

# L & T PINS

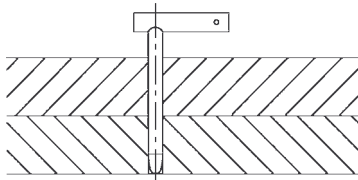
PIN: 12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH  
HANDLE: 12L14 STEEL, BLACK OXIDE FINISH

**ADDITIONAL  
DIAMETERS  
NOW AVAILABLE!**

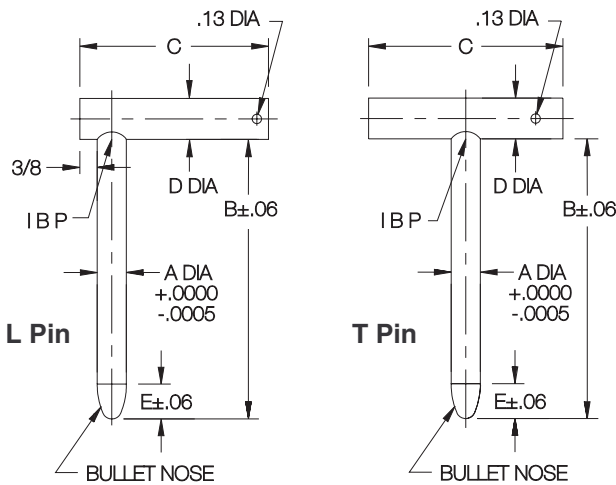


L Pin

T Pin



L and T Pins are removable locating pins, precision ground for accurately aligning holes. The pin is inset in the handle and silver soldered to create a sturdy assembly. The handle is drilled for attaching a cable.



L Pin

T Pin



To order L or T Pins with a standard 10-12" cable assembly attached, add "-C" to the part number. (CL-2-C cable with a terminal for #10-32 or M5 attachment screw).  
Example: CL-7-LP-C

## USA

L PIN PART NO.	T PIN PART NO.	A DIA		B	C	D DIA	E
		NOMINAL	ACTUAL				
CL-0-LP	CL-0-TP	1/8	.1250	2-1/2	1-1/2	1/4	1/4
CL-41-LP	CL-41-TP	#30	.1285	3			
CL-00-LP	CL-00-TP	5/32	.1562	3-1/2			
CL-1-LP	CL-1-TP			3			
CL-21-LP	CL-21-TP	3/16	.1875	4			
CL-2-LP	CL-2-TP			6			
CL-3-LP	CL-3-TP			3	2-1/2	5/16	1/4
CL-23-LP	CL-23-TP	#11	.1910	4			
CL-4-LP	CL-4-TP			6			
CL-43-LP	CL-43-TP	#10	.1935	3			
CL-20-LP	CL-20-TP	#9	.1960	3			
CL-44-LP	CL-44-TP	7/32	.2188	3			
CL-38-LP	CL-38-TP			2			
CL-5-LP	CL-5-TP	1/4	.2500	3	2-1/2	3/8	3/8
CL-25-LP	CL-25-TP			4			
CL-6-LP	CL-6-TP			6			
CL-17-LP	CL-17-TP			3			
CL-37-LP	CL-37-TP	F	.2570	4			
CL-45-LP	CL-45-TP	9/32	.2812	4	3		
CL-39-LP	CL-39-TP			2	2-1/2		
CL-7-LP	CL-7-TP	5/16	.3125	3-1/2	3	7/16	1/2
CL-27-LP	CL-27-TP			4			
CL-8-LP	CL-8-TP			6			
CL-40-LP	CL-40-TP			3	2-1/2		
CL-9-LP	CL-9-TP			4			
CL-29-LP	CL-29-TP	3/8	.3750	5	3-1/2	1/2	1/2
CL-10-LP	CL-10-TP			6			
CL-30-LP	CL-30-TP			7			
CL-11-LP	CL-11-TP			4			
CL-31-LP	CL-31-TP	7/16	.4375	5	3-1/2	9/16	5/8
CL-12-LP	CL-12-TP			6			
CL-32-LP	CL-32-TP			7			
CL-13-LP	CL-13-TP			4			
CL-14-LP	CL-14-TP	1/2	.5000	6	3-1/2	5/8	5/8
CL-33-LP	CL-33-TP			7			
CL-34-LP	CL-34-TP			9			
CL-18-LP	CL-18-TP	9/16	.5625	4			
CL-19-LP	CL-19-TP			6			
CL-15-LP	CL-15-TP	5/8	.6250	6			
CL-35-LP	CL-35-TP			8	3-1/2	7/8	3/4
CL-16-LP	CL-16-TP	3/4	.7500	6			
CL-36-LP	CL-36-TP			8			

## METRIC

CLM-4-LP	CLM-4-TP	4mm	.1575	3-1/2			
CLM-5-LP	CLM-5-TP	5mm	.1969	3	2-1/2	5/16	3/16
CLM-50-LP	CLM-50-TP			6			
CLM-6-LP	CLM-6-TP	6mm	.2362	3	2-1/2	3/8	1/4
CLM-60-LP	CLM-60-TP			6			
CLM-8-LP	CLM-8-TP	8mm	.3150	3-1/2	3	7/16	7/16
CLM-80-LP	CLM-80-TP			6			
CLM-10-LP	CLM-10-TP	10mm	.3937	3	2-1/2	1/2	7/16
CLM-100-LP	CLM-100-TP			6	3-1/2		
CLM-12-LP	CLM-12-TP	12mm	.4724	4	3-1/2	5/8	7/16
CLM-120-LP	CLM-120-TP			6			
CLM-16-LP	CLM-16-TP	16mm	.6299	6			
CLM-160-LP	CLM-160-TP			8	3-1/2	7/8	11/16
CLM-20-LP	CLM-20-TP	20mm	.7874	6			
CLM-200-LP	CLM-200-TP			8			



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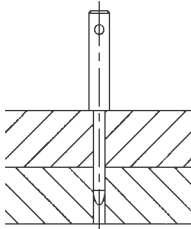
# SHOULDER PINS

PIN: 12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH  
HANDLE: 12L14 STEEL, BLACK OXIDE FINISH



To order Shoulder Pins with a standard 10-12" cable assembly attached, add "-C" to the part number. (CL-2-C cable with a terminal for #10-32 or M5 attachment screw). Example: CL-7-SP-C

Removable locating pin with a straight handle, precision ground for accurately aligning holes. The handle is drilled for attaching a cable.

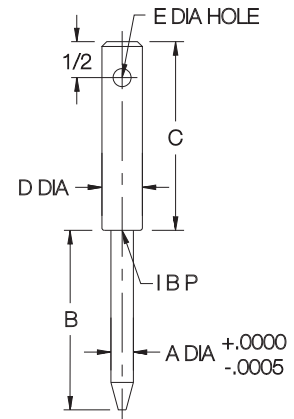


## USA

PART NO.	A DIA		B	C	D DIA	E DIA
	NOMINAL	ACTUAL				
CL-7-SP	1/4	.2500	2-1/2	2-5/8	1/2	1/4
CL-10-SP	5/16	.3125			9/16	
CL-14-SP	3/8	.3750	4		5/8	1/4
CL-19-SP	1/2	.5000	3		3/4	5/16

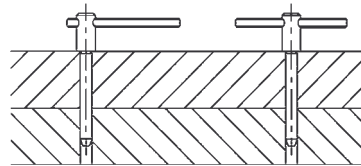
## METRIC

CLM-#-SP	mm		2.56	2.6	1/2	1/4
	NOMINAL	ACTUAL				
CLM-6-SP	6mm	.2362			9/16	
CLM-8-SP	8mm	.3150			5/8	1/4
CLM-10-SP	10mm	.3937	3.94		3/4	5/16
CLM-12-SP	12mm	.4724	2.95			



# JIG PINS

PIN: 1144 STEEL, HEAT TREATED, BLACK OXIDE FINISH  
HANDLE: SPRING STEEL, BLACK OXIDE FINISH



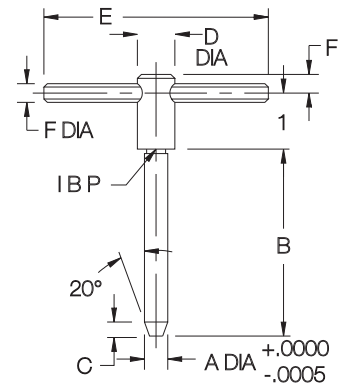
## USA

PART NO.	A DIA		B	C	D DIA	E	F
	NOMINAL	ACTUAL					
CL-10-JP	3/16	.1872	1-7/8	1/8	3/8	2	3/16
CL-20-JP	1/4	.2497	2	5/32			
CL-30-JP	5/16	.3120	2-1/2	3/16	1/2	3	1/4
CL-40-JP	3/8	.3745	3-1/4	1/4			
CL-50-JP	1/2	.4995	4	9/32	9/16	3	1/4

## METRIC

CLM-#-JP	mm		1-7/8	1/8	3/8	2	3/16
	NOMINAL	ACTUAL					
CLM-5-JP	5mm	.1966					
CLM-6-JP	6mm	.2359	2	5/32			
CLM-8-JP	8mm	.3145	2-1/2	3/16	1/2	3	1/4
CLM-10-JP	10mm	.3932	3-1/4	1/4			
CLM-12-JP	12mm	.4719	4	9/32	9/16	3	1/4

Similar to L and T Pins, but with a shoulder to keep the handle raised. Pins are ground slightly undersize. To convert from an L handle to a T handle, slide the roll-pin handle by tapping it with a hammer.



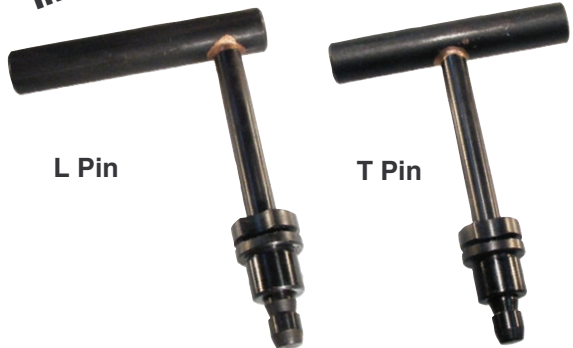
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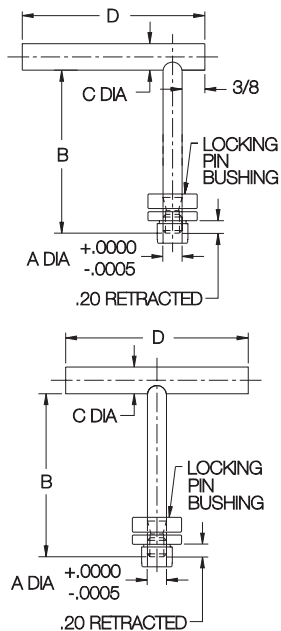
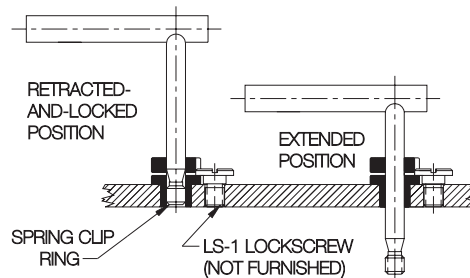
**NOW ALSO AVAILABLE IN METRIC!**

# LOCKING L & T PINS

PIN: 12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH  
 HANDLE: 12L14 STEEL, BLACK OXIDE FINISH  
 BUSHING: 8620 STEEL, CASE HARDENED, BLACK OXIDE FINISH



Locating pin is positively retained in the bushing. The bushing's spring clip ring locks the pin fully retracted by snapping into the pin's groove. Spring pressure also holds the pin in intermediate positions, an advantage especially if the fixture is turned upside down. Patent No. 3,471,186.



## USA

L PIN COMPLETE ASSY PART NO.	L PIN ONLY PART NO.	T PIN COMPLETE ASSY PART NO.	T PIN ONLY PART NO.	BUSHING ONLY PART NO.	A DIA		B	C DIA	D
					NOMINAL	ACTUAL			
CL-1A-LLP-B	CL-1A-LLP	CL-1A-LTP-B	CL-1A-LTP	CL-3-LPB	3/16	.1865	1-1/2	5/16	2-1/2
CL-1-LLP-B	CL-1-LLP	CL-1-LTP-B	CL-1-LTP				3		
CL-38-LLP-B	CL-38-LLP	CL-38-LTP-B	CL-38-LTP				2		
CL-5-LLP-B	CL-5-LLP	CL-5-LTP-B	CL-5-LTP	CL-4-LPB	1/4	.2490	3	3/8	2-1/2
CL-25-LLP-B	CL-25-LLP	CL-25-LTP-B	CL-25-LTP				4		
CL-39-LLP-B	CL-39-LLP	CL-39-LTP-B	CL-39-LTP	CL-5A-LPB	5/16	.3115	2	5/8	3
CL-7-LLP-B	CL-7-LLP	CL-7-LTP-B	CL-7-LTP				3-1/2		
CL-8-LLP-B	CL-8-LLP	CL-8-LTP-B	CL-8-LTP				6		
CL-40A-LLP-B	CL-40A-LLP	CL-40A-LTP-B	CL-40A-LTP	CL-6A-LPB	3/8	.3740	2	5/8	3-1/2
CL-9-LLP-B	CL-9-LLP	CL-9-LTP-B	CL-9-LTP				4		
CL-10-LLP-B	CL-10-LLP	CL-10-LTP-B	CL-10-LTP				6		
CL-13A-LLP-B	CL-13A-LLP	CL-13A-LTP-B	CL-13A-LTP	CL-8A-LPB	1/2	.4990	2	5/8	3-1/2
CL-13-LLP-B	CL-13-LLP	CL-13-LTP-B	CL-13-LTP				4		
CL-14-LLP-B	CL-14-LLP	CL-14-LTP-B	CL-14-LTP				6		

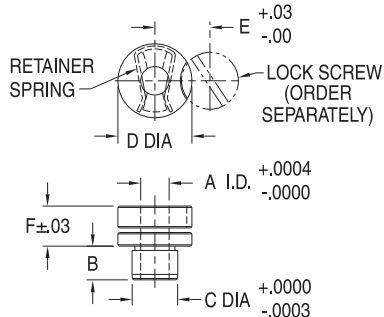
## METRIC

CLM-6-LLP-B	CLM-6-LLP	CLM-6-LTP-B	CLM-6-LTP	CLM-6-LPB	6mm	.2352	3	3/8	2-1/2
CLM-8-LLP-B	CLM-8-LLP	CLM-8-LTP-B	CLM-8-LTP	CLM-8-LPB	8mm	.3140	3	7/16	3
CLM-10-LLP-B	CLM-10-LLP	CLM-10-LTP-B	CLM-10-LTP	CLM-10-LPB	10mm	.3927	3	1/2	2-1/2
CLM-12-LLP-B	CLM-12-LLP	CLM-12-LTP-B	CLM-12-LTP	CLM-12-LPB	12mm	.4715	4	5/8	2-1/2

\*See below for additional bushings or more-detailed bushing dimensions.

# LOCKING-PIN BUSHINGS

8620 STEEL, CASE HARDENED, BLACK OXIDE FINISH



## USA

PART NO.	A DIA		B	C DIA		D DIA	E	F	LOCKSCREW (ORDER SEPARATELY)
	NOMINAL	ACTUAL		NOMINAL	ACTUAL				
CL-3-LPB	3/16	.1868	.31	13/32	.4078	13/16	.62	.44	LS-1
CL-4-LPB	1/4	.2493	.31						
CL-4A-LPB			.50						
CL-5-LPB	5/16	.3118	.31	1/2	.5017				
CL-5A-LPB			.37						
CL-5B-LPB			.50						
CL-6-LPB	3/8	.3743	.31	5/8	.6267				
CL-6A-LPB			.50						
CL-8-LPB	1/2	.4993	.50	3/4	.7518	1-1/16	.75		
CL-8A-LPB			.75						

## METRIC

CLM-6-LPB	6mm	.2355	.31	10mm	.3952	.87	.630	.47	LSM-3
CLM-8-LPB	8mm	.3143	.39	13mm	.5135				
CLM-10-LPB	10mm	.3930	.47	16mm	.6316				
CLM-12-LPB	12mm	.4717	.71	20mm	.7892	1.02	.709		

Bushing equipped with a retainer spring on the I.D. Used with Locking L Pins, Locking T Pins, and Locking Clamping Pins. Patent No. 3,471,186.

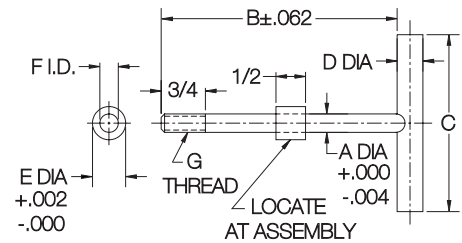
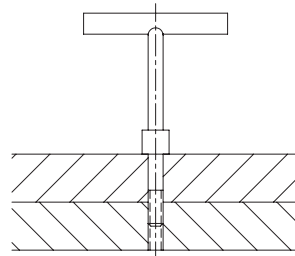


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# CLAMPING PINS

PIN: 12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH  
 BUSHING: 12L14 STEEL, BLACK OXIDE FINISH



Threaded alignment pin that is usually used to clamp two parts together. Weld bushing in place at the proper length to suit the application.

## USA

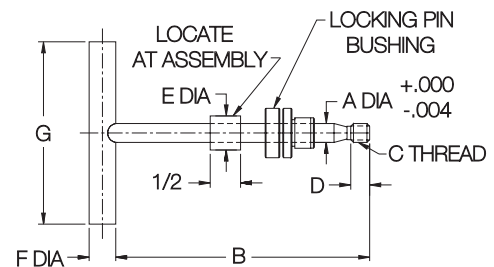
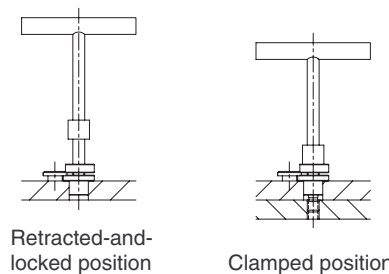
PART NO.	A DIA		B	C	D DIA	E DIA	F DIA	G
	NOMINAL	ACTUAL						
CL-0-CP	#10	.193	3	1-1/2	1/4	3/8	.203	#10-24
CL-0A-CP								#10-24
CL-1-CP	1/4	.250	4	2-1/2	3/8	1/2	.252	1/4-20
CL-2-CP	5/16	.312		3	7/16	9/16	.315	5/16-18
CL-3-CP	3/8	.375	4-1/2	3-1/2	1/2	5/8	.378	3/8-16
CL-4-CP	1/2	.500	5		5/8	3/4	.503	1/2-13

## METRIC

CLM-6-CP	6mm	.236	4	2-1/2	3/8	1/2	.252	M6
CLM-8-CP	8mm	.315		3	7/16	9/16	.315	M8
CLM-10-CP	10mm	.394	4-1/2	3-1/2	1/2	5/8	.378	M10
CLM-12-CP	12mm	.472	5		5/8	3/4	.503	M12

# LOCKING CLAMPING PINS

PIN: 12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH  
 BUSHING: 8620 STEEL, CASE HARDENED, BLACK OXIDE FINISH



Similar to the Clamping Pins shown above, except that the pin is positively retained in the bushing. The bushing's spring clip ring locks the pin in fully retracted position by snapping into the pin's groove. Patent No. 3,471,186.

