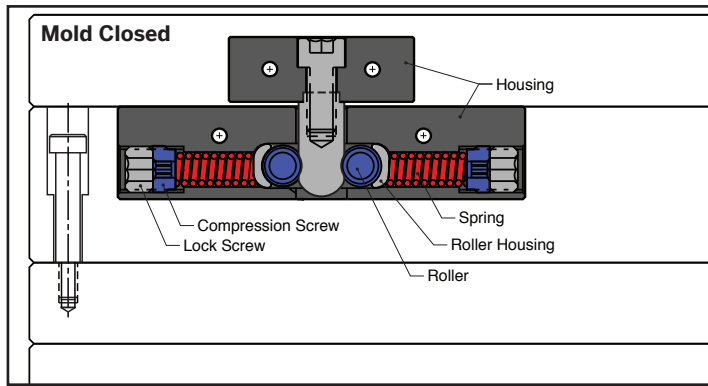


Housing: **M** 4140 **H** 27-32, HRC **S** Black Oxide  
 Roller: **M** M-2 **H** 62-64 HRC, Nitrided  
 Pull Rod: **M** M-2 **H** 62-64 HRC, Nitrided

▶ CAD insertion point

CATALOG NUMBER	W1	T1	W2	T2	A	B	G	S1	S2	S3	S4	D1	D2	Dowel Diam.	SHCS	PR See Below
RPL-135	135	25	38	25	28	19	1	60.0	25.0	7.0	15.6	30.0	22.1	5	M6-1.0 x 25	26
RPL-135-40	135	25	38	25	28	19	40	60.0	25.0	7.0	54.6	30.0	61.1	5	M6-1.0 x 25	65
RPL-140	140	32	64	25	32	22	2	70.0	35.0	10.0	23.1	100.0	28.1	6	M10-1.5 x 35	30
RPL-140-40	140	32	64	25	32	22	38	70.0	35.0	10.0	59.3	100.0	64.3	6	M10-1.5 x 35	66

Roller Pullers are available with special length rods to suit applications where a different distance between the housings is required. For pricing and delivery, contact Customer Service with the catalog number above along with the required gap or "G" dimension.



### Pull Force

Tighten lock screws equally to achieve forces below.

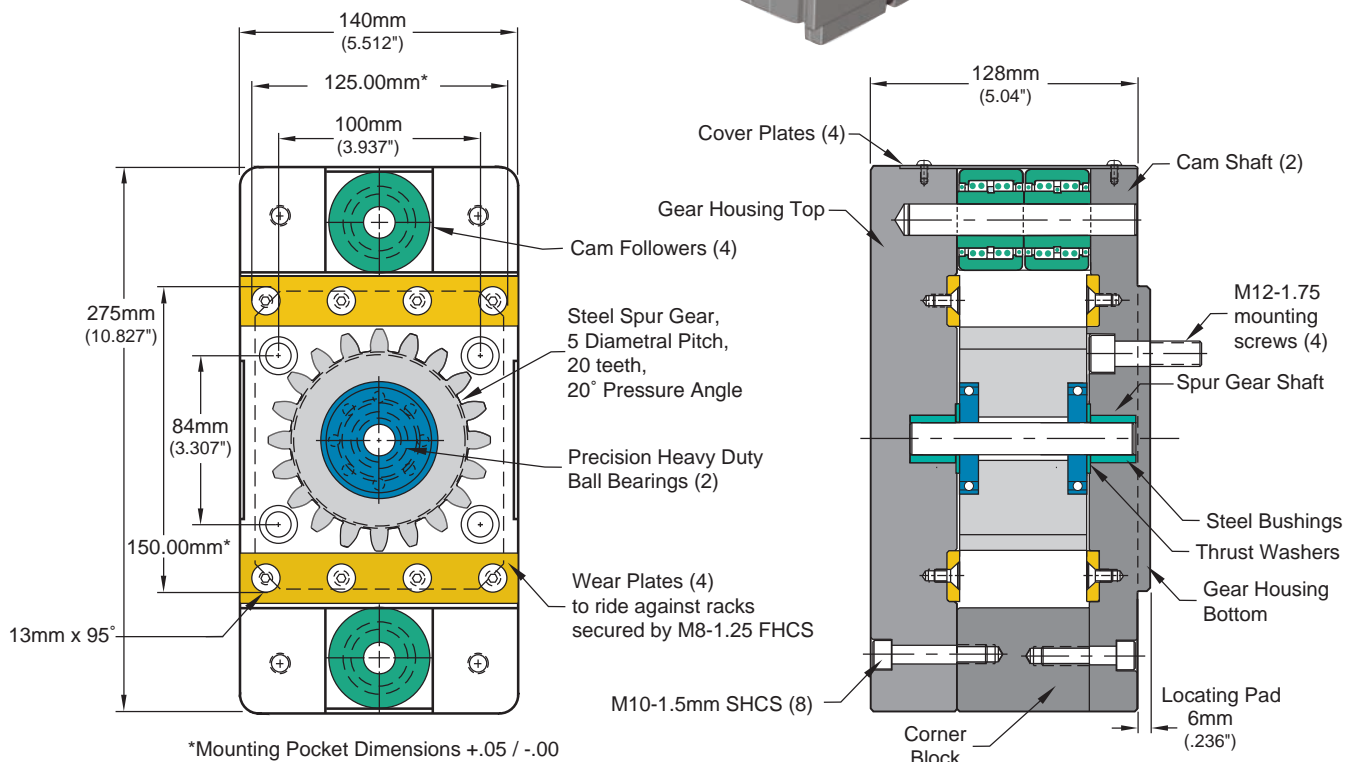
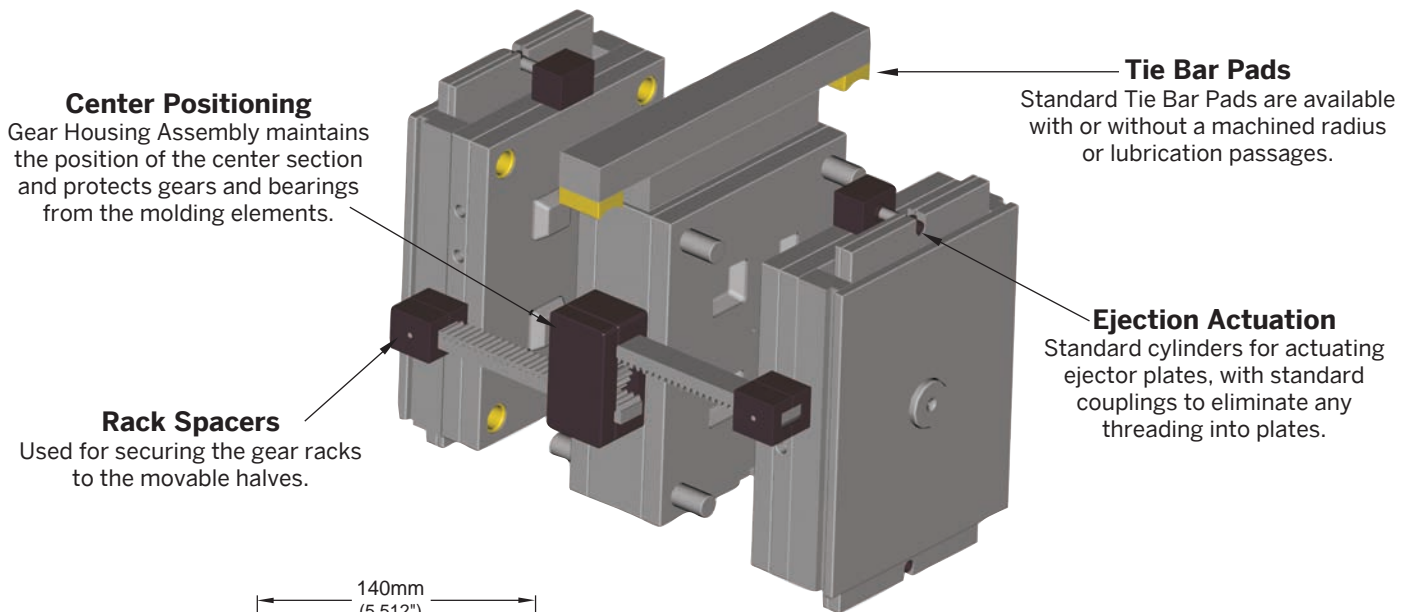
CATALOG NUMBER			
RPL-135	45 Kg (100 lbs)	75 Kg (160 lbs)	100 Kg (220 lbs)
RPL-135-40	45 Kg (100 lbs)	75 Kg (160 lbs)	100 Kg (220 lbs)
RPL-140	45 Kg (100 lbs)	100 Kg (220 lbs)	150 Kg (330 lbs)
RPL-140-40	45 Kg (100 lbs)	100 Kg (220 lbs)	150 Kg (330 lbs)

### Technical Information:

- Mounting pattern matches industry standards.
- Compression screw provides adjustable pull force.
- Roller design allows for smooth action.
- Mounting screws and dowels included.



# STACKIT® STACK MOLD SYSTEM



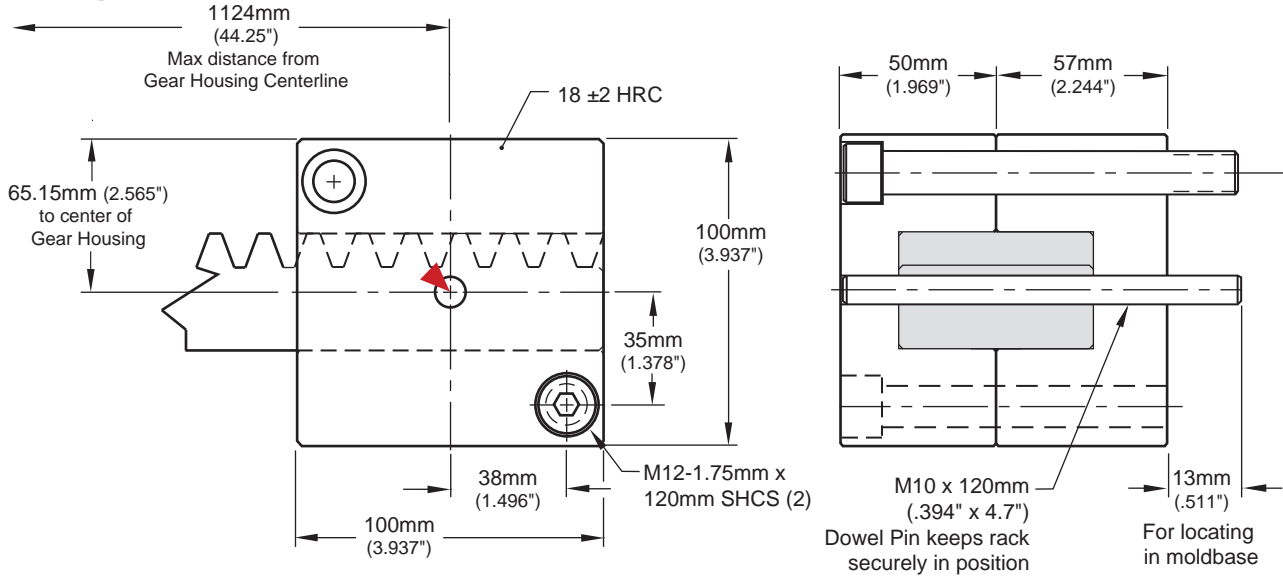
### Design Installation Guidelines:

- Max center section effective weight per StackKit pair is 10,000 lbs.
- Ensure mold is within maximum projected weight of molding machine.
- When mounting racks to a mold ensure both sides are timed equally.
- Install two gear housings in center, as shown above. For large molds, four housings should be installed—two per side.

CATALOG NUMBER	DESCRIPTION
<b>SK-GHA-250</b>	Gear Housing Assembly
<b>SK-SPRGRKIT</b>	Spur Gear Replacement Kit

- The Spur Gear Replacement Kit contains (1) Spur Gear, (1) Cam Shaft, (2) Ball Bearings, (2) Thrust Washers, and (2) Steel Bushings.
- Refer to the price list for additional replacement parts.
- Contact Customer Service for availability at [CustomerService@procomps.com](mailto:CustomerService@procomps.com).

# STACKIT® RACK SPACER



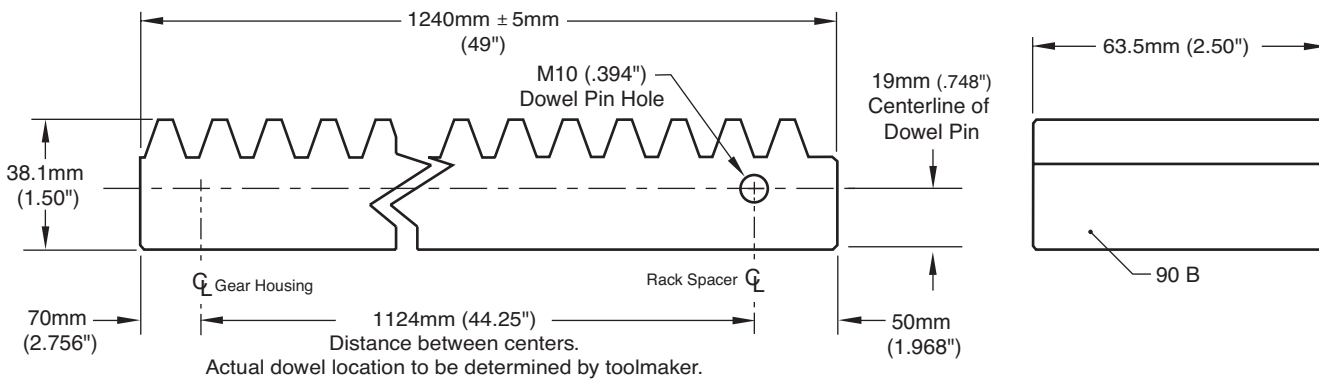
**M** A-36 **H** Pre-Hard **S** Black Oxide

CATALOG NUMBER	DESCRIPTION
SK-RSA-250	Rack Spacer Assembly

Screws and locating dowel included.

# STACKIT® RACK

▶ CAD insertion point



**M** CRS

CATALOG NUMBER	DESCRIPTION
SK-RC-250	Rack (Sold Individually)

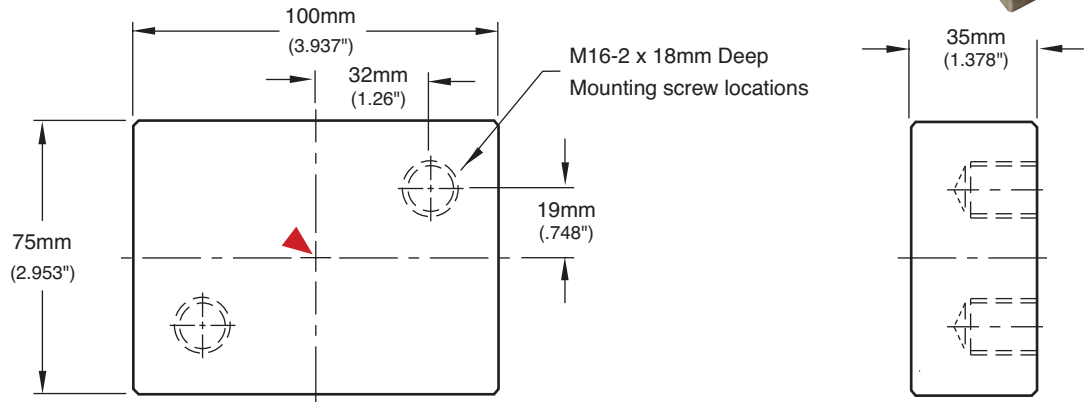


# STACKIT® TIE BAR PADS



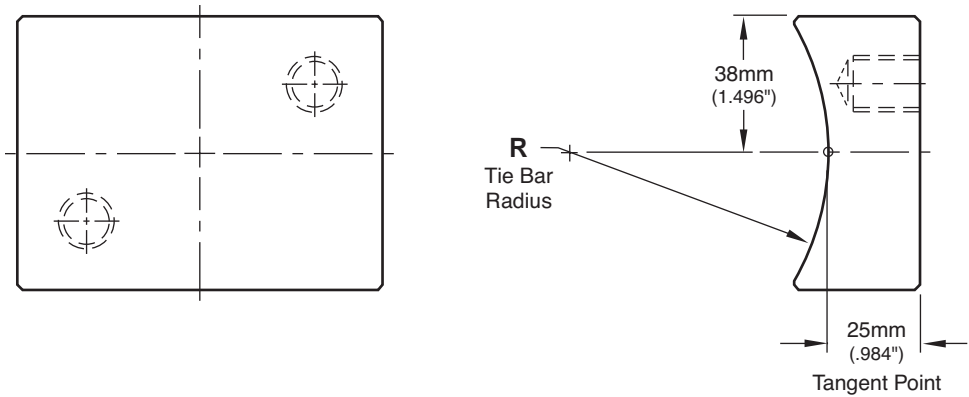
## SK-TBP-35

Tie Bar Pad Blanks



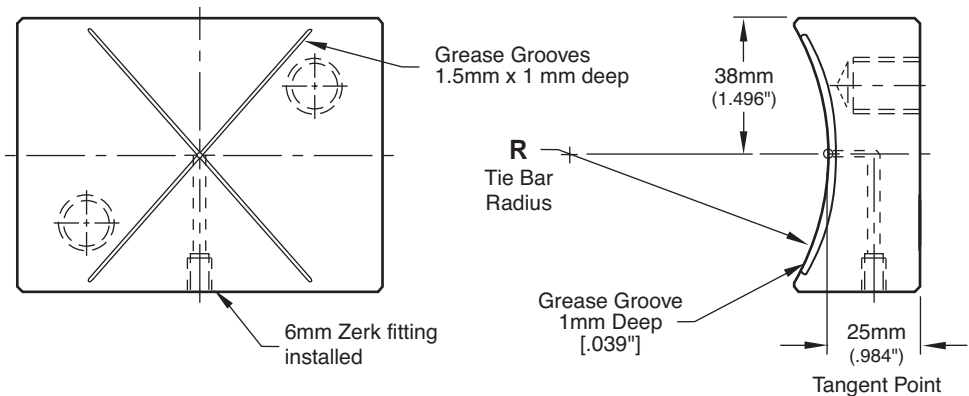
## SK-TBP-R

Tie Bar Pad with finished radius. Please specify “-R” when ordering.



## SK-TBP-RG

Tie Bar Pad with finished radius, grease grooves, and zerk fitting. Please specify “-RG” when ordering.



**M** CA954 Solid Bronze

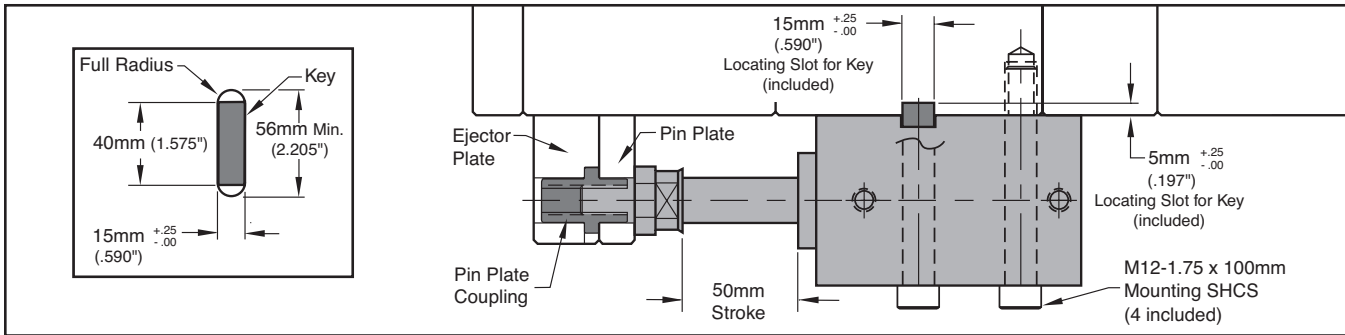
CAD insertion point

CATALOG NUMBER	DESCRIPTION
SK-TBP-35	Tie Bar Pad Blanks (No Radius)
SK-TBP-R	Tie Bar Pads with machined radius
SK-TBP-RG	Tie Bar Pads with machined radius, grease grooves and zerk fitting

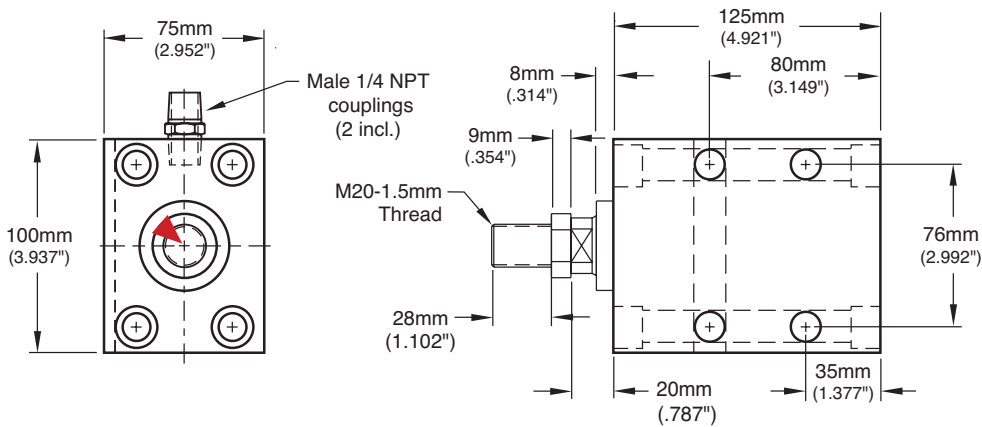
Sold individually.



# STACKIT® EJECTION ACTUATION



## CYLINDERS



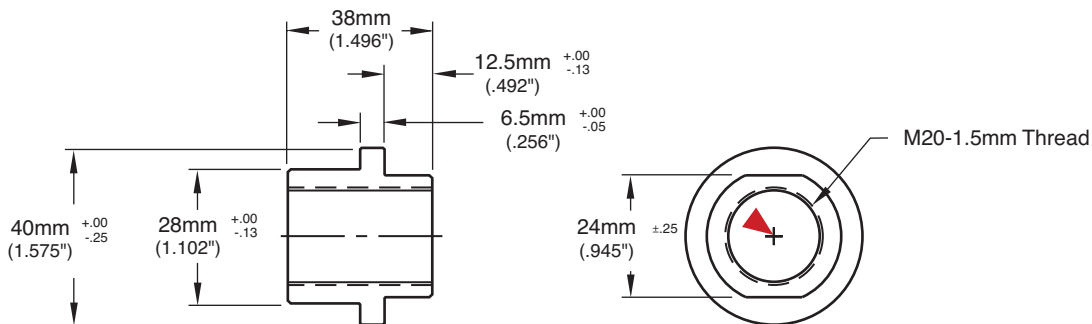
### Specifications:

- 50mm (2") Stroke
- Rated up to 3200 psi
- Temperature: 220° F (100° C) max
- Includes (2) NPT couplings and Locating Key

▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
SK-CYL-50	50 mm Block Cylinder

## PIN PLATE COUPLINGS



**M** AISI 4140 **S** Black Oxide ▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
SK-PPC-20	M20-1.55 mm Pin Plate Coupling



# ELECTRICAL COMPONENTS

## SECTION K



KO Switches	CamAction Switches	Plate Position Switch	Side Action Switch
Prefix: SWKO	Prefix: SWCA	Prefix: SWPPS	Prefix: SWSA
Page: K-1	Page: K-3	Page: K-4	Page: K-4



External Mount Switches	Thermocouples	Hot Sprue Bushings	Pressure Transducers
Prefix: SWXM	Prefix: TC	Prefix: BX	Prefix: CPT
Page: K-5	Page: K-7	Page: K-8	Page: K-10



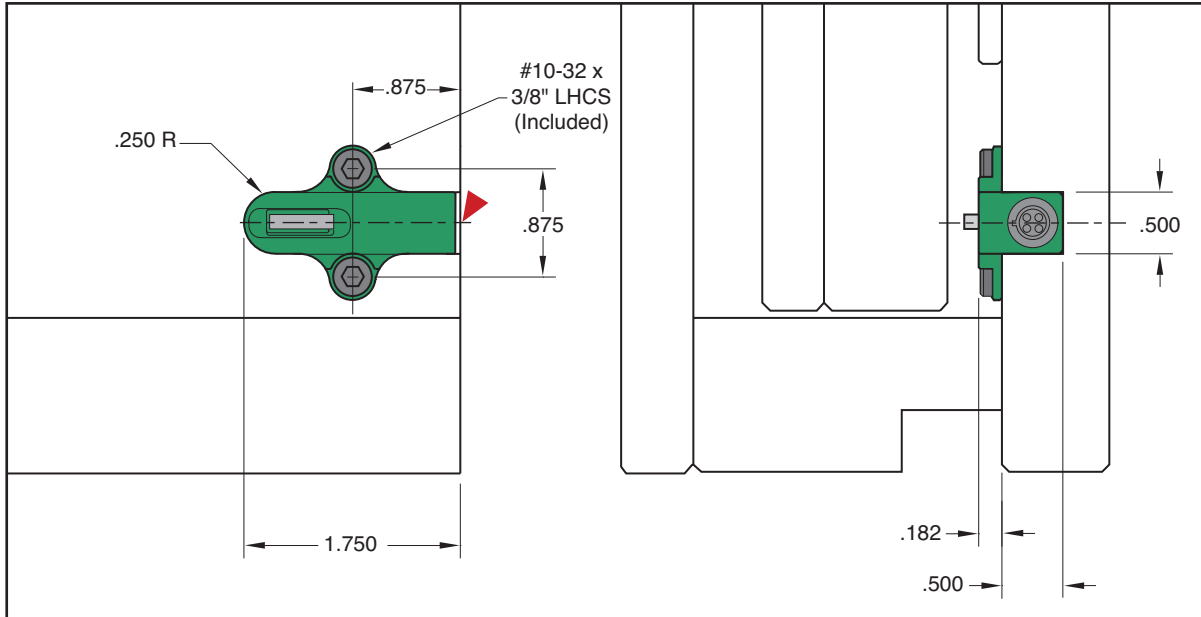
Patch Cables	Jumper Plugs	Recessed Connectors	Wire Channel Inserts
Prefix: ECCA	Prefix: ECJP	Prefix: ECRC	Prefix: WC
Page: K-12	Page: K-12	Page: K-13	Page: K-13





# SWITCHES

## KO™ SWITCH



▶ CAD insertion point

GENERAL SPECIFICATIONS FOR SWITCHES		
	<b>VOLTAGE</b>	
	<b>28 VDC</b>	<b>115 VAC 60 HZ</b>
Resistive Load	300mA min / 5A max	300mA min / 5A max
Inductive Load	300mA min / 3A max	300mA min / 5A max
Mechanical Life	10 million cycles	10 million cycles
Max Temperature	221° F	221° F
Features:	Color-coded, keyed for specific function. Gold-plated contacts for switching logic level signals. Switches are wired normally open. Sealed and splash resistant. UL/CSA rating: 5A, 250 vac	

CATALOG NUMBER	Color	Function
<b>SWKO-187</b>	Green	Ejection

## KO™ SWITCH CABLES

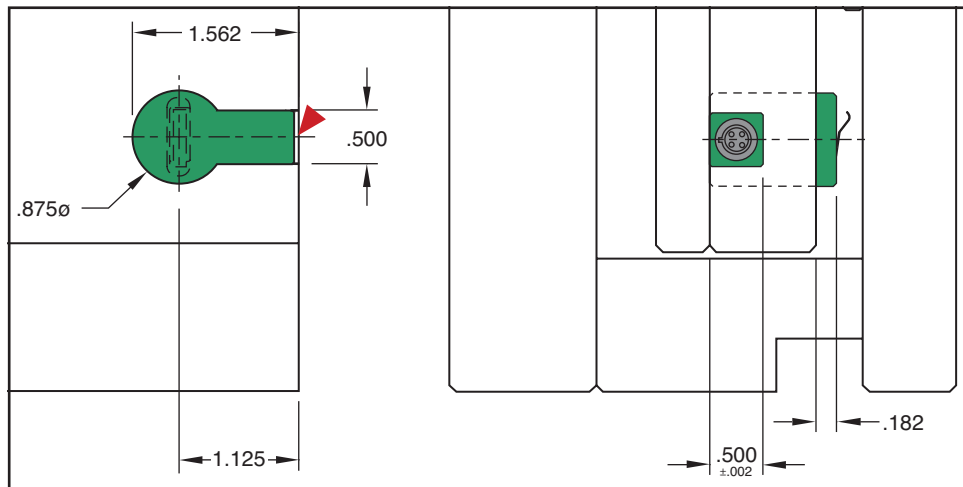
CATALOG NUMBER	Color	Function	Ends	Length (ft)
<b>ECCA-6-10</b>	Green	Ejector Switch	Male/Male	10
<b>ECCA-6-20</b>	Green	Ejector Switch	Male/Male	20
<b>ECCA-6-20S</b>	Green	Ejector Switch	Single Male	20



Single-ended cables also available in 20' lengths.

## SWITCHES

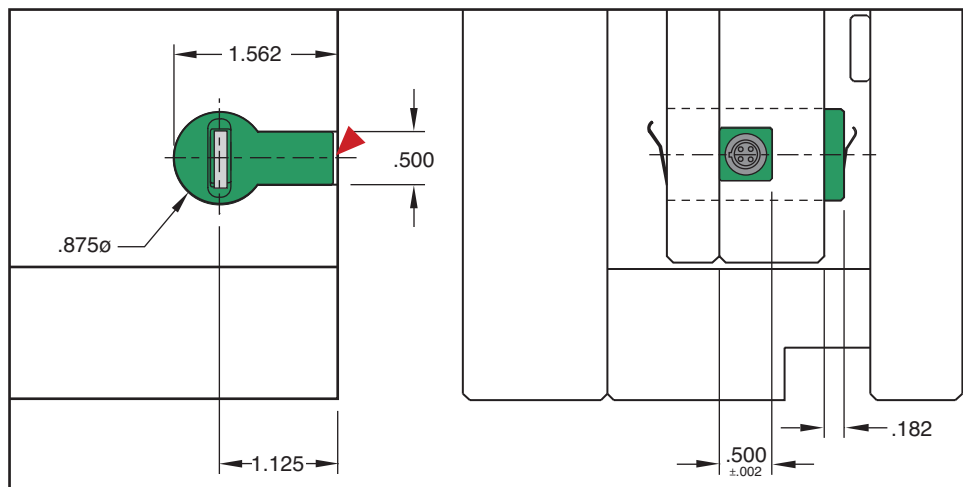
## KO™ SWITCH: SINGLE EJECTOR



▶ CAD insertion point

CATALOG NUMBER	Ej. Plate Thickness	Color	Function
SWKOS-100	1.000	Green	Ejection
SWKOS-112	1.125	Green	Ejection
SWKOS-118	1.187	Green	Ejection

## KO™ SWITCH: DUAL EJECTOR



▶ CAD insertion point

CATALOG NUMBER	Ej. Plate Thickness	Retainer Plate Thickness	Color	Function
SWKOD-100	1.000	.500	Green	Ejection
SWKOD-112	1.125	.500	Green	Ejection
SWKOD-118	1.187	.500	Green	Ejection

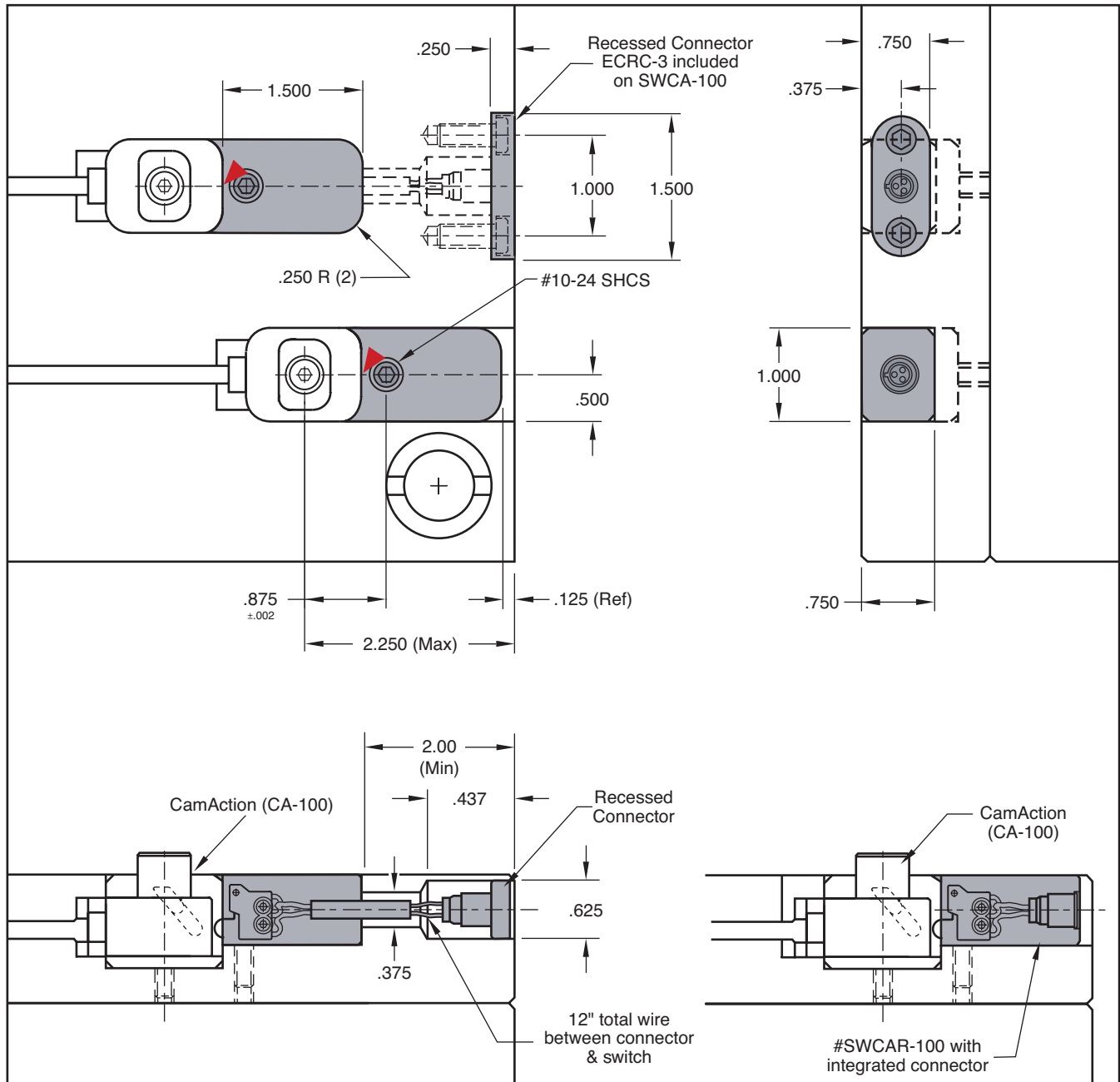


# SWITCHES

## CAMACTION® SWITCH



Progressive CamAction Switches verify that the slide carrier is fully retracted before the next controller sequence. Available with or without receptacle, depending on the position of the CamAction within the mold. Refer to page G-1 for CamAction data.