## USA

COMPLETE ASSY PART NO.	PIN ONLY PART NO.	BUSHING ONLY PART NO.*	A DIA		B	C	D	E DIA	F DIA	G
			NOMINAL	ACTUAL						
CL-1-LCP-B	CL-1-LCP	CL-4-LPB	1/4	.2490	4	1/4-20	1/4	1/2	3/8	2-1/2
CL-2-LCP-B	CL-2-LCP	CL-5A-LPB	5/16	.3115	4	5/16-18	5/16	9/16	7/16	3
CL-3-LCP-B	CL-3-LCP	CL-6A-LPB	3/8	.3740	4-1/2	3/8-16	3/8	5/8	1/2	3-1/2
CL-4-LCP-B	CL-4-LCP	CL-8A-LPB	1/2	.4990	5	1/2-13	1/2	3/4	5/8	3-1/2

## METRIC

CLM-6-LCP-B	CLM-6-LCP	CLM-6-LPB	6mm	.2352	4	M6	.24	1/2	3/8	2-1/2
CLM-8-LCP-B	CLM-8-LCP	CLM-8-LPB	8mm	.3140	4	M8	.31	9/16	7/16	3
CLM-10-LCP-B	CLM-10-LCP	CLM-10-LPB	10mm	.3927	4-1/2	M10	.39	5/8	1/2	3-1/2
CLM-12-LCP-B	CLM-12-LCP	CLM-12-LPB	12mm	.4715	5	M12	.47	3/4	5/8	3-1/2

\*See page 3 for additional bushings or more-detailed bushing dimensions.

**NOW ALSO AVAILABLE IN METRIC!**



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# SLOTTED LOCATOR BUSHINGS

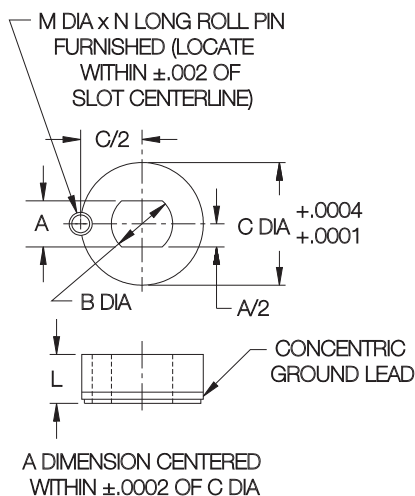
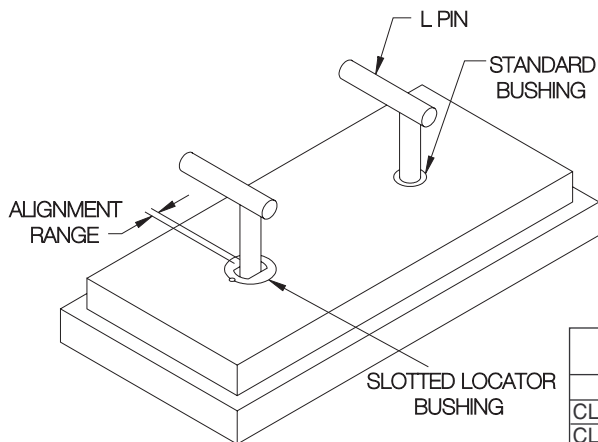
STEEL: TOOL STEEL, HEAT TREATED RC 58-62, BLACK OXIDE FINISH  
 STAINLESS: 440C STAINLESS STEEL, HEAT TREATED



Press Fit

**ADDITIONAL SIZES,  
 AND NOW ALSO AVAILABLE  
 IN STAINLESS STEEL!**

Use with L Pins, T Pins, Shoulder Pins, or Ball Lock Clamps to align two holes without binding. Precision bushing with a tight tolerance in one direction and full relief in the perpendicular direction. Available for 1/8 through 1" diameter pins (5mm-25mm in metric sizes). To install, first drill and ream hole for roll pin (furnished), then bore large bushing hole for .0003-.0005 press fit. Press in bushing and roll pin simultaneously for accurate orientation. Patent No. 3,381,554.



## PRESS FIT (USA)

PART NO.		PIN DIA	A	B DIA	C DIA	L	M DIA	N
STEEL	STAINLESS							
CL-2-SLLB	—	1/8	.1251/.1257	.250	.7500	.40	3/16	3/8
CL-3-SLLB-.1285	—	#30	.1286/.1292	.312	.7500	.40		
CL-3-SLLB-.1562	—	5/32	.1563/.1569	.312	.7500	.40		
CL-3-SLLB	CL-3-SLLB-S	3/16	.1876/.1882	.312	.7500	.40		
CL-4-SLLB-.1910	—	#11	.1911/.1917	.375	.7500	.40		
CL-4-SLLB-.1935	—	#10	.1936/.1942	.375	.7500	.40		
CL-4-SLLB-.1960	—	#9	.1961/.1967	.375	.7500	.40		
CL-4-SLLB-.2188	—	7/32	.2189/.2195	.375	.7500	.40		
CL-4-SLLB	CL-4-SLLB-S				.7500			
CL-4A-SLLB	—	1/4	.2501/.2507	.375	1.0000	.40		
CL-5-SLLB-.2570	—	F	.2571/.2577	.437	1.0000	.40		
CL-5-SLLB-.2812	—	9/32	.2813/.2819	.437	1.0000	.40		
CL-5-SLLB	CL-5-SLLB-S	5/16	.3126/.3132	.437				
CL-6-SLLB	CL-6-SLLB-S	3/8	.3751/.3757	.500	1.0000	.40		
CL-8A-SLLB	CL-8A-SLLB-S					.40		
CL-8-SLLB	—	1/2	.5001/.5007	.625	1.0000	.90		
CL-10-SLLB	CL-10-SLLB-S	5/8	.6251/.6257	.750	1.2500	.90		
CL-12-SLLB	CL-12-SLLB-S	3/4	.7501/.7510	.812	1.5000	1.00		
CL-14-SLLB	—	7/8	.8751/.8760	1.000	1.5000	1.00		
CL-16-SLLB	—	1	1.0001/1.0010	1.062	1.5000	1.00		

## PRESS FIT (METRIC)

CLM-5-SLLB	—	5mm	.1970/.1980	.315	.7874	.35	5mm	8mm
CLM-6-SLLB	CLM-6-SLLB-S	6mm	.2363/.2373	.354	.7874	.35		
CLM-8-SLLB	CLM-8-SLLB-S	8mm	.3151/.3161	.433		.35		
CLM-10-SLLB	CLM-10-SLLB-S	10mm	.3938/.3948	.512	.9449	.55		
CLM-12-SLLB	CLM-12-SLLB-S	12mm	.4725/.4735	.591		.47		
CLM-16-SLLB	CLM-16-SLLB-S	16mm	.6300/.6310	.709	1.1811	.75		
CLM-20-SLLB	CLM-20-SLLB-S	20mm	.7875/.7885	.866	1.4173			
CLM-25-SLLB	—	25mm	.9844/.9854	1.063	1.5748	.75		



## MANUFACTURING CO.

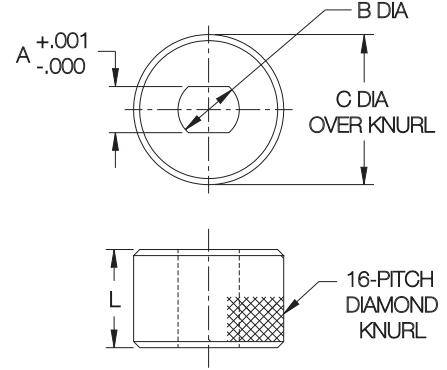
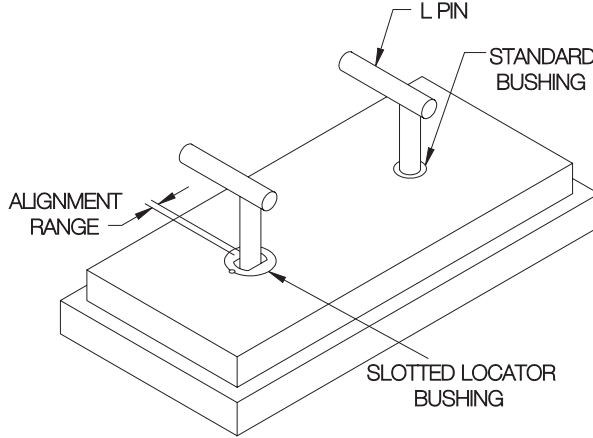
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 Phone: 314-647-6200, FAX: 314-647-5736  
 Web Site: www.carrlane.com

# SLOTTED LOCATOR BUSHINGS

BUSHING: TOOL STEEL, HEAT TREATED RC 58-62, BLACK OXIDE FINISH  
 LOCATING TOOL: O-2 DRILL ROD



Press Fit



## KNURLED SLOTTED LOCATOR BUSHINGS (USA)

Slotted Locator Bushings with a knurled design for embedding in plastic tooling. Use with L Pins, T Pins, and Shoulder Pins to align two holes without binding. Precision bushing with a tight tolerance in one direction and full relief in the perpendicular direction. Available for 3/16 through 1/2" pin diameters.

PART NO.	PIN DIA	A	B DIA	C DIA	L
CL-30-SLLB	3/16	.188	.312	.565	1/2
CL-40-SLLB	1/4	.250	.375	.640	
CL-50-SLLB	5/16	.313	.437	.765	
CL-60-SLLB	3/8	.375	.500	.890	
CL-80-SLLB	1/2	.500	.625	1.015	



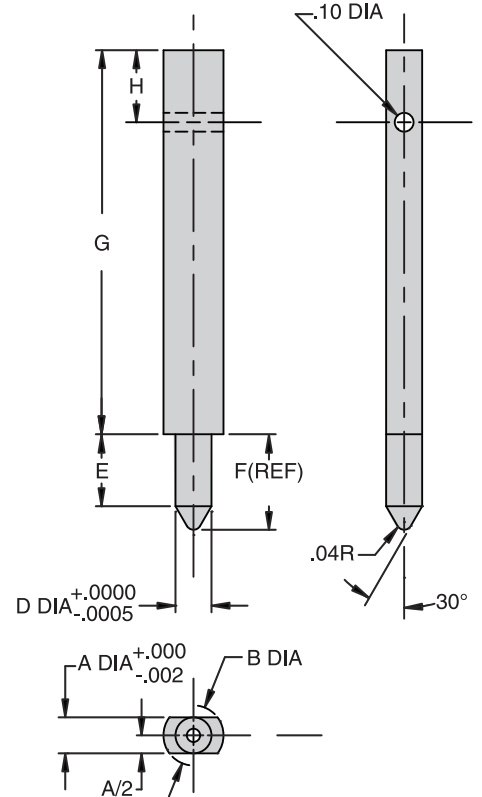
Locating Tool

**NEW!**

Handy locating tool for holding knurled Slotted Locator Bushings in place during embedment. This stepped locating pin has a slip-fit-tolerance shank to fit a locating liner bushing in a template plate, and a head diameter with flats to fit a Slotted Locator Bushing perfectly.

## LOCATING TOOLS (USA)

PART NO.	PIN DIA	A	B DIA	D DIA	E	F	G	H
CL-3-SLLT	3/16	.188	.312	.1875	.37	.50	2.00	.37
CL-4-SLLT	1/4	.250	.375	.2500	.50	.68		
CL-5-SLLT	5/16	.313	.437	.3125	.50	.73		
CL-6-SLLT	3/8	.375	.500	.3750	.50	.78		
CL-8-SLLT	1/2	.500	.625	.5000	.50	.89		



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# SLOTTED LOCATOR TEMPLATE BUSHINGS

BUSHING: 1144 STEEL, HEAT TREATED, BLACK OXIDE FINISH  
 RETAINER RING: ALUMINUM

**NEW!**



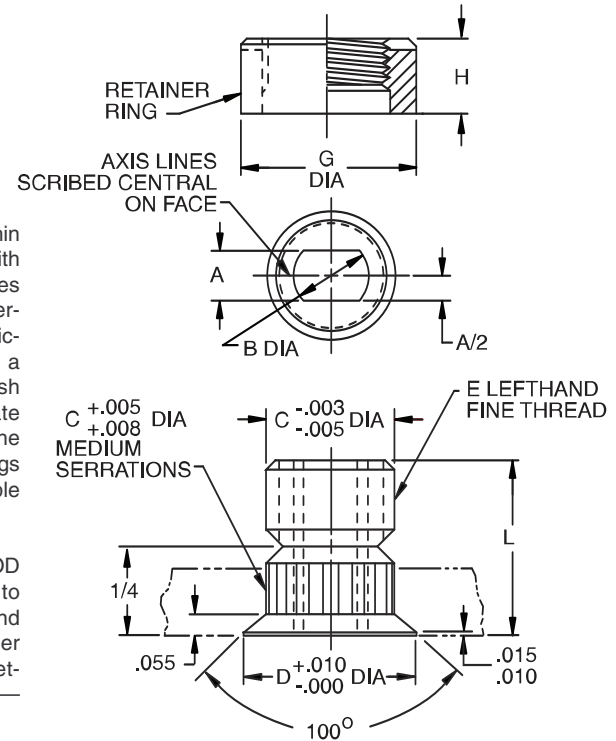
Retainer Ring



Bushing

These Slotted Locator Bushings are designed for thin template jig plates from 3/64" to 3/8" thick. Use with L Pins, T Pins, or Shoulder Pins to align two holes without binding. Precision bushing with a tight tolerance in one direction and full relief in the perpendicular direction. Bushings are held in place by a threaded Retainer Ring (order separately). Flush contact of the Retainer Ring against the jig plate ensures perpendicularity. OD serrations prevent the bushing from rotating. Threaded Template Bushings can be easily removed to replace or reuse. Available for pin diameters from 3/16 to 3/4".

To install, drill hole in jig plate to nominal bushing OD (B diameter). Countersink 90° to allow bushing to seat flush to .015" below surface of plate. Install and tighten Retainer Ring to secure. To make Retainer Ring installation easier, we offer a handy Socket-Type Installation Tool that fits 1/4" square drives — see page 51BU.



USA

PART NO.	PIN DIA	A	B DIA	C DIA	D DIA	E	L	RETAINER RING PART NO.	TEMPLATE THICKNESS	G DIA	H
CL-40-SLTB-.1875	3/16	.1876/.1882	3/8	.625	.725	5/8-18 LH	1/2	TTR-40-6	.047-.125	3/4	3/8
								TTR-40-5	.126-.188		5/16
								TTR-40-3	.189-.375		3/16
CL-40-SLTB-.1935	#10	.1936/.1942	3/8	.625	.725	5/8-18 LH	1/2	TTR-40-6	.047-.125	3/4	3/8
								TTR-40-5	.126-.188		5/16
								TTR-40-3	.189-.375		3/16
CL-40-SLTB-.2500	1/4	.2501/.2507	3/8	.625	.725	5/8-18 LH	1/2	TTR-40-6	.047-.125	3/4	3/8
								TTR-40-5	.126-.188		5/16
								TTR-40-3	.189-.375		3/16
CL-48-SLTB-.3125	5/16	.3126/.3132	7/16	.750	.850	3/4-16 LH	1/2	TTR-48-6	.047-.125	1	3/8
								TTR-40-5	.126-.188		5/16
								TTR-40-3	.189-.375		3/16
CL-48-SLTB-.3750	3/8	.3752/.3757	1/2	.750	.850	3/4-16 LH	1/2	TTR-48-6	.047-.125	1	3/8
								TTR-40-5	.126-.188		5/16
								TTR-40-3	.189-.375		3/16
CL-48-SLTB-.5000	1/2	.5001/.5007	5/8	.750	.850	3/4-16 LH	1/2	TTR-48-6	.047-.125	1	3/8
								TTR-40-5	.126-.188		5/16
								TTR-40-3	.189-.375		3/16
CL-64-SLTB-.6250	5/8	.6251/.6257	3/4	1.000	1.100	1"-14 LH	5/8	TTR-64-6	.047-.125	1-1/4	3/8
								TTR-40-5	.126-.188		5/16
								TTR-40-3	.189-.375		3/16
CL-64-SLTB-.7500	3/4	.7501/.7510	13/16	1.000	1.100	1"-14 LH	5/8	TTR-64-6	.047-.125	1-1/4	3/8
								TTR-40-5	.126-.188		5/16
								TTR-40-3	.189-.375		3/16



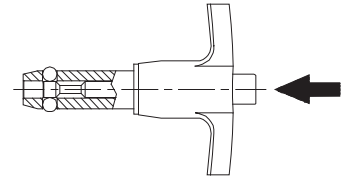
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# TECHNICAL INFORMATION

## BALL LOCK PINS

### BALL LOCK PINS

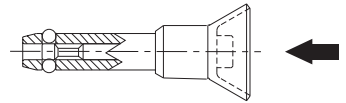
Precision alignment pin with a ground shank. This popular single-acting type is positive locking until released by pushing the button, which moves the center spindle forward to allow the locking balls to retract into a radial groove. Widest range of types and sizes, in steel or stainless steel. Choice of four handle styles: T, L, Button, and Ring. Standard shank diameters from 3/16 to 1" (5 to 20mm in metric). Any grip length up to 6" (150mm in metric) is available as standard, at no extra charge. Available from stock in many standard grip lengths, or quickly made to order in custom lengths and diameters.



Pages 10-11

### MARINE BALL LOCK PINS

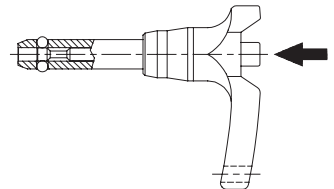
Similar to our standard single-acting Ball Lock Pins in stainless steel, except this type has its handle and button made of 300-series stainless steel. Choice of two handle styles: Recessed Button and Ring. Shank diameters from 3/16 to 1/2", each available in a choice of several standard grip lengths. Available from stock only (not made to order).



Pages 13

### HEAVY-DUTY BALL LOCK PINS

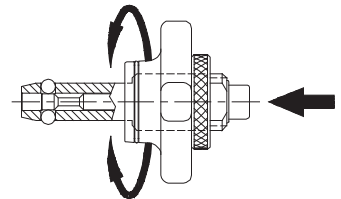
Similar to our standard single-acting Ball Lock Pins, except with a heavier handle for rough service. Available only in stainless steel. Handles are made of solid stainless steel for maximum impact strength (high-strength reinforced plastic optional), and are specially shaped to prevent accidentally pressing the release button. Choice of four handle styles: T, L, Button, and Ring. Shank diameters from 3/16 to 1/2" (5 to 12mm in metric), each in a choice of several standard grip lengths. Available from stock only (not made to order).



Page 14-15

### ADJUSTABLE BALL LOCK PINS

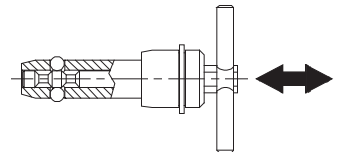
These Ball Lock Pins have an adjustable grip length. They can be used for clamping, or simply to provide a variable grip length. The threaded handle turns to provide a 1/2" clamping range or adjustment range. Available in steel or stainless steel. Choice of three handle styles: Knob, T, and L. Standard shank diameters from 1/4 to 1" (6 to 20mm in metric), each in a choice of many standard grip lengths. Other grip lengths are available as specials (extra charge and longer delivery time).



Pages 16-17

### DOUBLE-ACTING BALL LOCK PINS

Similar to a single-acting pin, except the center spindle has two grooves instead of one, to release the ball by either pushing or pulling. Pushing on the handle releases the balls and inserts the pin in one motion. Pulling on the handle releases the balls and removes the pin in one motion. Available in steel or stainless steel. Choice of three handle styles: T, L, and Ring. Standard shank diameters from 3/16 to 1" (5 to 20mm in metric). Any grip length up to 6" (150mm in metric) is available as a standard, at no extra charge. Available from stock in some standard grip lengths, or quickly made to order in custom lengths and diameters.



Pages 18-19

### LIFTING PINS

A single-acting ball lock pin with a solid, one-piece body and four balls for high tension loads. Positive locking until released by pushing the button. Sturdy forged shackle for heavy lifting. Shank diameters from 1/4 to 1", each in a choice of several standard grip lengths. Available from stock only (not made to order).



Page 20



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**MATERIAL SPECIFICATIONS**

(Any options listed below are manufacturing options, not options selectable by the customer.)

COMPONENT	ALLOY STEEL PINS	STAINLESS STEEL PINS
Shank	4130 steel, heat treated, 160,000 psi min. tensile strength, zinc or cadmium plated**	17-4 PH, heat treated, 180,000 psi min. tensile strength, or equivalent (300 Series on Detent Pins)**
Spindle	4130 steel or 416 stainless	17-4 PH or 416 stainless steel
Handle-BLPT,BLPL,ABP	Aluminum alloy, black or plain finish	Aluminum alloy, black or plain finish
Handle-BLPR,BLPB,BPD	Carbon steel, zinc or cadmium plated, or aluminum alloy, black finish	303 stainless, or aluminum alloy, black finish
Collar	Carbon steel, zinc or cadmium plated	303 stainless
Button	Carbon steel, zinc or cadmium plated, or aluminum alloy, anodized	302 or 303 stainless, or aluminum alloy, anodized
Balls	440 C stainless	440 C stainless
Spring	17-7PH, 302 stainless, or music wire	17-7PH or 302 stainless
Handle Ring	Carbon steel, zinc or cadmium plated, or 302 stainless	302 stainless
S-Hook	Carbon steel, zinc or cadmium plated, or 302 stainless	302 stainless
S-Hook Band	Carbon steel, zinc or cadmium plated, or 15-7MO or 302 stainless	15-7MO or 302 stainless

**STRENGTH DATA (USA)**

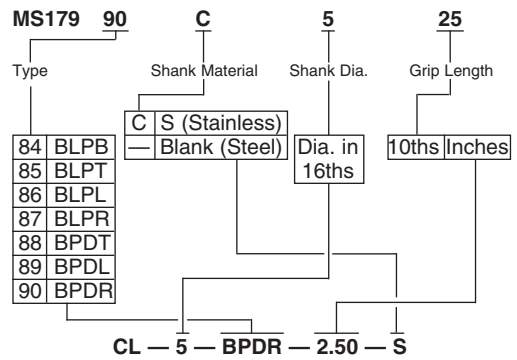
NOM. DIA	RECOMMENDED HOLE DIA		BLP, BPD, ABP APPROXIMATE PULL OUT STRENGTH (LBS)	BLP, BPD, ABP, LFP CALCULATED DOUBLE SHEAR STRENGTH (LBS)***		DEP CALCULATED DOUBLE SHEAR STRENGTH (LBS)***		BLP, BPD APPROX. WEIGHT (OUNCES)		DEP INSERTION/REMOVAL FORCE (LBS)	
	MAX	MIN		STEEL	STAINLESS	STEEL	STAINLESS	HANDLE	PER IN.	MAX	MIN
3/16 (#10)	.194	.190	200	2,100	2,300	2,200	2,000	1.25	.15	7	2
1/4	.254	.250	230	4,000	4,500	4,200	2,200	1.75	.25	7	2
5/16	.317	.313	510	6,000	7,100	6,700	3,500	2.00	.40	14	6
3/8	.379	.375	575	9,200	10,200	9,700	5,000	2.40	.50	14	6
7/16	.443	.438	710	12,300	13,600	13,200	7,000	2.90	.62	17	8
1/2	.505	.500	1160	16,000	18,000	17,500	9,200	3.40	.80	22	10
9/16	.568	.563	1420	20,500	23,000	22,000	11,500	3.65	1.20	22	10
5/8	.630	.625	2070	25,500	28,700	27,500	13,500	4.00	1.35	30	15
3/4	.757	.750	2970	36,700	41,000	39,500	20,500	4.25	2.30	30	15
7/8	.882	.875	3900	50,000	56,200	50,000	28,500	8.31	2.73	35	20
1	1.010	1.000	5400	65,500	73,500	70,700	37,200	9.00	3.47	40	20

**STRENGTH DATA (METRIC)**

5mm	.201	.197	230	2,600	3,000	2,500	1,400	1.25	.15	7	2
6mm	.240	.236	230	4,000	4,400	4,000	2,100	1.75	.25	7	2
8mm	.319	.315	510	7,000	8,000	7,200	3,700	2.00	.40	14	6
10mm	.398	.394	710	11,000	12,500	11,400	5,800	2.40	.50	14	6
12mm	.477	.472	1160	16,000	18,000	16,500	8,500	3.40	.80	22	10
16mm	.635	.630	2070	29,000	32,500	29,500	15,400	4.00	1.35	30	15
20mm	.794	.787	2970	45,200	50,900	46,100	21,600	4.25	2.30	30	15

**MS CONVERSIONS**

(MS-certified pins available as specials at higher cost)

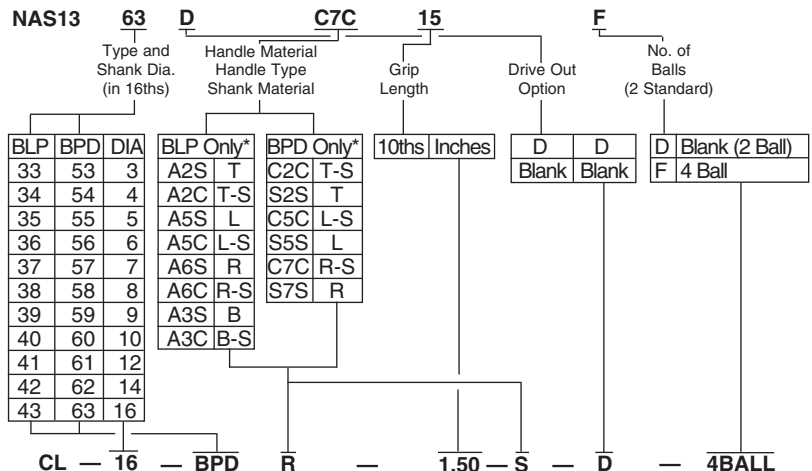


\*\*Pins with grip lengths over 8" (special) are not heat treated, in order to maintain straightness. Double shear strength will be reduced approximately 20-50%. Steel pins over 8" long will have a black oxide finish instead of plating. Pins in larger diameters than listed here are available as specials (may be made from alternate steels).

\*\*\*2:1 Safety factor

**NAS CONVERSIONS**

(NAS-certified pins available as specials at higher cost)



\*These are the only standard combinations of Handle Material, Handle Style, Spindle Material, and BLP-BPD type directly convertible from NAS to Carr Lane. Other combinations are available as specials.



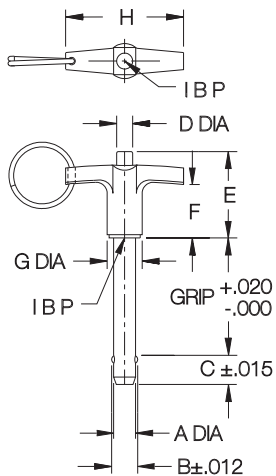
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# BALL LOCK PINS

SEE PAGE 9 FOR MATERIAL SPECIFICATIONS



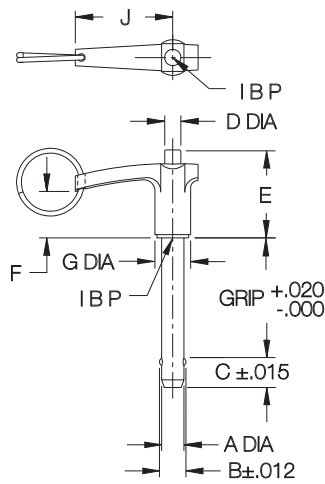
**T Handle**



**BLPT**



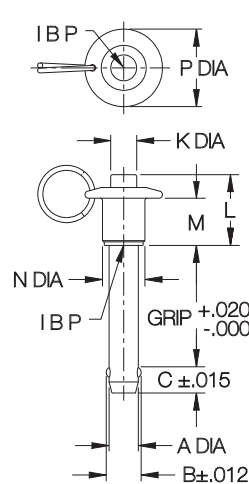
**L Handle**



**BLPL**



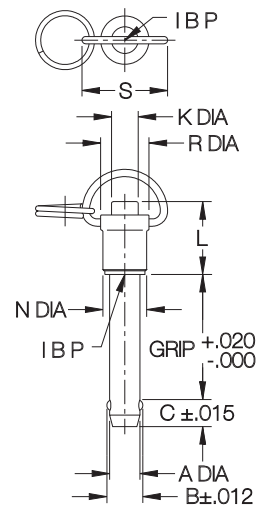
**Button Handle**



**BLPB**



**Ring Handle**



**BLPR**

**USA**

PART NO.	A DIA		B	C	D DIA	E	F	G DIA	H	J	K DIA	L	M	N DIA	P DIA	R DIA	S	
	NOMINAL	ACTUAL																
CL- 3-BLPx-x.xx	3/16 (#10)	.1885/.1870	.219	.245	.22	1.26	.78	.47	1.75	1.50	.22	1.26	.89	.47	.82	.57	1.13	
CL- 4-BLPx-x.xx	1/4	.2485/.2470	.290	.275	.27	1.47	.94	.59	2.00	1.62	.27	1.47	1.02	.59	1.00	.69	1.13	
CL- 5-BLPx-x.xx	5/16	.3110/.3095	.375	.315	.39	1.61	1.06	.75	2.25	1.88	.39	1.61	1.08	.75	1.31	.82	1.33	
CL- 6-BLPx-x.xx	3/8	.3735/.3720	.438	.350	.50	1.81	1.06	.93	3.00	2.50	.50	1.81	1.25	.93	1.56	1.01	1.33	
CL- 7-BLPx-x.xx	7/16	.4360/.4345	.508	.365	.71	2.07	1.25	1.31	3.50	2.90	.71	2.07	1.49	1.31	2.16	1.41	1.90	
CL- 8-BLPx-x.xx	1/2	.4985/.4970	.592	.445														
CL- 9-BLPx-x.xx	9/16	.5610/.5595	.666	.495														
CL-10-BLPx-x.xx	5/8	.6235/.6220	.750	.565														
CL-12-BLPx-x.xx	3/4	.7485/.7470	.886	.655														
CL-14-BLPx-x.xx	7/8	.8735/.8720	1.044	.745														
CL-16-BLPx-x.xx	1	.9985/.9970	1.217	.875														

**METRIC**

CLM-5-BLPx-xx	5mm	.1954/.1939	.212	.245	.22	1.26	.78	.47	1.75	1.50	.22	1.26	.89	.47	.82	.57	1.13	
CLM-6-BLPx-xx	6mm	.2347/.2332	.278	.275	.27	1.47	.94	.59	2.00	1.62	.27	1.47	1.02	.59	1.00	.69	1.13	
CLM-8-BLPx-xx	8mm	.3135/.3120	.371	.315	.39	1.61	1.06	.75	2.25	1.88	.39	1.61	1.08	.75	1.31	.82	1.33	
CLM-10-BLPx-xx	10mm	.3922/.3907	.469	.350	.50	1.81	1.06	.93	3.00	2.50	.50	1.81	1.25	.93	1.56	1.01	1.33	
CLM-12-BLPx-xx	12mm	.4709/.4694	.567	.445	.71	2.07	1.25	1.31	3.50	2.90	.71	2.07	1.49	1.31	2.16	1.41	1.74	
CLM-16-BLPx-xx	16mm	.6284/.6269	.748	.565														
CLM-20-BLPx-xx	20mm	.7859/.7844	.948	.795														

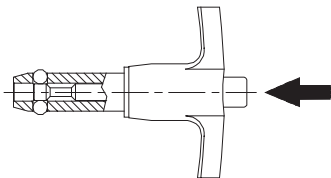


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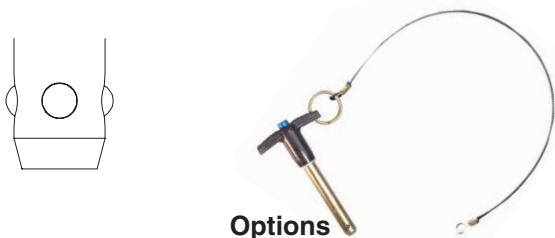
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# BALL LOCK PINS

SEE PAGE 9 FOR MATERIAL SPECIFICATIONS



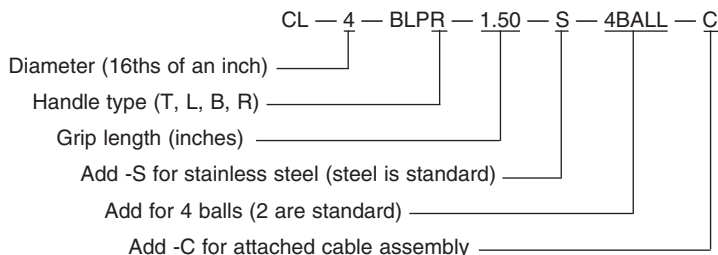
Precision alignment pin with a ground shank. This popular single-acting type is positive locking until released by pushing the button, which moves the center spindle forward to allow the locking balls to retract into a radial groove. Widest range of types and sizes, in steel or stainless steel. Choice of four handle styles: T, L, Button, and Ring. Standard shank diameters from 3/16 to 1" (5 to 20mm in metric). Any grip length up to 6" (150mm in metric) is available as standard, at no extra charge. Available from stock in many standard grip lengths, or quickly made to order in custom lengths and diameters.



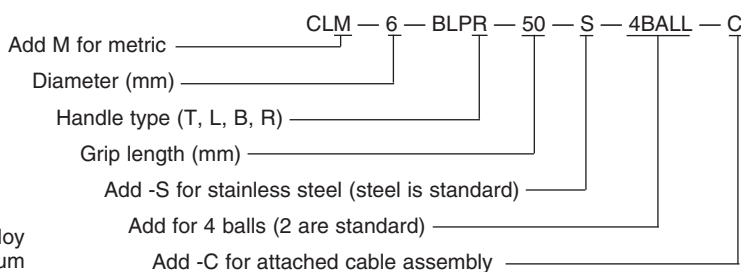
Options

Ball Lock Pins are optionally available in stainless steel instead of alloy steel for greater corrosion resistance. (Note: Both types have aluminum handles, and buttons.) Pins are also available with four balls instead of two, as specials, for more-distributed ball-contact force. Optional cable assemblies are 12" long, with a terminal at the free end for a #10-32 or M5 attachment screw (CL-82-KA-12.0).

### Ordering Example (USA):



### Ordering Example (Metric):



### STOCK GRIP LENGTHS (USA)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (INCHES)															
		.50	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
		TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR
CL-3-BLPx-x.xx	3/16 (#10)	••••	••••	X•X•X•	X••••	X•X•X•		X••••		••••	•••••	•					
CL-4-BLPx-x.xx	1/4	X•X•X•	X•X•X•	X•X•X•	X••••	X•X•X•	••••	X•X•X•	••••	X•X•X•	X•X•X•	••••	••••	••		•	
CL-5-BLPx-x.xx	5/16	••••	••••	X•X•X•	••••	X•X•X•	••••	X•X•X•	•	X•X•X•	••••	••••	••••	•	•	•	
CL-6-BLPx-x.xx	3/8	••••	X••••	X•X•X•	••••	X•X•X•	••••	X•X•X•	••••	X•X•X•	X•X•X•	X•X•X•	X••••	X••	••••	•	
CL-7-BLPx-x.xx	7/16			••••	••••	••••	••••	••••	••••	••••	••••	•					
CL-8-BLPx-x.xx	1/2	•	••	X••••	X•X•	X•X•X•	X•X•X•	X•X•X•	••	X•X•X•	X•X•X•	X••••	X••••	••••	••••	X••••	
CL-9-BLPx-x.xx	9/16							••••		••••	••	•					
CL-10-BLPx-x.xx	5/8					••••		••••		••••	••••	••••	••	••	••	•	
CL-12-BLPx-x.xx	3/4					••••		X••••		X•X•X•	X•X•X•	X•	X••••	••		X•	
CL-14-BLPx-x.xx	7/8							••		••	••						
CL-16-BLPx-x.xx	1							••		•	••••	••	••	•	••	••	

### STOCK GRIP LENGTHS (METRIC)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (mm)											
		10	15	20	25	30	40	50	60	70	80	90	100
		TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR	TLBR
CLM-5-BLPx-xx	5mm												
CLM-6-BLPx-xx	6mm	••	••	••	••	••	••	••					••
CLM-8-BLPx-xx	8mm			•	•	•	•	••					
CLM-10-BLPx-xx	10mm				••	••	••	••					••
CLM-12-BLPx-xx	12mm					••	••	••			•		••
CLM-16-BLPx-xx	16mm							••					
CLM-20-BLPx-xx	20mm												

• = STOCKED IN ALLOY STEEL ONLY  
 X = STOCKED IN ALLOY AND STAINLESS STEEL



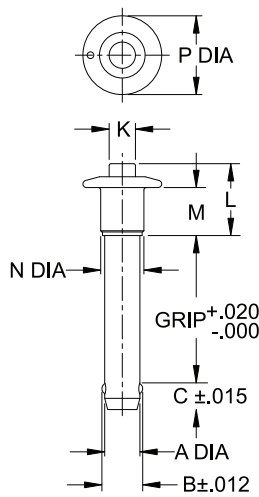
**MANUFACTURING CO.**  
 4200 Carr Lane Ct., P.O. Box 191970  
 St. Louis, Missouri 63119-7970 USA  
 Phone: 314-647-6200, FAX: 314-647-5736  
 Web Site: www.carrlane.com