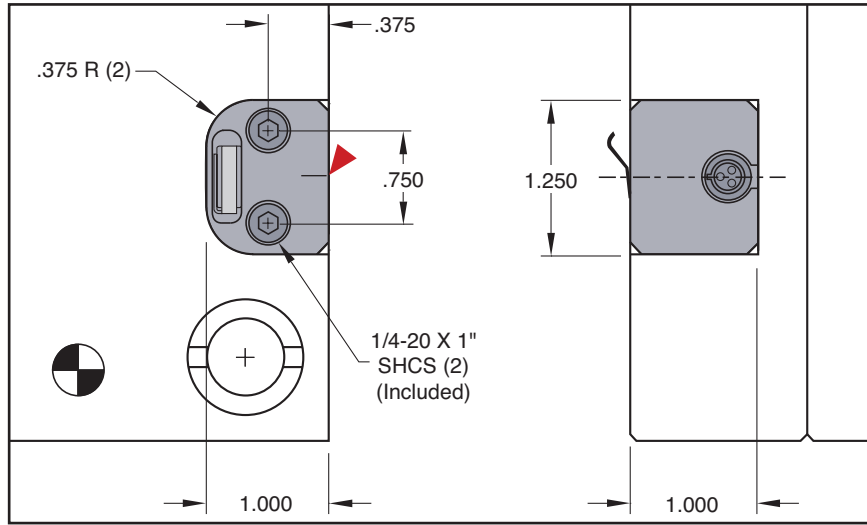


▶ CAD insertion point

CATALOG NUMBER	Description	Color	Function
SWCA-100	Recessed Connector	Gray	Enable
SWCAR-100	Integrated Connector	Gray	Enable

# SWITCHES

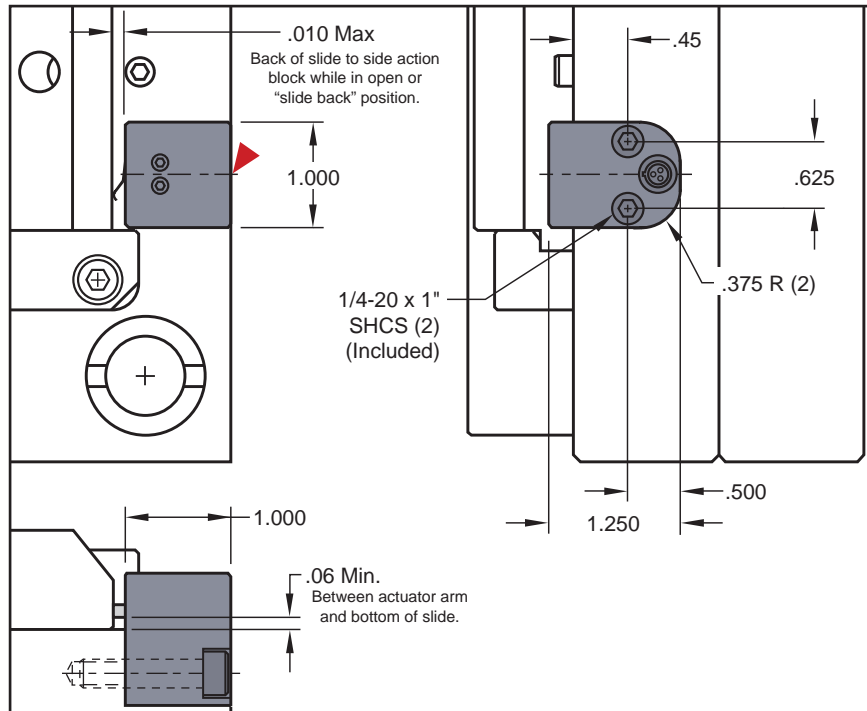
## PLATE POSITION SWITCH



▶ CAD insertion point

CATALOG NUMBER	Color	Function
SWPPS-100	Gray	Enable

## SIDE ACTION SWITCH



▶ CAD insertion point

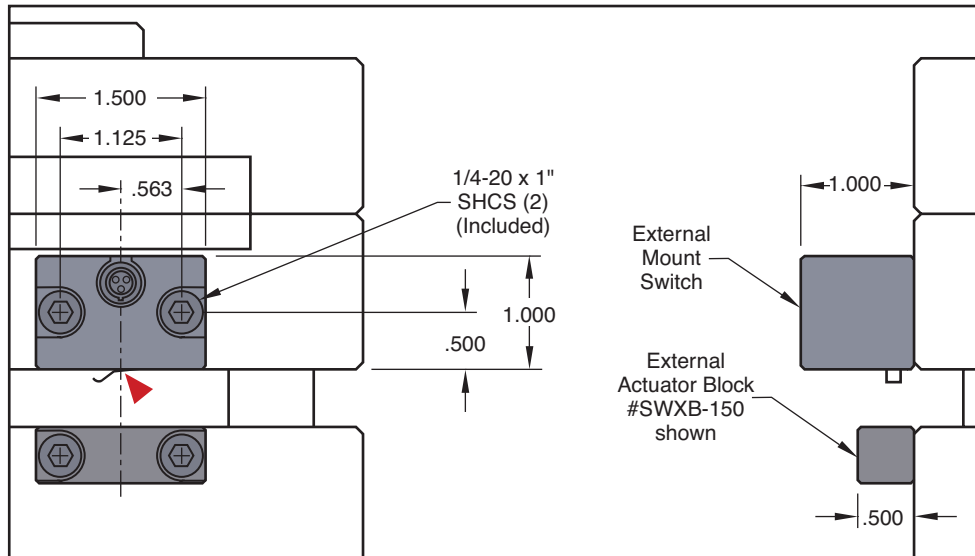
CATALOG NUMBER	Color	Function
SWSA-100	Gray	Enable





# SWITCHES

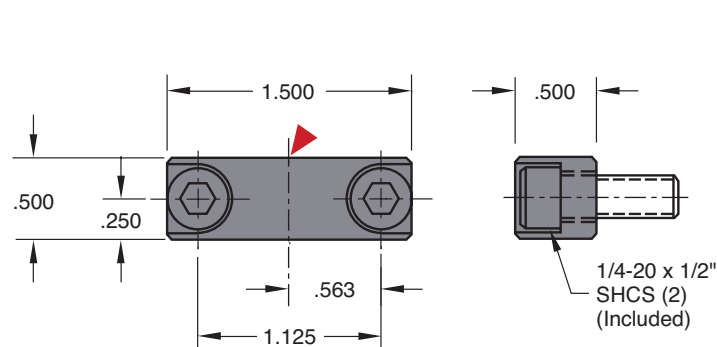
## EXTERNAL MOUNT SWITCHES



▶ CAD insertion point

CATALOG NUMBER	Color	Function
SWXM-3	Gray	Enable
SWXM-4	Black	Core In
SWXM-5	White	Core Out

## EXTERNAL ACTUATOR BLOCK

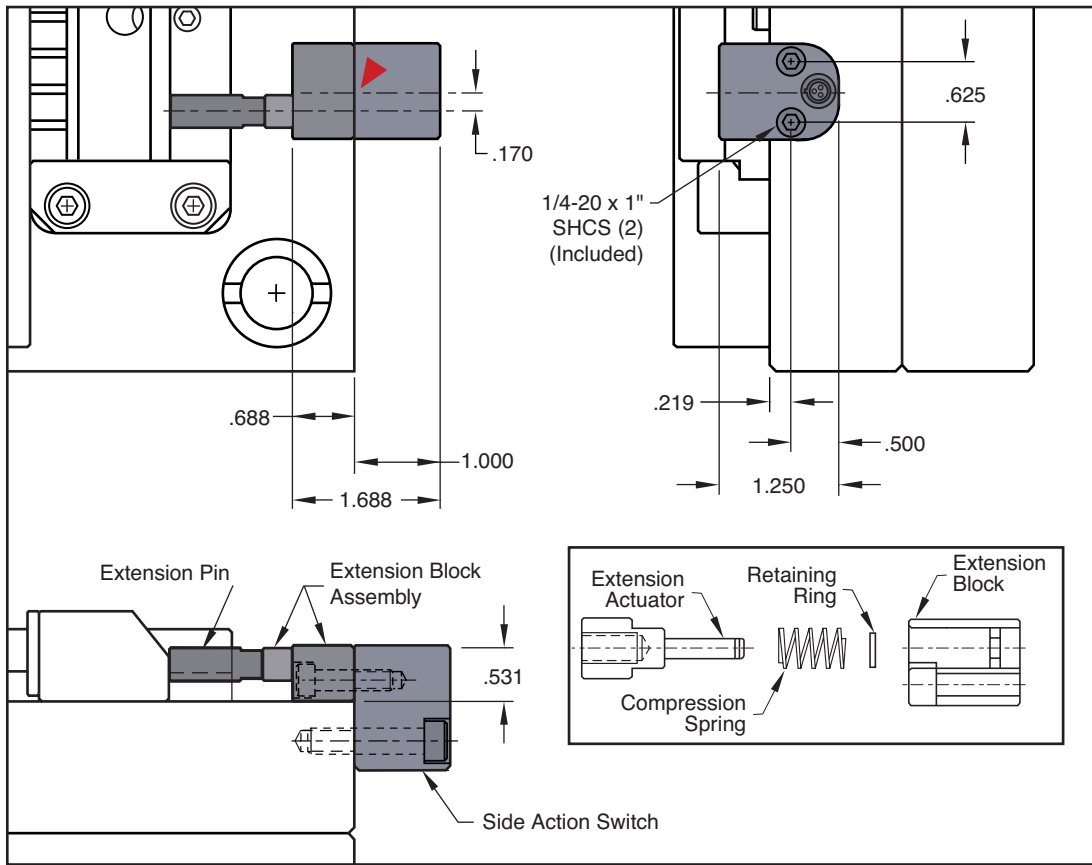


▶ CAD insertion point

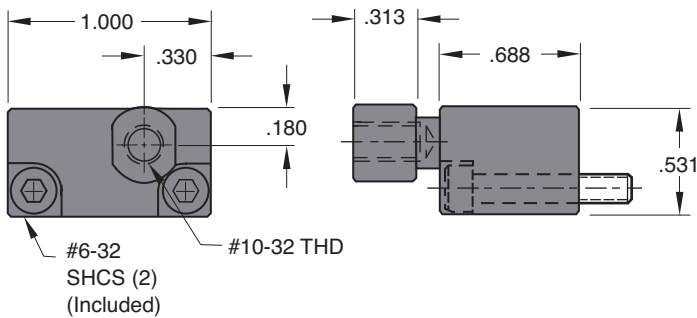
CATALOG NUMBER	DESCRIPTION
SWXB-150	Extension Actuator Block

# SWITCHES

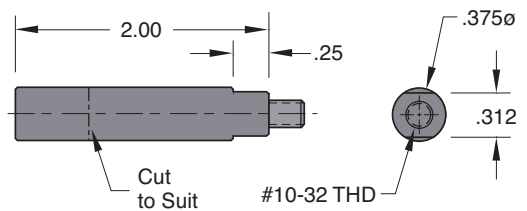
## EXTENSION BLOCK ASSEMBLY



### EXTENSION BLOCK ASSEMBLY



### EXTENSION PIN

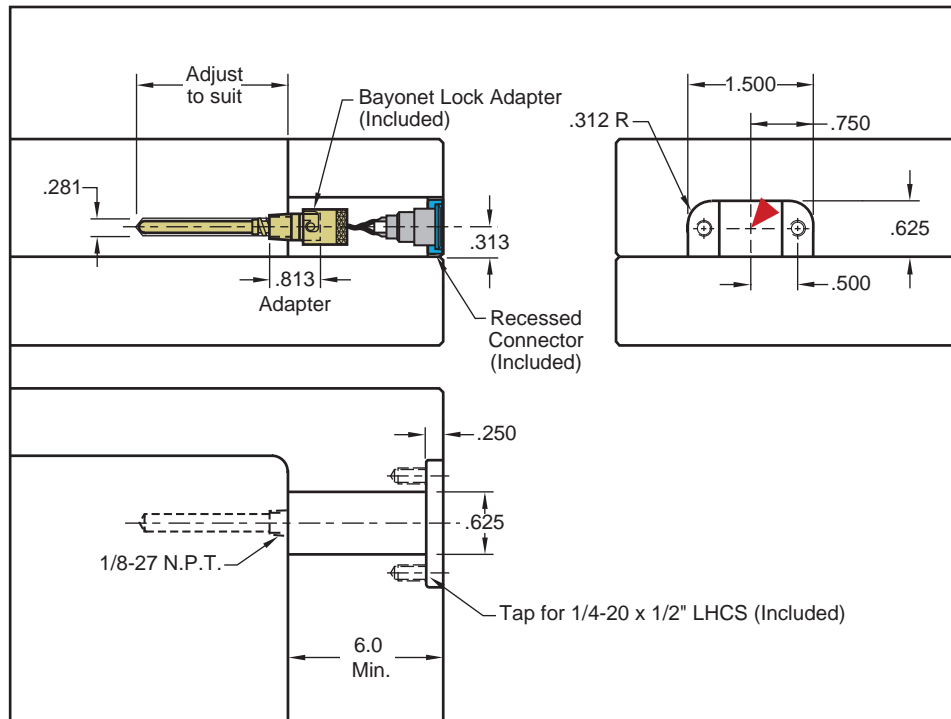


▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
SWXB-100	Extension Block Assembly
SWEP-100	Extension Pin



# THERMOCOUPLES



▶ CAD insertion point

CATALOG NUMBER	Color	Function
TC-7	Orange	Stationary Side T/C
TC-8	Blue	Movable Side T/C

### Specifications:

- Type "J"-Grounded
- 3/16" Diameter Ball Tip
- Maximum 750° F over probe
- 30" of wire included
- Maximum temperature of wire and connector: 220° F (104° C)

Each Thermocouple assembly includes: Thermocouple, Bayonet Lock Adapter, Recessed connector, & Screws. Replacement Thermocouples (TC-100) and Bayonet Lock Adapters (TCA-100) are also available.

Replacement Recessed Connectors sold on page K-13.

# HOT SPRUE BUSHINGS

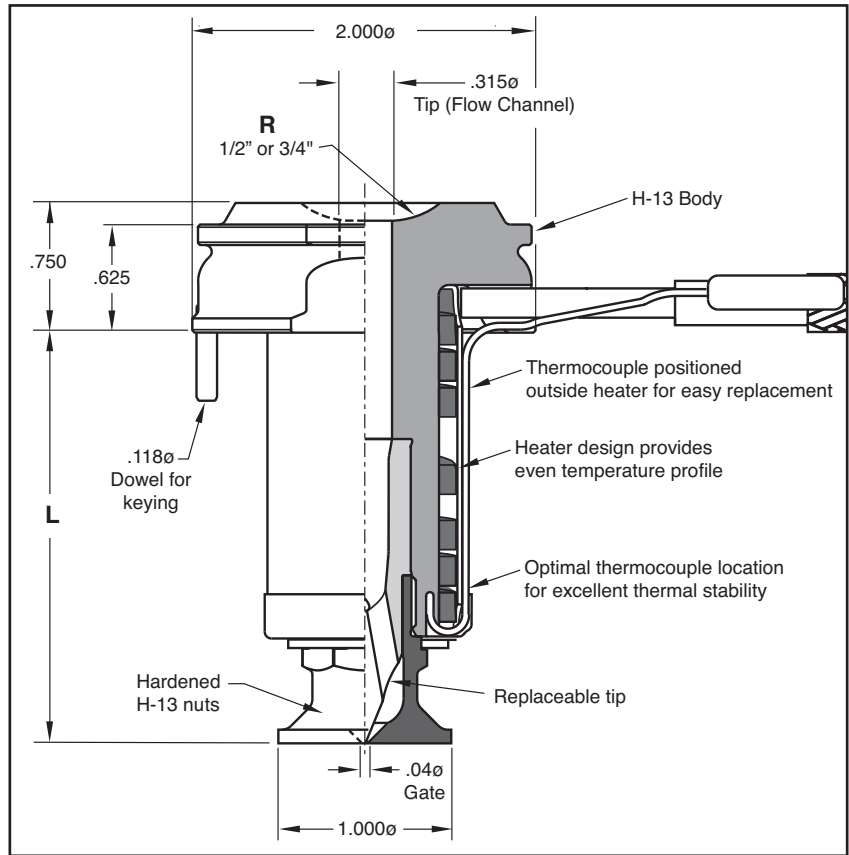
## INCH SERIES



Progressive's BX Inch Series Hot Sprue Bushings are designed as an advancement from previous Hot Sprue technology. This bushing's heater design and thermocouple placement provide excellent temperature distribution and thermal stability, resulting in superior performance both at start-up and during production, increased reliability, and easier maintenance.

Existing tools will benefit by replacing cold sprues, inefficient hot sprues, or applications used to feed cold runner systems.

Engineered and manufactured for Progressive by Mastip™ Technology Ltd.



### To Order:

Specify all options within catalog number as shown:

### Radius Options:

- 1/2" Specify **-50**
- 3/4" Specify **-75**

### Nut Options:

- Standard Length (.080) Specify **-SL**
- Extra Stock (+.250) Specify **-XS**
- Sprue Picker (+1.250) Specify **-SP**

### Tip Options:

- Nickel-Plated Be/Cu Tip:  
Used for unfilled commodity thermoplastics.  
Specify **-A** for Nickel-Plated Be/Cu
- Carbide-Tipped Be/Cu Tip:  
Used for fast cycling, thin-wall, high injection pressure olefins or multi-cavity molds with a single tip gating into a cold runner.  
Specify **-C** for Carbide-Tipped Be/Cu

Note: Engineering grade materials such as PC, PA, PBT and any heavy glass-filled materials should not be used with the BX series sprues. Contact Engineering for metric alternatives.

Prefix/ Length	L	Watts
<b>BX25137</b>	1.375	295
<b>BX25187</b>	1.875	350
<b>BX25237</b>	2.375	455
<b>BX25287</b>	2.875	490
<b>BX25337</b>	3.375	505

**BX25187** - **50** - **SL** - **C**  
Prefix/Length - Radius - Nut - Tip Material

Example: BX25237-75-SP-A or BX25337-50-XS-C

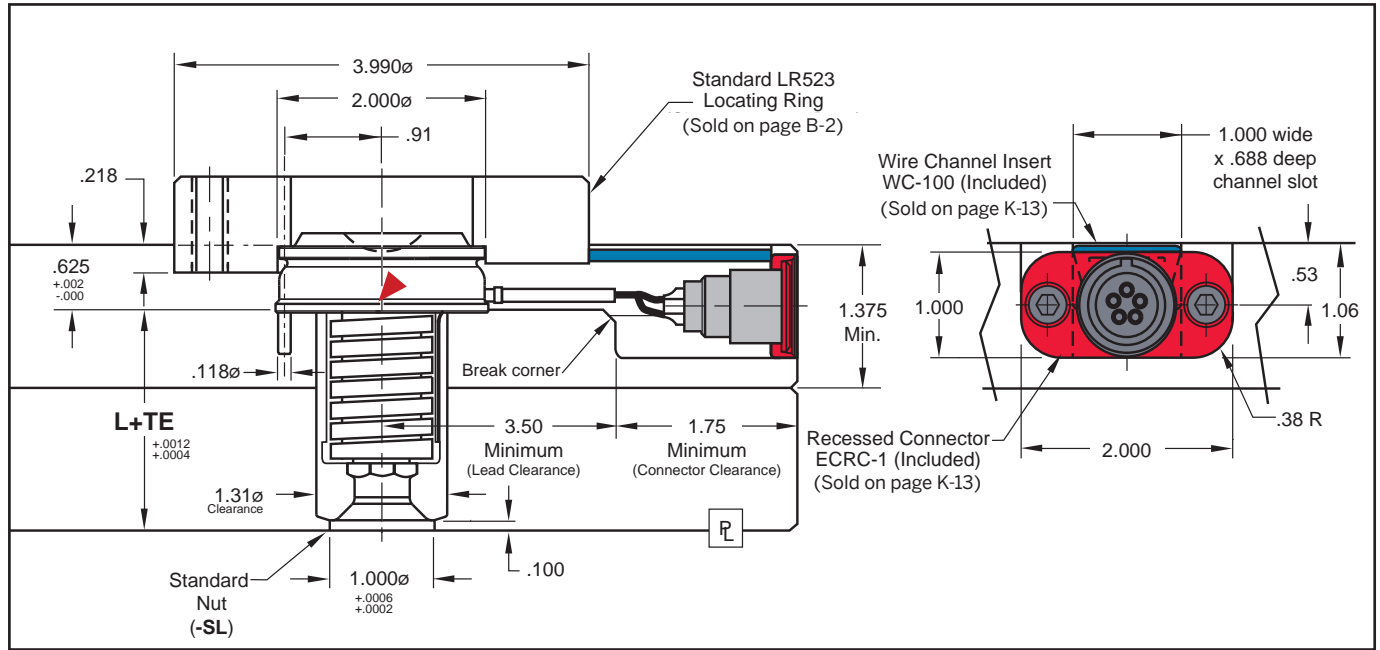
### Each Hot Sprue Bushing Assembly includes:

- Body, Tip, Nut, Thermocouple and wiring, Recessed Connector (ECRC-1), and Wire Channel Insert (WC-100).
- Replacement parts are available. Refer to the price list for catalog numbers.



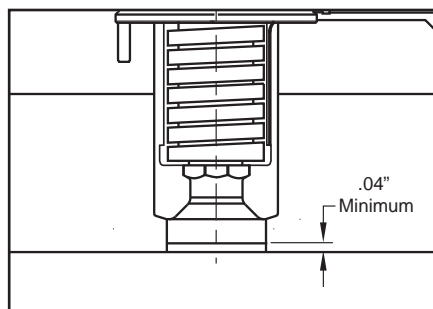
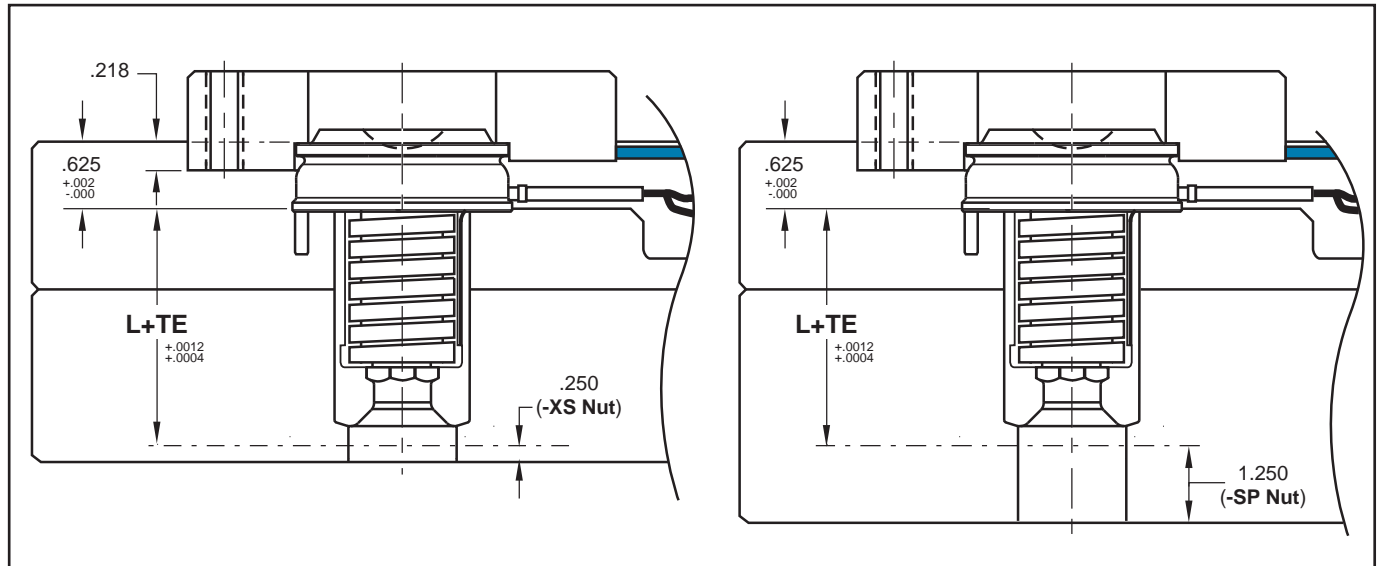
# HOT SPRUE BUSHINGS INSTALLATION

## Typical installation instructions:



▶ CAD insertion point

## Longer nut installation instructions:



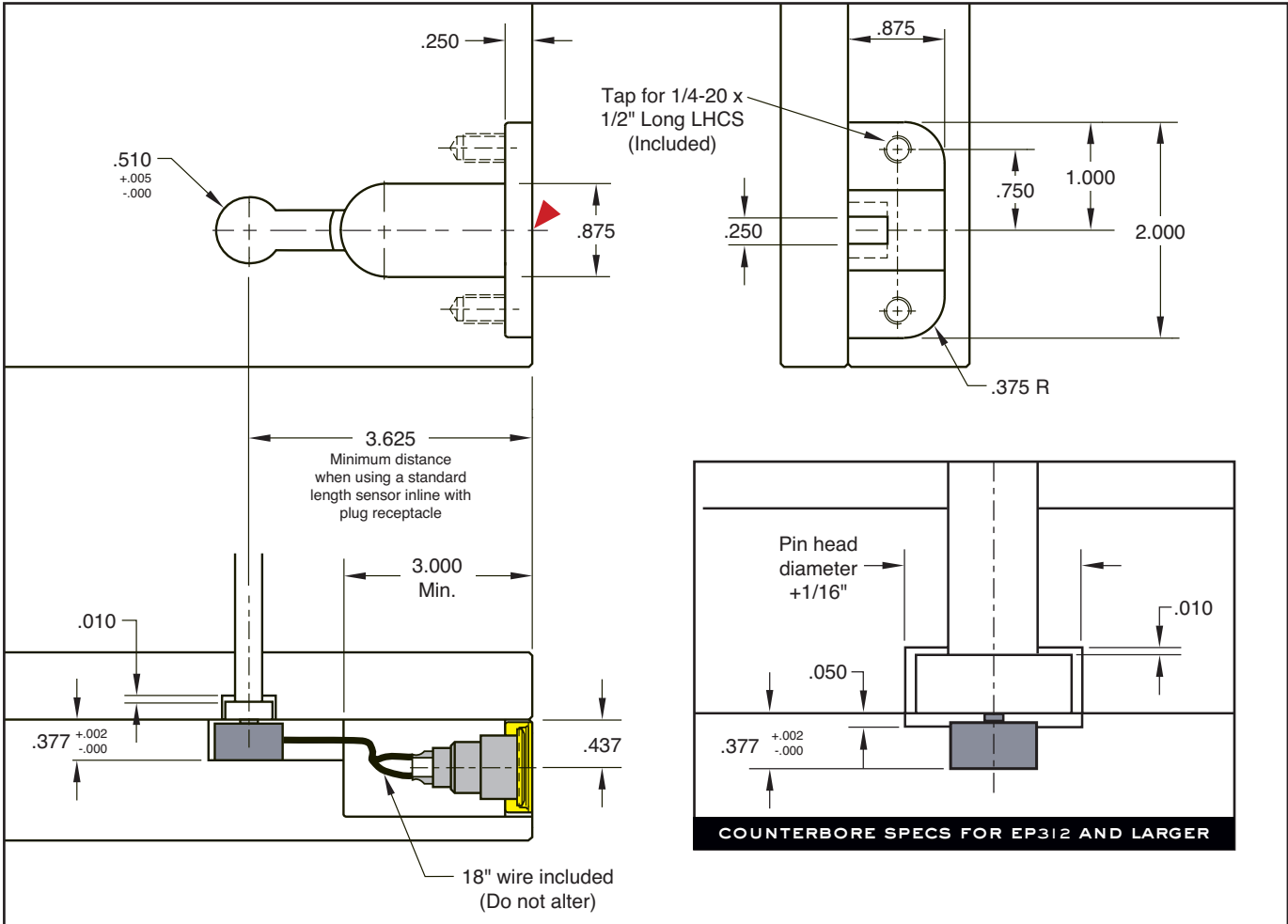
To ensure optimal performance, design for a minimum .04" gap between the face of the bushing nut and "B" side of the mold after thermal expansion when gating into a cold runner.

## General Specifications:

- Expansion formula (TE):  $000007 \times (\text{Processing Temp } ^\circ\text{F} - \text{Mold Temp } ^\circ\text{F}) \times L$
- 230 volt-15 amps
- "J" type thermocouple

# CAVITY PRESSURE TRANSDUCERS

## BUTTON STYLE



▶ CAD insertion point

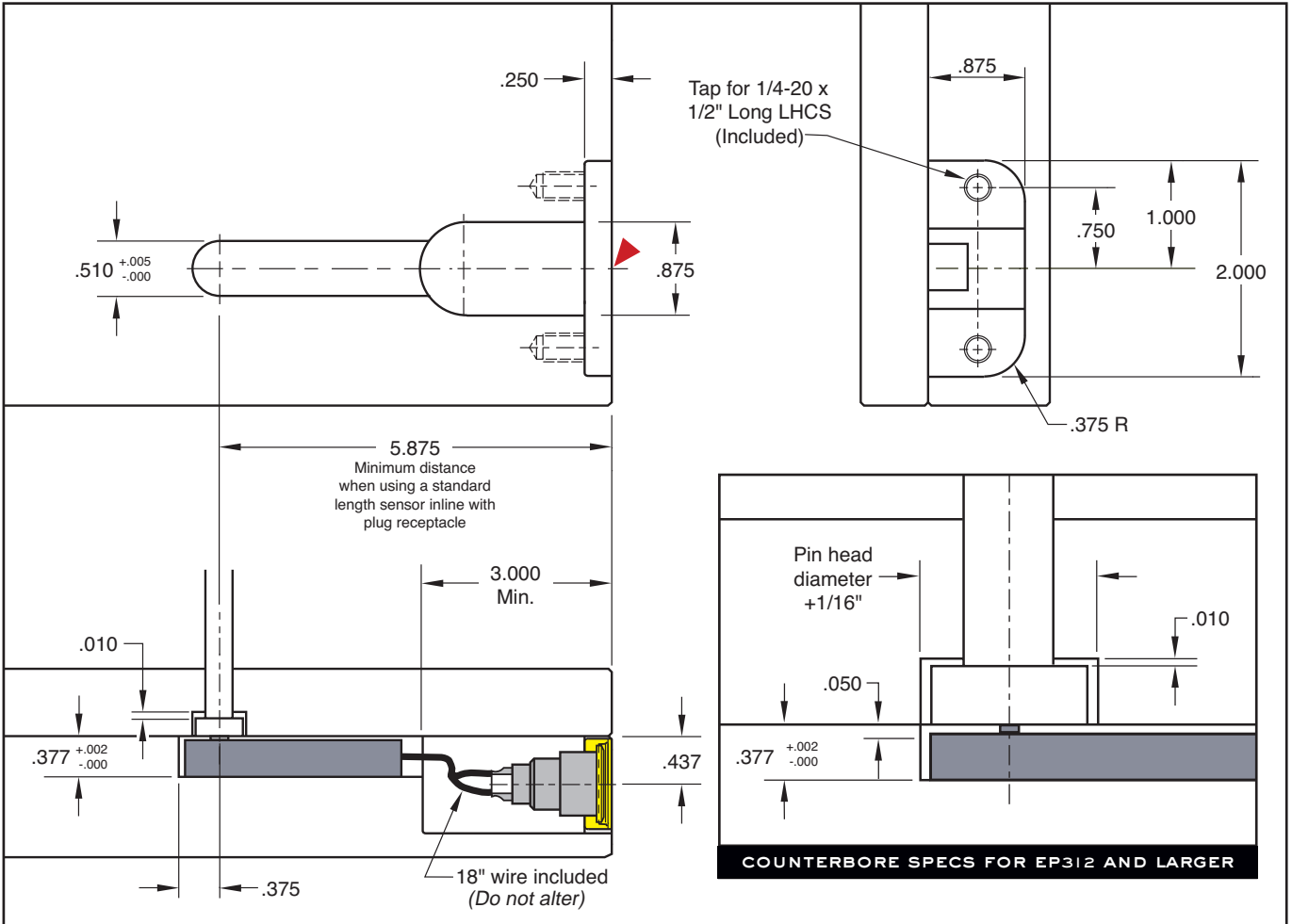
CATALOG NUMBER	Ejector Pin Size
CPT-412C	1/16 $\phi$ to 3/16 $\phi$
CPT-413C	3/16 $\phi$ to 1/2 $\phi$

Specifications	
Press Measure Range	0-2000 PSI
Force Range	CPT-412C 500LB (225Kg) CPT-413C 2000LB (900Kg)
Maximum Load	150% Full Scale
Temperature Range	0° - 450° F
Temperature Comp.	2% Full Scale
Input	12 Volt Max
Output	2.0mV/V Full Scale
Accuracy	3/4% Full Scale
Repeatability	0.1% Full Range Output
Full Range Deflection	Less than .0008
Circuit	4-ARM 350 OHM Bridge



# CAVITY PRESSURE TRANSDUCERS

## FLAT STYLE



▶ CAD insertion point

Specifications	
Press Measure Range	0-2000 PSI
Force Range	CPT-405C 500LB (225Kg) CPT-406C 2000LB (900Kg)
Maximum Load	150% Full Scale
Temperature Range	0° - 450° F
Temperature Comp.	2% Full Scale
Input	12 Volt Max
Output	2.0mV/V Full Scale
Accuracy	3/4% Full Scale
Repeatability	0.1% Full Range Output
Full Range Deflection	Less than .0008
Circuit	4-ARM 350 OHM Bridge

CATALOG NUMBER	Ejector Pin Size
CPT-405C	1/16ø to 3/16ø
CPT-406C	3/16ø to 1/2ø



## PATCH CABLES



CATALOG NUMBER	Color	Function	Ends	Length (ft)
ECCA-1-10	Red	Hot Sprue	Male/Female	10
ECCA-1-20	Red	Hot Sprue	Male/Female	20
ECCA-1-20SF	Red	Hot Sprue	Single Female	20
ECCA-1-10CC	Red	Hot Sprue	5 Pin M/5 Pin F	10
ECCA-1-10LC	Red	Hot Sprue	5 Pin M/Female	10
ECCA-2-10	Yellow	Cav. Press	Male/Male	10
ECCA-2-20	Yellow	Cav. Press	Male/Male	20
ECCA-2-20S	Yellow	Cav. Press	Single Male	20
ECCA-3-10	Gray	Enable Switch	Male/Male	10
ECCA-3-20	Gray	Enable Switch	Male/Male	20
ECCA-3-20S	Gray	Enable Switch	Single Male	20
ECCA-4-10	Black	Core In	Male/Male	10
ECCA-4-20	Black	Core In	Male/Male	20
ECCA-4-20S	Black	Core In	Single Male	20
ECCA-5-10	White	Core Out	Male/Male	10
ECCA-5-20	White	Core Out	Male/Male	20
ECCA-5-20S	White	Core Out	Single Male	20
ECCA-6-10	Green	Ejector Switch	Male/Male	10
ECCA-6-20	Green	Ejector Switch	Male/Male	20
ECCA-6-20S	Green	Ejector Switch	Single Male	20
ECCA-7-10	Orange/Blue	Stationary/Movable	Male/Male	10
ECCA-7-20	Orange/Blue	Stationary/Movable	Male/Male	20
ECCA-7-20S	Orange/Blue	Stationary/Movable	Single Male	20



ECCA-1-10CC has a 5-pin hooded connector compatible with most standard single zone controllers.



ECCA-1-10LC connects the Hot Sprue Recessed Connector and most standard single zone controllers.



Single-ended cables also available in 20' lengths.

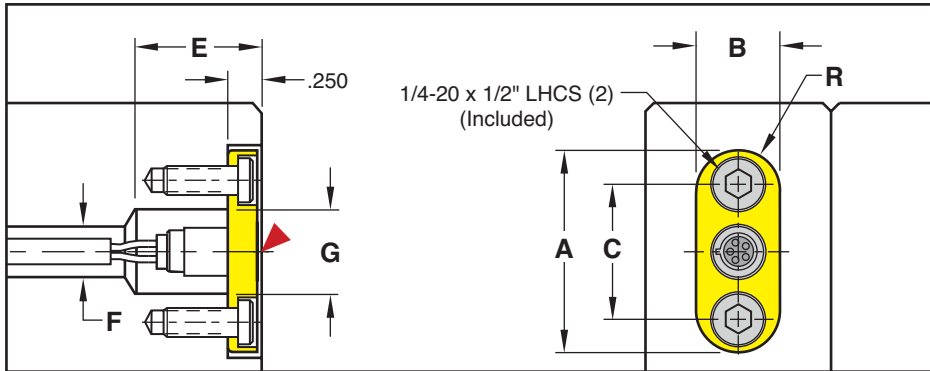
## JUMPER PLUGS



CATALOG NUMBER	Color	Function
ECJP-3	Gray	Enable Switches
ECJP-4	Black	Core In
ECJP-5	White	Core Out
ECJP-6	Green	Ejector Switches



# RECESSED CONNECTORS



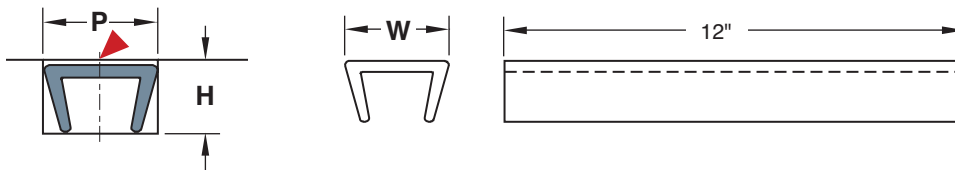
▶ CAD insertion point

CATALOG NUMBER	Color	Function	Pin Outs	A	B	C	R	E	F Diameter	G Diameter
<b>ECRC-1</b>	Red	Hot Sprue	5	2.000	1.00	1.500	.375	1.312	.500	1.00
<b>ECRC-2</b>	Yellow	Cav. Press	5	2.000	.875	1.500	.375	1.187	.375	.875
<b>ECRC-3</b>	Gray	Enable Switch	3	1.500	.625	1.000	.312	.937	.375	.625
<b>ECRC-4</b>	Black	Core In	3	1.500	.625	1.000	.312	.937	.375	.625
<b>ECRC-5</b>	White	Core Out	3	1.500	.625	1.000	.312	.937	.375	.625
<b>ECRC-6</b>	Green	Ejector Switch	4	1.500	.625	1.000	.312	.937	.375	.625
<b>ECRC-7</b>	Orange	Stationary T/C	2	1.500	.625	1.000	.312	.937	.375	.625
<b>ECRC-8</b>	Blue	Movable T/C	2	1.500	.625	1.000	.312	.937	.375	.625

Note: As a safety precaution, the ECRC-1 for the Hot Sprues include a male plug, which is compatible with the ECCA-1-20SF female ended patch cable. Hot Sprue Bushings are sold on page K-8.

Crimp-style bullet snap connectors included.