# MARINE BALL LOCK PINS

**NEW  
HANDLE  
STYLE!**



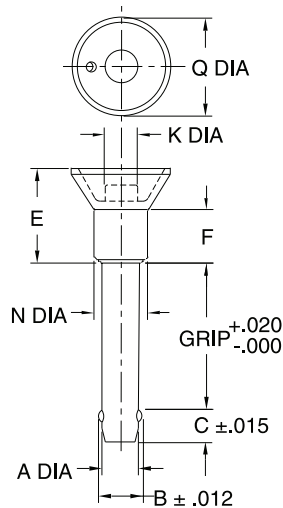
**Button Handle (B)**



**MBPB**



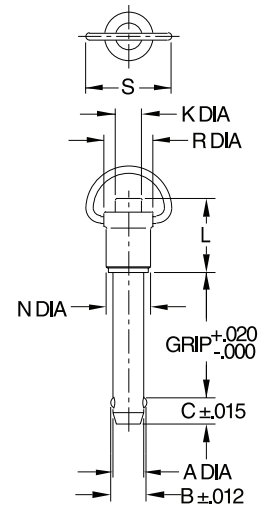
**Recessed Button Handle (M)**



**MBPM**



**Ring Handle (R)**



**MBPR**

**USA**

PART NO.	A DIA		B	C	E	F	K DIA	L	M	N DIA	P DIA	Q DIA	R	S	T						
	NOMINAL	ACTUAL																			
CL-3-MBPx-x.xx-S	3/16 (#10)	.1885/.1870	.219	.245	.94	.62	.25	.81	.56	.47	.79	1.00	.52	1.13	1.26						
CL-4-MBPx-x.xx-S	1/4	.2485/.2470	.290	.275																	
CL-5-MBPx-x.xx-S	5/16	.3110/.3095	.375	.315												1.00	.68	.92	.65	.88	.58
CL-6-MBPx-x.xx-S	3/8	.3735/.3720	.438	.350												1.06	.78	.31	.98	.65	.59
CL-8-MBPx-x.xx-S	1/2	.4985/.4970	.592	.445	1.19	.93	.44	1.20	.80	.75	1.31	1.12	.80	1.33	1.61						

**METRIC**

CLM-5-MBPx-xx-S	5mm	.1954/.1939	.212	.245	.94	.62	.22	.81	.56	.47	.82	1.00	.52	1.13	1.26					
CLM-6-MBPx-xx-S	6mm	.2347/.2332	.278	.275																
CLM-8-MBPx-xx-S	8mm	.3135/.3120	.371	.315												1.00	.68	.92	.65	.58
CLM-10-MBPx-xx-S	10mm	.3922/.3907	.469	.350												1.06	.78	.27	.98	.65
CLM-12-MBPx-xx-S	12mm	.4709/.4694	.567	.445	1.19	.93	.39	1.20	.80	.75	1.31	1.33	.80	1.33	1.61					

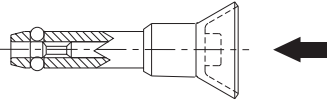


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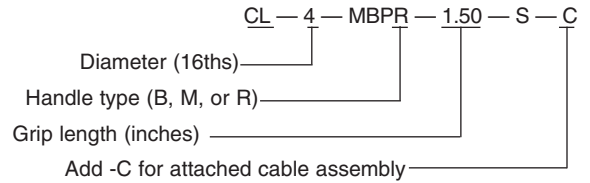
# MARINE BALL LOCK PINS

SHANK & SPINDLE: 17-4PH STAINLESS STEEL  
 HANDLE AND BUTTON: 300-SERIES STAINLESS STEEL  
 SPRING: 17-7 OR 300-SERIES STAINLESS STEEL  
 BALLS: 440C OR 300-SERIES STAINLESS STEEL



Similar to our standard single-acting Ball Lock Pins in stainless steel, except this type has its handle and button made of 300-series stainless steel. Choice of three handle styles: Buttons, Recessed Button and Ring. Shank diameters from 3/16 to 1/2" (5 to 12mm in metric), each available in a choice of several standard grip lengths. Available from stock only in the standard grip lengths listed below (other grip lengths available as specials).

### Ordering Example (USA):

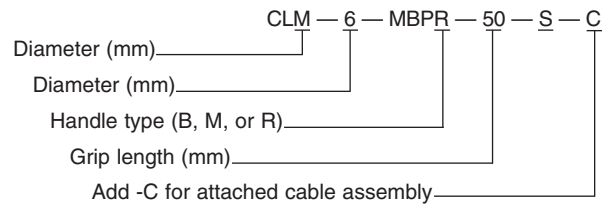


**Optional Cable**

Optional cable assemblies are 12" long, #2 cable, with a terminal at the free end for a #10 or M5 attachment screw.

**NOW ALSO AVAILABLE IN METRIC!**

### Ordering Example (Metric):



### STANDARD STOCK GRIP LENGTHS (USA)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (INCHES)												
		0.50 BMR	0.75 BMR	1.00 BMR	1.25 BMR	1.50 BMR	1.75 BMR	2.00 BMR	2.25 BMR	2.50 BMR	3.00 BMR	3.50 BMR	4.00 BMR	4.50 BMR
CL-3-MBPx-x.xx-S	3/16 (#10)	xxx	xxx	xxx	xxx	xxx		xxx		xxx	xxx			
CL-4-MBPx-x.xx-S	1/4	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx			
CL-5-MBPx-x.xx-S	5/16		xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	
CL-6-MBPx-x.xx-S	3/8		xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	
CL-8-MBPx-x.xx-S	1/2			xxx		xxx		xxx			xxx	xxx	xxx	xxx

### STANDARD STOCK GRIP LENGTHS (METRIC)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (mm)											
		10 BMR	15 BMR	20 BMR	25 BMR	30 BMR	40 BMR	50 BMR	60 BMR	70 BMR	80 BMR	100 BMR	
CLM-5-MBP-xx-S	5mm	xxx	xxx	xxx	xxx	xxx	xxx	xxx					
CLM-6-MBP-xx-S	6mm	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx				
CLM-8-MBP-xx-S	8mm			xxx	xxx	xxx	xxx	xxx	xxx			xxx	xxx
CLM-10-MBP-xx-S	10mm			xxx	xxx	xxx	xxx	xxx	xxx			xxx	xxx
CLM-12-MBP-xx-S	12mm				xxx	xxx	xxx	xxx	xxx			xxx	xxx

X = STOCKED IN STAINLESS STEEL



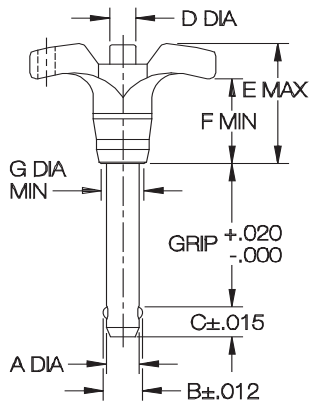
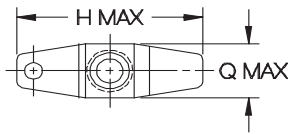
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# HEAVY-DUTY BALL LOCK PINS



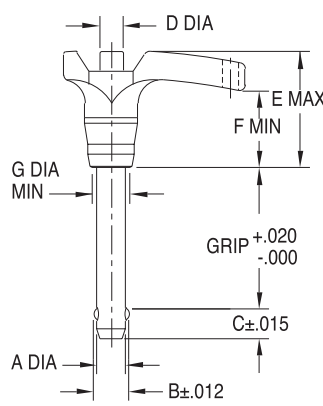
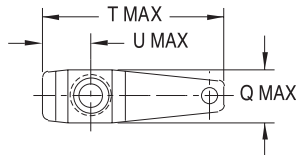
**T Handle**



**BLHT**



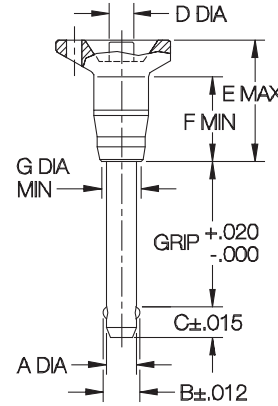
**L Handle**



**BLHL**



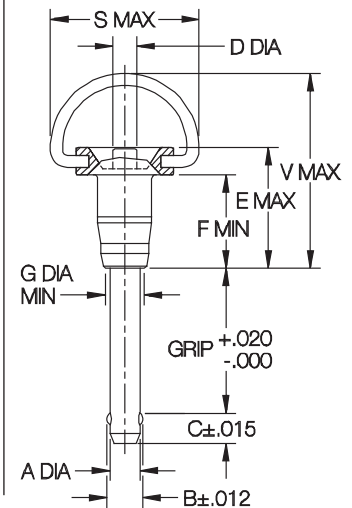
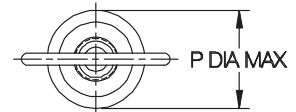
**Button Handle**



**BLHB**



**Ring Handle**



**BLHR**

**USA**

PART NO.	A DIA		B	C	D DIA	E	F	G DIA	H	P DIA	Q	S	T	U	V
	NOMINAL	ACTUAL													
CL-3-BLHx-x.xx-S	3/16 (#10)	.1885/.1870	.220	.245	.25	1.27	.70	.38	1.82	1.07	.63	1.56	1.95	.54	2.13
CL-4-BLHx-x.xx-S	1/4	.2485/.2470	.289	.275											
CL-5-BLHx-x.xx-S	5/16	.3110/.3095	.375	.315											
CL-6-BLHx-x.xx-S	3/8	.3735/.3720	.440	.350											
CL-7-BLHx-x.xx-S	7/16	.4360/.4345	.509	.365	.30	1.60	.85	.51	2.35	1.39	.80	2.00	2.51	.70	2.34
CL-8-BLHx-x.xx-S	1/2	.4985/.4970	.594	.445											

**METRIC**

CLM-5-BLHx-xx-S	5mm	.1954/.1939	.210	.245	.25	1.27	.70	.38	1.82	1.07	.63	1.56	1.95	.54	2.13
CLM-6-BLHx-xx-S	6mm	.2347/.2332	.275	.275											
CLM-8-BLHx-xx-S	8mm	.3135/.3120	.371	.315											
CLM-10-BLHx-xx-S	10mm	.3922/.3907	.467	.350	.30	1.60	.85	.51	2.35	1.39	.80	2.00	2.51	.70	2.34
CLM-12-BLHx-xx-S	12mm	.4709/.4694	.569	.445											

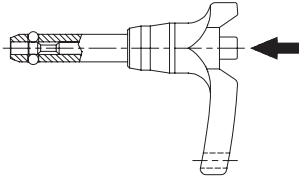


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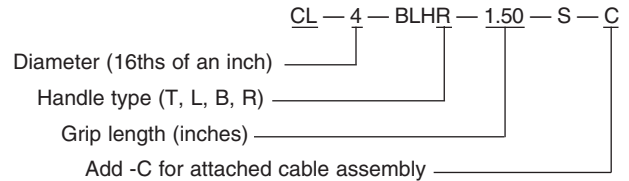
# HEAVY-DUTY BALL LOCK PINS

SHANK & SPINDLE: 17-4PH OR 15-7MO STAINLESS STEEL  
 HANDLE: 17-4PH STAINLESS STEEL  
 HEAD & BUTTON: 303 STAINLESS STEEL  
 R-HANDLE RING: 302 STAINLESS STEEL  
 SPRING & ATTACHING RING: 17-7PH OR 302 STAINLESS STEEL  
 BALLS: 440C STAINLESS STEEL

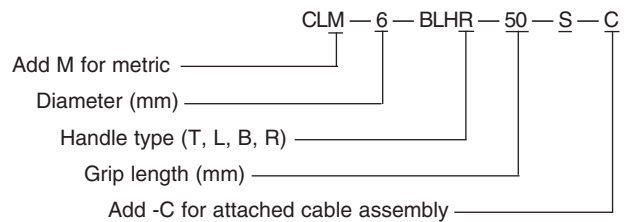


Similar to our standard single-acting Ball Lock Pins, except with a heavier handle for rough service. Available only in stainless steel. Handles are made of solid stainless for maximum impact strength, and are specially shaped to prevent accidentally pressing the release button. Choice of four handle styles: T, L, Button, and Ring. Shank diameters from 3/16 to 1/2" (5 to 12mm in metric), each in a choice of several standard grip lengths. Available from stock only (not made to order).

### Ordering Example (USA):



### Ordering Example (Metric):



### OPTIONS

Heavy-duty Ball Lock Pins are available only in stainless steel, with either a stainless steel handle or a plastic handle for lower cost. Optional cable assemblies are 12" long, with a terminal at the free end for a #10-32 or M5 attachment screw.

### STANDARD STOCK GRIP LENGTHS (USA)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (INCHES)														
		.50	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	3.00	3.50	4.00	4.50	5.00	6.00
CL-3-BLHx-x.xx-S	3/16 (#10)	xxxx	xxxx	xxxx	xxxx	xxxx		xxxx		xxxx	xxxx					
CL-4-BLHx-x.xx-S	1/4	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
CL-5-BLHx-x.xx-S	5/16	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx			
CL-6-BLHx-x.xx-S	3/8	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
CL-7-BLHx-x.xx-S	7/16			xxxx		xxxx		xxxx		xxxx	xxxx					
CL-8-BLHx-x.xx-S	1/2			xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx

### STOCK GRIP LENGTHS (METRIC)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (mm)														
		10	15	20	25	30	40	50	60	70	80	100				
CLM-5-BLHx-xx-S	5mm	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx								
CLM-6-BLHx-xx-S	6mm	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx					xxxx	
CLM-8-BLHx-xx-S	8mm			xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx				xxxx	
CLM-10-BLHx-xx-S	10mm			xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx			xxxx	xxxx	
CLM-12-BLHx-xx-S	12mm					xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx

X = Stocked in stainless steel.



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# ADJUSTABLE BALL LOCK PINS

SEE PAGE 9 FOR MATERIAL SPECIFICATIONS



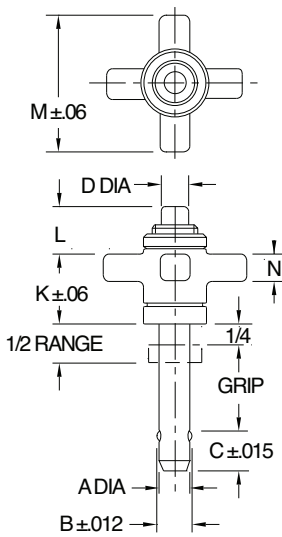
**Knob Handle**



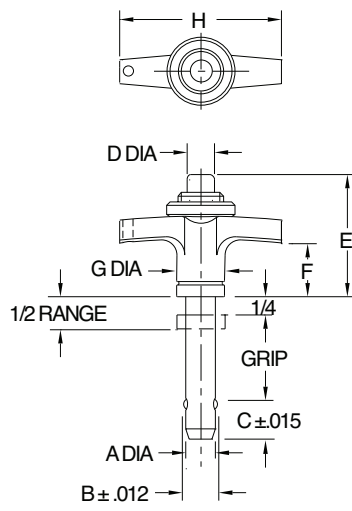
**T Handle**



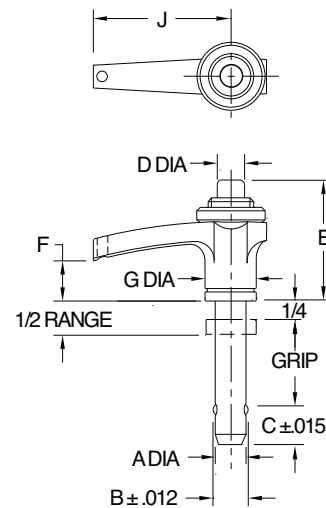
**L Handle**



**ABPK**



**ABPT**



**ABPL**

**USA**

PART NO.	A DIA		B	C	D DIA	E	F	G DIA	H	J	K	L	M	N
	NOMINAL	ACTUAL												
CL-4-ABPx-x.xx	1/4	.2485/.2470	.290	.275	.22	1.51 1.45	1.06	.75	2.25	1.87	.88	.58	1.75	.38
CL-5-ABPx-x.xx	5/16	.3110/.3095	.375	.315	.27	1.48	1.06	.93	3.00	2.50	.88	.63	2.12	.44
CL-6-ABPx-x.xx	3/8	.3735/.3720	.438	.350	.39	1.55	1.06	.93	3.00	2.50	1.00	.55	2.12	.44
CL-7-ABPx-x.xx	7/16	.4360/.4345	.508	.365	.50	2.07	1.25	1.31	3.50	2.87	1.25	1.13	2.75	.50
CL-8-ABPx-x.xx	1/2	.4985/.4970	.592	.445	.71	2.34	1.62	1.50	4.30	4.00	1.62	1.00	4.00	.75
CL-9-ABPx-x.xx	9/16	.5610/.5595	.666	.495										
CL-10-ABPx-x.xx	5/8	.6235/.6220	.750	.565										
CL-12-ABPx-x.xx	3/4	.7485/.7470	.886	.655										
CL-14-ABPx-x.xx	7/8	.8735/.8720	1.044	.745										
CL-16-ABPx-x.xx	1	.9985/.9970	1.217	.875										

**METRIC**

CLM-6-ABPx-xx	6mm	.2346/.2331	.278	.275	.22	1.51 1.45	1.06	.75	2.25	1.87	.88	.65 .75	1.75	.38
CLM-8-ABPx-xx	8mm	.3134/.3118	.371	.315	.27	1.48	1.06	.93	3.00	2.50	.88	.72	2.12	.44
CLM-10-ABPx-xx	10mm	.3921/.3906	.469	.350	.39	1.55	1.06	.93	3.00	2.50	1.00	.73	2.12	.44
CLM-12-ABPx-xx	12mm	.4709/.4693	.567	.445	.50	2.07	1.25	1.31	3.50	2.87	1.25	1.13	2.75	.50
CLM-16-ABPx-xx	16mm	.6283/.6268	.748	.565							2.00	1.00		
CLM-20-ABPx-xx	20mm	.7858/.7843	.948	.795										



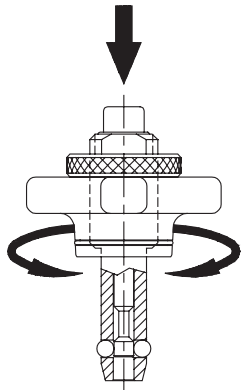
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 Web Site: www.carrlane.com

# ADJUSTABLE BALL LOCK PINS

SEE PAGE 9 FOR MATERIAL SPECIFICATIONS

**NEW DESIGN  
FOR GREATER  
CLAMPING STRENGTH!**



Adjustable Ball Lock Pins can be used for clamping, or simply to provide a variable grip length.