# WIRE CHANNEL INSERTS

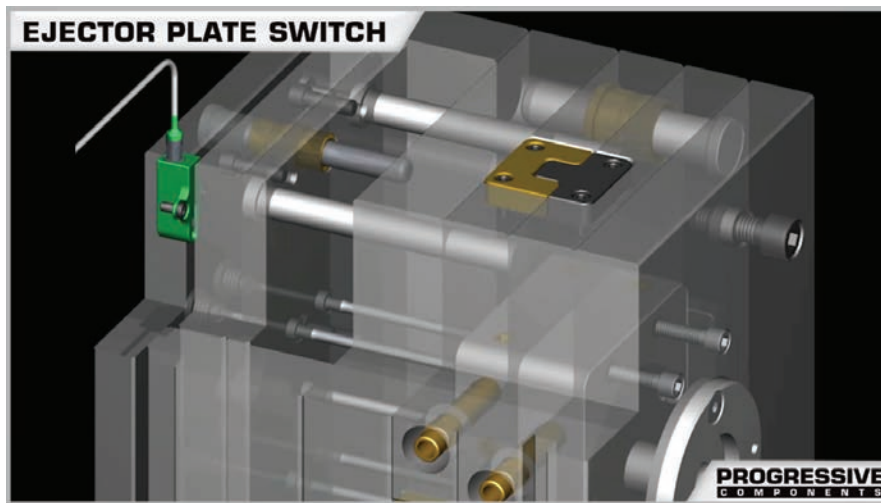


**M** Nylon ▶ CAD insertion point

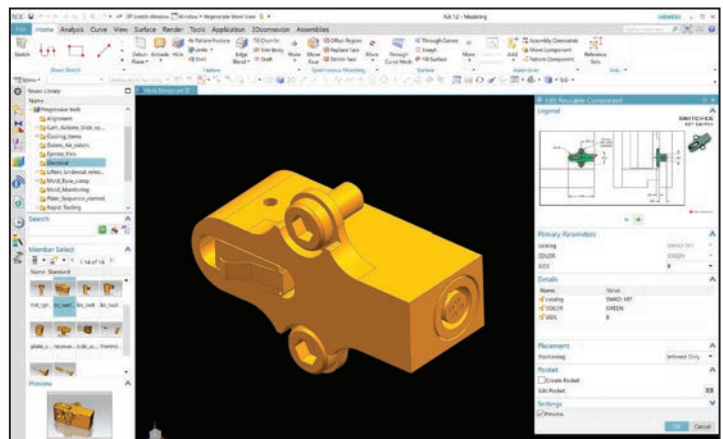
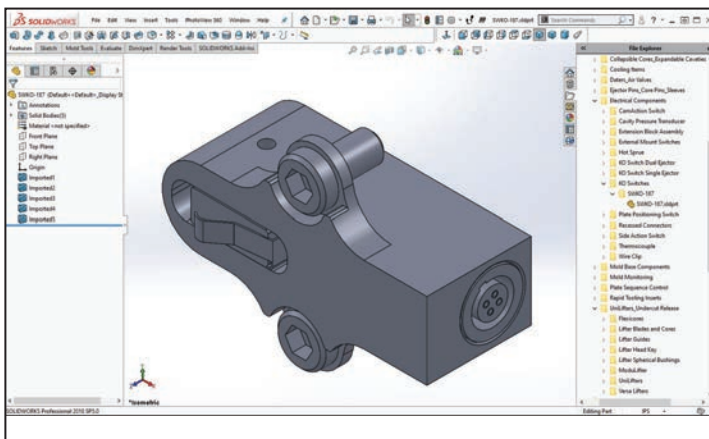
CATALOG NUMBER	P Pocket Width	H Pocket Depth	W Wire Channel Width
<b>WC-50</b>	.550	.500	.564 ±.01
<b>WC-100</b>	1.000	.688	1.021 ±.02

Maximum mold temperature: 450° F (230° C)

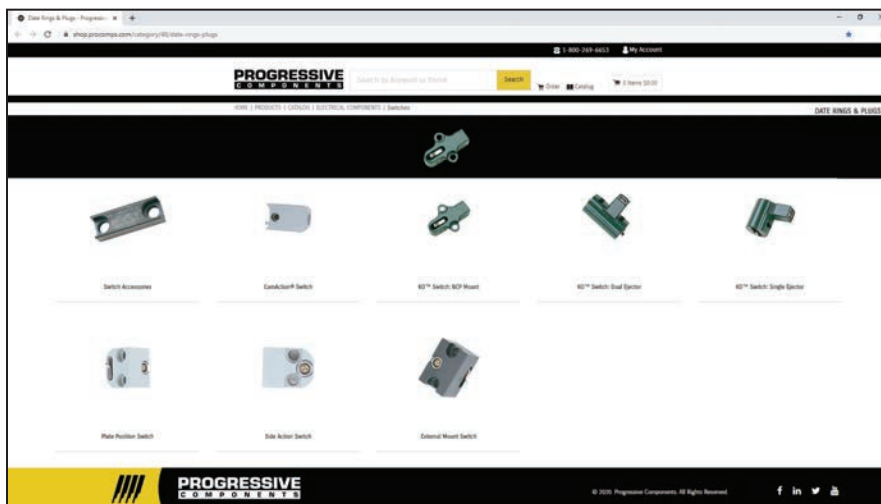
## ONLINE RESOURCES



When considering design options, numerous animations can be viewed at [procomps.com/animations](http://procomps.com/animations).



CAD geometry is available online as individual downloads or as part of the CADalog system. The seven formats include: IGES (.igs), ACIS (.sat), STEP (.step), Parasolid (.x\_t), Solidworks (.sldasm), NX (.prt) (Re-Use and MoldWizard) and Visi (.wkt).

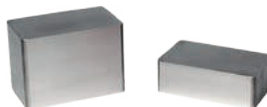


Industry-leading web store expedites the purchasing process. Go to [shop.procomps.com](http://shop.procomps.com) for information and additional resources.



# RAPID TOOLING INSERTS

## SECTION L



Rapid Tooling Inserts	RTI: Complete	RTI Cavity & Core Inserts	RTI Frames
Prefix: RTS, RTL, RTT	Prefix: RTLP	Prefix: RCI, RCIA	Prefix: RTF
Page: L-1	Page: L-14	Page: L-15	Page: L-16



RTI Pins & Bushings	Frame Sprue Bushing	Support Pillars	Straps
Prefix: RLP, RSB, RGEB	Prefix: RFS	Prefix: RSP	Prefix: MS
Page: L-20	Page: L-21	Page: L-21	Page: L-22

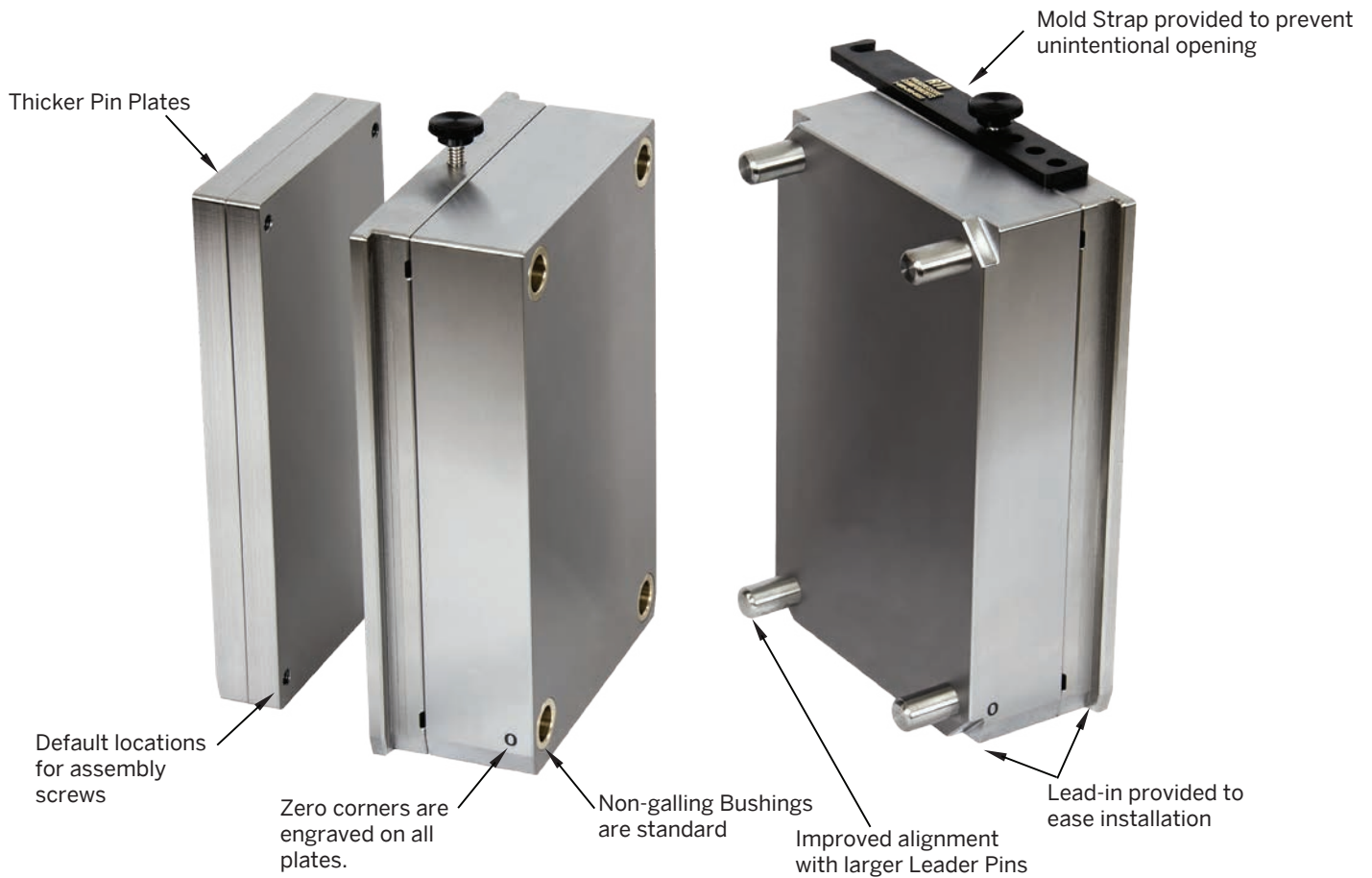


Frame Clamps	T-Handles
Prefix: RFC	Prefix: T
Page: L-22	Page: L-22





# RAPID TOOLING INSERTS®



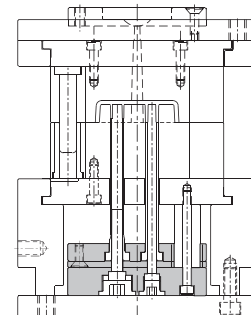
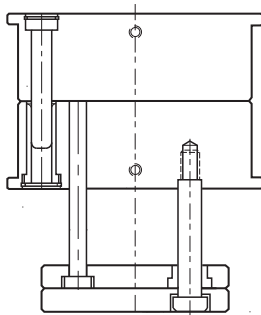
## Special design configurations and accessories available:

### Guide Pins and Bushings:

Rapid Tooling Inserts can include Guide Pins and Bushings and Return Pins at standard Progressive locations or modified to suit your application. See individual pages for more details.

### Sleeve Ejector Plate Systems:

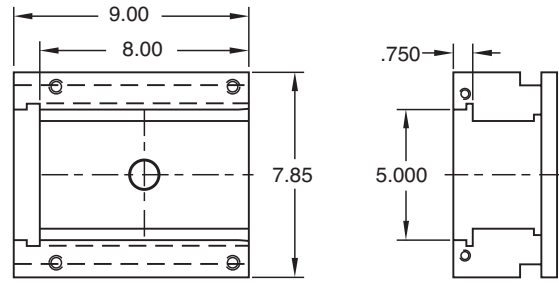
Available as an option on all Rapid Tooling Inserts, Sleeve Ejector Plates allow mold makers to install standard or Thin-Wall Sleeves. See individual pages for more details.



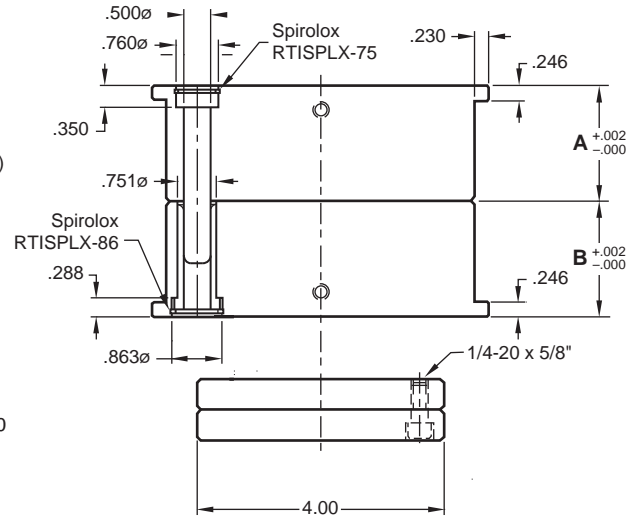
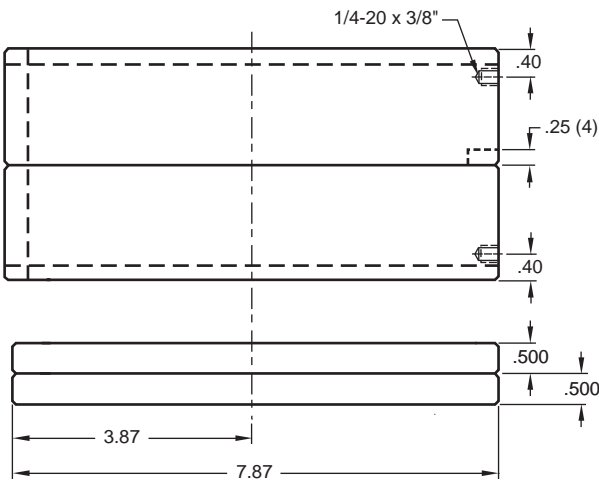
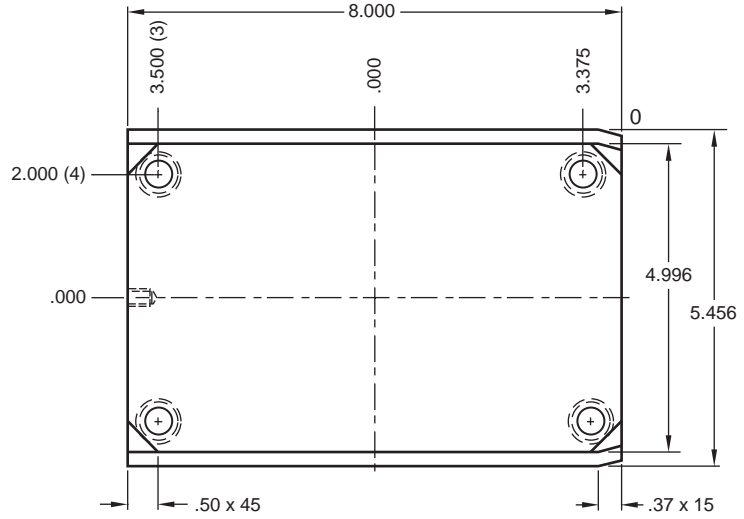
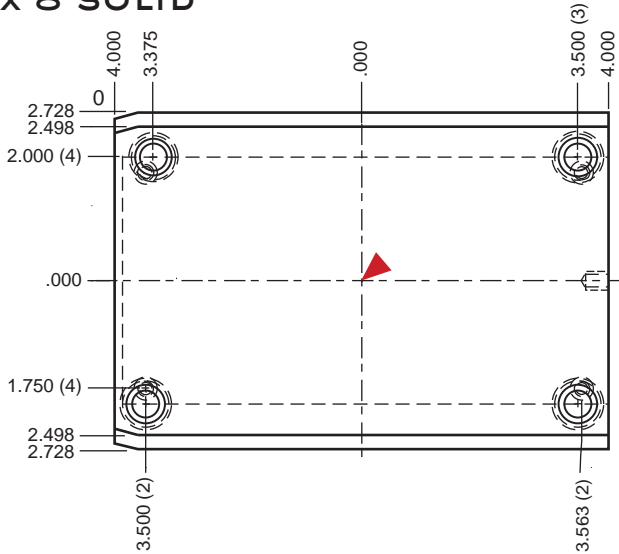
# RTI® 08/09 SERIES

The following inserts are used with frame 08/09:

- 5 x 8 Solid
- 5 x 8 Laminated
- 7.85 x 9 T-Style



## 5 x 8 SOLID



To order the 5 x 8 Solid RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTS0809-1313-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default pin locations. Ex. RTS0809-1313-RPGPB.

**M** All plates are P-20 Pre-Hard

CATALOG NUMBER	A	B
RTS0809-1313	1.376	1.376
RTS0809-1318	1.376	1.876
RTS0809-1818	1.876	1.876
RTS0809-1823	1.876	2.376
RTS0809-2323	2.376	2.376

CAD insertion point

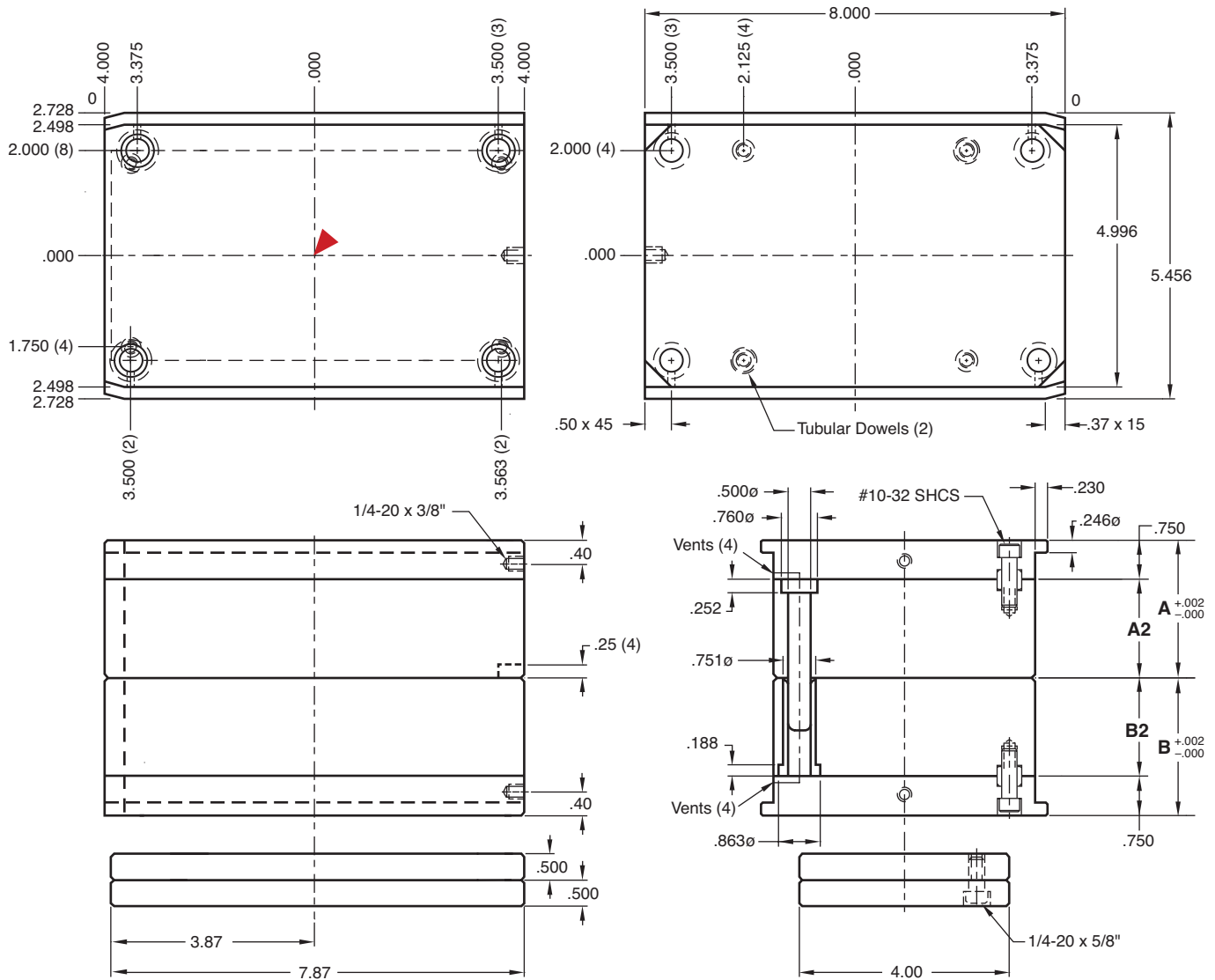
Includes Leader Pins, Bushings, all screws, and mold strap/thumb screws.





# RTI® 08/09 SERIES

## 5 x 8 LAMINATED



To order the 5 x 8 Laminated RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTL0809-1318-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTL0809-1318-RPGPB.

**M** All plates are P-20 Pre-Hard

CATALOG NUMBER	A	A2	B	B2
RTL0809-1818	1.876	1.126	1.876	1.126
RTL0809-1823	1.876	1.126	2.376	1.626
RTL0809-2323	2.376	1.626	2.376	1.626

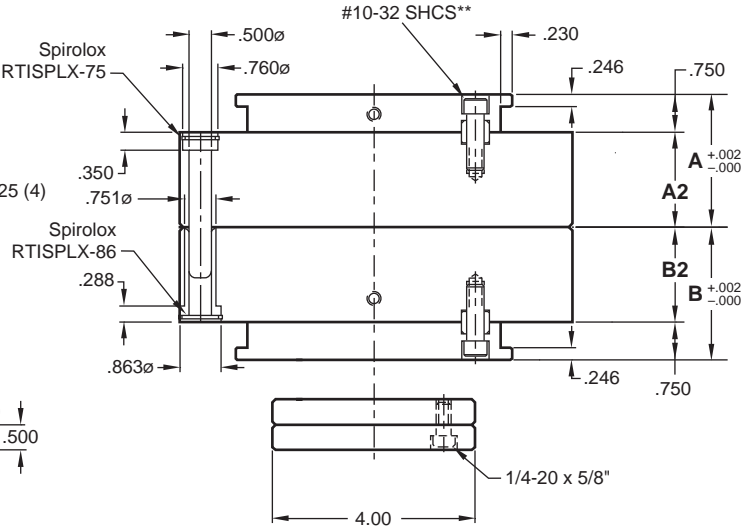
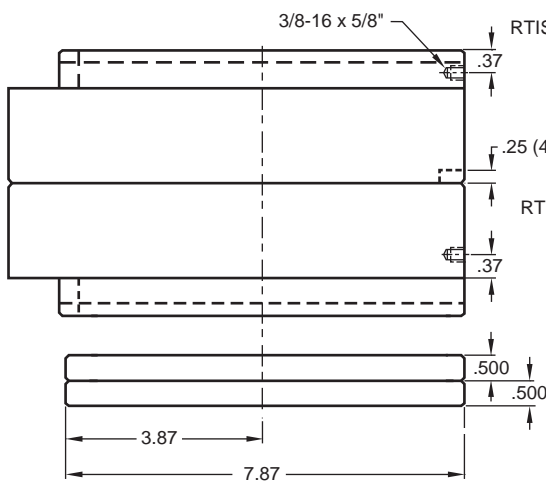
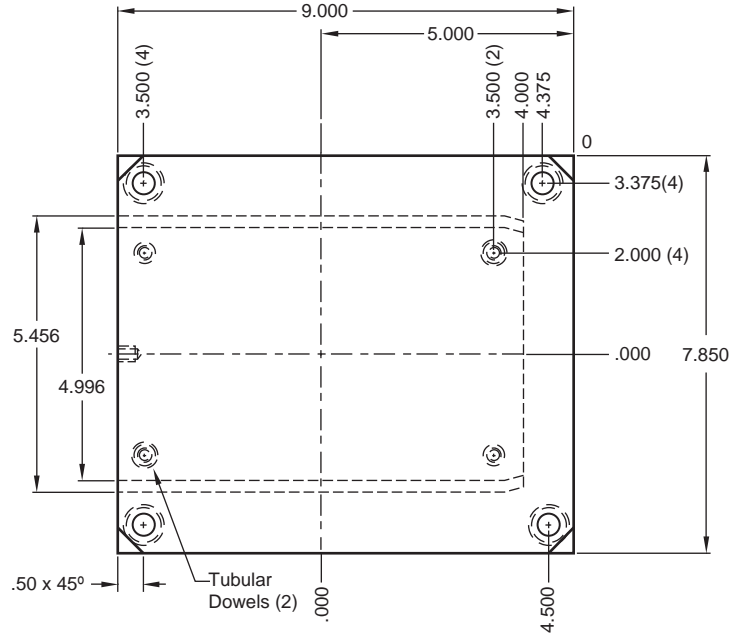
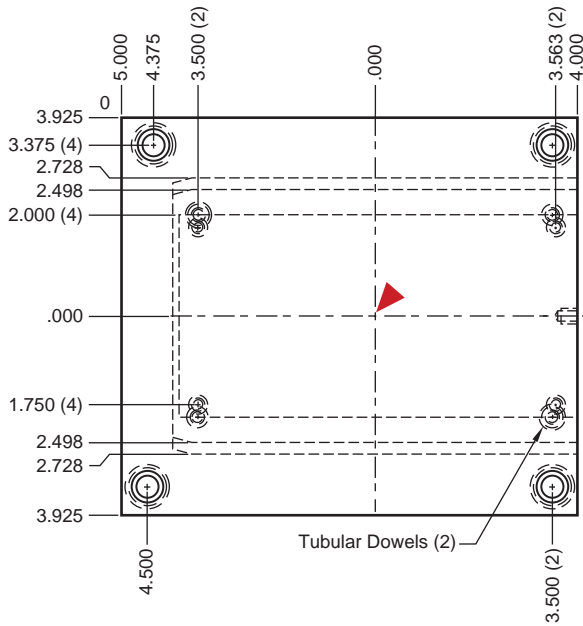
▶ CAD insertion point

Includes Leader Pins, Bushings, all screws, and mold strap/thumb screws.

# RTI® 08/09 SERIES

## 7.85 x 9 T-STYLE

Note: Offset zero location.



\*\*RTT0809-2222 & -2626 have 1/4-20 SHCS

To order the 7.85 x 9 T-Style RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTT0809-1717-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTT0809-1717-RPGPB.

**M** All plates are P-20 Pre-Hard

CATALOG NUMBER	A	A2	B	B2
RTT0809-1717	1.751	1.001	1.751	1.001
RTT0809-2222	2.251	1.501	2.251	1.501
RTT0809-2626	2.626	1.876	2.626	1.876

CAD insertion point

Includes Leader Pins, Bushings, all Screws, and MS65 Mold Strap and Screws.

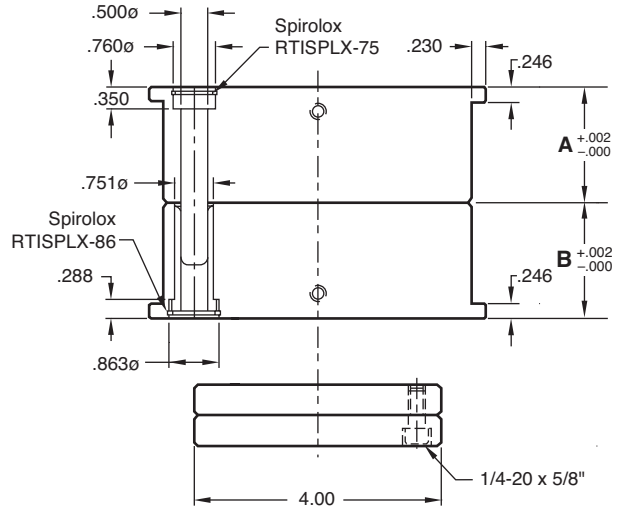
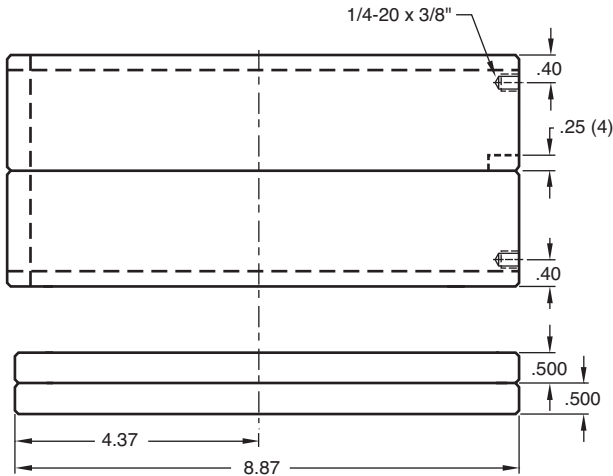
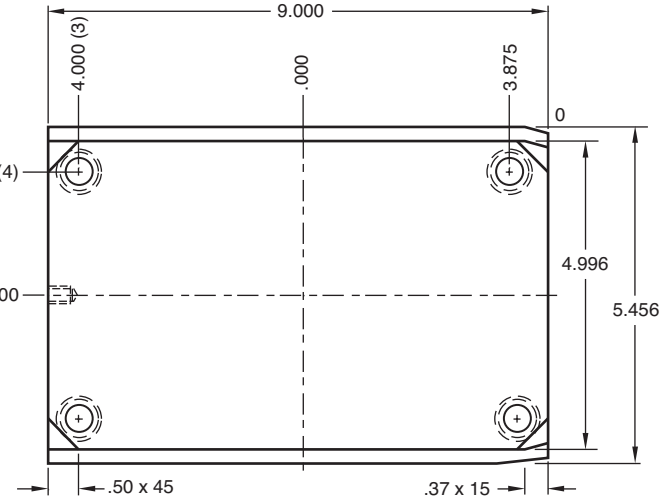
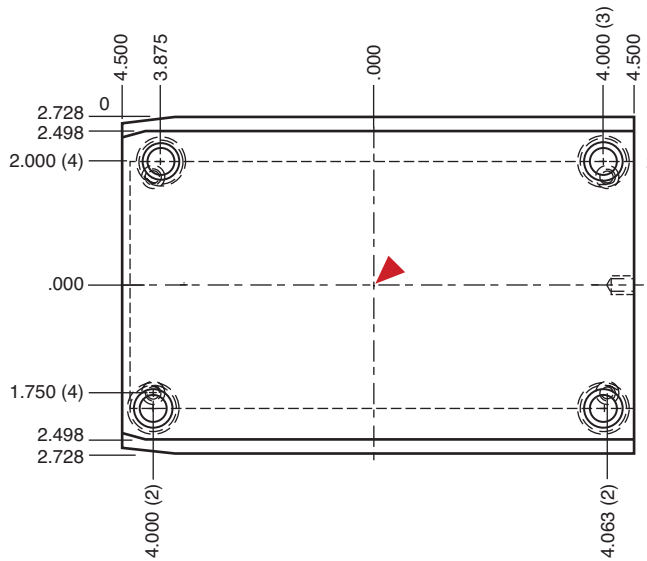
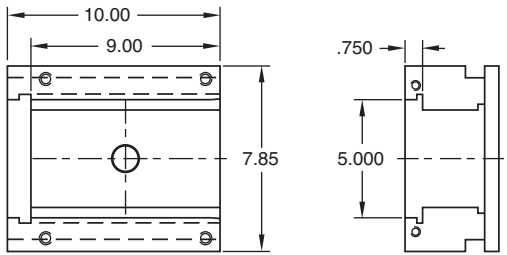


# RTI® 08/10 SERIES

The following inserts are used with frame 08/10:

- 5 x 9 Solid
- 5 x 9 Laminated
- 7.85 x 9 T-Style

## 5 x 9 SOLID



To order the 5 x 9 Solid RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTS0810-1318-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTS0810-1318-RPGPB.

**M** All plates are P-20 Pre-Hard

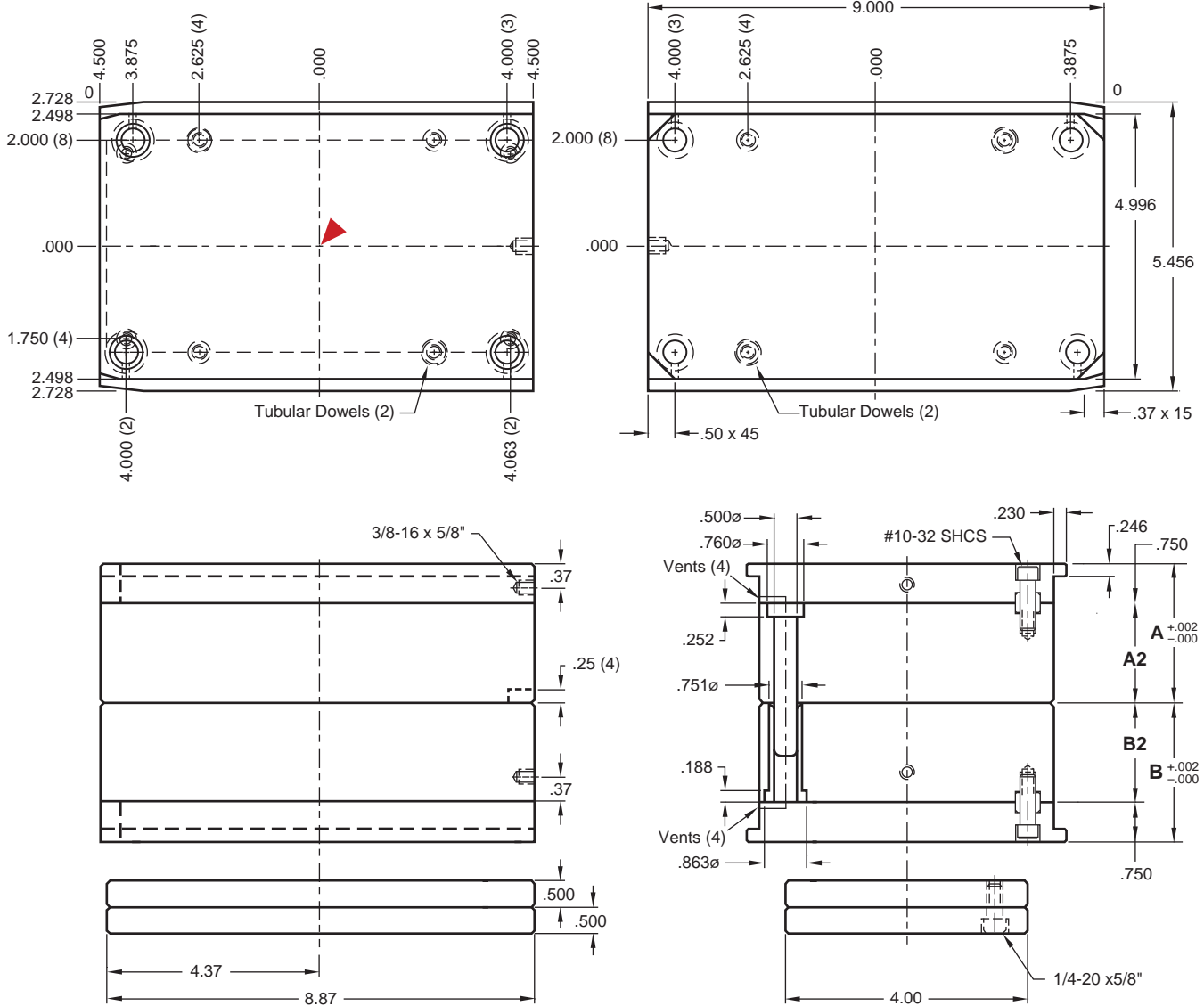
CATALOG NUMBER	A	B
RTS0810-1818	1.876	1.876
RTS0810-2323	2.376	2.376

▶ CAD insertion point

Includes Leader Pins, Bushings, all screws, and mold strap/thumb screws.

# RTI® 08/10 SERIES

## 5 x 9 LAMINATED



To order the 5 x 9 Laminated RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTL0810-1818-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTL0810-1818-RPGPB.