These Ball Lock Pins have an adjustable grip length. They can be used for clamping, or simply to provide a variable grip length. The threaded handle turns to provide a +/- 1/4" clamping range or adjustment range. When used just for variable grip length (not for clamping), the handle can be secured with the supplied knurled locknut. These single-acting pins are manufactured with four balls as standard, instead of two, for more-distributed ball-pullout force in clamping applications. Available in steel or stainless steel.

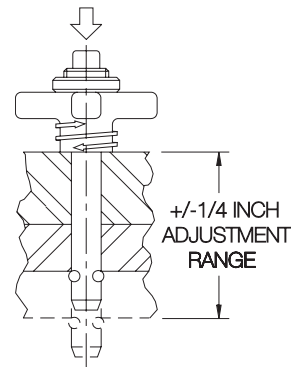
Choice of three handle styles: Knob, T, and L. Standard shank diameters from 1/4 to 1" (6 to 20mm in metric), each in a choice of many standard grip lengths. Available from stock only in the standard grip lengths listed below. Other grip lengths are available as specials (extra charge and longer delivery time).

Pins are optionally available in stainless steel instead of alloy steel, for greater corrosion resistance. Note: both steel and stainless pins have aluminum handles and buttons.

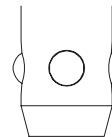
- CL-4-ABPK-1.50 (steel)
- CL-4-ABPK-1.50-S (stainless)

To order pins with a standard cable assembly attached (#2 cable size, 12" long, with a terminal at the free end for a #10 or M5 attachment screw), add "-C" to the part number:

- CL-4-ABPK-1.50-S-C



Grip length adjusts +/- 1/4" from nominal.



Four balls are standard on Adjustable Ball Lock Pins, to provide more distributed ball-pullout force in clamping applications.

## STOCK GRIP LENGTHS (USA)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (INCHES)															
		.50	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
CL-4-ABPx-x.xx	1/4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
CL-5-ABPx-x.xx	5/16	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
CL-6-ABPx-x.xx	3/8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
CL-7-ABPx-x.xx	7/16																
CL-8-ABPx-x.xx	1/2			x	x	x	x	x	x	x	x	x	x	x	x	x	x
CL-9-ABPx-x.xx	9/16																
CL-10-ABPx-x.xx	5/8			x	x	x		x	x	x		x	x	x			
CL-12-ABPx-x.xx	3/4			x	x	x		x	x	x		x	x	x			
CL-14-ABPx-x.xx	7/8																
CL-16-ABPx-x.xx	1								x	x	x	x	x	x			x

## STOCK GRIP LENGTHS (METRIC)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (mm)															
		10	15	20	25	30	40	50	60	70	80	90	100				
CLM-6-ABPx-xx	6mm			x	x	x		x	x	x	x	x					
CLM-8-ABPx-xx	8mm			x	x	x		x	x	x	x	x					
CLM-10-ABPx-xx	10mm							x	x	x	x	x					
CLM-12-ABPx-xx	12mm																
CLM-16-ABPx-xx	16mm																
CLM-20-ABPx-xx	20mm																

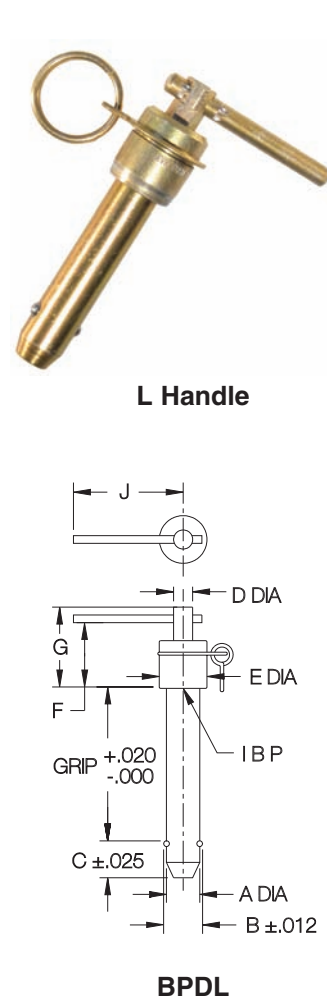
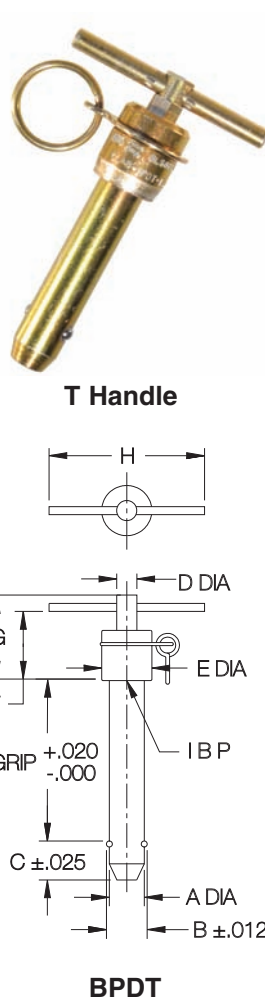
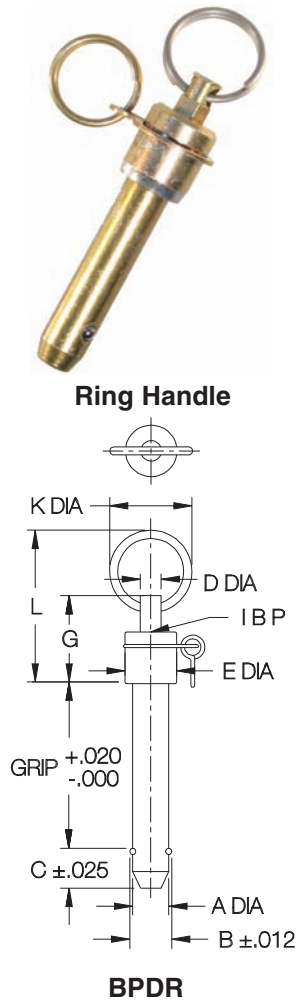
X = STOCKED IN ALLOY AND STAINLESS STEEL



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# DOUBLE-ACTING BALL LOCK PINS

SEE PAGE 9 FOR MATERIAL SPECIFICATIONS



**USA**

PART NO.	A DIA		B	C	D DIA	E DIA	F	G	H	J	K DIA	L	M	
	NOMINAL	ACTUAL												
CL-3-BPDx-x.xx	3/16 (#10)	.1885/.1870	.219	.385	.19	7/16	.86	1.02	1-1/2	1-1/4	1	1.86	.12	
CL-4-BPDx-x.xx	1/4	.2485/.2470	.290	.415	.25	1/2	.86	1.06	1-15/16	1-7/16			1.86	.12
CL-5-BPDx-x.xx	5/16	.3110/.3095	.375											.15
CL-6-BPDx-x.xx	3/8	.3735/.3720	.438	.16										
CL-7-BPDx-x.xx	7/16	.4360/.4345	.508	.18										
CL-8-BPDx-x.xx	1/2	.4985/.4970	.592	.18										
CL-9-BPDx-x.xx	9/16	.5610/.5595	.666	.635	.31	11/16	.97	1.24	2-3/16	1-19/32	1-5/16	1.97	.18	
CL-10-BPDx-x.xx	5/8	.6235/.6220	.750	.725	.43	13/16	1.14	1.44	2-7/16	1-3/4			2.45	.26
CL-12-BPDx-x.xx	3/4	.7485/.7470	.886	.765	.43	15/16	1.13	1.43					2.44	.29
CL-14-BPDx-x.xx	7/8	.8735/.8720	1.044	.925	.56	1-1/8	1.29	1.59	2-25/32	2-3/16	1-5/16	2.79	.28	
CL-16-BPDx-x.xx	1	.9985/.9970	1.217	1.075	.56	1-1/4	1.47	1.77					2.62	.30

**METRIC**

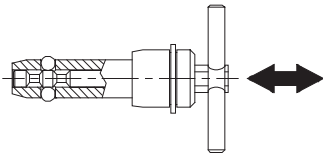
CLM-5-BPDx-xx	5mm	.1954/.1939	.212	.385	.19	7/16	.86	1.02	1-1/2	1-1/4	1	1.86	.12	
CLM-6-BPDx-xx	6mm	.2347/.2332	.278										.12	
CLM-8-BPDx-xx	8mm	.3135/.3120	.371	.14										
CLM-10-BPDx-xx	10mm	.3922/.3907	.469	.15										
CLM-12-BPDx-xx	12mm	.4709/.4694	.567	.18										
CLM-16-BPDx-xx	16mm	.6284/.6269	.748	.725	.31	11/16	.97	1.24	2-3/16	1-19/32			1-5/16	1.97
CLM-20-BPDx-xx	20mm	.7859/.7844	.948	.925	.56	1-1/8	1.29	1.59	2-25/32	2-3/16	2.45	.26		
											2.62	.28		



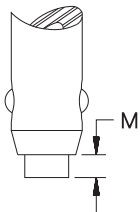
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# DOUBLE-ACTING BALL LOCK PINS

SEE PAGE 9 FOR MATERIAL SPECIFICATIONS



Similar to a single-acting pin, except the center spindle has *two* grooves instead of one, to release the ball by either pushing or pulling. Pushing on the handle releases the balls and inserts the pin in one motion. Pulling on the handle releases the balls and removes the pin in one motion. Available in steel or stainless steel. Choice of three handle styles: T, L, and Ring. Standard shank diameters from 3/16 to 1" (5 to 20mm in metric). Any grip length up to 6" (150mm in metric) is available as a standard, at no extra charge. Available from stock in some standard grip lengths, or quickly made to order in custom lengths and diameters.



### Drive-Out Option

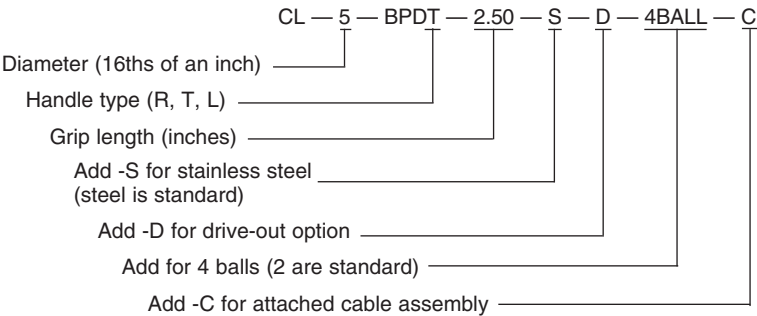
Double-acting Ball Lock Pins are available with a "drive-out" option, where the center spindle extends slightly beyond the shank end (see M dimension). This allows removing a pin under slight shear load by tapping the shank end with a hammer (releasing the balls at the same time).



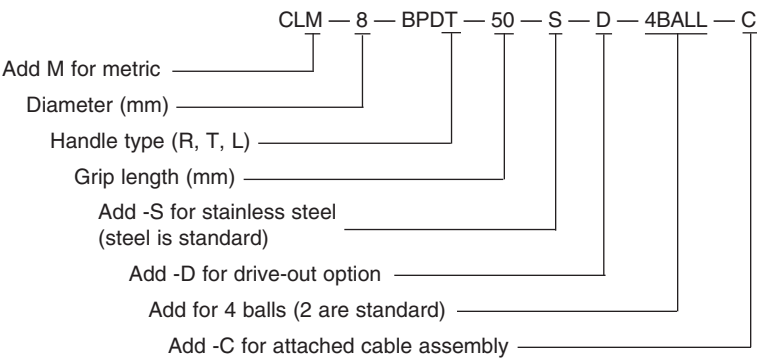
### Other Options

Ball Lock Pins are optionally available in stainless steel instead of alloy steel for greater corrosion resistance. Pins are also available with four balls instead of two, as specials, for additional pull-out strength and more distributed ball-contact force. Optional cable assemblies are 12" long, with a terminal at the free end for a #10-32 or M5 attachment screw (CL-82-KA-12.0).

### Ordering Example (USA):



### Ordering Example (Metric):



### STOCK GRIP LENGTHS (USA) ALLOY STEEL

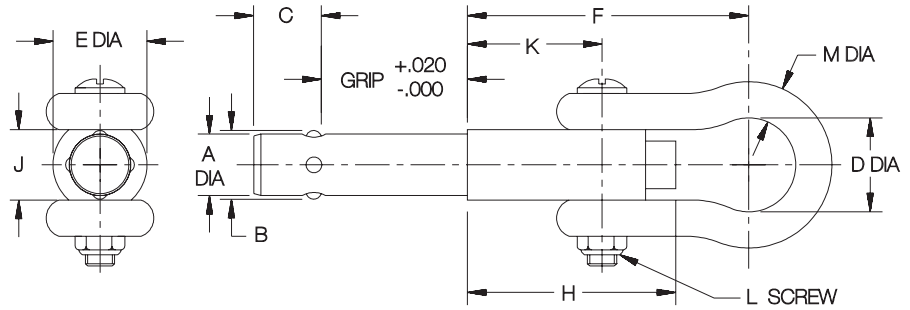
PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (INCHES)										
		1.00 R T L	1.25 R T L	1.50 R T L	1.75 R T L	2.00 R T L	2.50 R T L	3.00 R T L	3.50 R T L	4.00 R T L	5.00 R T L	
CL-3-BPDx-x.xx	3/16 (#10)	••		••								
CL-4-BPDx-x.xx	1/4	••	•	••		••	•					
CL-5-BPDx-x.xx	5/16											
CL-6-BPDx-x.xx	3/8	••		••		••	••	•				
CL-7-BPDx-x.xx	7/16											
CL-8-BPDx-x.xx	1/2	•		•••	•	••	••	••	••	•	•	
CL-9-BPDx-x.xx	9/16											
CL-10-BPDx-x.xx	5/8											
CL-12-BPDx-x.xx	3/4											
CL-14-BPDx-x.xx	7/8											
CL-16-BPDx-x.xx	1											



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# LIFTING PINS

ALLOY STEEL-MATERIAL SPECIFICATIONS ON PAGE 9  
FORGED STEEL SHACKLE PER AN116

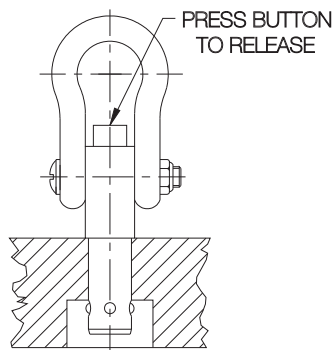


A single-acting ball lock pin with a solid, one-piece body and four balls for high tension loads. Sturdy forged shackle for heavy lifting. Shank diameters from 1/4 to 1" are available, in several standard lengths. See safety precautions on page 34.

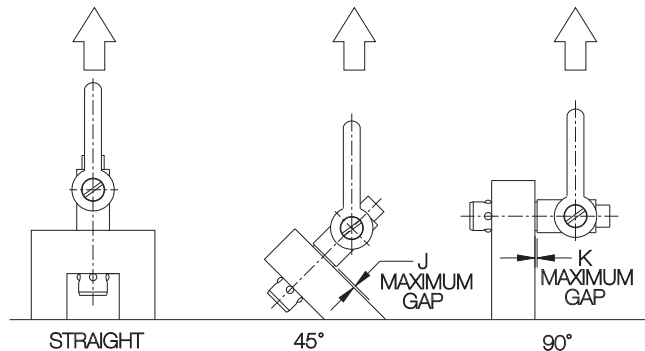
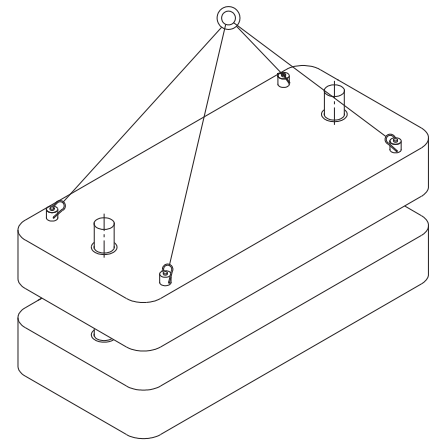
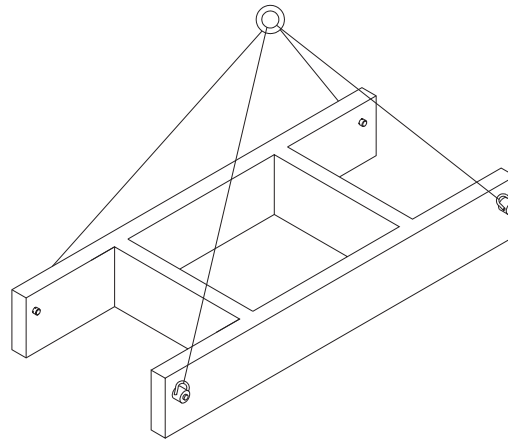
### Ordering Example:

CL-6-LFP-1.50  
 └──────────────────┬────────────────── GRIP LENGTH (inches)  
 └──────────────────┬────────────────── PIN DIAMETER (16ths of an inch)

PART NO.	NOM. DIA	A DIA		B	C MAX	D DIA	E DIA	F	H	J	K	L	M DIA	STOCK GRIP LENGTHS					
		MIN	MAX											.25	.50	1.00	1.50	2.00	3.00
CL-4-LFP-x.xx	1/4	.2470	.2485	.287	.333	9/16	9/16	1.982	1.500	1/2	7/8	#10	3/16	●	●	●	●	●	●
CL-6-LFP-x.xx	3/8	.3720	.3735	.438	.425	11/16	3/4	2.257	1.600	9/16	15/16	#10	1/4	●	●	●	●	●	●
CL-8-LFP-x.xx	1/2	.4970	.4985	.593	.519	13/16	13/16	2.431	1.800	11/16	1	1/4	5/16	●	●	●	●	●	●
CL-12-LFP-x.xx	3/4	.7470	.7485	.887	.707	15/16	1-1/8	2.791	2.200	7/8	1-1/4	5/16	7/16	●	●	●	●	●	●
CL-16-LFP-x.xx	1	.9970	.9985	1.217	.957	1-1/4	1-3/8	3.426	2.750	1-1/8	1-1/2	3/8	1/2	●	●	●	●	●	●



TYPICAL INSTALLATION



### TECHNICAL DATA

PART NO.	LOAD CAPACITY (LBS)*			J (45°)	K (90°)	RECOMMENDED HOLE DIA	
	STRAIGHT	45°	90°			MAX	MIN
CL-4-LFP-x.xx	240	190	140	.031	.037	.254	.250
CL-6-LFP-x.xx	590	600	400	.036	.042	.379	.375
CL-8-LFP-x.xx	1100	1000	880	.041	.047	.505	.500
CL-12-LFP-x.xx	2600	2600	2300	.046	.052	1.010	1.000
CL-16-LFP-x.xx	3400	3200	2900				

\* 5:1 Safety factor, based on the average failing load of test specimens. See above for allowable installation-hole tolerances. Straight pull capacity assumes pin is installed in a hardened tool steel plate or bushing. Use standard lifting hook so that button is not depressed while lifting.