**M** All plates are P-20 Pre-Hard

CATALOG NUMBER	A	A2	B	B2
RTL0810-1818	1.876	1.126	1.876	1.126
RTL0810-2323	2.376	1.626	2.376	1.626

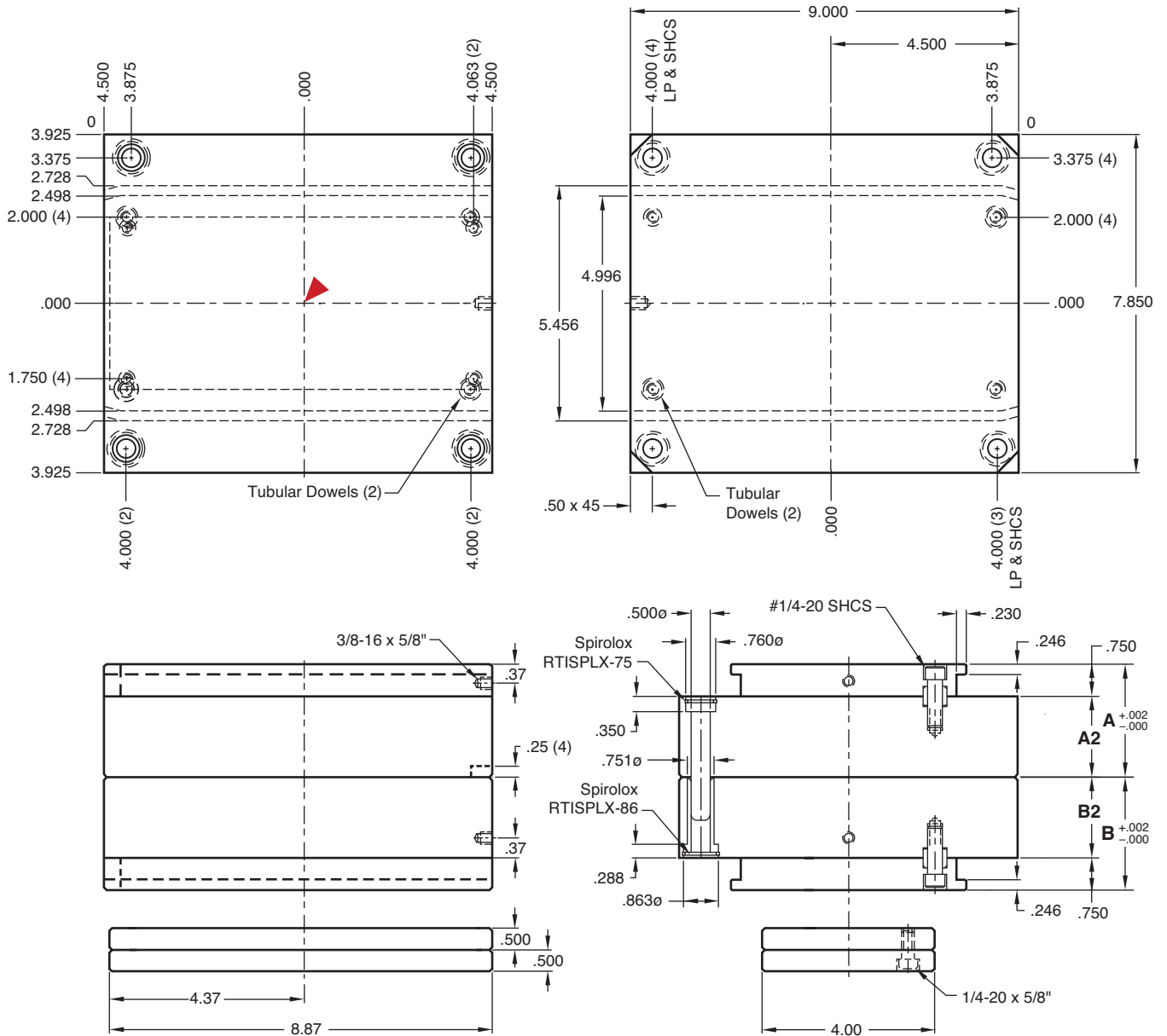
CAD insertion point

Includes Leader Pins, Bushings, all screws, and mold strap/thumb screws.



# RTI® 08/10 SERIES

## 7.85 x 9 T-STYLE



**M** All plates are P-20 Pre-Hard

To order the 7.85 x 9 T-Style RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

CATALOG NUMBER	A	A2	B	B2
RTT0810-2626	2.626	1.876	2.626	1.876

▶ CAD insertion point

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTT0810-2626-SEP.

Includes Leader Pins, Bushings, all Screws, and MS65 Mold Strap and Screws.

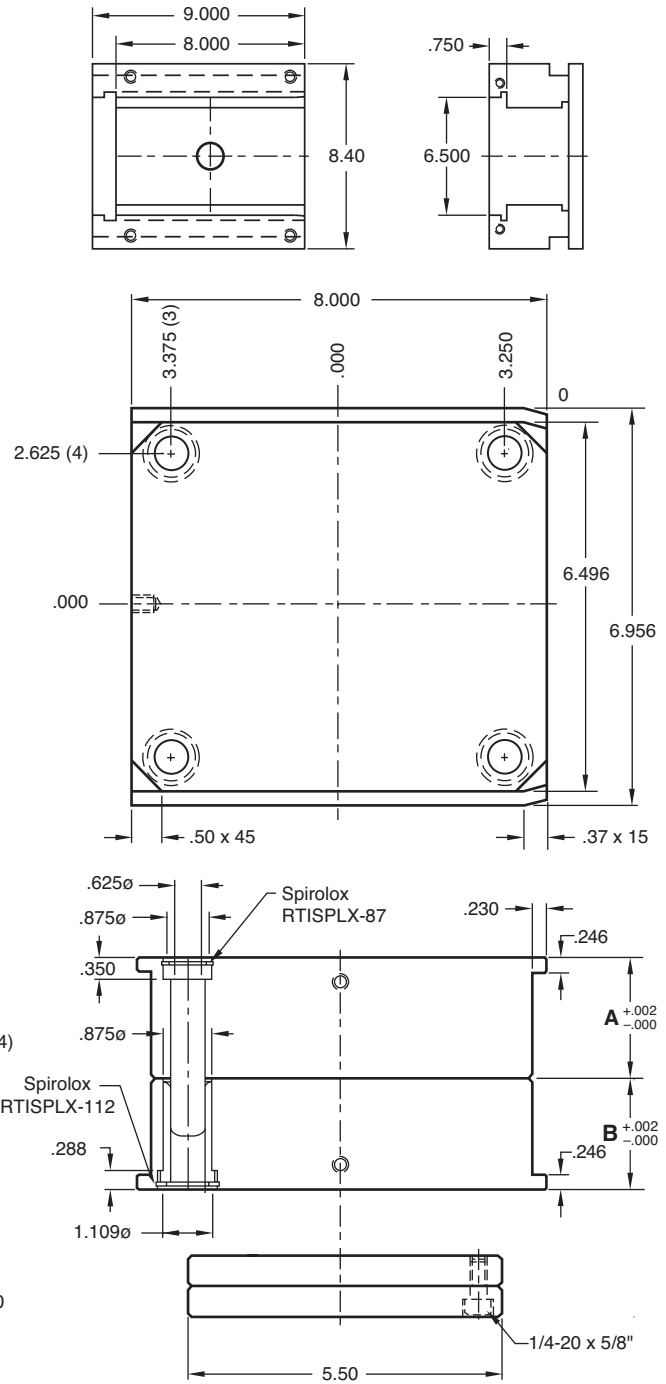
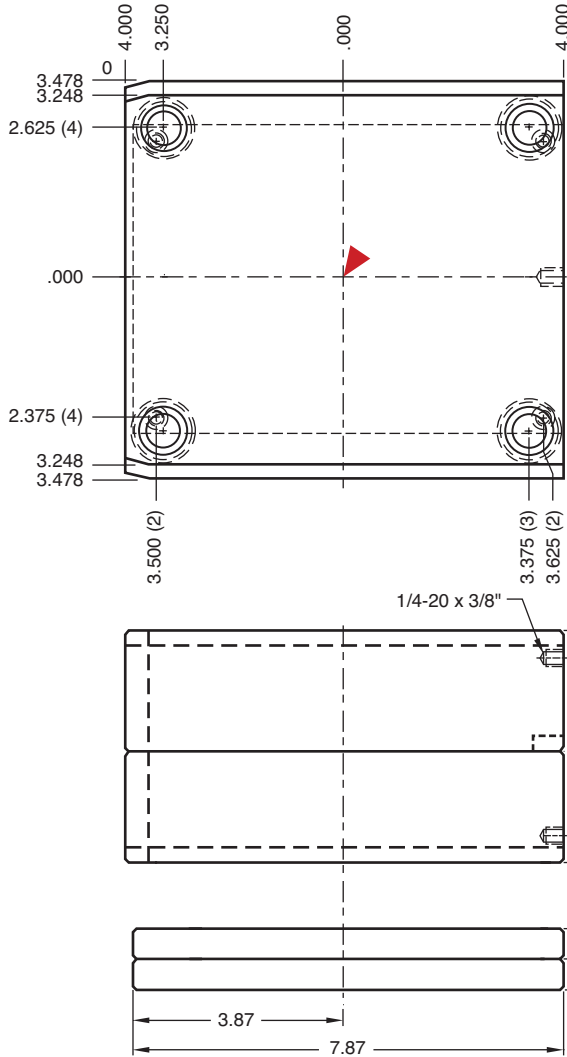
With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTT0810-2626-RPGPB.

# RTI® 84/90 SERIES

The following inserts are used with frame 84/90:

- 6.5 x 8 Solid
- 6.5 x 8 Laminated
- 8.4 x 9 T-Style

## 6.5 x 8 SOLID



To order the 6 x 5 Solid RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTS8490-1818-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTS8490-1818-RPGPB.

**M** All plates are P-20 Pre-Hard

CATALOG NUMBER	A	B
RTS8490-1818	1.876	1.876
RTS8490-2323	2.376	2.376

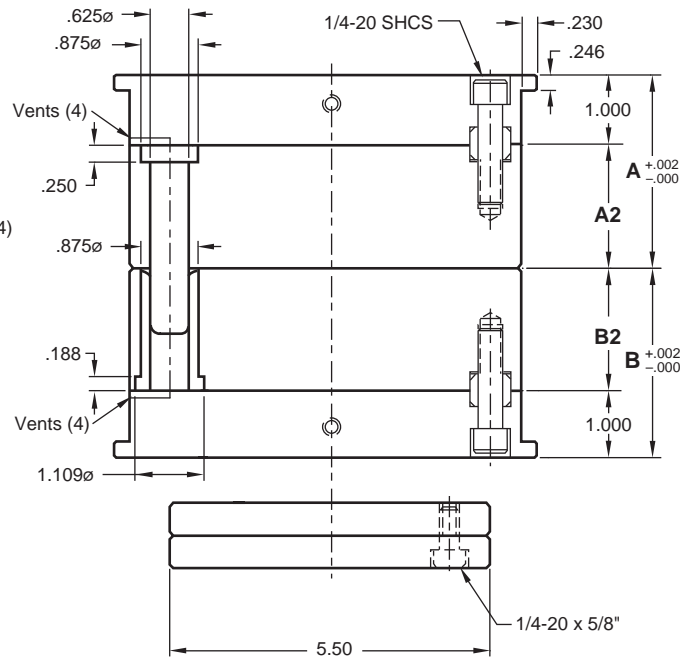
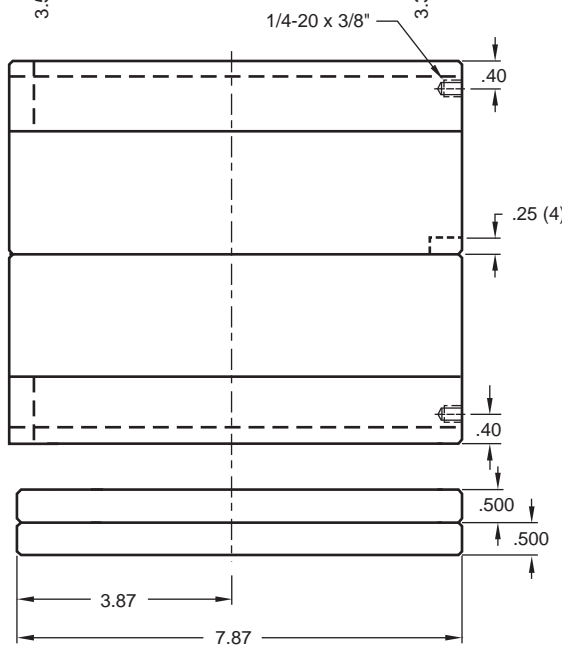
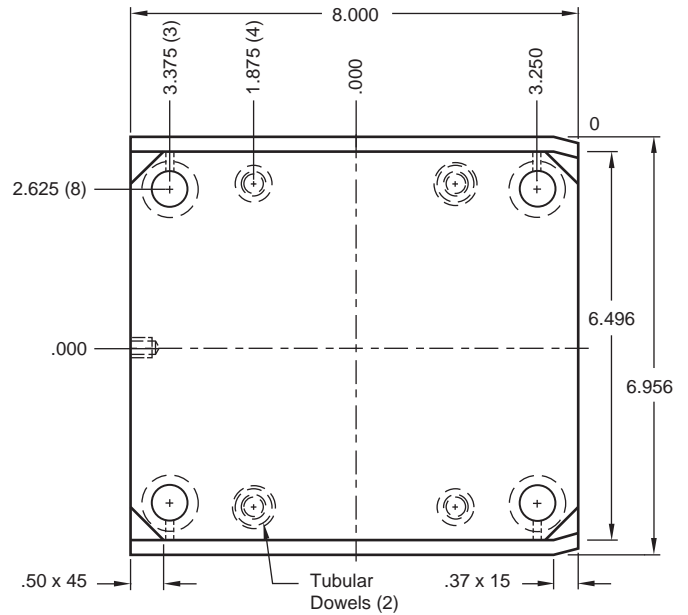
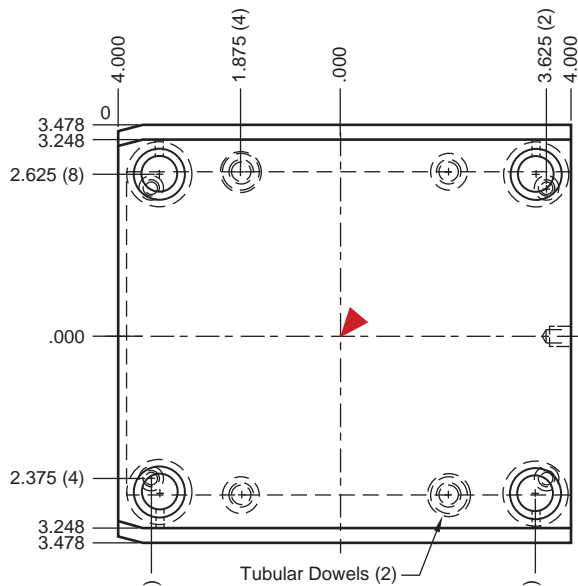
▶ CAD insertion point

Includes Leader Pins, Bushings, all screws, and mold strap/thumb screws.



# RTI® 84/90 SERIES

## 6.5 x 8 LAMINATED



To order the 6 x 5 Laminated RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTL8490-1818-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTL8490-1818-RPGPB.

**M** All plates are P-20 Pre-Hard

CATALOG NUMBER	A	A2	B	B2
RTL8490-1818	1.876	.876	1.876	.876
RTL8490-2323	2.376	1.376	2.376	1.376

▶ CAD insertion point

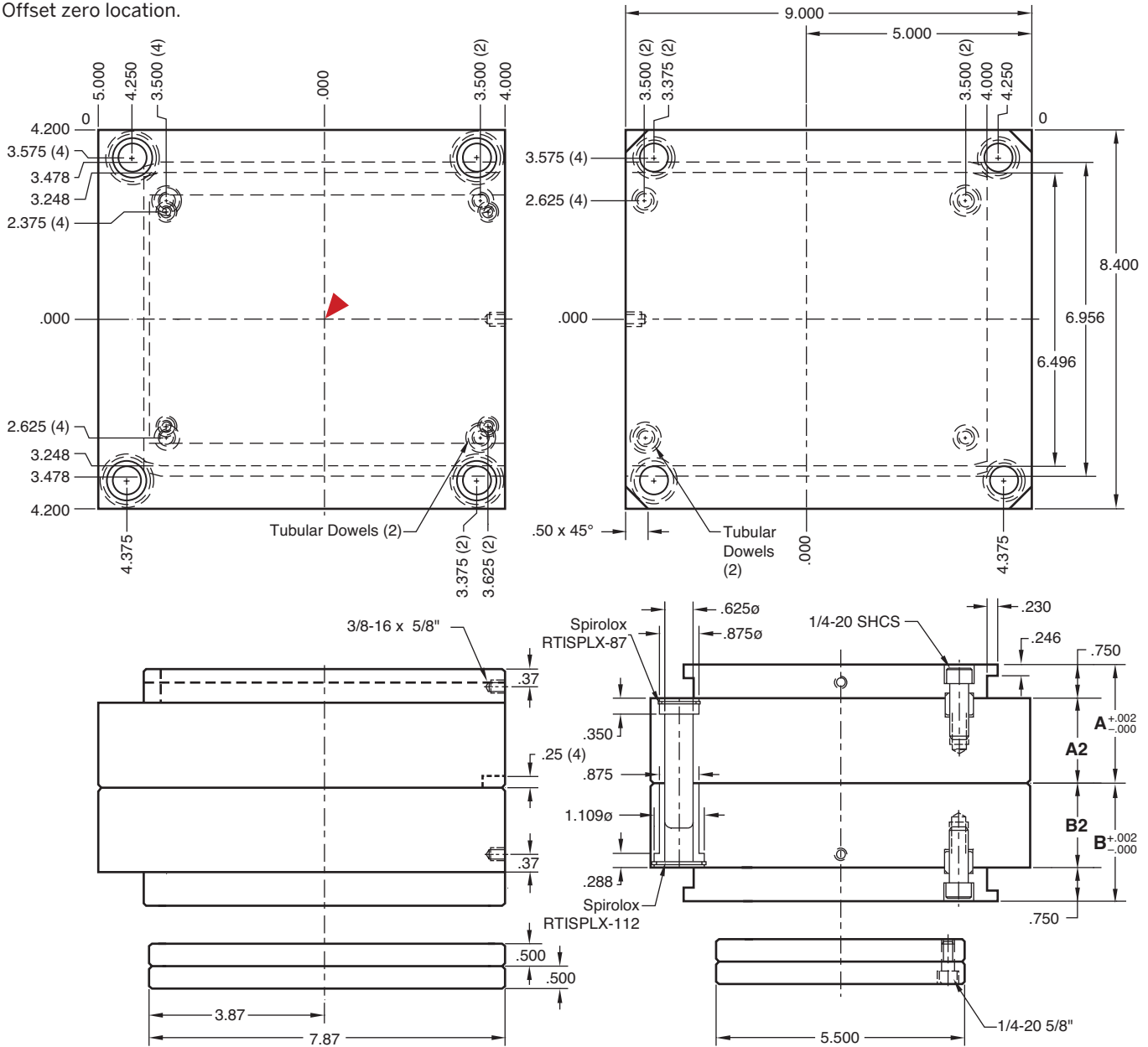
Includes Leader Pins, Bushings, all screws, and mold strap/thumb screws.



# RTI® 84/90 SERIES

## 8.4 x 9 T-STYLE

Note: Offset zero location.



To order the 8.4 x 9 T-Style RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

**Options Available:**

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTT8490-2020-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTT8490-2020-RPGPB.

**M** All plates are P-20 Pre-Hard

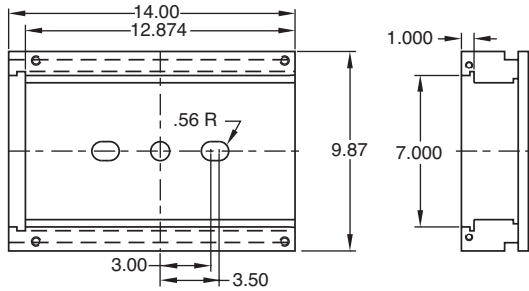
CATALOG NUMBER	A	A2	B	B2
RTT8490-2020	2.001	1.251	2.001	1.251
RTT8490-2222	2.251	1.501	2.251	1.501
RTT8490-2626	2.626	1.876	2.626	1.876

CAD insertion point

Includes Leader Pins, Bushings, Screws, and MS65 Mold Strap and Screws.



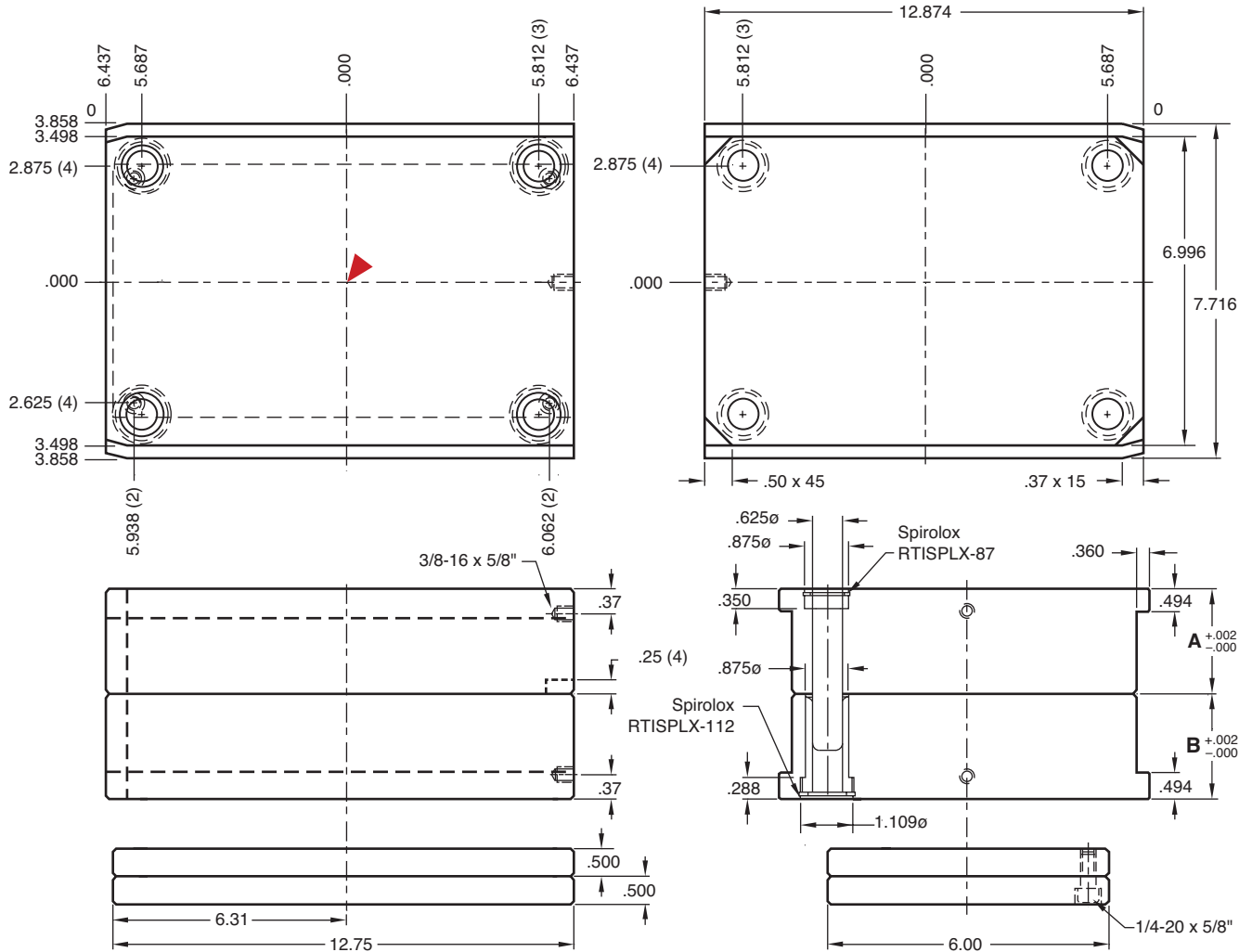
# RTI® 10/14 SERIES



The following inserts are used with frame 10/14:

- 7 x 12.9 Solid
- 7 x 12.9 Laminated

## 7 x 12.9 SOLID



To order the 7 x 12.9 Solid RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTS1014-2323-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTS1014-2323-RPGPB.

**M** All plates are P-20 Pre-Hard

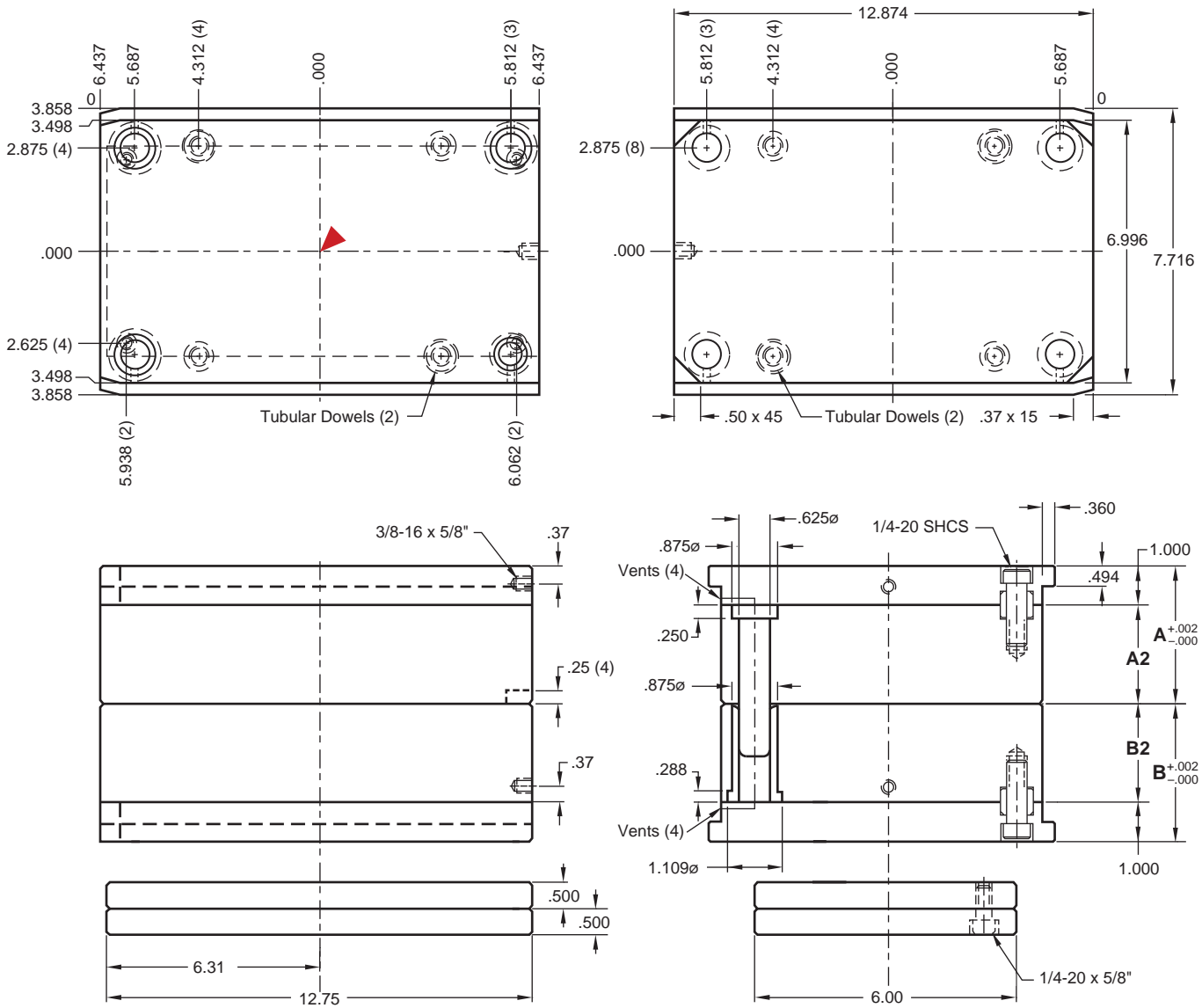
CATALOG NUMBER	A	B
RTS1014-2323	2.376	2.376
RTS1014-2828	2.876	2.876

CAD insertion point

Includes Leader Pins, Bushings, all screws, and MS65 Mold Strap and Screws.

# RTI<sup>®</sup> 10/14 SERIES

## 7 x 12.9 LAMINATED



To order the 7 x 12.9 Laminated RTI as shown above, specify the catalog number at right. Call for other materials, sizes, or component omissions and replacement plates.

### Options Available:

With Sleeve Ejector Plates and all components, extra plate. Specify the catalog number at right with -SEP as the suffix. Ex. RTL1014-2323-SEP.

With Guide Pins and Bushings (2) and Return Pins (4) machined and included. Specify the catalog number at right with -RPGPB as the suffix. Refer to page L-13 for the default locations. Ex. RTL1014-2323-RPGPB.

**M** All plates are P-20 Pre-Hard

CATALOG NUMBER	A	A2	B	B2
RTL1014-2323	2.376	1.376	2.376	1.376
RTL1014-2828	2.876	1.876	2.876	1.876

▶ CAD insertion point

Includes Leader Pins, Bushings, all screws, and MS65 Mold Strap and Screws.

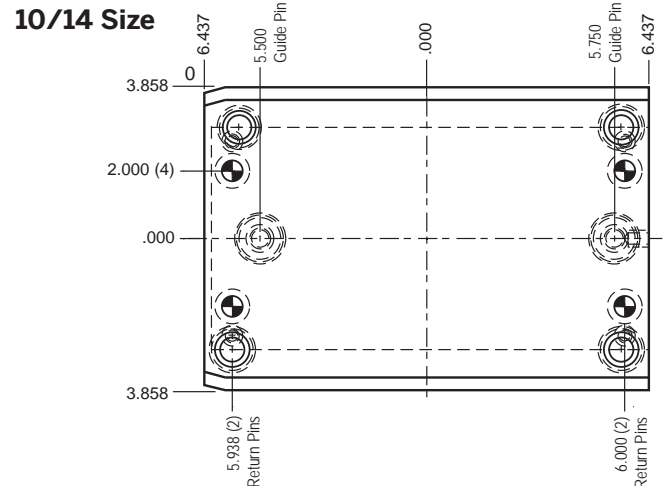
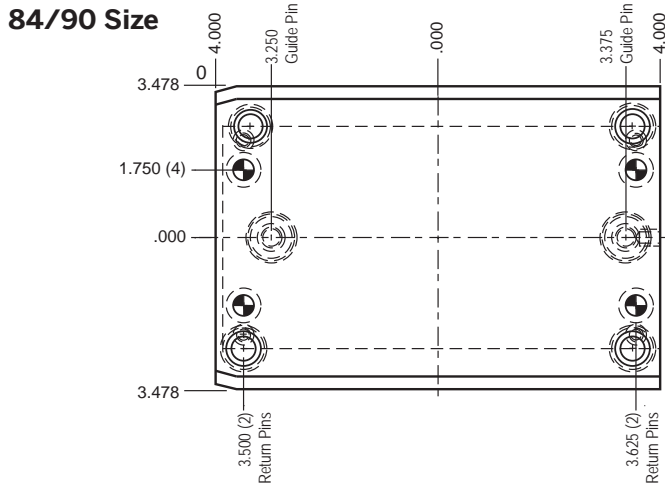
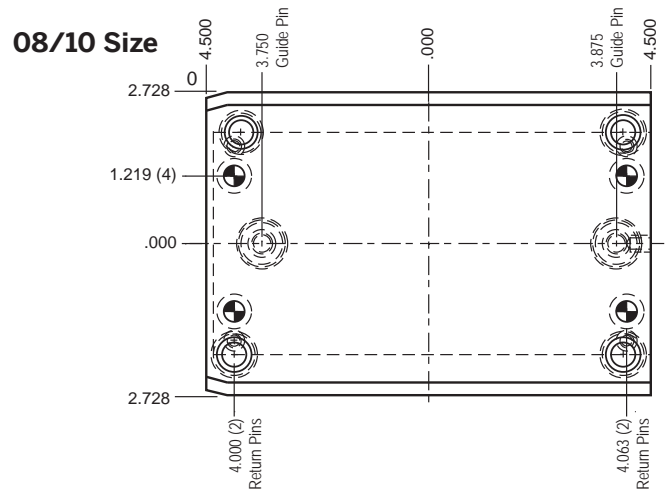
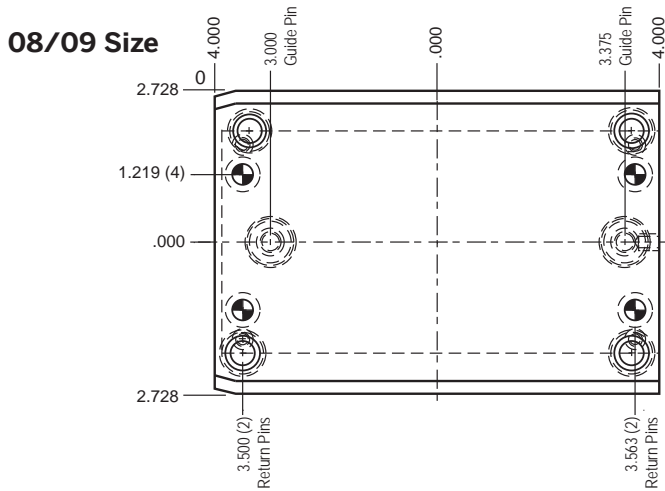


# RAPID TOOLING INSERTS®

## ADDITIONAL COMPONENT OPTIONS

RTIs are available with optional component configurations in the standard locations shown here. To order, specify the catalog number from the previous pages and add the appropriate suffix as shown:

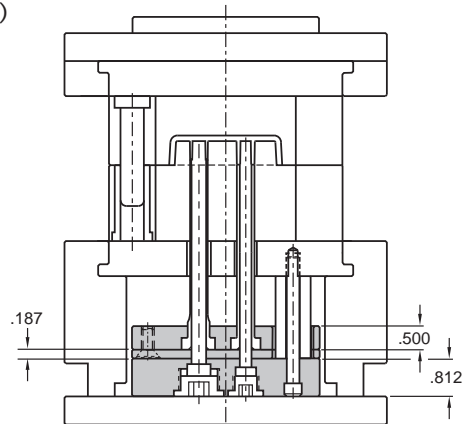
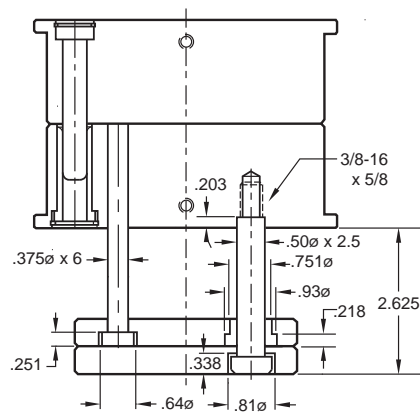
- RPGPB = Return Pins (4), Guide Pins and Bushings (2) machined and included.
- SEP = Sleeve Ejector Plate option



Return Pins, Guide Pins/Bushings are in the same locations for all sizes of Solid (shown), Laminated, and T-Style Inserts. Components may be relocated and other items machined. Contact [tech@procomps.com](mailto:tech@procomps.com) for a quotation.

The Sleeve Ejector Plate (-SEP) option includes the following:

- Extra plate
- Guide Pins & Bushings (2)
- Return Pins (4)



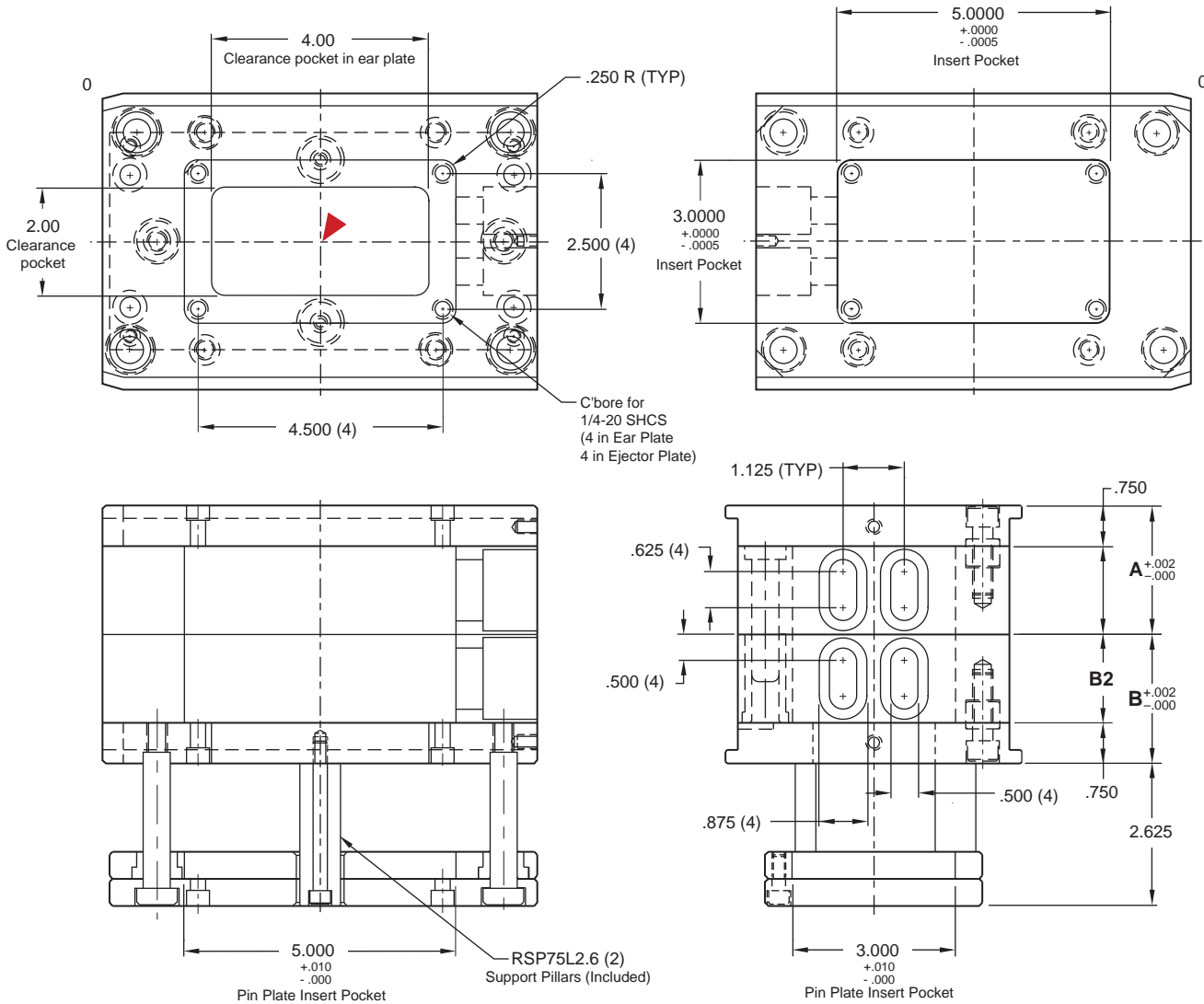
# RTI® COMPLETE



Rapid Tooling Inserts are now available with pre-machined pockets for core and cavity inserts. Also, the pin plate area is pocketed for complete quick tooling changes.

Size: 08/09 Series, 5x8 Laminated unit. Full specs are shown on page L-3.

Cavity, core, and pin plate inserts are available on page L-15.



**M** A & B Plates: P-20 Pre-Hard, Ear Plates: AISI 4130, Pin Plates: AISI 1018

CATALOG NUMBER	A	A2	B	B2
RTL-0809-2323-P	2.376	1.626	2.376	1.626

▶ CAD insertion point

Call for other materials, sizes, or component omissions.

For ejector plates, pin plates, or full ejector assembly sets, refer to the price list for specific catalog numbers and pricing.



# RTI® COMPLETE CORE AND CAVITY INSERTS

## Material Options:

### DH2F, Modified H-13 40-42 HRC

This through-hardened material requires no additional heat treatment and is ready for machining of cavity and core details.

CATALOG NUMBER	T
RCI-0809-16	1.630
RCI-0809-35	3.500

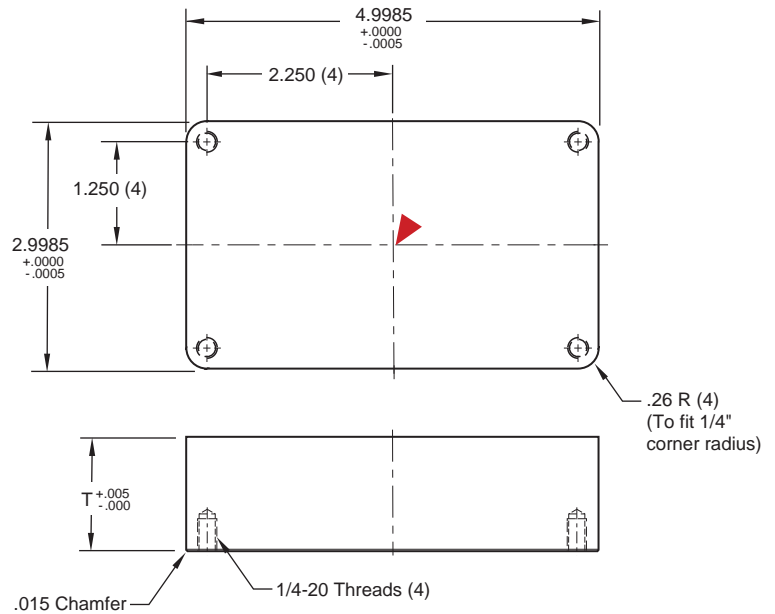
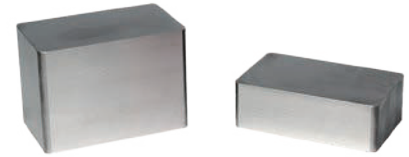
1/4-20 x 7/8" long screws included.

### QC-10, Aluminum Alloy 155-170 Brinell

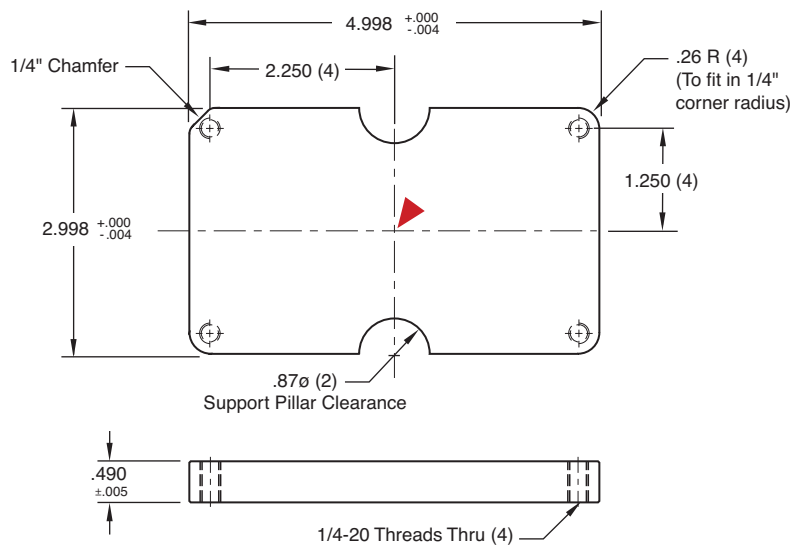
This aluminum material has excellent machinability, allowing faster cutting speeds for prototype tools which are not subjected to abrasive plastics.

CATALOG NUMBER	T
RCIA-0809-16	1.630
RCIA-0809-35	3.500

1/4-20 x 7/8" long screws included.



## PIN PLATE INSERTS

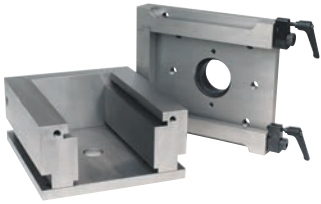


**M** AISI 1018 ▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
RPI-0809-5	Pin Plate Insert

1/4-20 x 5/8" long screws included.

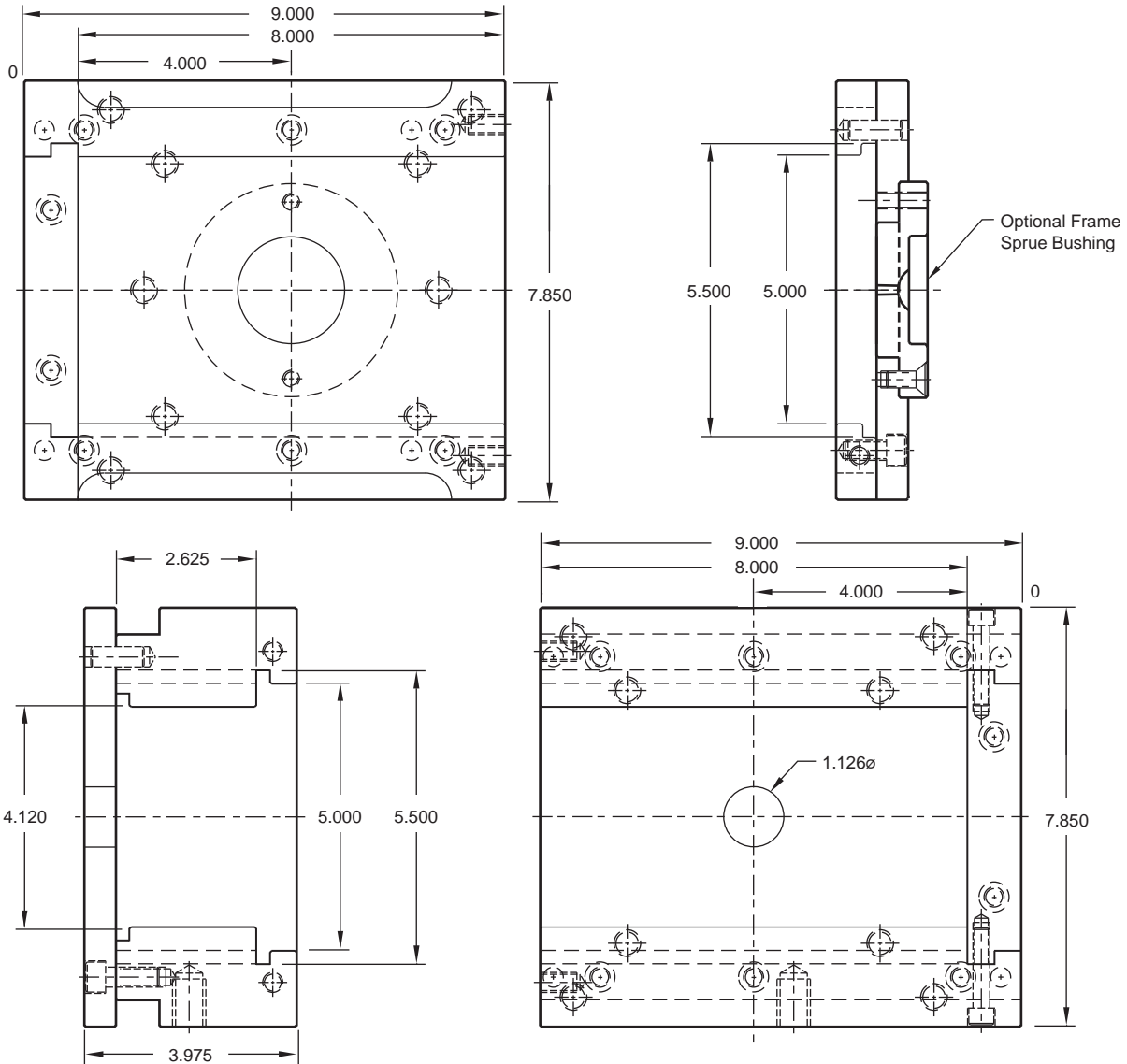
# RTI® 08/09 FRAME



Standard RTI ejection, knockout holes, mounting holes, and clamp slots used.

**Accepts:**

- 5 x 8 Solid Units, RTS-0809 on Page L-2
- 5 x 8 Laminated Units, RTL-0809 on Page L-3
- 7.85 x 9 T-Style Units, RTT-0809 on Page L-4



**M** Pre-Hardened Stainless Steel, 32-36 HRC

**Includes:**

- Frame
- Quick Change Clamps (4)

**To Order Frames and Halves:**

- To order complete frames specify catalog number: RTF-0809
- To order an A or B half, contact Customer Service.

Frame Sprue Bushings are sold separately on page L-21, Sprue Bushings on page B-3, and Locating Rings on B-2.

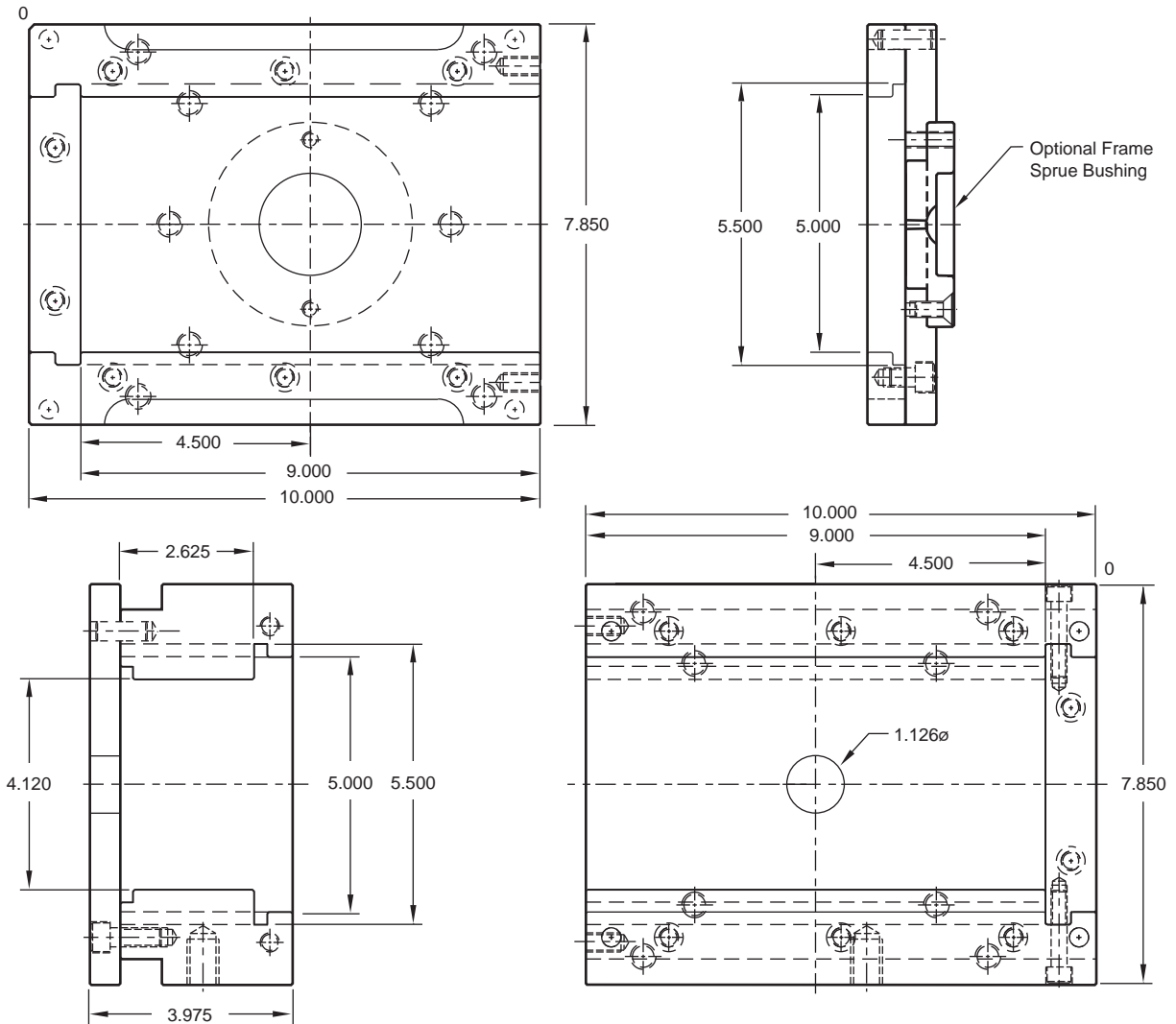
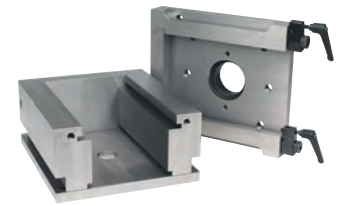


# RTI® 08/10 FRAME

Standard RTI ejection, knockout holes, mounting holes, and clamp slots used.

**Accepts:**

- 5 x 9 Solid Units, RTS-0810 on Page L-5
- 5 x 9 Laminated Units, RTL-0810 on Page L-6
- 7.85 x 9 T-Style Units, RTT-0810 on Page L-7



**M** Pre-Hardened Stainless Steel, 32-36 HRC

**Includes:**

- Frame
- Quick Change Clamps (4)

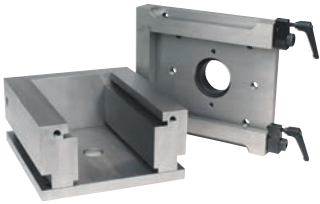
**To Order Frames and Halves:**

- To order complete frames specify catalog number: RTF-0810
- To order an A or B half, contact Customer Service.

Frame Sprue Bushings are sold separately on page L-21, Sprue Bushings on page B-3, and Locating Rings on B-2.



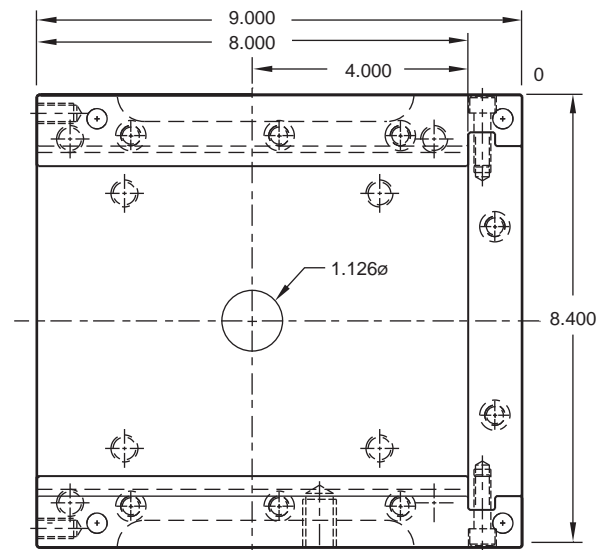
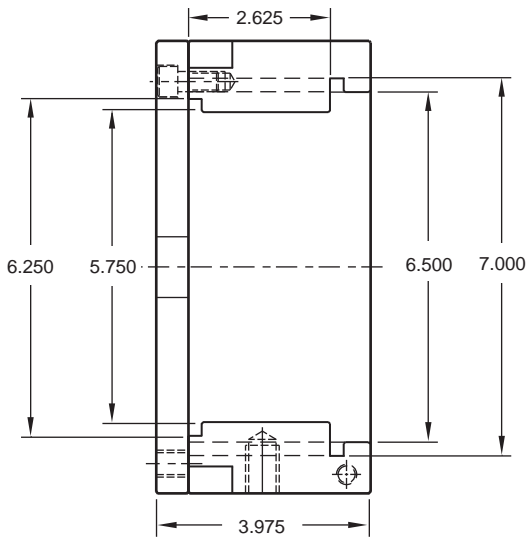
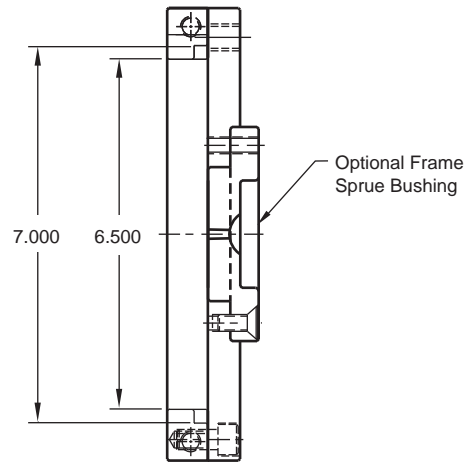
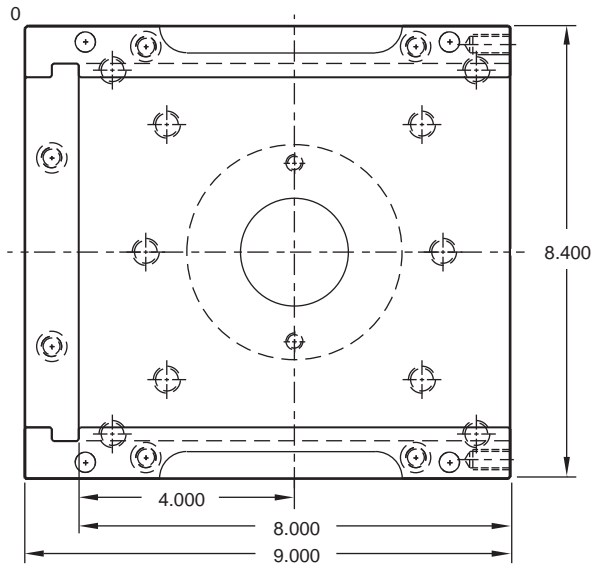
# RTI® 84/90 FRAME



Standard RTI ejection, knockout holes, mounting holes, and clamp slots used.

**Accepts:**

- 6.5 x 8 Solid Units, RTS-8490 on Page L-8
- 6.5 x 8 Laminated Units, RTL-8490 on Page L-9
- 8.4 x 9 T-Style Units, RTT-8490 on Page L-10



**M** Pre-Hardened Stainless Steel, 32-36 HRC

**Includes:**

- Frame
- Quick Change Clamps (4)

**To Order Frames and Halves:**

- To order complete frames specify catalog number: RTF-8490
- To order an A or B half, contact Customer Service.

Frame Sprue Bushings are sold separately on page L-21, Sprue Bushings on page B-3, and Locating Rings on B-2.

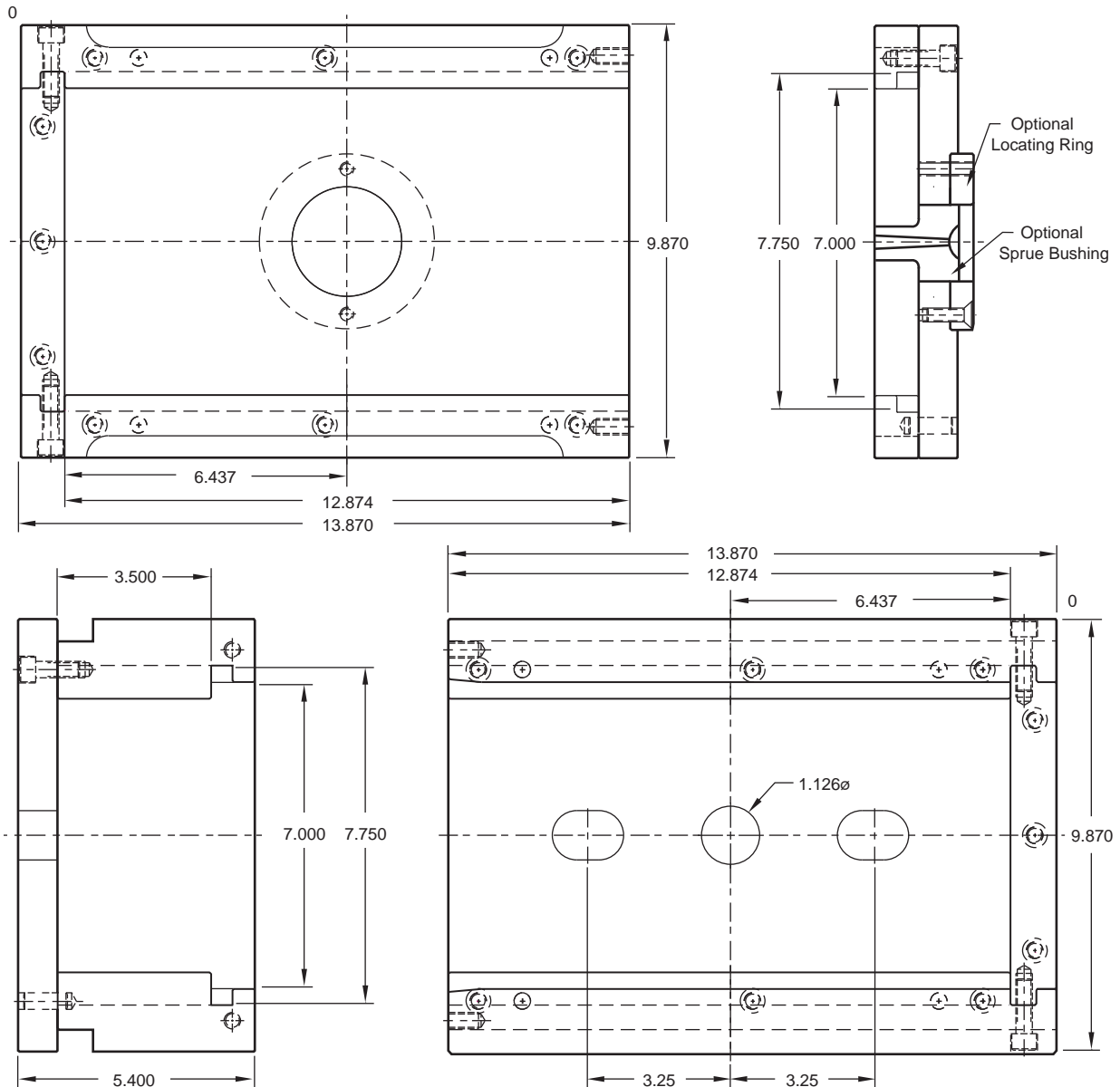
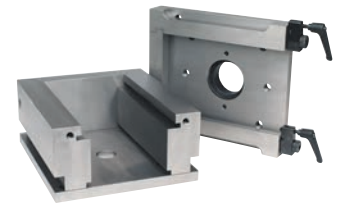


# RTI® 10/14 FRAME

Standard RTI ejection, knockout holes, mounting holes, and clamp slots used.

**Accepts:**

- 7 x 12.9 Solid Units, RTS-1014 on Page L-11
- 7 x 12.9 Laminated Units, RTL-1014 on Page L-12



**M** Pre-Hardened Stainless Steel, 32-36 HRC

**Includes:**

- Frame
- Quick Change Clamps (4)

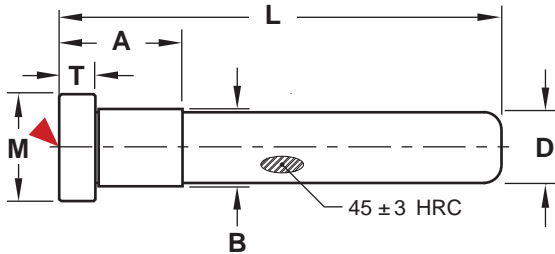
**To Order Frames and Halves:**

- To order complete frames specify catalog number: RTF-1014
- To order an A or B half, contact Customer Service.

Frame Sprue Bushings are sold separately on page L-21, Sprue Bushings on page B-3, and Locating Rings on B-2.

# RTI® ACCESSORIES

## LEADER PINS



NOMINAL DIAMETER	D +.0000 -.0005	A +.00 -.03	B +.0005 -.0000	M +.00 -.01	T +.000 -.002
1/2	.499	.75	.500	.750	.250
5/8	.624	.87	.625	.865	.250

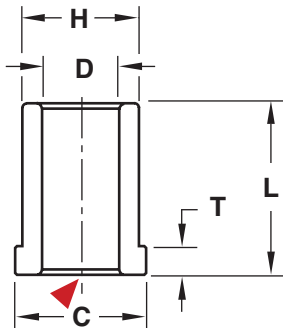
Note: The RLP50L1.25 has an "A" dimension of .62".

M AISI 1117

▶ CAD insertion point

L	D=1/2"	D=5/8"
1.250	RLP50L1.25	—
1.750	RLP50L1.75	RLP62L1.75
2.000	RLP50L2.00	—
2.250	RLP50L2.25	RLP62L2.25
2.500	RLP50L2.50	RLP62L2.50
3.000	RLP50L3.00	RLP62L3.00
3.500	RLP50L3.50	RLP62L3.50
4.000	—	RLP62L4.00

## SHOULDER BUSHINGS



NOMINAL DIAMETER	D +.0008 -.0000	H +.0005 -.0000	C +.000 -.005	T +.000 -.005
1/2	.5000	.7505	.863	.188
5/8	.6250	.8755	1.100	.188

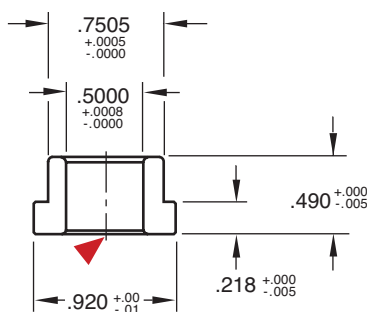
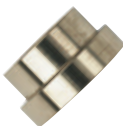
M CA954 Solid Bronze

▶ CAD insertion point

Nominal Plate Thickness	L	D=1/2"	D=5/8"
.625	.625	RSB50L.62	—
.875	.875	—	RSB62L.87
1.000	.900	RSB50L1.00	—
1.125	1.125	RSB50L1.12	—
1.250	1.150	—	RSB62L1.25
1.375-S	1.275	RSB50L1.27	RSB62L1.27
1.375	1.375	—	RSB62L1.37
1.500	1.400	RSB50L1.50	RSB62L1.50
1.625	1.625	RSB50L1.62	—
1.875-S	1.775	RSB50L1.87	RSB62L1.77
1.875	1.875	—	RSB62L1.87
2.375	2.275	RSB50L2.37	RSB62L2.37
2.875	2.775	—	RSB62L2.87

Note: The "-S" signifies use with solid inserts.

## GUIDE PIN BUSHINGS



M CA954 Solid Bronze

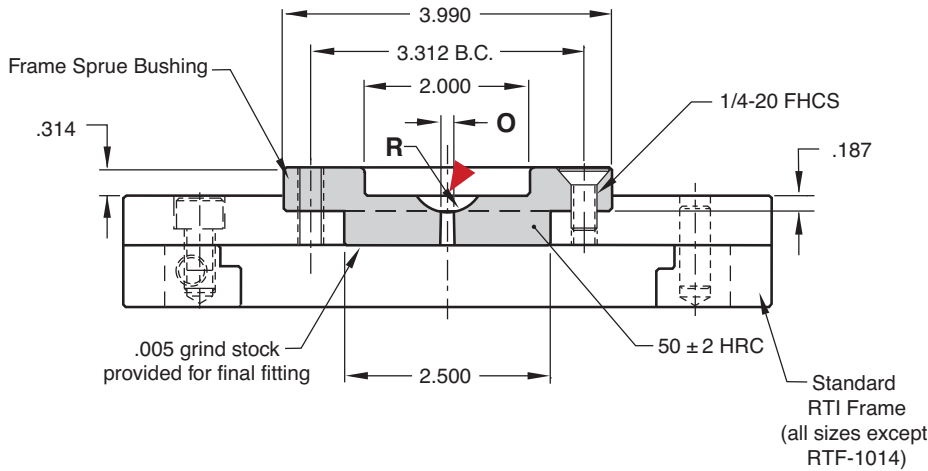
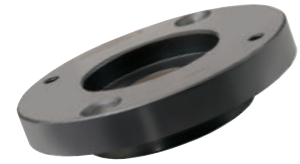
▶ CAD insertion point

CATALOG NUMBER	DESCRIPTION
RGE50	1/2" ID Guided Ejector Bushing



# RTI® ACCESSORIES

## FRAME SPRUE BUSHINGS



**M** H-13 **S** Melonite (SBN)

CATALOG NUMBER	O	R
RFS-512	5/32	1/2
RFS-534	5/32	3/4
RFS-712	7/32	1/2
RFS-734	7/32	3/4
RFS-912	9/32	1/2
RFS-934	9/32	3/4

Screws included.

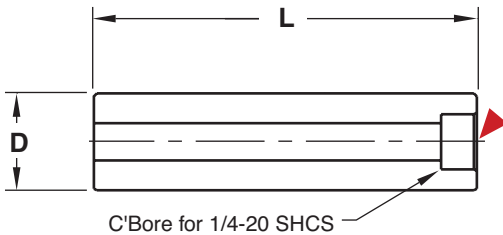
## SUPPORT PILLARS



### Counterbored

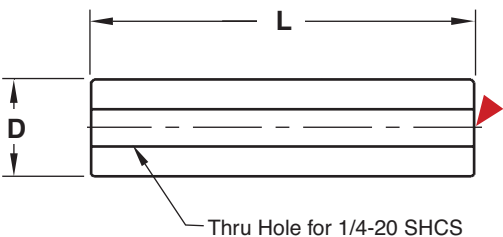
**M** AISI 1117

▶ CAD insertion point



D	CATALOG NUMBER	L +0.002 +0.000	Screw Length (1/4-20 SHCS)
3/4	RSP75L2.1	2.125	2.25
	RSP75L2.6	2.625	2.75
	RSP75L3.5	3.500	3.75
1	RSP100L2.1	2.125	2.25
	RSP100L2.6	2.625	2.75
	RSP100L3.5	3.500	3.75
1-1/4	RSP125L2.1	2.125	2.25
	RSP125L2.6	2.625	2.75
	RSP125L3.5	3.500	3.75

Screws included.



### Clearance Hole

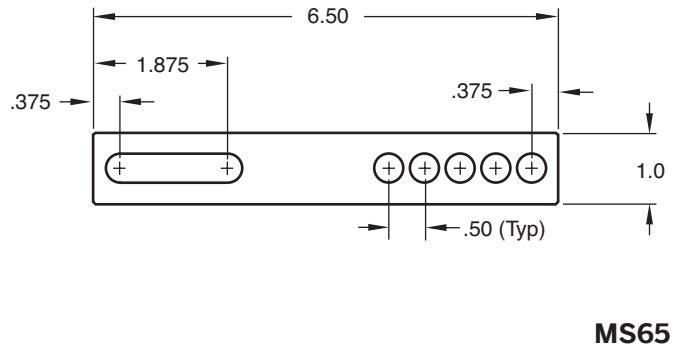
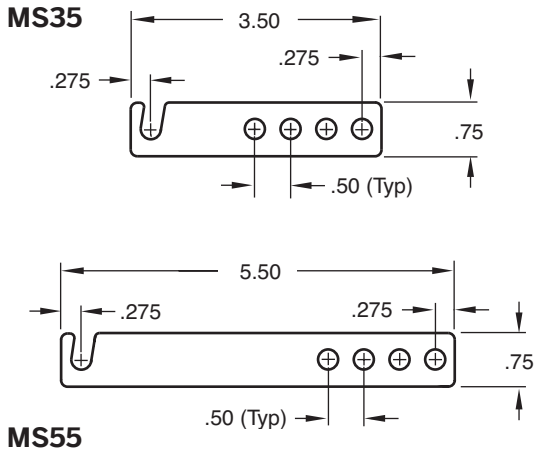
**M** AISI 1117

D	CATALOG NUMBER	L +0.001 +0.000	Screw Length (1/4-20 SHCS)
3/4	RSP75L1.8	1.813	2.75
	RSP75L2.7	2.688	3.75

Screws included.

# RTI® ACCESSORIES

## STRAPS

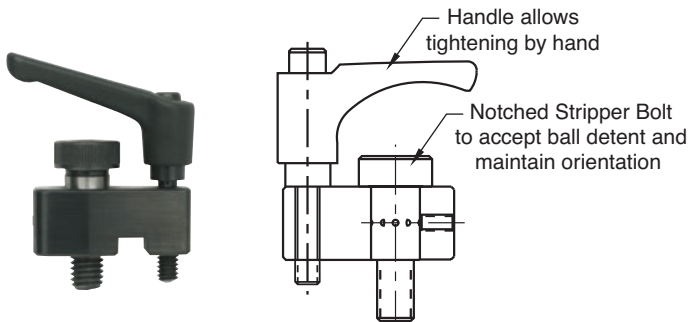


**M** MS35 & MS55: Polycarbonate, MS65: AISI 1018

CATALOG NUMBER	DESCRIPTION	THICKNESS
<b>MS35</b>	3.5" Long RTI Strap	.200
<b>MS55</b>	5.5" Long RTI Strap	.200
<b>MS65</b>	6.5" Long Heavy Duty Strap	.500

MS35 & MS55 includes 1/4-20 thumb screw.  
MS65 includes (2) 3/8-16 x 1" long SHCS.

## FRAME CLAMPS



CATALOG NUMBER	DESCRIPTION
<b>RFC-100</b>	RTI Frame/Insert Clamp (Sold Individually)

## T-HANDLES



CATALOG NUMBER	DESCRIPTION
<b>T100</b>	RTI T-Handle

Designed for inserts less than 75 pounds.



# TOOLROOM INNOVATIONS

## SECTION M



Rhino Foot™	Rhino Toes™	Nozzles	Nozzle Caddie/Wrench
Prefix: RHF	Prefix: RHT	Prefix: NZFT	Prefix: NZLCAD, NZLWR
Page: M-1	Page: M-1	Page: M-2	Page: M-3



Toolroom Bench	Status Tags	Mold Finish Guides	Mold Light Bar
Prefix: TRB	Prefix: ST	Prefix: LIT	Prefix: MLB, MLBTF
Page: M-4	Page: M-6	Page: M-7	Page: M-8



Synthetic Grease
Prefix: SYN
Page: M-8

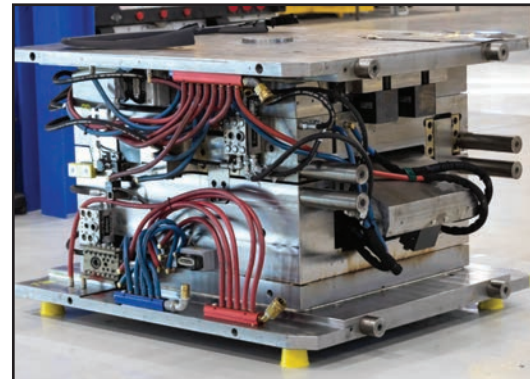
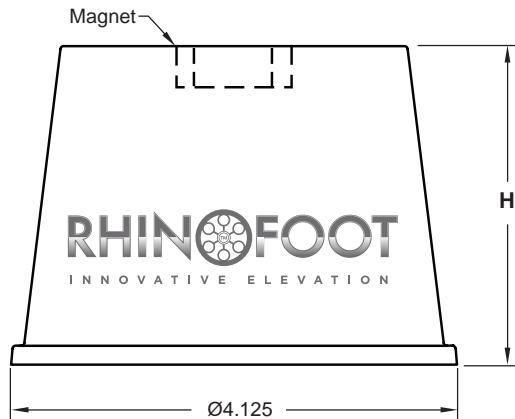




# RHINO FOOT™

Through an alliance with Rhino Visions, Progressive offers the Rhino foot product line to eliminate the hazards associated with placing molds and plates on wood blocks and pallets.

- Safer, cleaner, and improves 5S standards within the shop.
- Safe working load of 7,000 lbs (3,175 kg).
- Height is marked for easy identification.
- Yellow color, sold in packages of four.

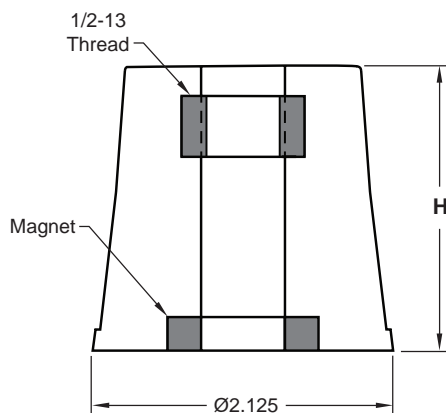


CATALOG NUMBER	H	AVERAGE COMPRESSIVE STRENGTH (LBS/KG)
RHF2	2"	27,392 / 12,425
RHF3	3"	26,815 / 12,163
RHF4	4"	27,604 / 12,521

# RHINO TOES™

Rhino toes are utilized to support a plate or hot runner system for bench work.