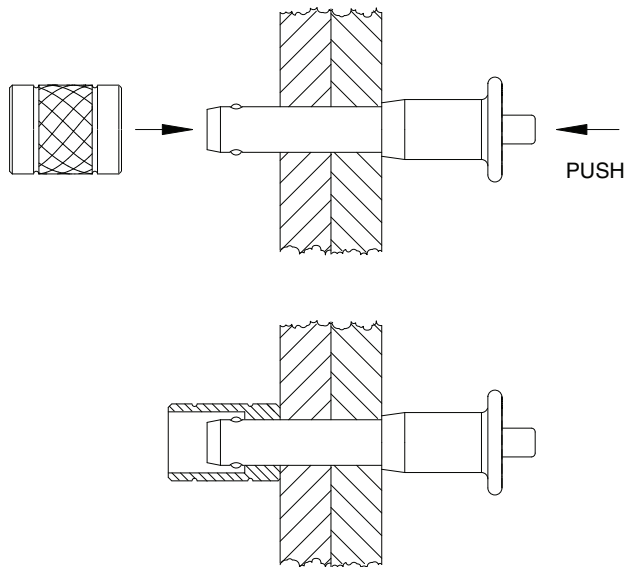
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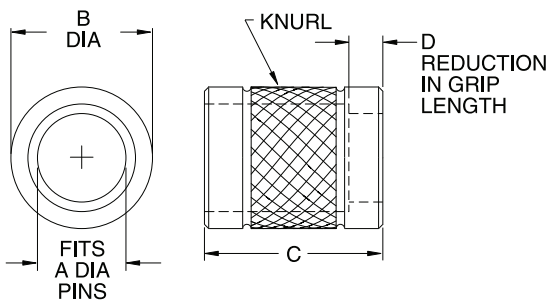
# BALL LOCK RECEIVER CAPS

300-SERIES STAINLESS STEEL, PASSIVATED

**NEW!**



Receiver Caps are ideal for securing Ball Lock Pins used in clevis applications, especially when the through-hole has excess clearance. The Receiver Cap's inside diameter fits the Ball Lock Pin exactly, and is stepped to provide a perfect locking surface for the balls. Available to fit Ball Lock Pin diameters from 1/4 to 1/2". Made of 300-series stainless steel. Please note, using a Receiver Cap reduces the Ball Lock Pin's effective grip length slightly (see D dimension).



**USA**

PART NO.	A DIA	B DIA	C	D
CL-4-BLCR-S	1/4	3/8	.58	1/8
CL-5-BLCR-S	5/16	1/2	.63	
CL-6-BLCR-S	3/8	17/32	.73	3/16
CL-8-BLCR-S	1/2	3/4	1.00	1/4



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# BALL LOCK MOUNTING SYSTEM™

CLAMP BODY: 4340 STEEL, HEAT TREATED RC 40-45, BLACK OXIDE FINISH  
 RECEIVER BUSHINGS: 4340 STEEL, HEAT TREATED RC 50-54, BLACK OXIDE FINISH  
 LINERS: 52100 OR TOOL STEEL, HEAT TREATED RC 58-64, BLACK OXIDE FINISH

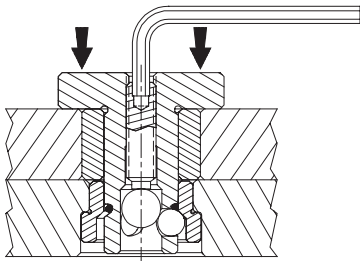
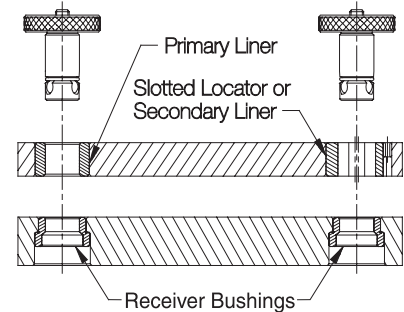


**Ball Lock Clamp**

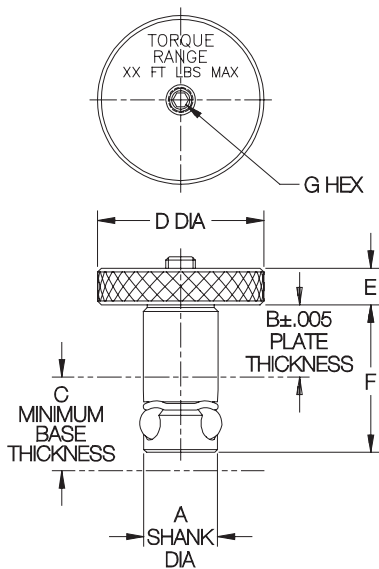
The Ball Lock Mounting System allows accurately locating and clamping at the same time, with just the turn of a hex wrench. Ideal for mounting quick-change tooling on a subplate. Each mount consists of three components: (1) a Ball Lock Clamp with a precisely ground shank; (2) a Liner Bushing in the top plate; (3) a Receiver Bushing in the subplate. This compact assembly provides considerable holddown force, together with an incredible ±.0005 inches repeatability!

Each top plate should have one Ball Lock Mount designated as its primary reference point, and one as its secondary reference point. These two mounts should be as far apart as possible. The secondary reference point should have a relieved liner to avoid redundant location (binding). Additional Ball Lock Mounts can be used for more clamping force, but these should be installed in clearance holes, not locating liners. Note that the same Ball Lock Clamp fits any type of liner or a clearance hole.

Ball Lock Clamps must be used with one of the Receiver Bushings on page 20. Plate thickness must be ±.005 inches to achieve proper clamping force. Special grip lengths for other plate thicknesses are available as specials. Do not exceed maximum screw torque shown.



Turning the clamping screw with a hex wrench advances the large center ball, pushing the three clamping balls outward. These balls engage the angled ID of the Receiver Bushing, pulling the entire unit firmly downward.



## BALL LOCK CLAMPS (USA)

PART NO.	A SHANK DIA		B		C	D DIA	E	F	G	MAX SCREW TORQUE (FT-LBS)	MAX HOLDDOWN FORCE (LBS)	SPARE PARTS KIT PART NO.*
	NOMINAL	ACTUAL	NOMINAL	ACTUAL								
CL-13-BLS-0.50	13mm	.5116	1/2	.500	.75	7/8	1/4	1.08	3/32	1	750	CL-13-BLK-0.50
CL-13-BLS-0.75		.5111	3/4	.750				1.33				CL-13-BLK-0.75
CL-16-BLS-0.50	16mm	.6297	1/2	.500	.75	1-1/2	5/16	1.15	1/8	2	1200	CL-16-BLK-0.50
CL-16-BLS-0.75		.6292	3/4	.750				1.40				CL-16-BLK-0.75
CL-20-BLS-0.75	20mm	.7872	3/4	.750	.83	1-3/4	3/8	1.53	1/8	3	3000	CL-20-BLK-0.75
CL-20-BLS-1.00		.7867	1	1.000				1.78				CL-20-BLK-1.00
CL-25-BLS-0.75		.9841	3/4	.750				1.70				5/32
CL-25-BLS-1.00	.9836	1	1.000	1.95	CL-25-BLK-1.00							
CL-30-BLS-0.75	30mm	1.1809	3/4	.750	1.23	2-1/4	1/2	1.88	3/16	12	10000	CL-30-BLK-0.75
CL-30-BLS-1.00		1.1804	1	1.000				2.13				CL-30-BLK-1.00
CL-35-BLS-0.75				3/4				.750				1.97
CL-35-BLS-1.00	1.3778	1	1.000	2.22	CL-35-BLK-1.00							
CL-35-BLS-1.50	35mm	1.3773	1-1/2	1.250	1.28	2-1/4	1/2	2.72	3/8	38	20000	CL-35-BLK-1.50
CL-35-BLS-2.00				2				2.000				3.22
CL-50-BLS-1.00	50mm	1.9683	1	1.000	1.80	3	3/4	2.70	3/8	38	20000	CL-50-BLK-1.00
CL-50-BLS-1.50		1.9678	1-1/2	1.500				3.20				CL-50-BLK-1.50
CL-50-BLS-2.00				2				2.000				3.70

## BALL LOCK CLAMPS (METRIC)

CLM-13-BLS-13	13mm	.5116	13mm	.512	.75	.87	.236	1.09	2.5mm	1	750	CLM-13-BLK-13
CLM-13-BLS-20		.5111	20mm	.787				1.36				
CLM-16-BLS-20	16mm	.6297	20mm	.787	.75	1.50	.315	1.44	3mm	2	1200	CLM-16-BLK-20
CLM-16-BLS-25		.6292	25mm	.984				1.63				CLM-16-BLK-25
CLM-20-BLS-20	20mm	.7872	20mm	.787	.83	1.77	.394	1.56	3mm	3	3000	CLM-20-BLK-20
CLM-20-BLS-25		.7867	25mm	.984				1.75				CLM-20-BLK-25
CLM-25-BLS-20	25mm	.9841	20mm	.787	1.00	1.97	.394	1.73	4mm	7	7000	CLM-25-BLK-20
CLM-25-BLS-25		.9836	25mm	.984				1.93				CLM-25-BLK-25

\* Spare Parts Kit includes screw, center ball, locking balls, and O-ring.



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# BALL LOCK MOUNTING SYSTEM™



**Primary Liner Bushing**



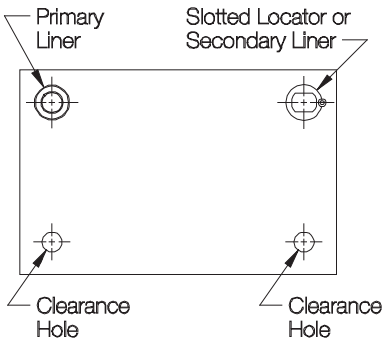
**Secondary Liner Bushing**



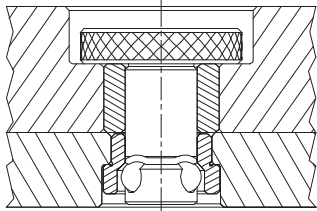
**Slotted Locator Bushing**

**LINER BUSHINGS**

Each top plate should have one Primary Liner, and one Secondary Liner or Slotted Locator Bushing. Primary Liners have a tight ID (+.0002/+.0007 tolerance) for precise reference in two axes. Secondary Liners have slight ID clearance (+.0010/+.0020 tolerance) to avoid binding. Slotted Locator Bushings provide better accuracy than Secondary Liners, but take a few extra steps to install (see page 5 for instructions and additional dimensions). Slotted Locators have a tight ID tolerance in one direction and full relief in the perpendicular direction (available only in 16mm, 20mm, and 25mm diameters). Note: alternatively, two Primary Liners can be used for alignment if hole locations are held to ±.0002 inches.



To mount top plates with more than two Ball Lock Clamps, use clearance holes .015-.030" over nominal size for the additional holes, instead of liner bushings, to avoid redundant location. (Still use four Receiver Bushings in the subplate.)



Extra-thick top plates can be counter-bored to achieve proper clamping thickness (hold thickness to ±.005). Special-length Ball Lock Clamps are also available, as specials.

**PRIMARY LINER BUSHINGS (USA)**

PART NO.	ID	LENGTH	OD	HOLE IN PLATE		
CL-13-BLL-0.50	13mm	.50	.7518	.7504		
CL-13-BLL-0.75		.75	.7514	.7509		
CL-16-BLL-0.50	16mm	.50	1.0018	1.0004		
CL-16-BLL-0.75		.75	1.0014	1.0009		
CL-20-BLL-0.75	20mm	.75	1.3772	1.3758		
CL-20-BLL-1.00		1.00	1.3768	1.3763		
CL-25-BLL-0.75	25mm	.75	1.3772	1.3758		
CL-25-BLL-1.00		1.00	1.3768	1.3763		
CL-30-BLL-0.75	30mm	.75	1.7523	1.7509		
CL-30-BLL-1.00		1.00	1.7519	1.7514		
CL-35-BLL-0.75	35mm	.75	1.7523	1.7509		
CL-35-BLL-1.00		1.00			1.7519	1.7514
CL-35-BLL-1.50		1.50				
CL-35-BLL-2.00		2.00				
CL-50-BLL-1.00	50mm	1.00	2.5025	2.5007		
CL-50-BLL-1.50		1.50	2.5021	2.5012		
CL-50-BLL-2.00		2.00				

**(METRIC)**

CLM-13-BLL-13	13mm	.512	19mm	.7487
CLM-13-BLL-20		.787		.7491
CLM-16-BLL-20	16mm	.787	25mm	.9849
CLM-16-BLL-25		.984		.9853
CLM-20-BLL-20	20mm	.787	35mm	1.3787
CLM-20-BLL-25		.984		1.3791
CLM-25-BLL-20	25mm	.787	35mm	1.3787
CLM-25-BLL-25		.984		1.3791

**SECONDARY LINER BUSHINGS (USA)**

PART NO.	ID	LENGTH	OD	HOLE IN PLATE		
CL-13-BLT-0.50	13mm	.50	.7518	.7504		
CL-13-BLT-0.75		.75	.7514	.7509		
CL-16-BLT-0.50	16mm	.50	1.0018	1.0004		
CL-16-BLT-0.75		.75	1.0014	1.0009		
CL-20-BLT-0.75	20mm	.75	1.3772	1.3758		
CL-20-BLT-1.00		1.00	1.3768	1.3763		
CL-25-BLT-0.75	25mm	.75	1.3772	1.3758		
CL-25-BLT-1.00		1.00	1.3768	1.3763		
CL-30-BLT-0.75	30mm	.75	1.7523	1.7509		
CL-30-BLT-1.00		1.00	1.7519	1.7514		
CL-35-BLT-0.75	35mm	.75	1.7523	1.7509		
CL-35-BLT-1.00		1.00			1.7519	1.7514
CL-35-BLT-1.50		1.50				
CL-35-BLT-2.00		2.00				
CL-50-BLT-1.00	50mm	1.00	2.5025	2.5007		
CL-50-BLT-1.50		1.50	2.5021	2.5012		
CL-50-BLT-2.00		2.00				

**(METRIC)**

CLM-13-BLT-13	13mm	.512	19mm	.7487
CLM-13-BLT-20		.787		.7491
CLM-16-BLT-20	16mm	.787	25mm	.9849
CLM-16-BLT-25		.984		.9853
CLM-20-BLT-20	20mm	.787	35mm	1.3787
CLM-20-BLT-25		.984		1.3791
CLM-25-BLT-20	25mm	.787	35mm	1.3787
CLM-25-BLT-25		.984		1.3791

**SLOTTED LOCATOR BUSHINGS (USA)**

PART NO.	ID	LENGTH	OD	HOLE IN PLATE
—	13mm	—	—	—
CLM-16-SLLB	16mm	.472	1.1815 1.1812	1.1806 1.1809
CLM-20-SLLB	20mm	.748	1.4177 1.4174	1.4168 1.4171
CLM-25-SLLB	25mm	.748	1.5752 1.5749	1.5743 1.5746
—	30mm	—	—	—
—	35mm	—	—	—
—	50mm	—	—	—

**(METRIC)**

—	13mm	—	—	—
CLM-16-SLLB	16mm	.472	30mm	1.1806 1.1809
CLM-20-SLLB	20mm	.748	36mm	1.4168 1.4171
CLM-25-SLLB	25mm	.748	40mm	1.5743 1.5746



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 Web Site: www.carrlane.com

# BALL LOCK MOUNTING SYSTEM™



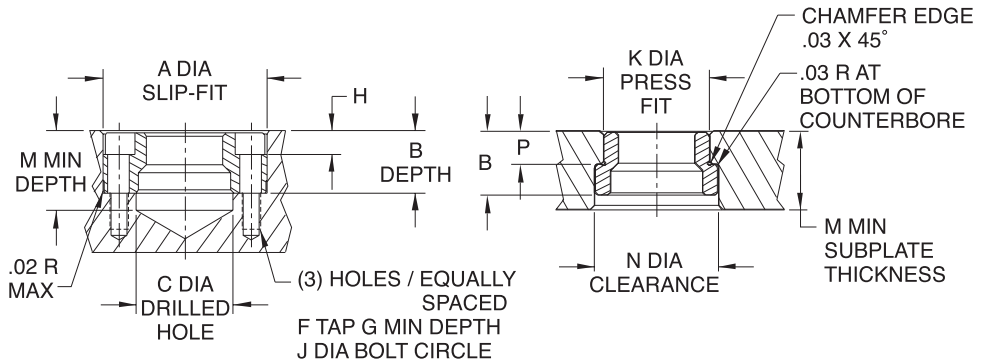
**Face-Mount Receiver Bushing**



**Back-Mount Receiver Bushing**

## RECEIVER BUSHINGS

Ball Lock Clamps must be used in conjunction with one of these Receiver Bushings. Face-Mount Receiver Bushings can be bolted into a slip-fit bored hole from above, with three socket-head cap screws (furnished). Back-Mount Receiver Bushings are more compact, but take more effort to install. Back-mount bushings are installed in the subplate from below, with a slight press fit (measure actual bushing before boring hole to provide .0005 maximum press fit, to avoid I.D. distortion). With either bushing type, the installation holes must be jig sized and located. Installed bushings will be approximately .012" below the subplate surface.