- Orange color, sold in packages of four.



### Application Guidelines:

- Using a 1/2-13 threaded rod as shown at left, utilize two toes for additional mold plate separation.
- As shown above, a bolt can be used to attach the toe to the mold or for additional heights.

CATALOG NUMBER	H	SAFE WORKING LOAD WITH SHCS (LBS/KG)	AVERAGE COMPRESSIVE STRENGTH WITH SHCS (LBS/KG)	SAFE WORKING LOAD WITH MAGNET (LBS/KG)	AVERAGE COMPRESSIVE STRENGTH WITH MAGNET (LBS/KG)
RHT1	1"	630 / 286	3,840 / 1,742	2,530 / 1,148	9,380 / 4,255
RHT2	2"	800 / 363	3,340 / 1,515	2,670 / 1,211	11,180 / 5,107
RHT3	3"	830 / 377	3,390 / 1,538	3,000 / 1,361	11,330 / 5,139

1/2-13 threaded rod and bolt not included.

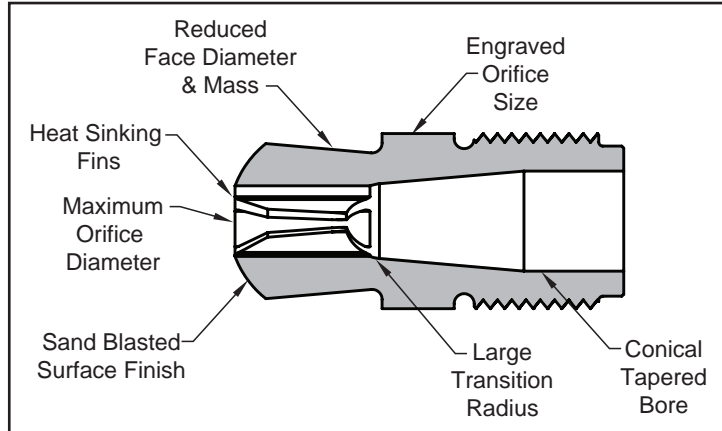
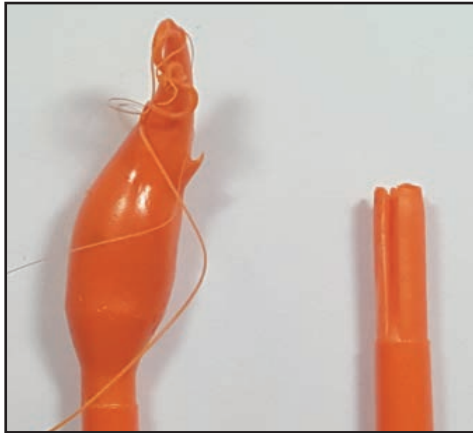


# NOZZLES



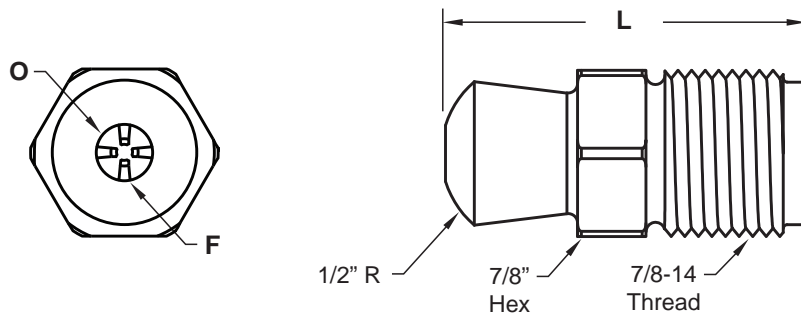
Progressive Components provides the best solution to prevent mold-damaging strings. A patented new machine nozzle tip dramatically reduces the solidification time, the root cause of string formation.

- No need to increase cycle times, use smaller orifice sizes, or nozzle tips with restrictive internal bores in order to stop nozzle stringing.
- Proven successful with commodity and engineering grade materials, both filled and non-filled.



### Technical Information:

- Heat-conducting thermal fins extend 75% into the melt stream, for rapid solidification.
- Reduced tip mass provides faster thermal equilibrium and shorter cycle times.
- Flow area equivalent to Full Flow style tips, for minimal increase in shear and pressure.
- Hardened 420 stainless steel for corrosion resistance and long life.
- Large internal transition radius virtually eliminates “dead spots”, where material can stagnate.
- Reduced face diameter increases machine’s nozzle touch force, reduces blowback, and eliminates the need for nozzle insulators.
- The 1/2” nozzle radius is actually 0.496”. Together with the sand blasted surface finish, it ensures a proper seal with the sprue bushing, which prevents material leaks and air infiltration.
- Land lengths vary with the orifice size. The larger the orifice, the longer the land length, for increased thermal conductivity.
- Engraved orifice size helps reduce mold set-up time.



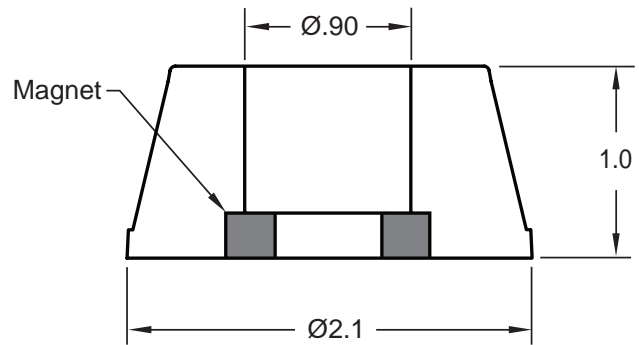
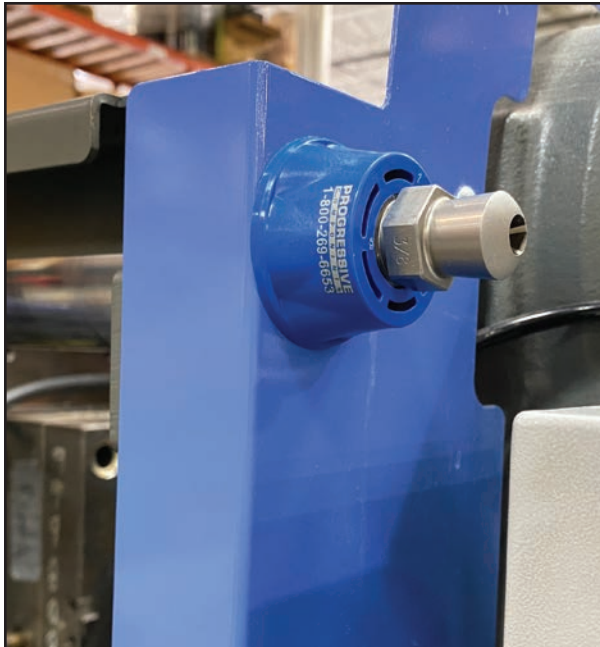
**M** 420 Stainless Steel **H** 48-50 HRC

CATALOG NUMBER	NOMINAL	DECIMAL	F QTY FINS	L
NZFT156	5/32	.1563	3	1.794
NZFT187	3/16	.1875	3	1.817
NZFT219	7/32	.2188	4	1.839
NZFT250	1/4	.2500	4	1.886
NZFT281	9/32	.2813	4	1.881
NZFT312	5/16	.3125	4	1.903
NZFT344	11/32	.3438	4	1.923
NZFT375	3/8	.3750	4	1.943



# NOZZLE CADDIE

Through an alliance with Rhino Visions, Progressive offers a caddy to keep the Fin Tip and other machine Nozzles on the press, close to the tools.



CATALOG NUMBER	DESCRIPTION
NZLCAD1	Machine Nozzle Caddy (Blue)

# WRENCH

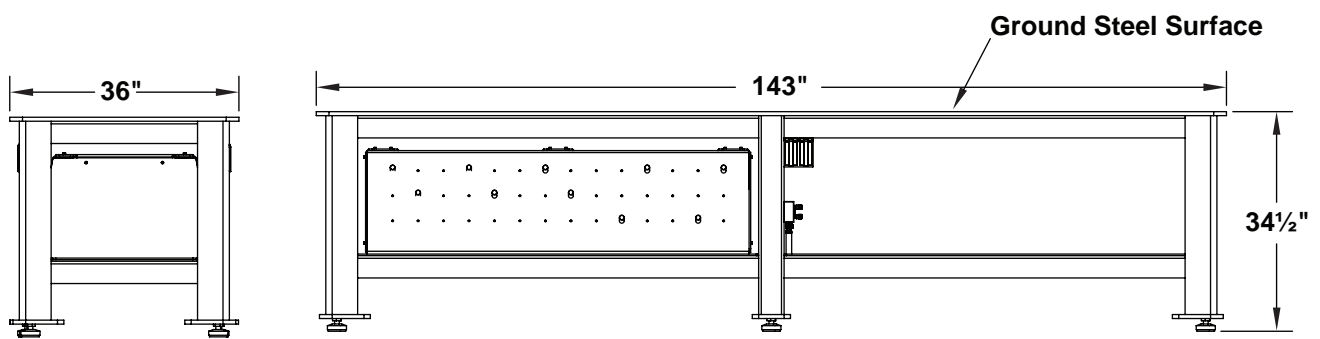
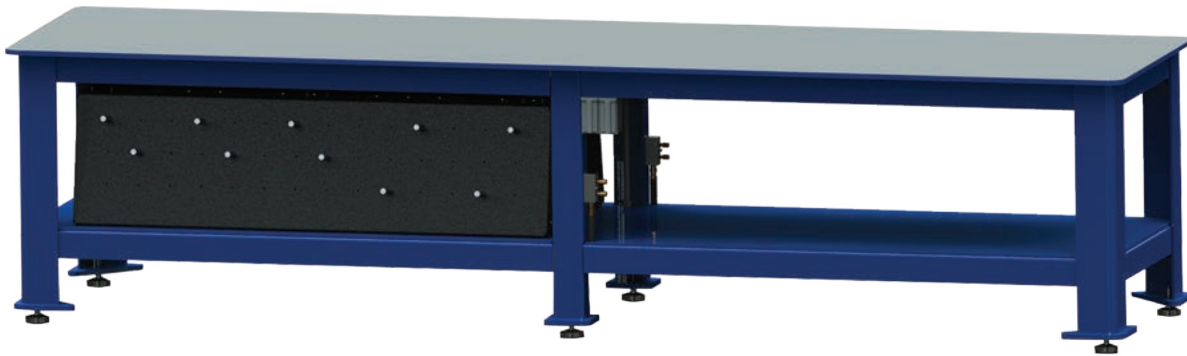
Progressive's offset slugging Wrench is designed for the installation and removal of machine and Fin Tip Nozzles when access is limited.



**M** Steel **S** Zinc Phosphate

CATALOG NUMBER	DESCRIPTION
NZLWR1	7/8" Hex Offset Wrench

# TOOLROOM BENCH



### Bench Optimized for Mold Assembly/Disassembly:

- More efficient mold assembly and disassembly
- Convenient working height
- Shelf for storage
- 3/4" thick Blanchard Ground steel work surface for smooth and easy positioning of mold plates
- Radiused corners on legs to reduce knee injuries
- Bench is all-welded construction
- Max static load rating is 30,000 lbs



### Standardized Design:

- Adopt best practices across your facility
- Consistent so all work areas are equal

### Tool Storage Option:

- Easy access to tools needed on the bench
- Prevent clutter
- Pre-drilled holes and repositionable aluminum pegs for organized and flexible tool storage
- Tool Storage unit fits under one section of the bench
- 1/4" steel, black powder coated
- Recessed 2" from shelf edge and angled back to keep tools in place
- Each tool storage unit includes one board on each side of bench

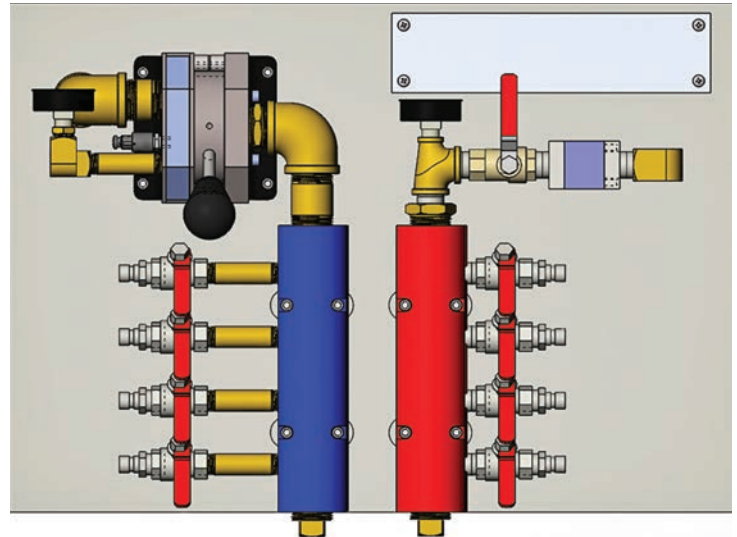




# TOOLROOM BENCH

## Water Manifold and Flow Meter Option:

- Manifold and valves allow quick connection for mold water testing
- Flow meter can be used to ensure flow is even and there are no restrictions
- Ability to bench test for leaks saves valuable time versus testing in the press
- Red and blue manifold similar to what is at the press
- Convenient drain feature provides cleaner, more efficient drainage after testing

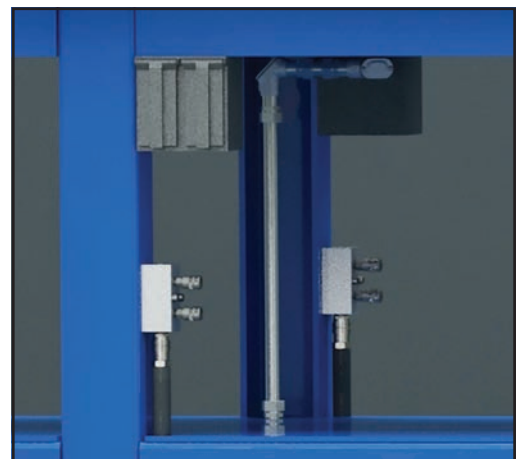


## Air Manifold Option:

- Convenient connection of air tools
- One on each side of the bench
- Hooks to hold air hose

## Electrical Option:

- 2 outlets on either side of the bench
- Electrical hookups are routed under the bench to minimize obstructions
- Positioned centrally on bench for easy access



## Ordering and Configuration Information:

TRB34 - F T A E

### Options:

- F = Manifold and Flow Meter
- T = Tool Storage
- A = Air
- E = Electrical

Note: Standard Toolroom Bench dimensions are 3' wide, by 12' long and 34" high.

### Examples:

- TRB34-FTAE = Toolroom Bench with all options installed
- TRB34-AE = Toolroom Bench with Air and Electrical options installed

# STATUS TAGS

Status Tags magnetically attach to molds and are color-coded for easy identification of mold status at a glance.

- 3.75" Diameter
- Magnetic back
- Laminated vinyl surface
- Sold in packages of 12 tags



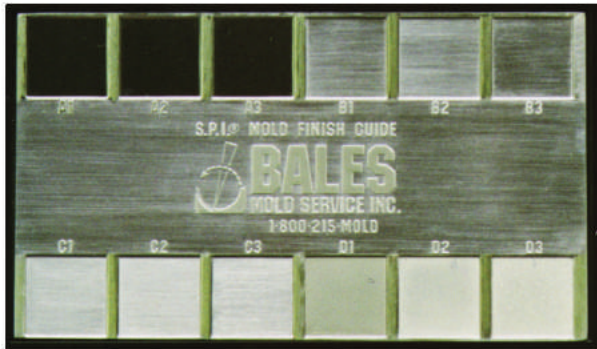
CATALOG NUMBER	COLOR	DESCRIPTION
ST-GRE	Green	Ready to Run
ST-YEL	Yellow	Qualify Mold / Sample
ST-RED	Red	Do Not Run Mold / Repair
ST-ORN	Orange	Maintenance Required
ST-WHT	White	Operator Required
ST-BLK	Black	Obsolete Mold



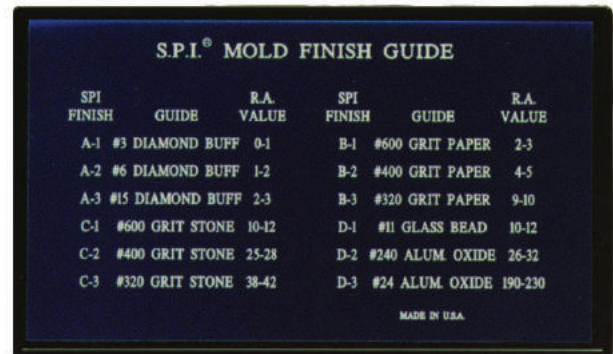


# MOLD FINISH GUIDES

## STEEL INSERT



Front



Back

Manufactured by Bales Mold Service, this SPI Mold Finish Guide shows several finishes, including several diamond comparisons, for measurement of tooling surfaces. The gauge is easy to read and includes data on the back to cross-reference the Roughness Average (RA) and SPI scales.

The 72 HRC surface hardness prevents damage or wear to the finishes after continual usage. In addition, the 3.5" x 6" guide is stored in a plastic sleeve for safe handling.

CATALOG NUMBER  
LIT-BMG

## MOLDED PLASTIC

Molded, ABS plastic plaque, 8-1/2 x 11, showing typical finishes to aid in communication with customers.

Includes A-1, A-2, A-3, B-1, B-2, B-3, C-1, C-2, C-3, D-1, and D-3 finishes.

Provided by the Society of Plastics Industry

CATALOG NUMBER  
LIT-MFC



# MOLD LIGHT BAR



Mold Light Bars provide illumination at the molding press to reduce eye strain and increase visibility for operators and repair technicians.

**Light Bar Technical Information:**

- Wire direct to 24V machine power or optional transformer
- Mounts to press platen magnetically to direct light on mold
- 12w 450mA

**Light Bar Product Information:**

- Six LED floodlights per unit. Rated for 50,000 hours
- Aluminum casting with tempered glass is water and shock resistant
- 45° and 90° swivel mounting brackets included
- IP67 Rated

**Transformer Information:**

- Plugs directly into 110v outlet
- Two screw wire connection



CATALOG NUMBER	DESCRIPTION	VOLTAGE	L	W
MLB2X16	Light Bar	24V	16"	2"
MLBTF	Transformer	110V 24V	—	—

# SYNTHETIC MOLD GREASE



Premium synthetic mold grease provides superior lubrication to sliding or moving components within molds and tooling.

- Engineered for food and medical molding environments
- Low migration
- Should only be applied in a thin layer, by hand

**Technical Information:**

- NSF H1 Registered
- Thermally stable to 300 °C

CATALOG NUMBER	DESCRIPTION
SYN-100	100g Tube



# MOLD-READY™ COMPONENTS

## SECTION X



<b>Keyed Pins, Sleeves &amp; Blade Ejectors</b>	<b>Finished Core Pins</b>	<b>Core/TL Pins: Straight</b>	<b>Core Pins: Single Step</b>
Page: X-1	Page: X-2	Page: X-3	Page: X-4
<b>Core Pins: Two Step</b>	<b>Ejector Pins: Straight</b>	<b>Ejector Pins: Single Step</b>	<b>Ejector Pins: Water Cooled</b>
Page: X-5	Page: X-6	Page: X-7	Page: X-8
<b>Ejector Sleeves: Straight</b>	<b>Ejector Sleeves: Thin Wall</b>	<b>Ejector Sleeves: Stepped</b>	<b>Blade Ejectors</b>
Page: X-9	Page: X-10	Page: X-11	Page: X-12
<b>Side Locks</b>	<b>X-Style Side Locks</b>	<b>Top Locks</b>	<b>Guide Locks</b>
Page: X-13	Page: X-14	Page: X-15	Page: X-16
<b>Bar Locks</b>	<b>Leader Pins: Straight</b>	<b>Leader Pins: Shoulder</b>	<b>Bushings: Shoulder</b>
Page: X-17	Page: X-18	Page: X-19	Page: X-20
<b>Puller Pins</b>	<b>UniLifter Core Blades</b>	<b>UniLifter Core Blades: L-Shaped</b>	<b>UniLifter Core Blades: T-Shaped</b>
Page: X-21	Page: X-22	Page: X-23	Page: X-24
<b>UniLifter Core Blades: Round</b>	<b>Special Tubes</b>	<b>Extension Plugs: Finished Length</b>	<b>Asset Tracking Tags</b>
Page: X-25	Page: X-26	Page: X-27	Page: X-28
<b>Asset Tracking Plates</b>	<b>Angle Pins</b>	<b>Support Pillars</b>	<b>Press Knock Out: Hex Series</b>
Page: X-29	Page: X-30	Page: X-31	Page: X-32







# MOLD-READY™ PINS

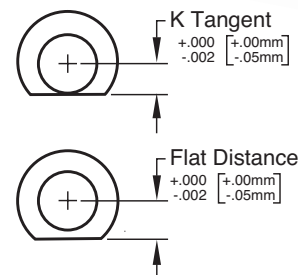
## KEYED PINS, SLEEVES, & BLADE EJECTORS

To order Pins, Sleeves, or Blades with the flat machined on the head tangent to the diameter, designate -K on the end of the catalog number. Ex: EP437L10-K or ES562L5-K.

To order Pins, Sleeves, or Blades with the flat machined on the head at a specific distance from the center of the pin, specify the catalog number and the specific distance after the "K" designation for the flat as shown below.

Examples:

- EP437L10-K.250 for a 7/16" diameter Ejector Pin with a flat 1/4" from center.
- EPD10L200-K6 for a 10mm diameter DIN pin with a flat 6mm from center.
- EPJ055L250-K4 for a 5.5mm diameter JIS pin with a flat 4mm from center.
- CPH125L6-K.094 for a 1/8" diameter Core Pin with a flat ground 3/32" from center.
- ES562L5-K.375 for a 9/16" ID Sleeve with a flat ground 3/8" from center.
- ESTW375L8-K.375 for a 3/8" ID Thin Wall Sleeve with a flat ground .375" from center.
- BE125-046L6.5-K.094 for an Ejector Blade (.046" thickness) with the flat 3/32" from center.

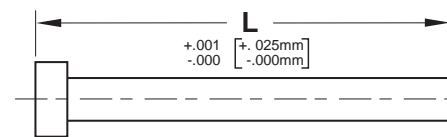
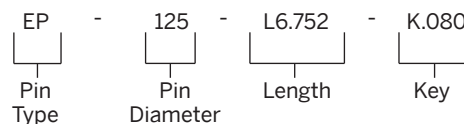


## CUT-TO-LENGTH PINS & SLEEVES

To order Pins, Sleeves, or Blades cut to your specified length,  $+0.001/-0.000$  ( $+0.025/-0.000\text{mm}$ ), with or without keyed heads, specify the length required after the standard catalog numbers.

Examples:

- EP437L6.25-K.250 for a 7/16" diameter pin x 6.25" long with a flat 1/4" from center
- EPD10L225.5 for a 10mm diameter x 225.5mm long DIN pin
- ES562L5.75 is a 9/16" ID Sleeve cut to 5.75" long
- CPH125L5.25 for a 1/8" Core Pin cut to 5.25" long
- BE125-046L4.250-K is an Ejector Blade (.046" thickness) cut to 4.250" with a key tangent to the 1/8" diameter.



## Additional Services Provided:

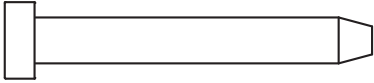
- Laser engraving of detail or model numbers can be performed on the heads.
- Ejector Pins and Sleeves can be ordered with Black Nitriding treatment for better performance. To order, specify -BN at the end of the catalog number, including any special modifications to lengths or keys as noted previously.



Progressive can provide mold-ready components based on your application with specific part numbers as shown above. In addition, items can be quoted using the templates in this section or by providing prints or 3D models.

For a quote, submit your request to [tech@procomps.com](mailto:tech@procomps.com).

# FINISHED CORE PINS



Material: H-13

Core Pins are Hard (**H**=50-55 HRC) or Soft (**S**=30-35 HRC).

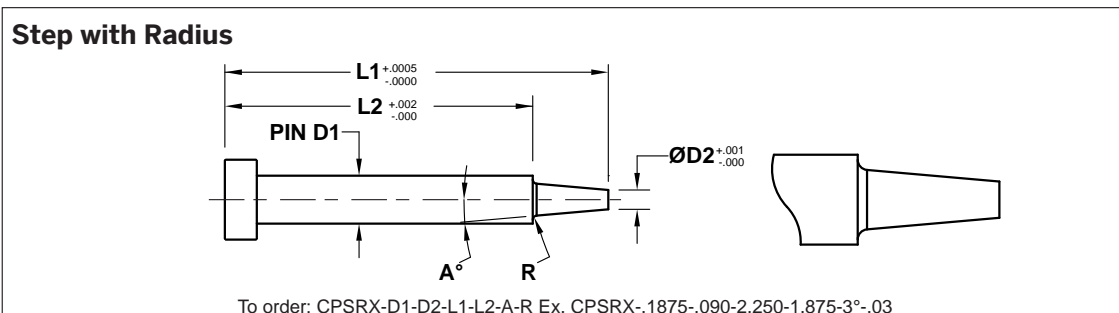
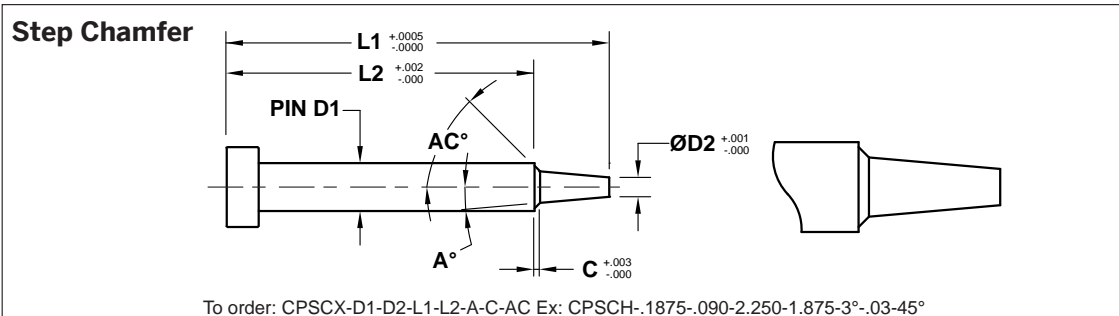
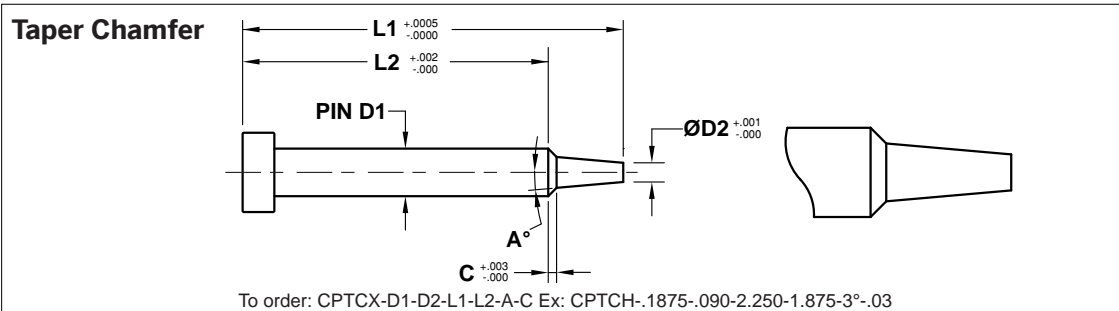
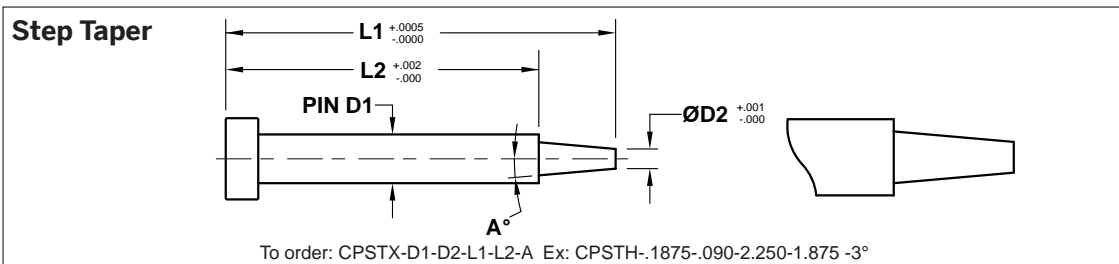
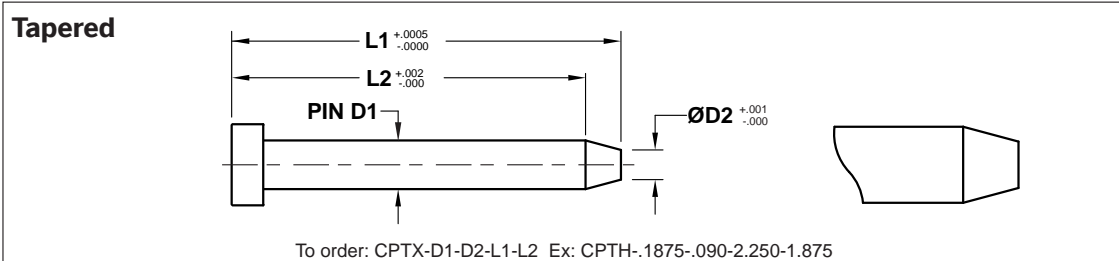
Specify "**H**" or "**S**" as "**X**" in the catalog number below.

All unspecified inside corners = R.010

Angles  $\pm .25^\circ$

Radii  $\pm .004$

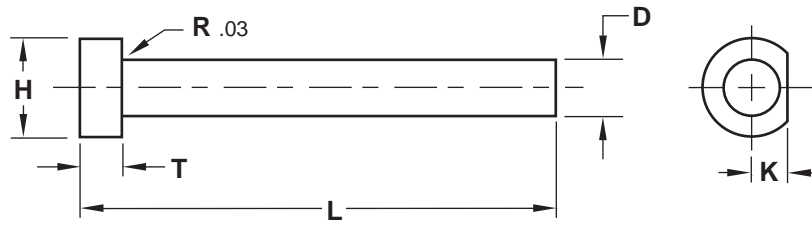
Note: Pin Diameter (D1), head diameter and head thickness are per standard Core Pins as shown on page A-12.





# CORE / TI PINS

## STRAIGHT



Material:

- Core Pin                       TI Pin  
 Material = H-13                      Material = M-2  
 Hard = 50-55 HRC                      Core = 60-64 HRC  
 Soft = 30-35 HRC

Other:

Material	Core Hardness	Surface Hardness	Treatment

STANDARD TOLERANCES		
D	CORE PINS	
	+0.0010	+0.02
+0.0005	+0.01	
D	TI PINS	
	+0.0003	+0.008
-0.0000	-0.000	
T	+0.000	+0.00
	-0.002	-0.05
H	+0.000	+0.0
	-0.010	-0.2
L	+0.060	+1.5
	-0.000	-0.0
K	+0.000	+0.00
	-0.002	-0.05
	INCH	METRIC

PIN #1			
Dimension	Tolerance		
D	<input type="checkbox"/> Standard Core Pin		+
	<input type="checkbox"/> Standard TI Pin		-
H	<input type="checkbox"/> Standard		+
			-
T	<input type="checkbox"/> Standard		+
			-
L	<input type="checkbox"/> Standard		+
	<input type="checkbox"/> Finished Length (+.001/-.000)		-
K	<input type="checkbox"/> Standard		+
			-
R	<input type="checkbox"/> .03 (.75mm)		+
	<input type="checkbox"/> .06 (1.5mm)		-
<b>Quantity:</b>			

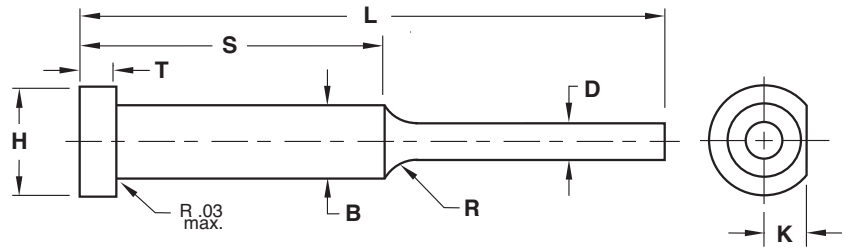
PIN #2			
Dimension	Tolerance		
D	<input type="checkbox"/> Standard Core Pin		+
	<input type="checkbox"/> Standard TI Pin		-
H	<input type="checkbox"/> Standard		+
			-
T	<input type="checkbox"/> Standard		+
			-
L	<input type="checkbox"/> Standard		+
	<input type="checkbox"/> Finished Length (+.001/-.000)		-
K	<input type="checkbox"/> Standard		+
			-
R	<input type="checkbox"/> .03 (.75mm)		+
	<input type="checkbox"/> .06 (1.5mm)		-
<b>Quantity:</b>			

**E-MAIL TECH@PROCOMPS.COM**

CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# CORE PINS

## SINGLE STEP



STANDARD TOLERANCES		
CORE PINS		
D	+0.0005 +0.0000	+0.02 +0.00
B	+0.0005 +0.0010	+0.01 +0.02
L	+0.06 -0.00	+1.5 -0.0
H	+0.000 -0.010	+0.00 -0.2
T	+0.000 -0.002	+0.00 -0.05
K	+0.000 -0.002	+0.00 -0.05
S	±0.03	±1.0
	INCH	METRIC

Material:

- Core Pin  
 Material = H-13  
 Hard = 50-55 HRC  
 Soft = 30-35 HRC

Other:

Material	Core Hardness	Surface Hardness	Treatment

PIN #1			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard Ejector Pin		+
	<input type="checkbox"/> Standard Core Pin		-
<b>B</b>	<input type="checkbox"/> Standard Ejector Pin		+
	<input type="checkbox"/> Standard Core Pin		-
<b>L</b>	<input type="checkbox"/> Standard		+
			-
<b>S</b>	<input type="checkbox"/> Standard		+
			-
<b>H</b>	<input type="checkbox"/> Standard		+
			-
<b>T</b>	<input type="checkbox"/> Standard		+
			-
<b>K</b>	<input type="checkbox"/> Standard		+
			-
<b>R</b>	<input type="checkbox"/> To Suit		+
			-
<b>Quantity:</b>			

PIN #2			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard Ejector Pin		+
	<input type="checkbox"/> Standard Core Pin		-
<b>B</b>	<input type="checkbox"/> Standard Ejector Pin		+
	<input type="checkbox"/> Standard Core Pin		-
<b>L</b>	<input type="checkbox"/> Standard		+
			-
<b>S</b>	<input type="checkbox"/> Standard		+
			-
<b>H</b>	<input type="checkbox"/> Standard		+
			-
<b>T</b>	<input type="checkbox"/> Standard		+
			-
<b>K</b>	<input type="checkbox"/> Standard		+
			-
<b>R</b>	<input type="checkbox"/> To Suit		+
			-
<b>Quantity:</b>			

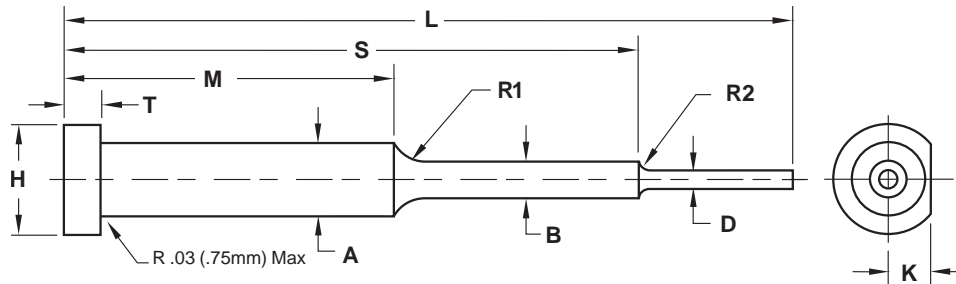
E-MAIL TECH@PROCOMPS.COM

CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# CORE PINS

## TWO STEP



Material:

- Core Pin  
 Material = H-13  
 Hard = 50-55 HRC  
 Soft = 30-35 HRC

Other:

Material	Core Hardness	Surface Hardness	Treatment

STANDARD TOLERANCES		
CORE PINS		
D	+0.0005	+0.02
B	-0.000	-0.00
A	+0.000	+0.00
	-0.001	-0.02
L	+0.060	+1.5
	-0.000	-0.0
H	+0.000	+0.00
	-0.010	-0.2
T	+0.000	+0.00
	-0.002	-0.05
S	±0.03	±1.0
M	±0.03	±1.0
K	+0.000	+0.00
	-0.002	-0.05
	INCH	METRIC

PIN #1			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	-
<b>B</b>	<input type="checkbox"/> Standard	+	-
<b>A</b>	<input type="checkbox"/> Standard	+	-
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/-0.00)	+	-
<b>S</b>	<input type="checkbox"/> Standard	+	-
<b>H</b>	<input type="checkbox"/> Standard	+	-
<b>T</b>	<input type="checkbox"/> Standard	+	-
<b>M</b>	<input type="checkbox"/> Standard	+	-
<b>K</b>	<input type="checkbox"/> Standard	+	-
<b>R1</b>	<input type="checkbox"/> To Suit		
<b>R2</b>	<input type="checkbox"/> To Suit		
<b>Quantity:</b>			

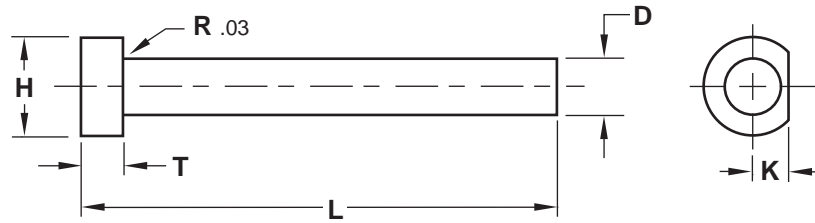
PIN #2			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	-
<b>B</b>	<input type="checkbox"/> Standard	+	-
<b>A</b>	<input type="checkbox"/> Standard	+	-
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/-0.00)	+	-
<b>S</b>	<input type="checkbox"/> Standard	+	-
<b>H</b>	<input type="checkbox"/> Standard	+	-
<b>T</b>	<input type="checkbox"/> Standard	+	-
<b>M</b>	<input type="checkbox"/> Standard	+	-
<b>K</b>	<input type="checkbox"/> Standard	+	-
<b>R1</b>	<input type="checkbox"/> To Suit		
<b>R2</b>	<input type="checkbox"/> To Suit		
<b>Quantity:</b>			

**E-MAIL TECH@PROCOMPS.COM**

CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# EJECTOR PINS

## STRAIGHT



Material:  
 Ejector Pin  
 Material = H-13  
 Core = 48-50 HRC  
 Surface = 65-70 HRC

Treatment:  
 Chrome  
 Black Nitride

Other:

Material	Core Hardness	Surface Hardness	Treatment

STANDARD TOLERANCES		
EJECTOR PIN		
D	-0.0004	-0.01
	-0.0007	-0.02
TI PINS		
T	+0.000	+0.00
	-0.002	-0.05
H	+0.000	+0.0
	-0.010	-0.2
L	+0.060	+1.5
	-0.000	-0.0
K	+0.000	+0.00
	-0.002	-0.05
	INCH	METRIC

PIN #1			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard Ejector Pin	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/-0.000)	+	
		-	
<b>K</b>	<input type="checkbox"/> Standard	+	
		-	
<b>R</b>	<input type="checkbox"/> .03 (.75mm) <input type="checkbox"/> .06 (1.5mm)	+	
		-	
<b>Quantity:</b>			

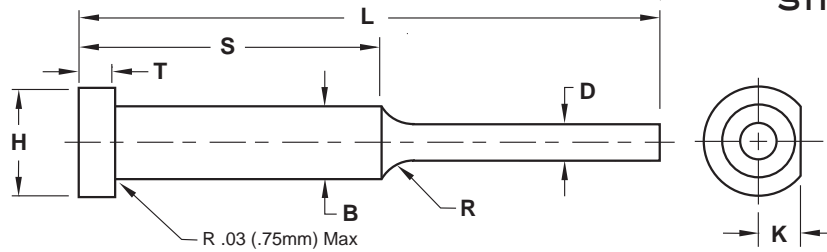
PIN #2			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard Ejector Pin	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/-0.000)	+	
		-	
<b>K</b>	<input type="checkbox"/> Standard	+	
		-	
<b>R</b>	<input type="checkbox"/> .03 (.75mm) <input type="checkbox"/> .06 (1.5mm)	+	
		-	
<b>Quantity:</b>			

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# EJECTOR PINS

## SINGLE STEP



STANDARD TOLERANCES		
D	-0.0004	-0.01
	-0.0007	-0.02
B	+0.000	+0.00
	-0.001	-0.02
L	+0.06	+1.5
	-0.00	-0.0
H	+0.000	+0.00
	-0.010	-0.2
T	+0.000	+0.05
	-0.002	-0.05
K	+0.000	+0.00
	-0.002	-0.05
S	±0.03	±1.0
	INCH	METRIC

Material:

- Ejector Pin  
 Material = H-13  
 Core = 48-50 HRC  
 Surface = 65-70 HRC

Treatment:

- Chrome  
 Black Nitride

Other:

Material	Core Hardness	Surface Hardness	Treatment

PIN #1			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/-0.000)	+	
		-	
<b>S</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>K</b>	<input type="checkbox"/> Standard	+	
		-	
<b>R</b>	<input type="checkbox"/> To Suit	+	
		-	
<b>Quantity:</b>			

PIN #2			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/-0.000)	+	
		-	
<b>S</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>K</b>	<input type="checkbox"/> Standard	+	
		-	
<b>R</b>	<input type="checkbox"/> To Suit	+	
		-	
<b>Quantity:</b>			

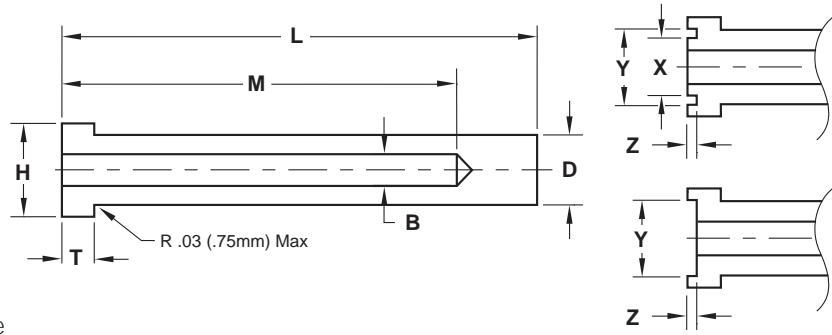
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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# EJECTOR PINS

## WATER COOLED



STANDARD TOLERANCES		
D	-0.004 -0.007	-0.01 -0.02
L	+0.030 -0.000	+0.8 -0.0
H	+0.000 -0.010	+0.0 -0.2
T	+0.000 -0.002	+0.0 -0.05
B	+0.015 -0.000	+0.4 -0.0
M	+0.000 -0.060	+0.0 -1.5
X	+0.002 -0.002	+0.05 -0.05
Y	+0.002 -0.002	+0.05 -0.05
Z	+0.002 -0.002	+0.05 -0.05
	INCH	METRIC

Material:  
 Ejector Pin  
 Material = H-13  
 Core = 48-50 HRC  
 Surface = 65-70 HRC

Treatment:  
 Chrome  
 Black Nitride

Other:

Material	Core Hardness	Surface Hardness	Treatment

PIN #1			
Dimension	Tolerance		
D	<input type="checkbox"/> Standard	+	-
L	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length	+	-
H	<input type="checkbox"/> Standard	+	-
T	<input type="checkbox"/> Standard	+	-
B	<input type="checkbox"/> Standard	+	-
M	<input type="checkbox"/> Standard	+	-
X	<input type="checkbox"/> Standard	+	-
Y	<input type="checkbox"/> Standard	+	-
Z	<input type="checkbox"/> Standard	+	-
<b>Quantity:</b>			

PIN #2			
Dimension	Tolerance		
D	<input type="checkbox"/> Standard	+	-
L	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length	+	-
H	<input type="checkbox"/> Standard	+	-
T	<input type="checkbox"/> Standard	+	-
B	<input type="checkbox"/> Standard	+	-
M	<input type="checkbox"/> Standard	+	-
X	<input type="checkbox"/> Standard	+	-
Y	<input type="checkbox"/> Standard	+	-
Z	<input type="checkbox"/> Standard	+	-
<b>Quantity:</b>			

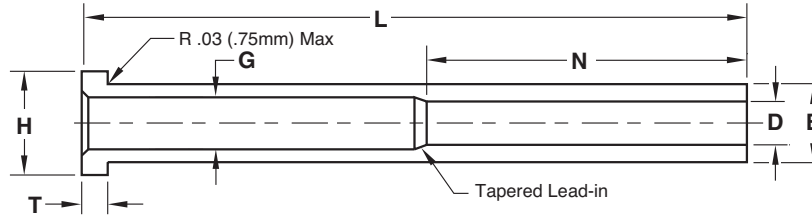
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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# EJECTOR SLEEVES

## STRAIGHT



STANDARD TOLERANCES		
D	+0.0003 -0.0000	+0.007 -0.000
B	-0.0004 -0.0007	-0.01 -0.02
G	±0.015	±0.3
L	+0.030 -0.000	+1.0 -0.0
N	+0.20 -0.00	+5.0 -0.0
H	+0.000 -0.010	+0.0 -0.2
T	+0.000 -0.002	+0.00 -0.05
	INCH	METRIC

**Material:**

- H-13  
Core = 40-45 HRC  
Surface = Nitrided ID/OD\*

- M-2  
Core = 58-62 HRC (Thru Hard)

**Treatment (ID/OD):**

- Chrome  
 Black Nitride  
 Nicklon

Other:

Material	Core Hardness	Surface Hardness	Treatment

Note: \*Nitriding IDOD may not be applicable on all sizes. Progressive will verify when quoting.

SLEEVE #1			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>G</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/- .000)	+	
		-	
<b>N</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

SLEEVE #2			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>G</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/- .000)	+	
		-	
<b>N</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

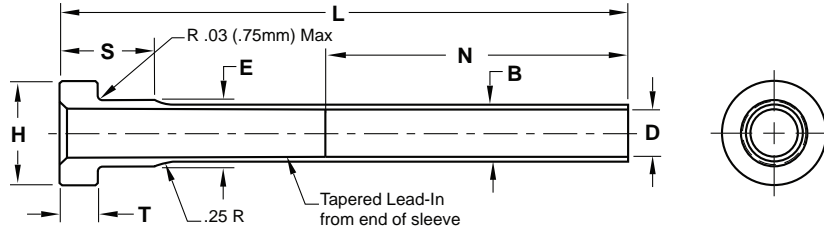
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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# EJECTOR SLEEVES

## THIN WALL

STANDARD TOLERANCES		
D	+0.0003 -0.0000	+0.007 -0.000
B	-0.0004 -0.0007	-0.01 -0.02
L	+0.030 -0.000	+1.0 -0.0
N	+0.20 -0.00	+5.0 -0.0
S	+0.0 -0.1	+0.0 -3.0
G	+0.000 -0.001	+0.00 -0.02
H	+0.000 -0.010	+0.0 -0.2
T	+0.000 -0.002	+0.0 -0.05
	INCH	METRIC



Material:

M-2

Core = 58-62 HRC (Thru Hard)

H-13

Core = 40-45 HRC

Surface = Nitrided ID/OD\*

Other:

Treatment (ID/OD):

Chrome

Black Nitride

Nicklon

Material	Core Hardness	Surface Hardness	Treatment

Note: \*Nitriding IDOD may not be applicable on all sizes. Progressive will verify when quoting.

SLEEVE #1			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/- .000)	+	
		-	
<b>N</b>	<input type="checkbox"/> Standard	+	
		-	
<b>S</b>	<input type="checkbox"/> Standard	+	
		-	
<b>E</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

SLEEVE #2			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/- .000)	+	
		-	
<b>N</b>	<input type="checkbox"/> Standard	+	
		-	
<b>S</b>	<input type="checkbox"/> Standard	+	
		-	
<b>E</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

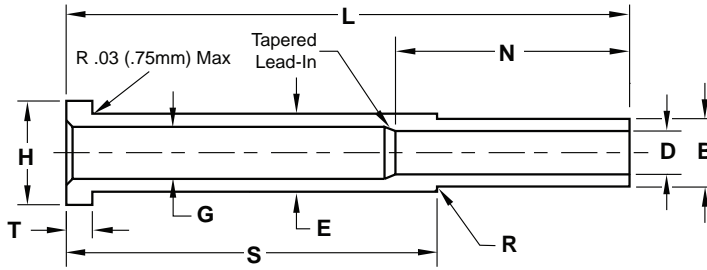
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REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# EJECTOR SLEEVES

## STEPPED



STANDARD TOLERANCES		
D	+0.0003 -0.0000	+0.007 -0.000
B	-0.0004 -0.0007	-0.01 -0.02
E	+0.000 -0.001	+0.00 -0.02
G	±0.015	±0.4
L	+0.030 -0.000	+1.0 -0.0
N	+0.20 -0.00	+5.0 -0.0
S	+0.0 -0.1	+0.0 -3.0
H	+0.000 -0.010	+0.00 -0.20
T	+0.000 -0.002	+0.00 -0.05
	INCH	METRIC

Material:

H-13

Core = 40-45 HRC  
Surface = Nitrided ID/OD\*

M-2

Core = 58-62 HRC (Thru Hard)

Treatment (ID/OD):

Chrome

Black Nitride

Nicklon

Other:

Material	Core Hardness	Surface Hardness	Treatment

Note: \*Nitriding ID/OD may not be applicable on all sizes. Progressive will verify when quoting.

SLEEVE #1			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>E</b>	<input type="checkbox"/> Standard	+	
		-	
<b>G</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/- .000)	+	
		-	
<b>N</b>	<input type="checkbox"/> Standard	+	
		-	
<b>S</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>R</b>	<input type="checkbox"/> To Suit		
<b>Quantity:</b>			

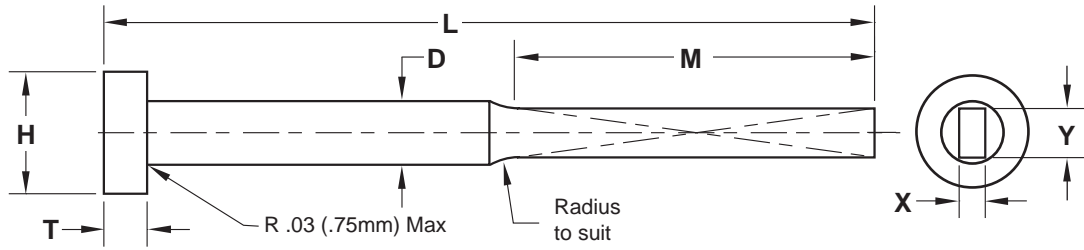
SLEEVE #2			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>E</b>	<input type="checkbox"/> Standard	+	
		-	
<b>G</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard	+	
		-	
<b>N</b>	<input type="checkbox"/> Standard	+	
		-	
<b>S</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>R</b>	<input type="checkbox"/> To Suit		
<b>Quantity:</b>			

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REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# BLADE EJECTORS

STANDARD TOLERANCES		
X	+0.0000 -0.0005	+0.000 -0.015
Y	+0.0000 -0.0005	+0.000 -0.015
D	+0.000 -0.001	+0.00 -0.02
L	+0.04 -0.00	+1.0 -0.0
M	+0.04 +0.08	+1.0 +2.0
H	+0.000 -0.010	+0.0 -0.2
T	+0.000 -0.002	+0.00 -0.05
	INCH	METRIC



Material:  
O-1  
58-62 HRC Thru Hard

Treatment:  
 Chrome

BLADE #1			
Dimension		Tolerance	
X	<input type="checkbox"/> Standard	+	
		-	
Y	<input type="checkbox"/> Standard	+	
		-	
D	<input type="checkbox"/> Standard	+	
		-	
L	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/- .000)	+	
		-	
M	<input type="checkbox"/> Standard	+	
		-	
H	<input type="checkbox"/> Standard	+	
		-	
T	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

BLADE #2			
Dimension		Tolerance	
X	<input type="checkbox"/> Standard	+	
		-	
Y	<input type="checkbox"/> Standard	+	
		-	
D	<input type="checkbox"/> Standard	+	
		-	
L	<input type="checkbox"/> Standard <input type="checkbox"/> Finished Length (+.001/- .000)	+	
		-	
M	<input type="checkbox"/> Standard	+	
		-	
H	<input type="checkbox"/> Standard	+	
		-	
T	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

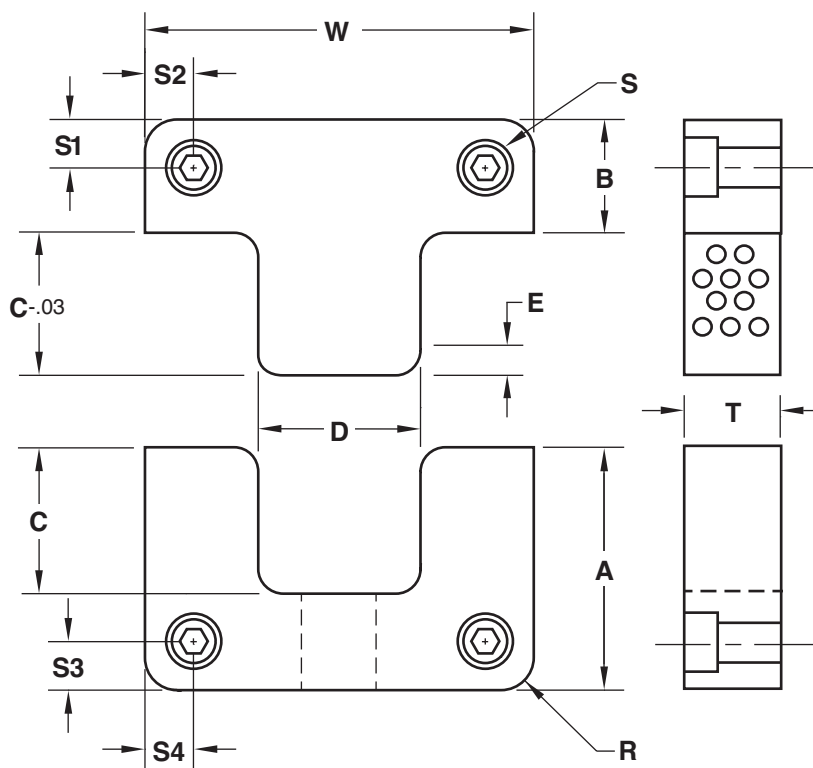
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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# SIDE LOCKS

## Z-SERIES™



**Male Insert**  
 Material = H-13  
 Core = 42-48 HRC  
 Surface = 70 HRC  
 Treatment = Salt Bath Nitride

**Female Insert**  
 Material = D-2  
 Core = 58-62 HRC  
 Surface = 80 HRC  
 Treatment = Titanium Nitride Coated

STANDARD TOLERANCES		
A	+0.000 -0.002	+0.00 -0.05
B	+0.000 -0.002	+0.00 -0.05
C	±0.01	±0.2
T	+0.000 -0.002	+0.00 -0.05
W	+0.0000 -0.0004	+0.00 -0.01
S1-4	±0.01	±0.25
	INCH	METRIC

SIDE LOCK				R	<input type="checkbox"/> To Suit	Pocket Radius (Lock machined to suit)
Dimension	Tolerance					
A	<input type="checkbox"/> Standard	+	-	E	<input type="checkbox"/> To Suit	Engagement Radius
B	<input type="checkbox"/> Standard	+	-	S		SHCS SIZE
C	<input type="checkbox"/> Standard	+	-	S1		
D	<input type="checkbox"/> Standard	.0001-.0003 (.002-.008mm) Clearance per side		S2		
T	<input type="checkbox"/> Standard	+	-	S3		
W	<input type="checkbox"/> Standard	+	-	S4		
<b>Quantity (Sets of 1M/1F):</b>		<b>Special Configs:</b>		<b>Qty Male:</b>	<b>Qty Female:</b>	

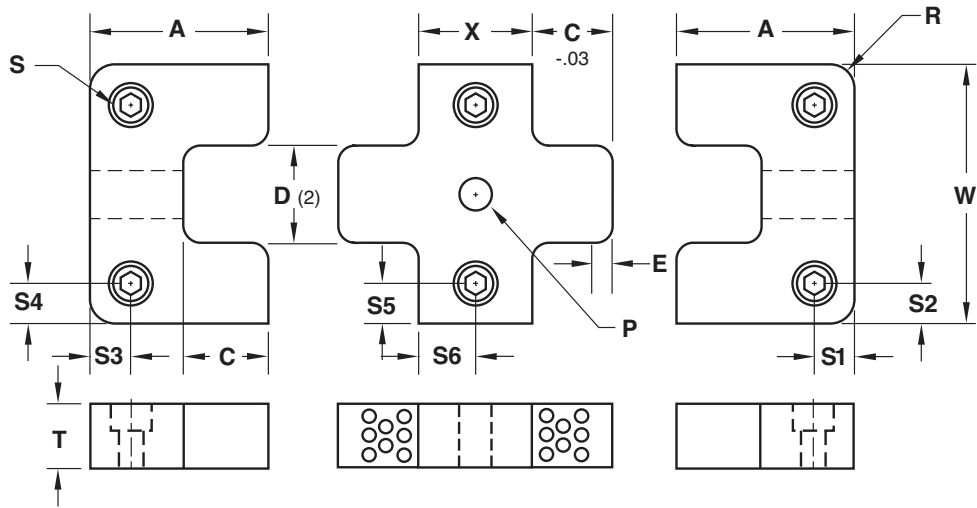
**E-MAIL TECH@PROCOMPS.COM**

CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# X-STYLE SIDE LOCKS

## Z-SERIES™

STANDARD TOLERANCES		
A	+0.000 -0.002	+0.00 -0.05
X	+0.000 -0.002	+0.00 -0.05
C	±0.01	±0.2
T	+0.000 -0.002	+0.00 -0.05
W	+0.0000 -0.0004	+0.00 -0.01
S1-6	±0.01	±0.2
P	+0.001 -0.000	+0.03 -0.00
	INCH	METRIC



**Male Insert**

Material = H-13  
 Core = 42-48 HRC  
 Surface = 70 HRC  
 Treatment = Salt Bath Nitride

**Female Insert**

Material = D-2  
 Core = 58-62 HRC  
 Surface = 80 HRC  
 Treatment = Titanium Nitride Coated

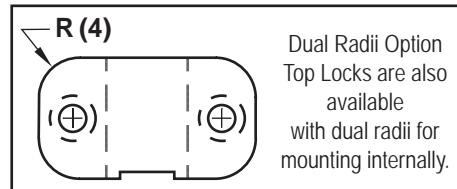
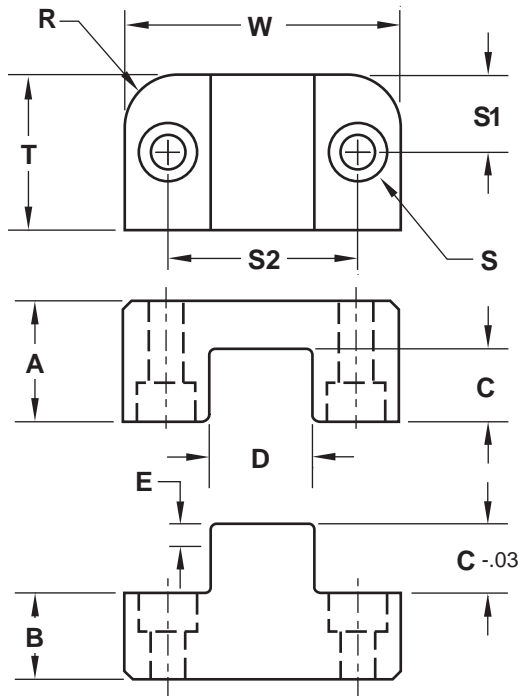
X-STYLE LOCK				D	<input type="checkbox"/> Standard .0001-.0003 (.002-.008mm) Clearance per side	S1
Dimension	Tolerance					
A	<input type="checkbox"/> Standard	+ -	R	<input type="checkbox"/> To Suit	Pocket Radius (Lock machined to suit)	S2
X	<input type="checkbox"/> Standard	+ -	E	<input type="checkbox"/> To Suit	Engagement Radius	S3
C	<input type="checkbox"/> Standard	+ -	S		SHCS SIZE	S4
T	<input type="checkbox"/> Standard	+ -	P		Dowel Diameter	S5
W	<input type="checkbox"/> Standard	+ -				S6
Quantity (Sets of 1M/2F):		Special Configs:		Qty Male:	Qty Female:	

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# TOP LOCKS

## Z-SERIES™



STANDARD TOLERANCES		
A	+0.000 -0.002	+0.00 -0.05
B	+0.000 -0.002	+0.00 -0.05
C	±0.01	±0.2
T	+0.000 -0.002	+0.00 -0.05
W	+0.0000 -0.0004	+0.00 -0.01
S1-2	±0.01	±0.2
	INCH	METRIC

**Male Insert**  
Material = H-13  
Core = 42-48 HRC  
Surface = 70 HRC  
Treatment = Salt Bath Nitride

**Female Insert**  
Material = D-2  
Core = 58-62 HRC  
Surface = 80 HRC  
Treatment = Titanium Nitride Coated

TOP LOCK				R	<input type="checkbox"/> To Suit	Pocket Radius (Lock machined to suit)
Dimension	Tolerance					
A	<input type="checkbox"/> Standard	+	-	DUAL RADII	<input type="checkbox"/> Yes <input type="checkbox"/> No	
B	<input type="checkbox"/> Standard	+	-			
C	<input type="checkbox"/> Standard	+	-	S		SHCS SIZE
D	<input type="checkbox"/> Standard	.0001-.0003 (.002-.008mm) Clearance per side				
T	<input type="checkbox"/> Standard	+	-	S2		
W	<input type="checkbox"/> Standard	+	-			
<b>Quantity (Sets of 1M/1F):</b>		<b>Special Configs:</b>		<b>Qty Male:</b>	<b>Qty Female:</b>	

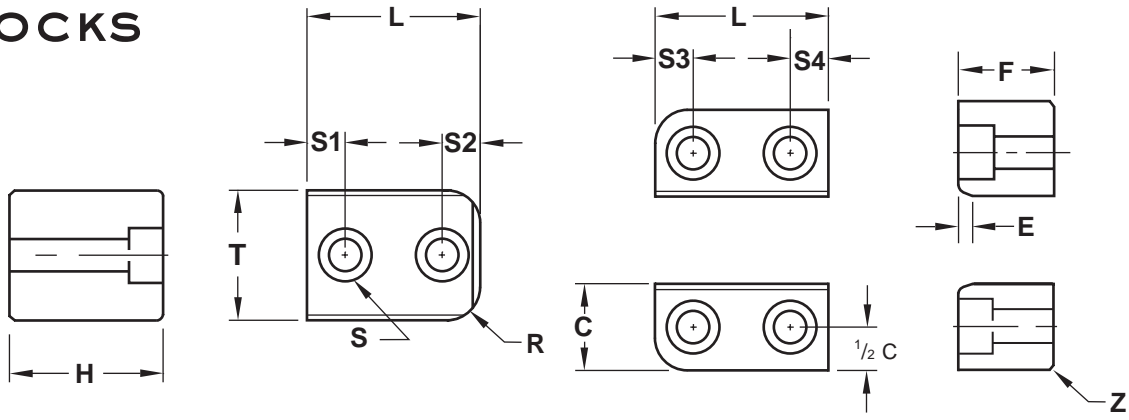
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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# GUIDE LOCKS

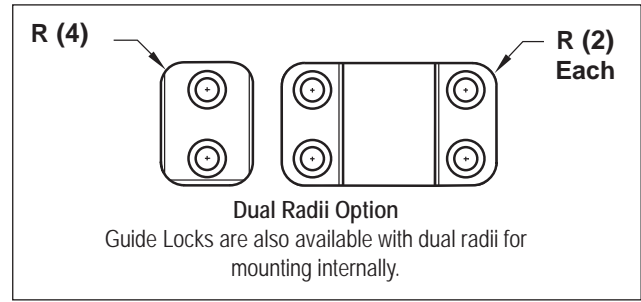
## Z-SERIES™



STANDARD TOLERANCES		
L	+0.000 -0.010	+0.00 -0.25
H	+0.00 -0.01	+0.0 -0.2
T	+0.0000 -0.0003	+0.00 -0.01
C	+0.0000 -0.0003	+0.00 -0.01
F	+0.000 -0.005	+0.00 -0.12
S1-4	±0.01	±0.2
	INCH	METRIC

**Male Insert**  
 Material = H-13  
 Core = 42-48 HRC  
 Surface = 70 HRC  
 Treatment = Salt Bath Nitride

**Female Insert**  
 Material = D-2  
 Core = 58-62 HRC  
 Surface = 80 HRC  
 Treatment = Titanium Nitride Coated



GUIDE LOCK				R	<input type="checkbox"/> To Suit Pocket Radius (Lock machined to suit)	DUAL RADII	<input type="checkbox"/> Yes <input type="checkbox"/> No
Dimension	Tolerance						
L	<input type="checkbox"/> Standard	+	-	Z	<input type="checkbox"/> Standard	+	-
H	<input type="checkbox"/> Standard	+	-	S	SHCS		
T	<input type="checkbox"/> Standard	+	-	S1	<b>Quantity (Sets of 1M/2F):</b>		
C	<input type="checkbox"/> Standard	+	-	S2			
F	<input type="checkbox"/> Standard	+	-	S3	<b>Special Configs:</b>		
E	<input type="checkbox"/> To Suit	Engagement Radius	S4	<b>Qty Male:</b>			
				<b>Qty Female:</b>			

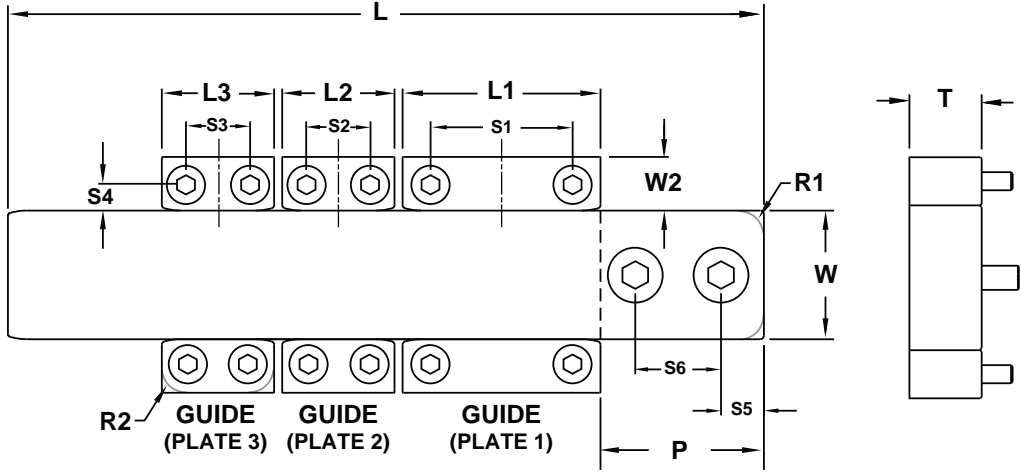
<b>E-MAIL TECH@PROCOMPS.COM</b>		
CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# BAR LOCKS Z-SERIES™

**Bars**  
 Material = H-13  
 Core = 42-48 HRC  
 Surface = 70 HRC  
 Treatment = Salt Bath Nitride

**Guides**  
 Material = D-2  
 Core = 58-62 HRC  
 Surface = 80 HRC  
 Treatment = Titanium Nitride Coated



BAR		W	S5	S6	P	R1 (Optional)
L	T					
Quantity:						

STANDARD TOLERANCES		
L-L3	+0.000 -0.005	+0.00 -0.15
T	+0.000 -0.005	+0.00 -0.15
W-W2	+0.0000 -0.0003	+0.000 -0.007
S1-S6	±0.005	±0.1
	INCH	METRIC

GUIDE 1		W2	S1	S4	R2 (Optional)
L1	T				
Quantity:					

GUIDE 2		W2	S2	S4	R2 (Optional)
L2	T				
Quantity:					

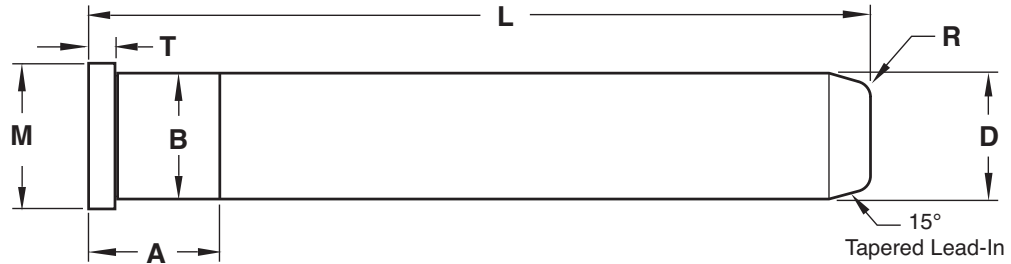
GUIDE 3		W2	S3	S4	R2 (Optional)
L3	T				
Quantity:					

**Note:**  
 When ordering full sets of bars/guides, the "T" dimension should be equal on all items.  
 Progressive will determine the lead-in radius, SHCS size, and center spacing.  
 Bars sold individually.  
 Guides sold in pairs.  
 To order standard bars cut to length or bars/guides with pocket radii, please refer to page C-7.