**Face Mount Hole Dimensions**

**Back Mount Hole Dimensions**

## FACE-MOUNT RECEIVER BUSHINGS (USA)

PART NO.	ID	A DIA		B		C	F	G	H	J DIA	M
		BUSHING	HOLE	BUSHING	HOLE						
CL-13-BLRC	13mm	1.3750	1.3750	.455	.469	.688	#8-32	.31	.180	.984	.75
		1.3746	1.3755		.471						
CL-16-BLRC	16mm	1.4370	1.4370	.455	.469	.812	#8-32	.31	.193	1.125	.75
		1.4366	1.4375		.471						
CL-20-BLRC	20mm	1.6873	1.6873	.623	.637	.812	#10-32	.38	.273	1.362	.83
		1.6869	1.6878		.639						
CL-25-BLRC	25mm	2.0623	2.0623	.785	.799	1.000	1/4-28	.50	.316	1.644	1.00
		2.0619	2.0628		.801						
CL-30-BLRC	30mm	2.2654	2.2654	.857	.871	1.188	1/4-28	.75	.316	1.876	1.23
		2.2650	2.2659		.873						
CL-35-BLRC	35mm	2.6873	2.6873	.890	.904	1.562	5/16-24	.88	.375	2.178	1.28
		2.6869	2.6878		.906						
CL-50-BLRC	50mm	3.4998	3.4998	1.225	1.239	2.156	3/8-24	1.00	.475	2.916	1.80
		3.4994	3.5003		1.241						

### (METRIC)

CLM-13-BLRC	13mm	1.3776	1.3780	.455	.468	.531	M4	.39	.177	.984	.78
		1.3772	1.3783		.470						
CLM-16-BLRC	16mm	1.4563	1.4567	.455	.468	.650	M4	.39	.177	1.142	.78
		1.4559	1.4570		.470						
CLM-20-BLRC	20mm	1.7713	1.7717	.623	.637	.807	M5	.47	.236	1.378	.78
		1.7709	1.7720		.639						
CLM-25-BLRC	25mm	2.1650	2.1654	.785	.799	1.004	M6	.59	.276	1.654	.98
		2.1646	2.1657		.801						

## BACK-MOUNT RECEIVER BUSHINGS (USA)

PART NO.	ID	B	K DIA		M	N DIA		P
			BUSHING	HOLE		BUSHING	HOLE	
CL-13-BLRV	13mm	.475	.7870	.984	.75	.995	1.005	.277
			.7866			1.005		.275
CL-16-BLRV	16mm	.475	.8760	1.125	.75	1.150	1.160	.285
			.8756			1.160		.283
CL-20-BLRV	20mm	.673	1.0950	1.250	.83	1.275	1.285	.345
			1.0946			1.285		.343
CL-25-BLRV	25mm	.826	1.3763	1.562	1.00	1.588	1.598	.416
			1.3759			1.598		.414
CL-30-BLRV	30mm	.857	1.6264	1.875	1.23	1.901	1.911	.432
			1.6260			1.911		.430
CL-35-BLRV	35mm	.990	1.8764	2.125	1.28	2.150	2.160	.493
			1.8760			2.160		.491
CL-50-BLRV	50mm	1.225	2.6269	2.937	1.80	2.963	2.973	.621
			2.6265			2.973		.619

### (METRIC)

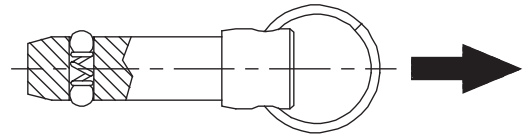
CLM-13-BLRV	13mm	.476	.7890	.984	.78	.995	1.019	.273
			.7886			1.029		.271
CLM-16-BLRV	16mm	.476	.8677	1.125	.78	1.137	1.147	.286
			.8673			1.147		.284
CLM-20-BLRV	20mm	.673	1.1039	1.268	.78	1.294	1.304	.345
			1.1035			1.304		.343
CLM-25-BLRV	25mm	.826	1.3795	1.583	.98	1.609	1.619	.416
			1.3791			1.619		.414



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# DETENT PINS

SEE PAGE 9 FOR MATERIAL SPECIFICATIONS



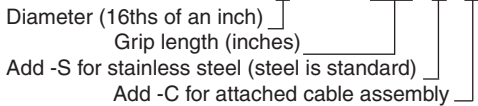
Solid alignment pin with spring-loaded locking balls (not positive locking like a ball lock pin). Simply push pin to insert, and pull to remove. Available in steel or stainless steel. Standard shank diameters from 3/16 to 1" (6 to 20mm in metric). Note: 3/16-diameter pins have one ball, instead of two, due to their small size. Any grip length up to 6" (150mm in metric) is available as a standard, at no extra charge. Available from stock in many standard grip lengths, or quickly made to order in custom lengths and diameters.

### Optional Cable

Optional cable assemblies are 12" long, with a terminal at the free end for a #10-32 or M5 attachment screw. (CL-82-KA-12.0).

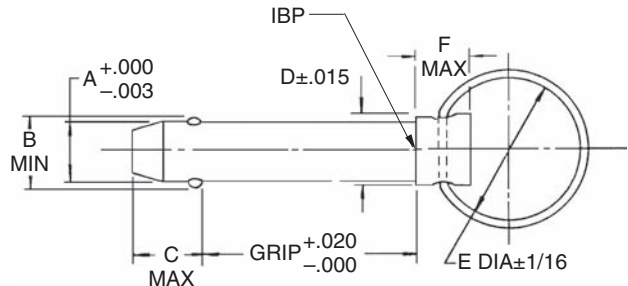
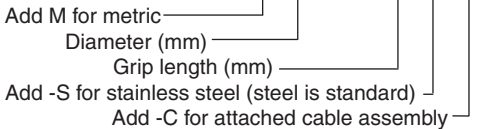
### Ordering Example (USA):

CL - 4 - DEP - 1.50 - S - C



### Ordering Example (Metric):

CLM - 6 - DEP - 50 - S - C



- = STOCKED IN ALLOY STEEL ONLY
- X = STOCKED IN ALLOY AND STAINLESS STEEL

### USA

PART NO.	A DIA		B	C	D DIA	E DIA	F	STOCK GRIP LENGTHS, ALLOY STEEL (INCHES)															
	NOMINAL	ACTUAL						.50	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.50
CL-3-DEP-x.xx	3/16 (#10)	.1880	.217	.250	.375	1.00	.562	•	X	X	X	X	•	•									
CL-4-DEP-x.xx	1/4	.2480	.280	.344		1.00	.562	X	X	X	X	X	•	•	•	•	•	•	•	•	•	•	•
CL-5-DEP-x.xx	5/16	.3105	.360	.359	.438	1.00	.562	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-6-DEP-x.xx	3/8	.3730	.430	.390	.500	1.00	.562	•	X	X	X	X	•	•	•	•	•	•	•	•	•	•	•
CL-7-DEP-x.xx	7/16	.4355	.495	.469	.563	1.00	.562		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-8-DEP-x.xx	1/2	.4980	.570	.516	.625	1.00	.562	•	•	X	•	X	•	•	•	•	•	•	•	•	•	•	•
CL-9-DEP-x.xx	9/16	.5605	.645	.593	.688	1.00	.562																
CL-10-DEP-x.xx	5/8	.6230	.720	.672	.750	1.50			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-12-DEP-x.xx	3/4	.7480	.860	.750	.875	1.50			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-14-DEP-x.xx	7/8	.8730	1.03	.859	1.000	2.00																	
CL-16-DEP-x.xx	1	.9980	1.16	.984	1.125	2.00																	

### METRIC

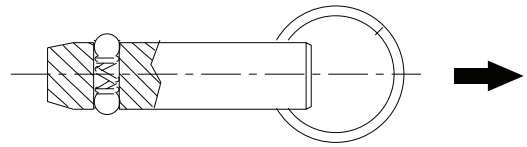
PART NO.	A DIA		B	C	D DIA	E DIA	F	STOCK GRIP LENGTHS, ALLOY STEEL (MM)														
	NOMINAL	ACTUAL						10	15	20	25	30	40	50	60	70	80	90	100			
CLM-6-DEP-xx	6mm	.2342	.266	.344	.375	1.00	.562	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CLM-8-DEP-xx	8mm	.3130	.363	.359	.438	1.00	.562			•	•	•	•	•	•	•	•	•	•	•	•	•
CLM-10-DEP-xx	10mm	.3917	.451	.390	.500	1.00	.562			•	•	•	•	•	•	•	•	•	•	•	•	•
CLM-12-DEP-xx	12mm	.4704	.540	.516	.563	1.00	.562					•	•	•	•	•	•	•	•	•	•	•
CLM-16-DEP-xx	16mm	.6279	.725	.672	.750	1.50																
CLM-20-DEP-xx	20mm	.7854	.897	.750	1.000	2.00																



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# MARINE DETENT PINS

SHANK: 316 STAINLESS STEEL  
 RING: 316 OR 300-SERIES STAINLESS STEEL  
 SPRING & BALLS: 316 STAINLESS STEEL



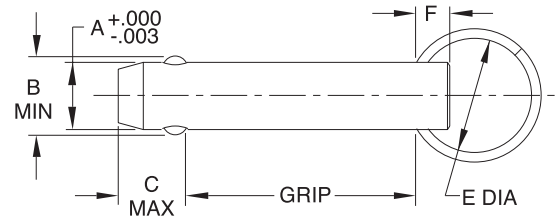
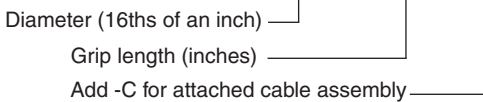
Marine Detent pins are made of 316 stainless steel for extra corrosion resistance. Economical shear pin, without a head for applications where exact grip length is not important. Solid alignment pins with spring-loaded locking balls (not positive locking like a ball lock pin). Simply push pin to insert, and pull to remove. Shank diameters from 3/16" to 1/2", each available in a choice of several standard grip lengths. Note: 3/16-diameter pins have one ball, instead of two, due to their small size. Available from stock only in the standard grip lengths listed below (other grip lengths available as specials).

### Optional Cable

Optional cable assemblies are 12" long, with a terminal at the free end for a #10-32 or M5 attachment screw. (CL-82-KA-12.0).

### Ordering Example (USA):

CL - 4 - MDP - 1.50 - S - C



### DIMENSIONS (USA)

PART NO.	A DIA		B	C	E DIA	F DIA
	NOMINAL	ACTUAL				
CL-3-MDP-x.xx-S	3/16 (#10)	.1880	.200	.329		
CL-4-MDP-x.xx-S	1/4	.2480	.280	.344		
CL-5-MDP-x.xx-S	5/16	.3105	.360	.359	1.00	.25
CL-6-MDP-x.xx-S	3/8	.3730	.430	.390		
CL-8-MDP-x.xx-S	1/2	.4980	.570	.516		

### STANDARD STOCK GRIP LENGTHS (USA)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (INCHES)											
		0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	3.00	3.50	4.00
CL-3-MDP-x.xx-S	3/16 (#10)	X	X	X	X	X	X	X		X			
CL-4-MDP-x.xx-S	1/4	X	X	X	X	X	X	X	X	X			
CL-5-MDP-x.xx-S	5/16		X	X	X	X	X	X		X	X	X	X
CL-6-MDP-x.xx-S	3/8		X	X	X	X	X	X	X	X	X	X	X
CL-8-MDP-x.xx-S	1/2			X	X	X	X	X		X	X	X	X

X-Stocked in stainless steel.



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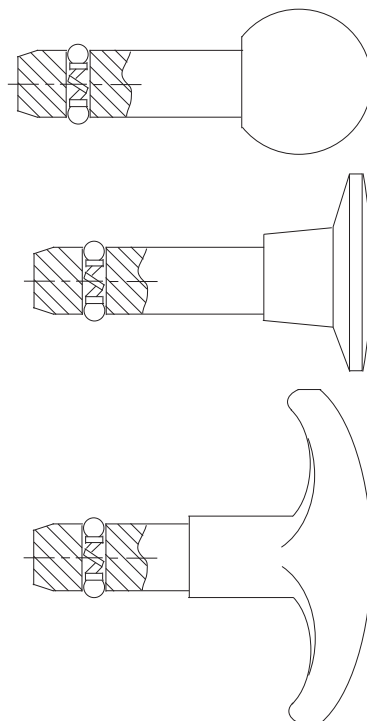
# THREADED DETENT PINS

SHANK: 300-SERIES STAINLESS STEEL  
 SPRING: 17-7PH OR 302 STAINLESS STEEL  
 BALLS: 440C STAINLESS STEEL

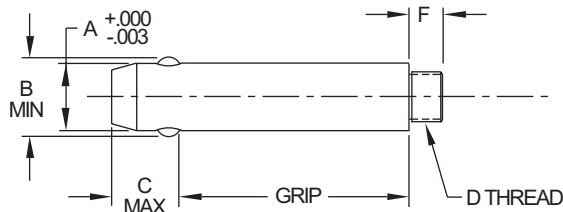


**NOW ALSO  
 AVAILABLE  
 IN METRIC!**

Threaded Detent Pins are solid alignment pins with a ground shank and a threaded end for a knob handle. Two locking balls hold the pin in place by spring force. Simply push to insert, and pull to remove. The threaded end accepts virtually any type of knob handle (order separately — available in steel, stainless steel, and several different plastics). Knob handles can be permanently secured with thread-locking adhesive if desired. Threaded Detent Pins are available in stainless steel only. Standard shank diameters from 3/16 to 1/2" (6 to 10mm in metric), each in a choice of many standard grip lengths. Note: 3/16-dia pins have only one locking ball instead of two due to their small size. Available from stock only in the standard grip lengths listed (other grip lengths available as specials).



For a wide selection of knob handles to fit these Threaded Detent Pins, see pages 104-111.



**USA**

PART NO.	A DIA		GRIP LENGTH	B	C	D	F
	NOMINAL	ACTUAL					
CL-3-TDP-0.50-S	3/16(#10)	.1880	.50	.200	.250	#8-32	1/4
CL-3-TDP-0.75-S			.75				
CL-3-TDP-1.00-S			1.00				
CL-3-TDP-1.25-S			1.25				
CL-3-TDP-1.50-S			1.50				
CL-3-TDP-1.75-S			1.75				
CL-3-TDP-2.00-S			2.00				
CL-4-TDP-0.50-S	1/4	.2480	.50	.280	.344	#10-32	1/4
CL-4-TDP-0.75-S			.75				
CL-4-TDP-1.00-S			1.00				
CL-4-TDP-1.25-S			1.25				
CL-4-TDP-1.50-S			1.50				
CL-4-TDP-1.75-S			1.75				
CL-4-TDP-2.00-S			2.00				
CL-4-TDP-2.50-S	2.50						
CL-4-TDP-3.00-S	3.00						
CL-5-TDP-0.75-S	5/16	.3105	.75	.360	.359	1/4-20	3/8
CL-5-TDP-1.00-S			1.00				
CL-5-TDP-1.25-S			1.25				
CL-5-TDP-1.50-S			1.50				
CL-5-TDP-1.75-S			1.75				
CL-5-TDP-2.00-S			2.00				
CL-5-TDP-2.50-S			2.50				
CL-5-TDP-3.00-S	3.00						
CL-6-TDP-0.75-S	3/8	.3730	.75	.430	.390	1/4-20	3/8
CL-6-TDP-1.00-S			1.00				
CL-6-TDP-1.25-S			1.25				
CL-6-TDP-1.50-S			1.50				
CL-6-TDP-1.75-S			1.75				
CL-6-TDP-2.00-S			2.00				
CL-6-TDP-2.50-S			2.50				
CL-6-TDP-3.00-S	3.00						
CL-6-TDP-3.50-S	3.50						
CL-6-TDP-4.00-S	4.00						
CL-8-TDP-1.00-S	1/2	.4980	1.00	.570	.516	3/8-16	1/2
CL-8-TDP-1.50-S			1.50				
CL-8-TDP-2.00-S			2.00				
CL-8-TDP-2.50-S			2.50				
CL-8-TDP-3.00-S			3.00				
CL-8-TDP-3.50-S			3.50				
CL-8-TDP-4.00-S	4.00						

**METRIC**

PART NO.	A DIA		GRIP LENGTH	B	C	D	F
	NOMINAL	ACTUAL					
CLM-6-TDP-15-S	6mm	.2342	15mm	.266	.344	M5	.24
CLM-6-TDP-20-S			20mm				
CLM-6-TDP-25-S			25mm				
CLM-6-TDP-30-S			30mm				
CLM-6-TDP-40-S			40mm				
CLM-6-TDP-50-S			50mm				
CLM-8-TDP-20-S	8mm	.3130	20mm	.363	.359	M6	.39
CLM-8-TDP-25-S			25mm				
CLM-8-TDP-30-S			30mm				
CLM-8-TDP-40-S			40mm				
CLM-8-TDP-50-S	50mm						
CLM-10-TDP-20-S	10mm	.3917	20mm	.451	.390	M8	.39
CLM-10-TDP-25-S			25mm				
CLM-10-TDP-30-S			30mm				
CLM-10-TDP-40-S			40mm				
CLM-10-TDP-50-S			50mm				



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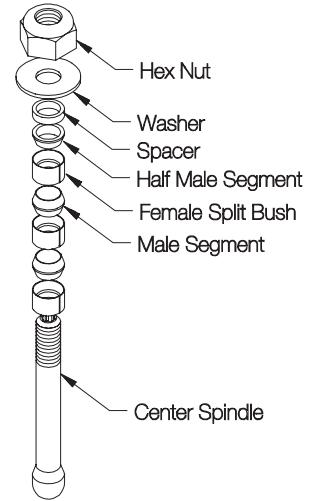
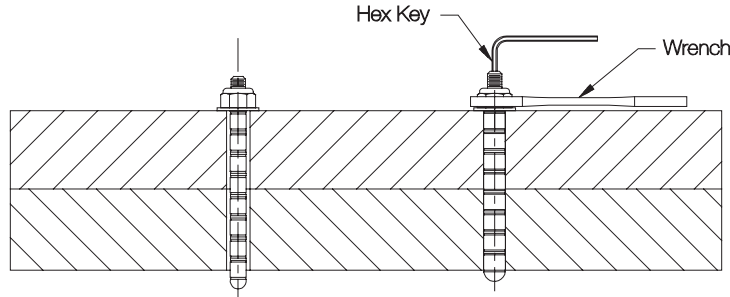
# EXPANDING PINS

SPLIT BUSHINGS, MALE SEGMENTS, & SPACERS: 17-4PH STAINLESS STEEL, RC 40 MIN, PASSIVATED, DRY FILM LUBE  
 CENTER SPINDLE: 17-4PH STAINLESS STEEL, RC 36-40, PASSIVATED, DRY FILM LUBE  
 WASHER: 17-4PH STAINLESS STEEL, PASSIVATED, DRY FILM LUBE  
 HEX NUT: 17-4PH STAINLESS STEEL, WITH LOCKING ELEMENT

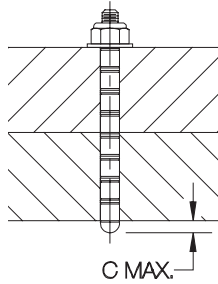


Hex Head

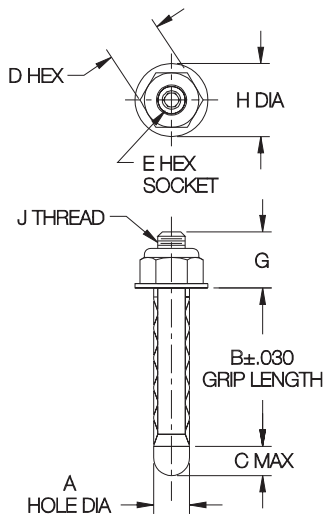
Precision alignment pin that expands up to .006 inches to tighten up hole clearance. The pin is an assembly of female split bushings separated by male segments, on a center spindle, that expands when drawn together. This assembly provides excellent shear strength, comparable to a solid pin. Diameters from 1/4 to 1" are available in several standard lengths. Pins can be installed in through holes or blind holes. Also see page 29, for cam-handle type.



Tightening the hex nut with a wrench expands pin diameter up to .006 inches, to take up slack and secure the pin in place. Hold center spindle stationary with a hex key while tightening.



Important: Install pin so that all split bushings are contained in the installation hole.



## HEX HEAD

PART NO.	A DIA			B	C	D	E	G	H DIA	J	DOUBLE-SHEAR STRENGTH (LBS)*	INSTALLATION TORQUE (FT-LBS)
	NOMINAL	MIN	MAX									
CL-4-EXPH-0.50	1/4	.250	.254	.50	1/4	3/8	3/32	.39	.67	#10-32	4,000	3
CL-4-EXPH-0.75				.75								
CL-4-EXPH-1.00				1.00								
CL-4-EXPH-1.50				1.50								
CL-4-EXPH-2.00				2.00								
CL-4-EXPH-3.00	3.00											
CL-5-EXPH-1.00	5/16	.312	.317	1.00	5/16	3/8	3/32	.40	.67	#10-32	6,300	3
CL-5-EXPH-2.00				2.00								
CL-5-EXPH-3.00				3.00								
CL-6-EXPH-0.50	3/8	.375	.380	.50	3/8	7/16	1/8	.49	.67	1/4-28	9,000	7.5
CL-6-EXPH-0.75				.75								
CL-6-EXPH-1.00				1.00								
CL-6-EXPH-1.50				1.50								
CL-6-EXPH-2.00				2.00								
CL-6-EXPH-3.00	3.00											
CL-8-EXPH-0.50	1/2	.500	.505	.50	1/2	9/16	3/16	.71	.92	3/8-24	16,100	29
CL-8-EXPH-1.00				1.00								
CL-8-EXPH-1.50				1.50								
CL-8-EXPH-2.00				2.00								
CL-8-EXPH-3.00	3.00											
CL-10-EXPH-0.50	5/8	.625	.630	.50	5/8	3/4	1/4	.90	1.22	1/2-20	25,100	83
CL-10-EXPH-1.00				1.00								
CL-10-EXPH-1.50				1.50								
CL-10-EXPH-2.00				2.00								
CL-10-EXPH-3.00	3.00											
CL-12-EXPH-1.00	3/4	.750	.757	1.00	3/4	7/8	1/4	1.02	1.35	9/16-18	36,200	121
CL-12-EXPH-2.00				2.00								
CL-12-EXPH-3.00				3.00								
CL-12-EXPH-4.00				4.00								
CL-16-EXPH-1.00	1	1.000	1.010	1.00	1	1-1/16	1/4	1.23	1.47	3/4-16	64,300	375
CL-16-EXPH-2.00				2.00								
CL-16-EXPH-3.00				3.00								
CL-16-EXPH-4.00				4.00								

\* 2:1 Safety Factor

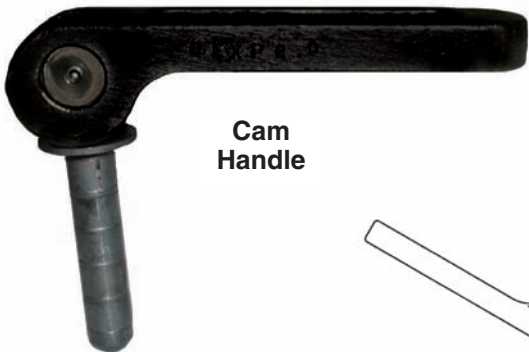


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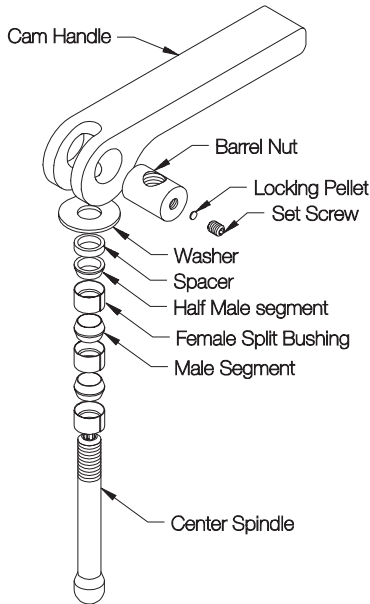
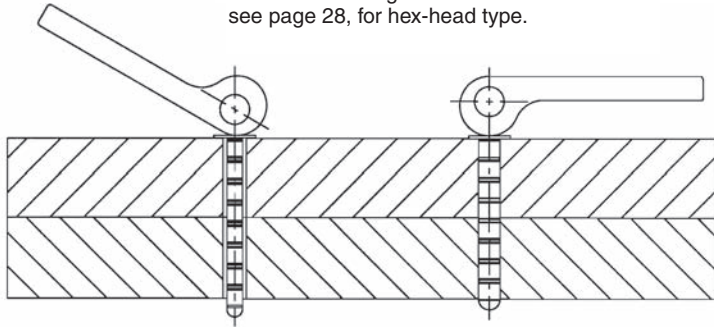
# EXPANDING PINS

SPLIT BUSHINGS, MALE SEGMENTS, & SPACERS: 17-4PH STAINLESS STEEL, RC 40 MIN, PASSIVATED, DRY FILM LUBE  
 CENTER SPINDLE: 17-4PH STAINLESS STEEL, RC 36-40, PASSIVATED, DRY FILM LUBE  
 BARREL NUT & WASHER: 17-4PH STAINLESS STEEL, PASSIVATED, DRY FILM LUBE  
 HANDLE: ALUMINUM ALLOY, BLACK ANODIZED



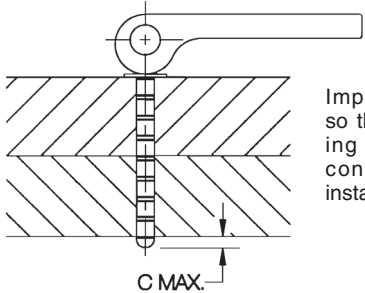
Cam Handle

Precision alignment pin that expands up to .006 inches to tighten up hole clearance. The pin is an assembly of female split bushings separated by male segments, on a center spindle, that expands when drawn together. This assembly provides excellent shear strength, comparable to a solid pin. Diameters from 1/4 to 1" are available in several standard lengths. Pins can be installed in through holes or blind holes. Also see page 28, for hex-head type.

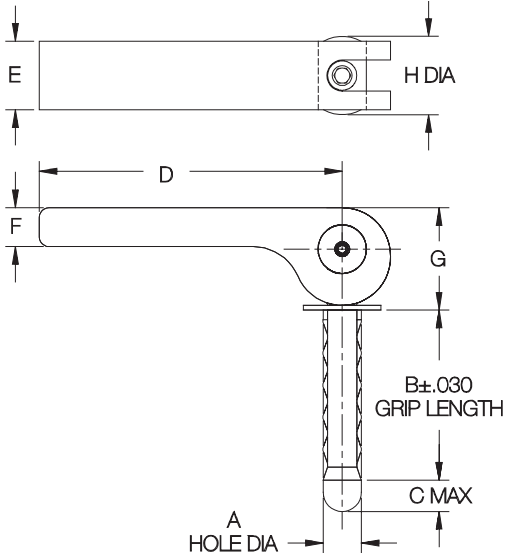


Moving the cam handle expands pin diameter up to .006 inches, to take up slack and secure the pin in place. If additional adjustment is required, remove setscrew and turn the cam handle.

### CAM HANDLE



Important: Install so that all expanding bushings are contained in the installation hole.



PART NO.	A DIA			B	C	D	E	F	G	H DIA	DOUBLE-SHEAR STRENGTH (LBS)*
	NOMINAL	MIN	MAX								
CL-4-EXP-0.50	1/4	.250	.254	.50	1/4	2-3/8	1/2	5/16	.81	5/8	4,000
CL-4-EXP-0.75				.75							
CL-4-EXP-1.00				1.00							
CL-4-EXP-1.50				1.50							
CL-4-EXP-2.00				2.00							
CL-4-EXP-3.00				3.00							
CL-5-EXP-1.00	5/16	.312	.317	1.00	5/16	2-3/8	1	1/2	1.12	1	6,300
CL-5-EXP-2.00				2.00							
CL-5-EXP-3.00				3.00							
CL-6-EXP-0.50	3/8	.375	.380	.50	3/8	4-1/2	1	1/2	1.12	1	9,000
CL-6-EXP-0.75				.75							
CL-6-EXP-1.00				1.00							
CL-6-EXP-1.50				1.50							
CL-6-EXP-2.00				2.00							
CL-6-EXP-3.00				3.00							
CL-8-EXP-0.50	1/2	.500	.505	.50	1/2	4-1/2	1	1/2	1.12	1	16,100
CL-8-EXP-1.00				1.00							
CL-8-EXP-1.50				1.50							
CL-8-EXP-2.00				2.00							
CL-8-EXP-3.00	3.00										
CL-10-EXP-0.50	5/8	.625	.630	.50	5/8	4-1/2	1	1/2	1.31	1	25,100
CL-10-EXP-1.00				1.00							
CL-10-EXP-1.50				1.50							
CL-10-EXP-2.00				2.00							
CL-10-EXP-3.00	3.00										
CL-12-EXP-1.00	3/4	.750	.757	1.00	3/4	6	1-1/4	3/4	2.09	1-1/4	36,200
CL-12-EXP-2.00				2.00							
CL-12-EXP-3.00				3.00							
CL-12-EXP-4.00	4.00										
CL-16-EXP-1.00	1	1.000	1.010	1.00	1	6	1-1/4	3/4	2.09	1-1/4	64,300
CL-16-EXP-2.00				2.00							
CL-16-EXP-3.00				3.00							
CL-16-EXP-4.00				4.00							

\* 2:1 Safety Factor



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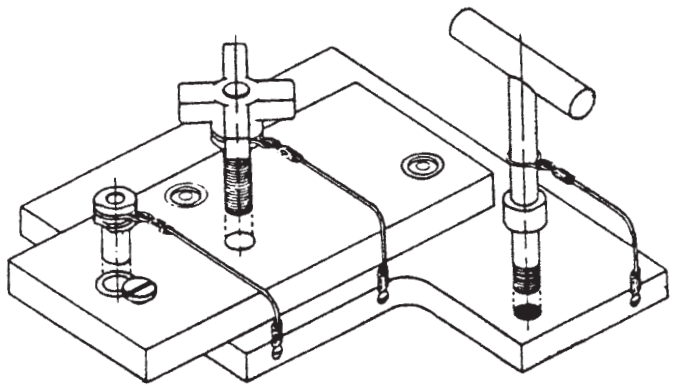
# CABLE ASSEMBLIES

SEE PAGES 32-33 FOR MATERIAL SPECIFICATIONS



Cable Assemblies are ideal for attaching removable tooling components. High-strength stranded wire cable with a green nylon coating. These versatile attachment cables are available with various loops, Cable Rings, Terminals, and Cable Tabs (see page 31 for assembly drawings and example part numbers).

Cable Assemblies are available in four cable sizes, in steel or stainless steel (#1 cable is only available in stainless steel). Stainless Cable Assemblies with Cable Rings are furnished with stainless Cable Rings. Minimum assembly length is 3.0". Length tolerance is held to ± 1/4" up to 24" long. See page 32-33 for dimensions and specifications of Ferrules, Cable Rings, Terminals, and Cable Tabs. Note: These Cable Assemblies should not be used for lifting and other high-tension applications.



To order Cable Assemblies with an uncrimped ferrule (for installation), add a suffix to the part number shown on page 31:

- L for uncrimped left end
- R for uncrimped right end
- LR for both ends uncrimped



Cable Sizes

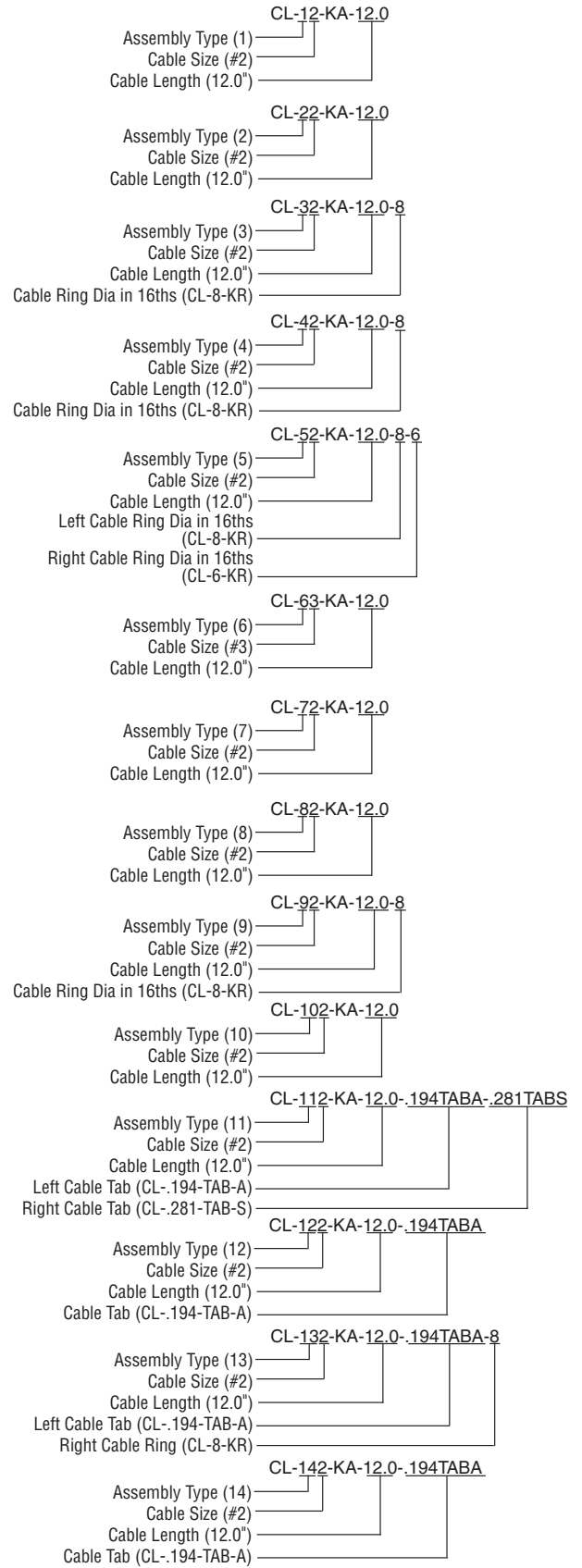
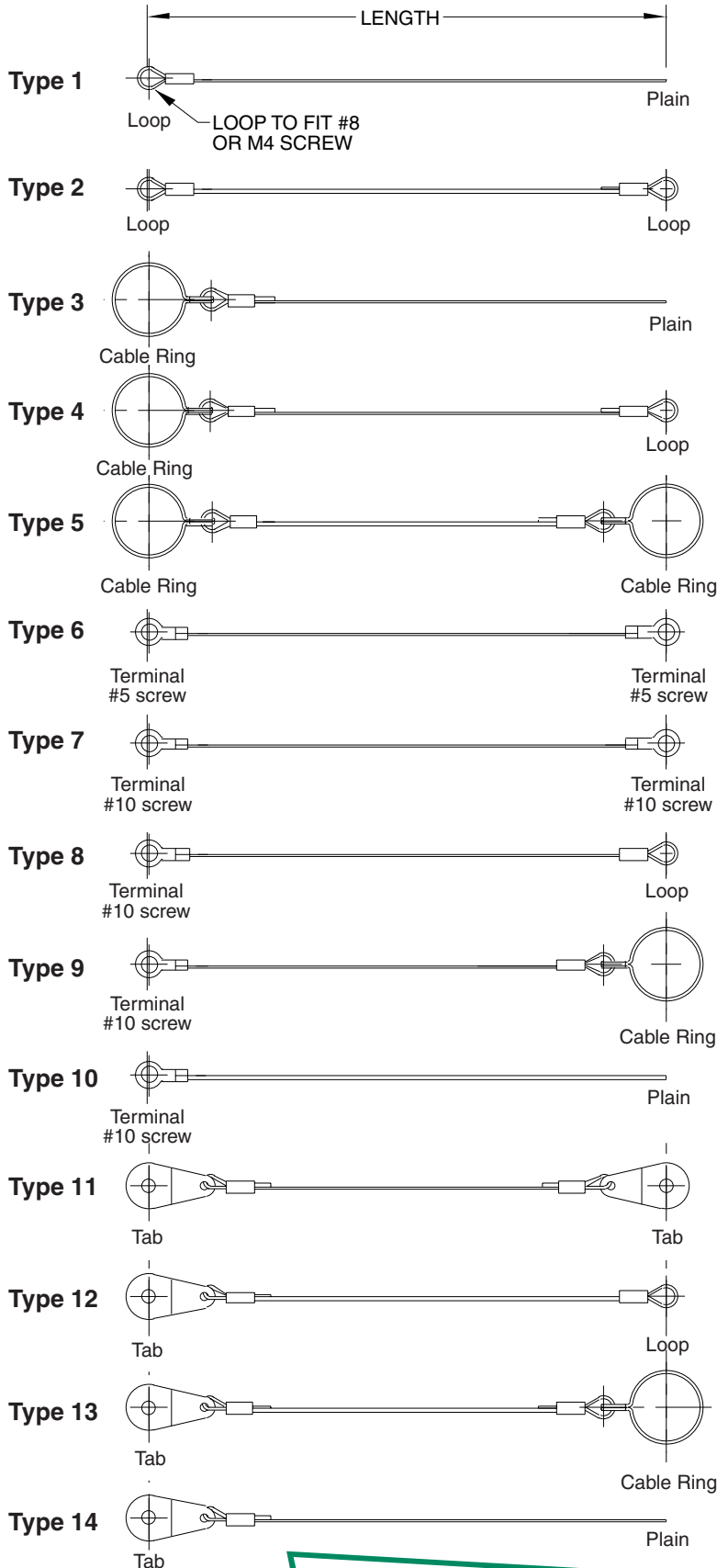
ASSEMBLY TYPE	LEFT END	RIGHT END	CABLE SIZES							
			1		2		3		4	
			STAINLESS	STEEL	STAINLESS	STEEL	STAINLESS	STEEL	STAINLESS	STEEL
1	LOOP	PLAIN	CL-11-KA	CL-12-KA	CL-12-SKA	CL-13-KA	CL-13-SKA	CL-14-KA	CL-14-SKA	
2	LOOP	LOOP	CL-21-KA	CL-22-KA	CL-22-SKA	CL-23-KA	CL-23-SKA	CL-24-KA	CL-24-SKA	
3	CABLE RING	PLAIN	CL-31-KA	CL-32-KA	CL-32-SKA	CL-33-KA	CL-33-SKA	—	—	
4	CABLE RING	LOOP	CL-41-KA	CL-42-KA	CL-42-SKA	CL-43-KA	CL-43-SKA	—	—	
5	CABLE RING	CABLE RING	CL-51-KA	CL-52-KA	CL-52-SKA	CL-53-KA	CL-53-SKA	—	—	
6	#5 TERMINAL	#5 TERMINAL	—	—	—	CL-63-KA	CL-63-SKA	—	—	
7	#10 TERMINAL	#10 TERMINAL	—	CL-72-KA	CL-72-SKA	CL-73-KA	CL-73-SKA	—	—	
8	#10 TERMINAL	LOOP	—	CL-82-KA	CL-82-SKA	—	—	—	—	
9	#10 TERMINAL	CABLE RING	—	CL