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# LEADER PINS

## STRAIGHT



STANDARD TOLERANCES		
D	+0.0000 -0.0005	+0.00 -0.01
B	+0.0005 -0.0000	+0.01 -0.00
A	+0.000 -0.030	+0.0 -1.0
L	+0.000 -0.030	+0.0 -1.0
M	+0.000 -0.010	+0.0 -0.2
T	+0.000 -0.002	+0.00 -0.05
	INCH	METRIC

**Material:**  
 AISI 1117  
 Surface = 58-62 HRC  
 Core = 20-22 HRC

**Treatment:**  
 Black Nitride

PIN #1			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>A</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard	+	
		-	
<b>M</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>R</b>	<input type="checkbox"/> 1/16 for D = 1 1/4 max. <input type="checkbox"/> 3/16 for D over 1 1/4		
<b>Quantity:</b>			

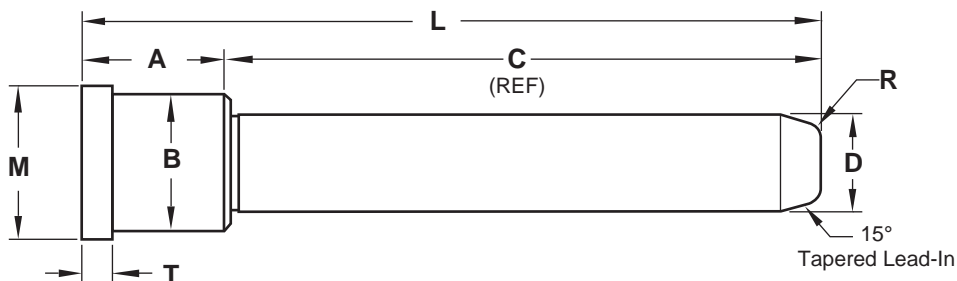
PIN #2			
Dimension	Tolerance		
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>A</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> Standard	+	
		-	
<b>M</b>	<input type="checkbox"/> Standard	+	
		-	
<b>T</b>	<input type="checkbox"/> Standard	+	
		-	
<b>R</b>	<input type="checkbox"/> 1/16 for D = 1 1/4 max. <input type="checkbox"/> 3/16 for D over 1 1/4		
<b>Quantity:</b>			

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# LEADER PINS SHOULDER



STANDARD TOLERANCES		
D	+0.0000	+0.00
	-0.0005	-0.01
B	+0.0005	+0.01
	-0.0000	-0.00
L	+0.000	+0.0
	-0.030	-1.0
A	+0.000	+0.0
	-0.030	-1.0
M	+0.000	+0.0
	-0.010	-0.2
T	+0.000	+0.00
	-0.002	-0.05
	INCH	METRIC

Material:  
AISI 1117  
Surface = 58-62 HRC  
Core = 42-48 HRC

Treatment:  
 Black Nitride

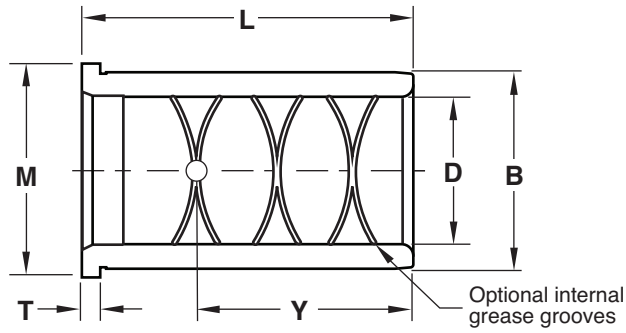
PIN #1			
Dimension	Tolerance		
D	<input type="checkbox"/> Standard	+	
		-	
B	<input type="checkbox"/> Standard	+	
		-	
A	<input type="checkbox"/> Standard	+	
		-	
L	<input type="checkbox"/> Standard	+	
		-	
C	REF		
M	<input type="checkbox"/> Standard	+	
		-	
T	<input type="checkbox"/> Standard	+	
		-	
R	<input type="checkbox"/> 1/16 for D = 1 1/4 max. <input type="checkbox"/> 3/16 for D over 1 1/4		
Quantity:			

PIN #2			
Dimension	Tolerance		
D	<input type="checkbox"/> Standard	+	
		-	
B	<input type="checkbox"/> Standard	+	
		-	
A	<input type="checkbox"/> Standard	+	
		-	
L	<input type="checkbox"/> Standard	+	
		-	
C	REF		
M	<input type="checkbox"/> Standard	+	
		-	
T	<input type="checkbox"/> Standard	+	
		-	
R	<input type="checkbox"/> 1/16 for D = 1 1/4 max. <input type="checkbox"/> 3/16 for D over 1 1/4		
Quantity:			

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# BUSHINGS: SHOULDER



STANDARD TOLERANCES		
D	+0.005 -0.000	+0.012 -0.000
B	+0.005 -0.000	+0.012 -0.000
L	-0.015 -0.030	-0.040 -0.070
H	+0.000 -0.010	+0.000 -0.030
T	+0.000 -0.010	+0.000 -0.050
	INCH	METRIC

**Material:**

Steel (STL)

Material = AISI 1117  
Surface = 58-62 HRC

Bronze Plated Steel (SHB)

Material = AISI 1026  
Surface = 22-28 HRC  
Bronze Plated: .004 Deep

**Treatment:**

Black Nitride (STL only)

BUSHING #1			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>B</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>M</b>		<input type="checkbox"/> Standard	+
			-
<b>T</b>		<input type="checkbox"/> Standard	+
			-
<b>Y</b>		<input type="checkbox"/> N/A	+
			-
Grease Grooves		<input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Quantity:</b>			

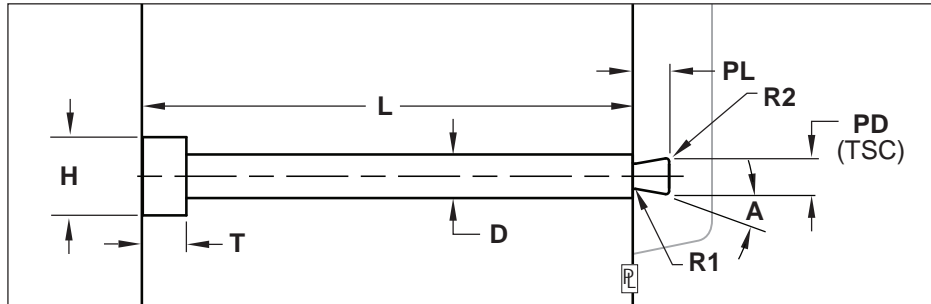
BUSHING #2			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>B</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>M</b>		<input type="checkbox"/> Standard	+
			-
<b>T</b>		<input type="checkbox"/> Standard	+
			-
<b>Y</b>		<input type="checkbox"/> N/A	+
			-
Grease Grooves		<input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Quantity:</b>			

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# PULLER PINS



Material:

- H-13  
Core = 40-45 HRC  
Surface = 60-70 HRC

Other:

Material	Core Hardness	Surface Hardness	Treatment

STANDARD TOLERANCES		
D	-0.0004 -0.0007	-0.01 -0.02
L	±0.003	±0.07
PD	±0.003	±0.07
PL	±0.003	±0.07
	INCH	METRIC

## PULLER PIN #1

Dimension	Tolerance
<b>D</b>	<input type="checkbox"/> Standard + -
<b>L</b>	<input type="checkbox"/> Standard + -
<b>PL</b>	<input type="checkbox"/> Standard + -
<b>PD</b>	<input type="checkbox"/> Standard + -
<b>H</b>	<input type="checkbox"/> Standard + -
<b>T</b>	<input type="checkbox"/> Standard + -
<b>A</b>	
<b>R1</b>	
<b>R2</b>	
<b>Quantity:</b>	

## PULLER PIN #2

Dimension	Tolerance
<b>D</b>	<input type="checkbox"/> Standard + -
<b>L</b>	<input type="checkbox"/> Standard + -
<b>PL</b>	<input type="checkbox"/> Standard + -
<b>PD</b>	<input type="checkbox"/> Standard + -
<b>H</b>	<input type="checkbox"/> Standard + -
<b>T</b>	<input type="checkbox"/> Standard + -
<b>A</b>	
<b>R1</b>	
<b>R2</b>	
<b>Quantity:</b>	

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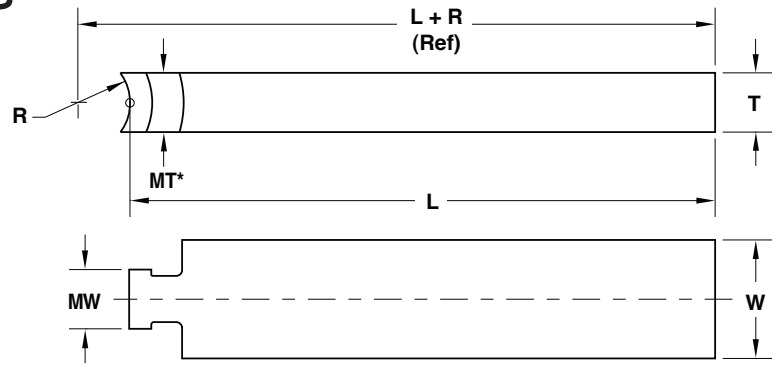
CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# UNILIFTER™ CORE BLADES

STANDARD TOLERANCES		
T	+0.000 -0.001	+0.0 -0.025
W	+0.000 -0.001	+0.0 -0.025
L	+0.06 -0.00	+2.0 -0.0
	INCH	METRIC

Series	R	MT*	MW
MiniLifter	.250	.31	.24
UniLifter	.406	.49	.49
XL Series	.875	1.00	1.00
Metric	10mm	15mm	10mm
Metric Mini	12mm	6mm or T	6mm

\*Note: MT may increase for strength.  
 Note: Altering the MT & MW dimensions (Minimum Thickness and Width of heel area) is not recommended.



Series:

- MiniLifter U-Coupling = UCM50
- UniLifter U-Coupling = UCU87
- Metric MiniLifter U-Coupling = UCMM16
- XL Series U-Coupling = UCX175
- Metric U-Coupling = UCMM22

Material:

- H-13 Hardness = 38-42 HRC
- S-7 Hardness = 54-56 HRC
- H-13 Hardness = 48-50 HRC
- DC53 Hardness = 58-60 HRC
- Aluminum Bronze Hardness = 30 HRC

CORE BLADE #1			
Dimension	Tolerance		
T	<input type="checkbox"/> Standard	+	-
W	<input type="checkbox"/> Standard	+	-
L	<input type="checkbox"/> Standard	+	-
<b>Quantity:</b>			

CORE BLADE #2			
Dimension	Tolerance		
T	<input type="checkbox"/> Standard	+	-
W	<input type="checkbox"/> Standard	+	-
L	<input type="checkbox"/> Standard	+	-
<b>Quantity:</b>			

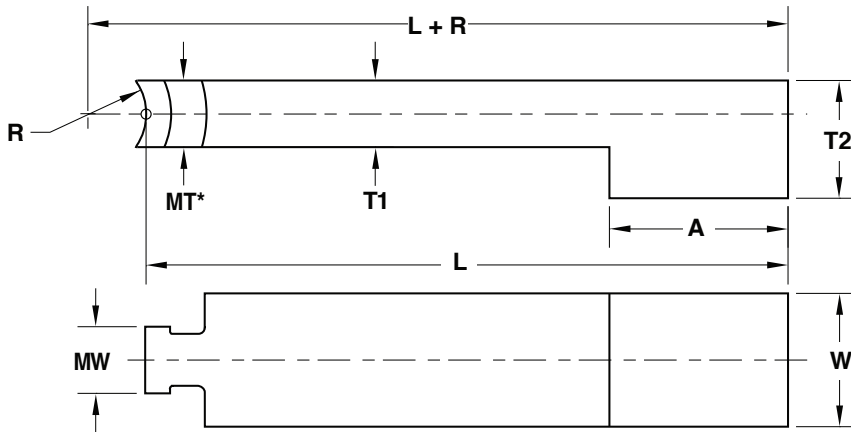
CORE BLADE #3			
Dimension	Tolerance		
T	<input type="checkbox"/> Standard	+	-
W	<input type="checkbox"/> Standard	+	-
L	<input type="checkbox"/> Standard	+	-
<b>Quantity:</b>			

CORE BLADE #4			
Dimension	Tolerance		
T	<input type="checkbox"/> Standard	+	-
W	<input type="checkbox"/> Standard	+	-
L	<input type="checkbox"/> Standard	+	-
<b>Quantity:</b>			

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# UNILIFTER CORE BLADES: L-SHAPED



Series	R	MT*	MW
MiniLifter	.250	.31	.24
UniLifter	.406	.49	.49
XL Series	.875	1.00	1.00
Metric	10mm	15mm	10mm
Metric Mini	12mm	6mm or T	6mm

STANDARD TOLERANCES		
T1	+0.000	+0.0
	-0.001	-0.025
T2	+0.020	+0.5
	-0.000	-0.0
W	+0.000	+0.0
	-0.001	-0.025
A	+0.020	+0.5
	-0.000	-0.0
L	+0.020	+0.5
	-0.000	-0.0
	INCH	METRIC

\*Note: MT may increase for strength.  
 Note: Altering the MT & MW dimensions (Minimum Thickness and Width of heel area) is not recommended.

**Series:**

- MiniLifter  
U-Coupling = UCM50
- UniLifter  
U-Coupling = UCU87
- Metric MiniLifter  
U-Coupling = UCMM16
- XL Series  
U-Coupling = UCX175
- Metric  
U-Coupling = UCMM22

**Material:**

- H-13  
Hardness = 38-42 HRC
- S-7  
Hardness = 54-56 HRC
- H-13  
Hardness = 48-50 HRC
- DC53  
Hardness = 58-60 HRC
- Aluminum Bronze  
Hardness = 30 HRC

CORE BLADE #1			
Dimension		Tolerance	
T1	<input type="checkbox"/> Standard	+	
		-	
T2	<input type="checkbox"/> Standard	+	
		-	
W	<input type="checkbox"/> Standard	+	
		-	
A	<input type="checkbox"/> Standard	+	
		-	
L	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

CORE BLADE #2			
Dimension		Tolerance	
T1	<input type="checkbox"/> Standard	+	
		-	
T2	<input type="checkbox"/> Standard	+	
		-	
W	<input type="checkbox"/> Standard	+	
		-	
A	<input type="checkbox"/> Standard	+	
		-	
L	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

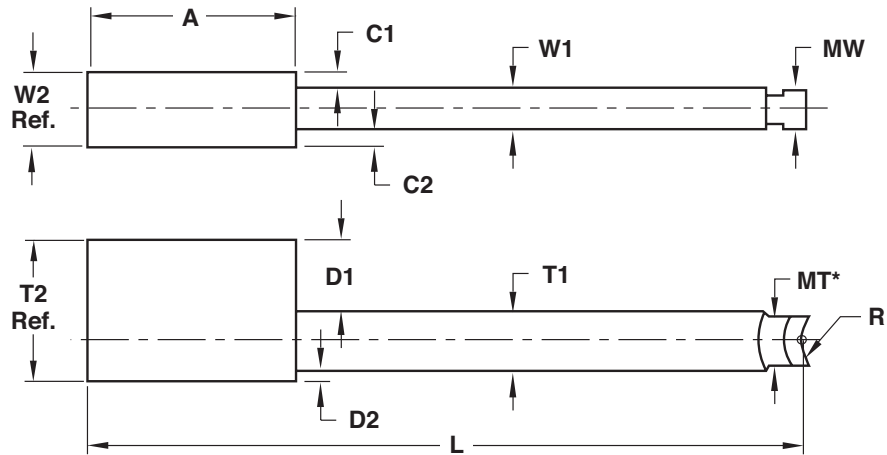
<b>E-MAIL TECH@PROCOMPS.COM</b>		
CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# UNILIFTER CORE BLADES: T-SHAPED

STANDARD TOLERANCES		
T1	+0.000 -0.001	+0.0 -0.025
W1	+0.000 -0.001	+0.0 -0.025
A	+0.020 -0.000	+0.5 -0.0
L	+0.020 -0.000	+0.5 -0.0
	INCH	METRIC

Series	R	MT*	MW
MiniLifter	.250	.31	.24
UniLifter	.406	.49	.49
XL Series	.875	1.00	1.00
Metric	10mm	15mm	10mm
Metric Mini	12mm	6mm or T	6mm



\*Note: MT may increase for strength.

Note: Altering the MT & MW dimensions (Minimum Thickness and Width of heel area) is not recommended.

**Series:**

- MiniLifter  
U-Coupling = UCM50
- Metric MiniLifter  
U-Coupling = UCMM16
- Metric  
U-Coupling = UCMM22
- UniLifter  
U-Coupling = UCU87
- XL Series  
U-Coupling = UCX175

**Material:**

- H-13  
Hardness = 38-42 HRC
- H-13  
Hardness = 48-50 HRC
- Aluminum Bronze  
Hardness = 30 HRC
- S-7  
Hardness = 54-56 HRC
- DC53  
Hardness = 58-60 HRC

## CORE BLADES

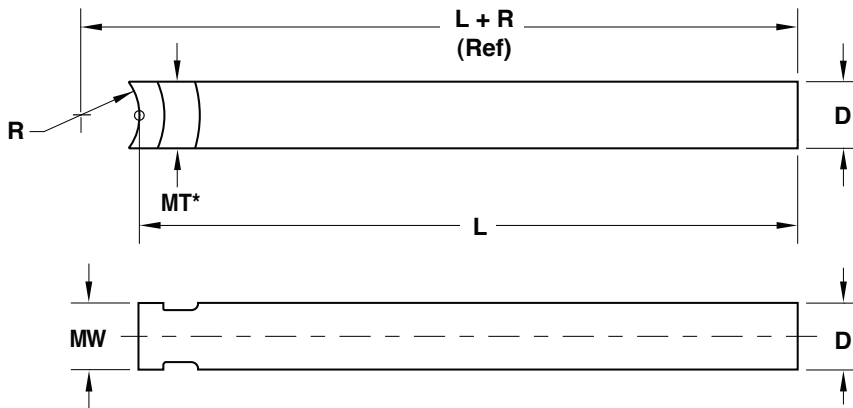
Dimension		Tolerance					
<b>T1</b>	<input type="checkbox"/> Standard	+		<b>W2</b>	REF		
		-					+
<b>T2</b>	REF			<b>C1</b>			-
<b>D1</b>		+		<b>C2</b>			+
		-					-
<b>D2</b>		+		<b>A</b>	<input type="checkbox"/> Standard		+
		-					-
<b>W1</b>	<input type="checkbox"/> Standard	+		<b>L</b>	<input type="checkbox"/> Standard		+
		-					-
				<b>Quantity:</b>			

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# UNILIFTER CORE BLADE: ROUND



Series	R	MT*	MW
MiniLifter	.250	.31	.24
UniLifter	.406	.49	.49
XL Series	.875	1.00	1.00
Metric	10mm	15mm	10mm

STANDARD TOLERANCES		
D	+0.000 -0.001	+0.000 -0.025
L	+0.06 -0.00	+2.0 -0.0
	INCH	METRIC

\*Note: MT may increase for strength.

Note: Altering the MT & MW dimensions (Minimum Thickness and Width of heel area) is not recommended.

### Series:

- MiniLifter  
U-Coupling = UCM50
- Metric MiniLifter  
U-Coupling = UCMM16
- Metric  
U-Coupling = UCMM22
- UniLifter  
U-Coupling = UCU87
- XL Series  
U-Coupling = UCX175

### Material:

- H-13  
Hardness = 38-42 HRC
- H-13  
Hardness = 48-50 HRC
- Aluminum Bronze  
Hardness = 30 HRC
- S-7  
Hardness = 54-56 HRC
- DC53  
Hardness = 58-60 HRC

CORE BLADE #1			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>Quantity:</b>			

CORE BLADE #2			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>Quantity:</b>			

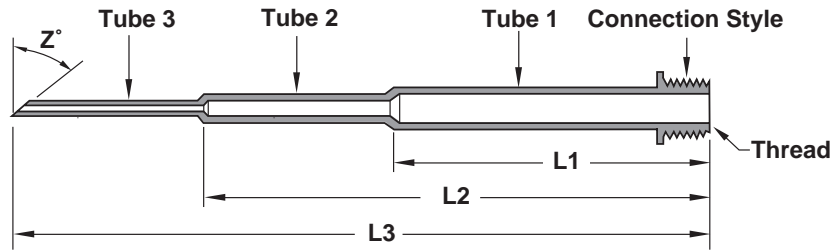
CORE BLADE #3			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>Quantity:</b>			

CORE BLADE #4			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>Quantity:</b>			

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# SPECIAL TUBES



## Special High Flow (Stainless Steel) Specification Template

<b>Quantity Required:</b>		<b>Z=</b>
<b>Tube 1</b>	<b>Tube Gage Size=</b>	<b>L1=</b>
<b>Tube 2</b>	<b>Tube Gage Size=</b>	<b>L2=</b>
<b>Tube 3</b>	<b>Tube Gage Size=</b>	<b>L3=</b>

**Connection Style:** For the specific style of connection, document the thread size needed or select the box with a straight tube.

<p><u>High Flow Tube Style</u></p> <p>Thread Size= _____</p>	<p><u>Hex Series Tube Style</u></p> <p>Thread Size= _____</p>	<p><u>Pipe Plug Style</u></p> <p>Thread Size= _____</p>	<p><u>Set Screw</u></p> <p>Thread Size= _____</p>	<p><input type="checkbox"/> None</p>
--------------------------------------------------------------	---------------------------------------------------------------	---------------------------------------------------------	---------------------------------------------------	--------------------------------------

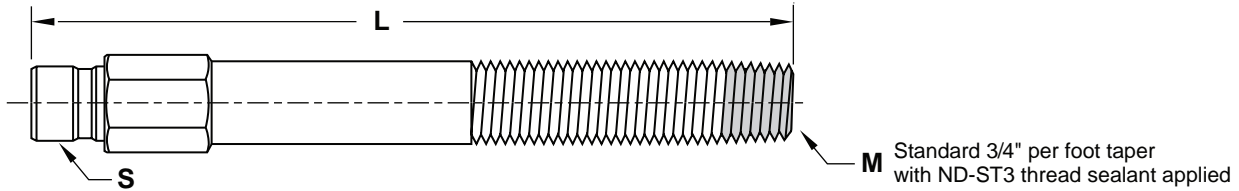
Progressive Components' standard tube sizes shown in red. All others are standard gage sizes.

Gage Size	OD	ID	Theoretic Channel Diam.	Gage Size	OD	ID	Theoretic Channel Diam.	Gage Size	OD	ID	Theoretic Channel Diam.	Gage Size	OD	ID	Theoretic Channel Diam.	Gage Size	OD	ID	Theoretic Channel Diam.
HF437T	.427	.397	.583	7TW	.180	.160	.241	13RW	.095	.071	.119	18XT	.050	.042	0.065	24XX	.022	.016	0.027
HF375T	.365	.340	.499	7X	.180	.166	.245	13TW	.095	.077	.122	19RW	.042	.027	0.050	25RW	.020	.010	0.022
HF312T	.312	.288	.425	8RW	.165	.135	.213	13X	.095	.085	.127	19TW	.042	.032	0.053	25TW	.020	.012	0.023
3RW	.259	.219	.339	8TW	.165	.145	.220	HF093T	.090	.076	.118	19XT	.042	.035	0.055	25XX	.020	.016	0.026
3TW	.259	.229	.346	8XX	.165	.150	.223	14RW	.083	.063	.104	20RW	.0355	.0235	0.043	26RW	.018	.010	0.021
3XT	.259	.239	.352	9RW	.148	.118	.189	14TW	.083	.067	.107	20TW	.0355	.0255	0.044	26TW	.018	.012	0.022
HF250T	.250	.230	.340	9TW	.148	.128	.196	14XT	.083	.072	.110	20XT	.0355	.0275	0.045	26XV	.018	.0135	0.023
4RW	.238	.198	.310	9XX	.148	.135	.200	15RW	.072	.054	.090	21RW	.032	.020	0.038	27RW	.016	.008	0.018
4TW	.238	.208	.316	10RW	.134	.106	.171	HF078T	.072	.060	.094	21TW	.032	.023	0.039	27TW	.016	.010	0.019
4XT	.238	.218	.323	10TW	.134	.114	.176	15XTS	.072	.063	.096	21XT	.032	.025	0.041	27XV	.016	.0115	0.020
5RW	.219	.189	.289	10XT	.134	.118	.179	16RW	.065	.047	.080	22RW	.028	.016	0.032	28RW	.014	.007	0.016
5TW	.219	.199	.296	HF125T	.125	.109	.166	16TW	.065	.053	.084	22TW	.028	.020	0.034	28TW	.014	.009	0.017
5XT	.219	.205	.300	11RW	.120	.094	.152	16TXT	.065	.055	.085	22XTS	.028	.021	0.035	28XV	.014	.0105	0.018
6RW	.203	.173	.267	11TW	.120	.100	.156	17RW	.058	.042	.072	23RW	.025	.013	0.028	29RW	.013	.007	0.015
6TW	.203	.183	.273	11X	.120	.106	.160	17TW	.058	.048	.075	23TW	.025	.017	0.030	30RW	.012	.006	0.013
6X	.203	.189	.277	12RW	.109	.085	.138	17XT	.058	.050	.077	23XX	.025	.020	0.032	31RW	.010	.005	0.011
HF187T	.187	.167	.251	12TW	.109	.091	.142	18RW	.050	.033	.060	24RW	.022	.012	0.025	32RW	.009	.004	0.010
7RW	.180	.150	.234	12XT	.109	.095	.145	18TW	.050	.038	.063	24TW	.022	.014	0.026	33RW	.008	.004	0.009

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# EXTENSION PLUGS: FINISHED LENGTH



EXT. PLUG #1	
Variable	Dimensions
<b>Series (S)</b>	<input type="checkbox"/> 200 (1/4" Flow) <input type="checkbox"/> 300 (3/8" Flow) <input type="checkbox"/> 500 (1/2" Flow) <input type="checkbox"/> Keyed Connect
<b>Thread (M)</b>	<input type="checkbox"/> 1/16-27 NPT (50) <input type="checkbox"/> 1/8-27 NPT (51) <input type="checkbox"/> 1/4-18 NPT (52) <input type="checkbox"/> 3/8-18 NPT (53) <input type="checkbox"/> 1/2-14 NPT (54) <input type="checkbox"/> BSPT Thd: _____
<b>Length (L)</b>	±.015
<b>Material</b>	<input type="checkbox"/> Brass <input type="checkbox"/> Stainless
<b>Quantity:</b>	

EXT. PLUG #2	
Variable	Dimensions
<b>Series (S)</b>	<input type="checkbox"/> 200 (1/4" Flow) <input type="checkbox"/> 300 (3/8" Flow) <input type="checkbox"/> 500 (1/2" Flow) <input type="checkbox"/> Keyed Connect
<b>Thread (M)</b>	<input type="checkbox"/> 1/16-27 NPT (50) <input type="checkbox"/> 1/8-27 NPT (51) <input type="checkbox"/> 1/4-18 NPT (52) <input type="checkbox"/> 3/8-18 NPT (53) <input type="checkbox"/> 1/2-14 NPT (54) <input type="checkbox"/> BSPT Thd: _____
<b>Length (L)</b>	±.015
<b>Material</b>	<input type="checkbox"/> Brass <input type="checkbox"/> Stainless
<b>Quantity:</b>	

EXT. PLUG #3	
Variable	Dimensions
<b>Series (S)</b>	<input type="checkbox"/> 200 (1/4" Flow) <input type="checkbox"/> 300 (3/8" Flow) <input type="checkbox"/> 500 (1/2" Flow) <input type="checkbox"/> Keyed Connect
<b>Thread (M)</b>	<input type="checkbox"/> 1/16-27 NPT (50) <input type="checkbox"/> 1/8-27 NPT (51) <input type="checkbox"/> 1/4-18 NPT (52) <input type="checkbox"/> 3/8-18 NPT (53) <input type="checkbox"/> 1/2-14 NPT (54) <input type="checkbox"/> BSPT Thd: _____
<b>Length (L)</b>	±.015
<b>Material</b>	<input type="checkbox"/> Brass <input type="checkbox"/> Stainless
<b>Quantity:</b>	

EXT. PLUG #4	
Variable	Dimensions
<b>Series (S)</b>	<input type="checkbox"/> 200 (1/4" Flow) <input type="checkbox"/> 300 (3/8" Flow) <input type="checkbox"/> 500 (1/2" Flow) <input type="checkbox"/> Keyed Connect
<b>Thread (M)</b>	<input type="checkbox"/> 1/16-27 NPT (50) <input type="checkbox"/> 1/8-27 NPT (51) <input type="checkbox"/> 1/4-18 NPT (52) <input type="checkbox"/> 3/8-18 NPT (53) <input type="checkbox"/> 1/2-14 NPT (54) <input type="checkbox"/> BSPT Thd: _____
<b>Length (L)</b>	±.015
<b>Material</b>	<input type="checkbox"/> Brass <input type="checkbox"/> Stainless
<b>Quantity:</b>	

EXT. PLUG #5	
Variable	Dimensions
<b>Series (S)</b>	<input type="checkbox"/> 200 (1/4" Flow) <input type="checkbox"/> 300 (3/8" Flow) <input type="checkbox"/> 500 (1/2" Flow) <input type="checkbox"/> Keyed Connect
<b>Thread (M)</b>	<input type="checkbox"/> 1/16-27 NPT (50) <input type="checkbox"/> 1/8-27 NPT (51) <input type="checkbox"/> 1/4-18 NPT (52) <input type="checkbox"/> 3/8-18 NPT (53) <input type="checkbox"/> 1/2-14 NPT (54) <input type="checkbox"/> BSPT Thd: _____
<b>Length (L)</b>	±.015
<b>Material</b>	<input type="checkbox"/> Brass <input type="checkbox"/> Stainless
<b>Quantity:</b>	

EXT. PLUG #6	
Variable	Dimensions
<b>Series (S)</b>	<input type="checkbox"/> 200 (1/4" Flow) <input type="checkbox"/> 300 (3/8" Flow) <input type="checkbox"/> 500 (1/2" Flow) <input type="checkbox"/> Keyed Connect
<b>Thread (M)</b>	<input type="checkbox"/> 1/16-27 NPT (50) <input type="checkbox"/> 1/8-27 NPT (51) <input type="checkbox"/> 1/4-18 NPT (52) <input type="checkbox"/> 3/8-18 NPT (53) <input type="checkbox"/> 1/2-14 NPT (54) <input type="checkbox"/> BSPT Thd: _____
<b>Length (L)</b>	±.015
<b>Material</b>	<input type="checkbox"/> Brass <input type="checkbox"/> Stainless
<b>Quantity:</b>	

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# PROFILE®

## ASSET MANAGEMENT SYSTEMS

To order your custom Asset Supply Tracking Tags, for use with either ProFile or CVE Live systems, please complete this form, providing all the details requested, and then submit to [tech@procomps.com](mailto:tech@procomps.com) along with your company logo in one of the formats specified.

Progressive will review the logo and provide either a quote or order confirmation with your purchase order received, and a proof will be submitted for your approval within one week.

Progressive assigns the AST serial number for each tag, which is included within the quote/order for reference.

Once your custom tags ship, Progressive will set up the ProFile database on ProFile-System.com with the required information, establish any accounts, and notify the contact of all log-in and password details, along with instructions on how to get started.



Please select your color scheme from the options below. (The text in the block will be that color. No additional color options are available.)

<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>
BLACK	BROWN	DK. BLUE	GREEN	PURPLE	LT. BLUE	RED	FLAME RED	ORANGE	YELLOW
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide the 'custom text' required for each entry below. (20 character limit per line. If no text is supplied, that area will be left blank.) For small tags, only the logo will be used in the color as specified above.

Custom Text 1:

Custom Text 2:

Custom Text 3:

Custom Text 4:

### CUSTOM TAG SPECIFICATIONS

Custom Tag Quantity:

Note: Minimum order quantity is 50 tags.

- Overall Tag Size: 4" x 2"
- Maximum Logo Size: 2" x .5"
- Custom text font is Helvetica, sized as shown.

### SMALL CUSTOM TAG SPECIFICATIONS

Small Custom Tag Quantity:

Note: Minimum order quantity is 100 tags.

- Overall Tag Size: 1.25" x .5"
- Maximum Logo Size: .62" x .34"



Logo formats accepted: .jpg, .gif, .bmp, .png, .tif, .pcx, .tiff

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CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# PROFILE®

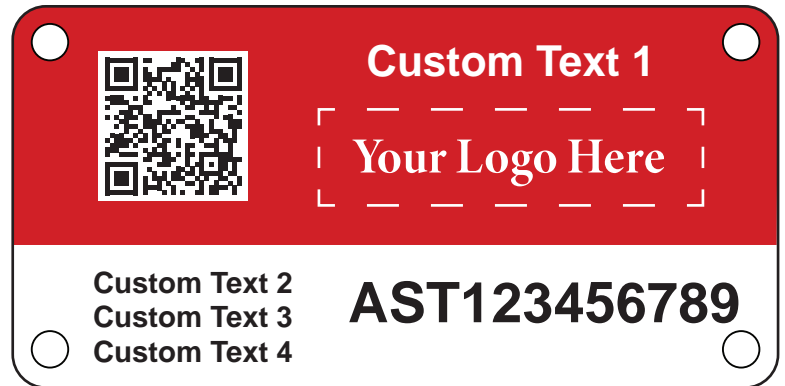
## ASSET MANAGEMENT SYSTEMS

To order your custom Asset Supply Tracking Plates, for use with either ProFile or CVE Live systems, please complete this form, providing all the details requested, and then submit to tech@procomps.com along with your company logo in one of the formats specified.

Progressive will review the logo and provide either a quote or order confirmation with your purchase order received, and a proof will be submitted for your approval within one week.

Progressive assigns the AST serial number for each plate, which is included within the quote/order for reference.

Once your custom plates ship, Progressive will set up the ProFile database on ProFile-System.com with the required information, establish any accounts, and notify the contact of all log-in and password details, along with instructions on how to get started.



Please select your color scheme from the options below. (The text in the block will be that color. No additional color options are available.)

<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>	<b>TEXT</b>
BLACK	BROWN	DK. BLUE	GREEN	PURPLE	LT. BLUE	RED	FLAME RED	ORANGE	YELLOW
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide the 'custom text' required for each entry below. (20 character limit per line. If no text is supplied, that area will be left blank.)

Each plate can have different information to signify specific tool or asset identification. Please submit an Excel spreadsheet with the lines of text needed for each plate.

Custom Text 1:

Custom Text 2:

Custom Text 3:

Custom Text 4:

Custom Plate Quantity:

Note: Minimum order quantity is 50 plates.

### CUSTOM PLATE SPECIFICATIONS

- Overall Plate Size: 4" x 2"
- Maximum Logo Size: 2" x .5"
- Custom text font is Helvetica, sized as shown.

Logo formats accepted: .jpg, .gif, .bmp, .png, .tif, .pcx, .tiff

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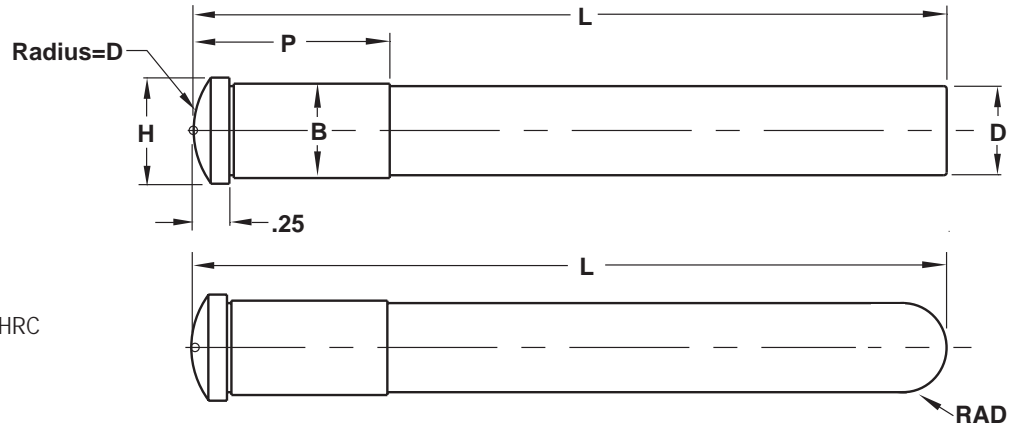
CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:

# ANGLE PINS

STANDARD TOLERANCES		
D	+0.0000 -0.0005	+0.00 -0.01
B	+0.0005 -0.0000	+0.01 -0.00
H	+0.000 -0.010	+0.0 -0.2
P	+0.00 -0.06	+0.0 -1.5
L	+0.125 -0.000	+3.0 -0.0
RAD	+0.000 -0.015	+0.0 -0.4
L (With RAD)	+0.005 -0.005	+0.13 -0.13
	INCH	METRIC

Material  
AISI 8620  
Surface = 50-55 HRC

Treatment:  
 Chrome



ANGLE PIN #1			
Dimension		Tolerance	
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>P</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> +.125/-.000 <input type="checkbox"/> With RAD: ±.005.	+	
		-	
<b>RAD</b> <input type="checkbox"/> Full <input type="checkbox"/> None	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

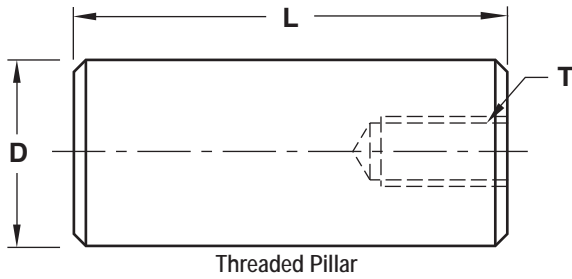
ANGLE PIN #2			
Dimension		Tolerance	
<b>D</b>	<input type="checkbox"/> Standard	+	
		-	
<b>B</b>	<input type="checkbox"/> Standard	+	
		-	
<b>H</b>	<input type="checkbox"/> Standard	+	
		-	
<b>P</b>	<input type="checkbox"/> Standard	+	
		-	
<b>L</b>	<input type="checkbox"/> +.125/-.000 <input type="checkbox"/> With RAD: ±.005.	+	
		-	
<b>RAD</b> <input type="checkbox"/> Full <input type="checkbox"/> None	<input type="checkbox"/> Standard	+	
		-	
<b>Quantity:</b>			

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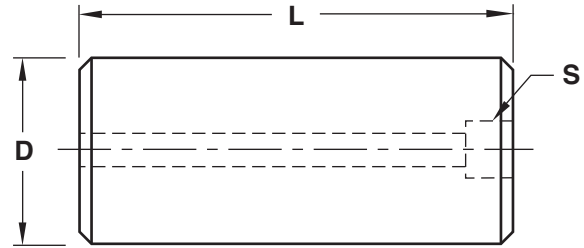
CONTACT:	COMPANY NAME:	PHONE #:
REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS:



# SUPPORT PILLARS



Threaded Pillar



Counterbored Pillar

STANDARD TOLERANCES		
D	+0.005 -0.015	+0.12 -0.25
L	+0.001 +0.002	+0.01 +0.02
	INCH	METRIC

Thread	
D	Thread
Up to 2"	3/8-16
3+ up	5/8-11

Material:

AISI 1018

Hardness = approx. 20 HRC

410 SS

Hardness = 30-34 HRC

Other:

Material	Core Hardness

THREADED PILLAR #1			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>T</b>		Thread	<input type="checkbox"/> Tap both ends
<b>Quantity:</b>			

COUNTERBORED PILLAR #1			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>S</b>			Clearance for SHCS (Not included.)
<b>Quantity:</b>			

THREADED PILLAR #2			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>T</b>		Thread	<input type="checkbox"/> Tap both ends
<b>Quantity:</b>			

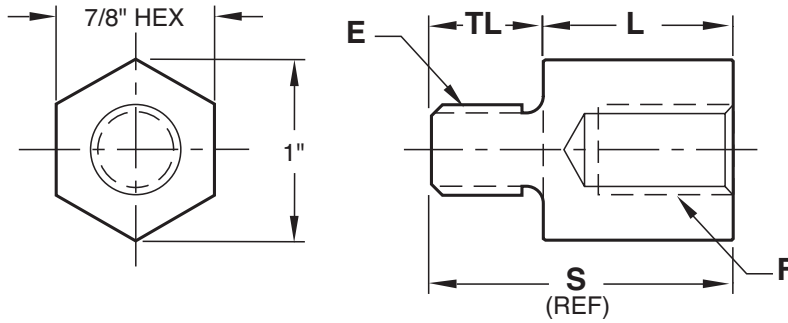
COUNTERBORED PILLAR #2			
Dimension		Tolerance	
<b>D</b>		<input type="checkbox"/> Standard	+
			-
<b>L</b>		<input type="checkbox"/> Standard	+
			-
<b>S</b>			Clearance for SHCS (Not included.)
<b>Quantity:</b>			

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# PRESS KNOCK OUT: HEX SERIES



Material:

- AISI 4140 PH  
Treatment = Black Oxide

Other:

Material	Core Hardness	Surface Hardness	Treatment

STANDARD TOLERANCES		
TL	+0.015	+0.25
L	+0.000	+0.00
	-0.002	-0.05
	INCH	METRIC

Note: Hex sizes other than 7/8" are also available.

PKO #1			
Dimension		Tolerance	
TL		<input type="checkbox"/> Standard	+
			-
L		<input type="checkbox"/> Standard	+
			-
S		REF	
E		Ext. Thread	
F		Int. Thread	
Quantity:			

PKO #2			
Dimension		Tolerance	
TL		<input type="checkbox"/> Standard	+
			-
L		<input type="checkbox"/> Standard	+
			-
S		REF	
E		Ext. Thread	
F		Int. Thread	
Quantity:			

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REFERENCE #:	ACCOUNT #:	E-MAIL ADDRESS: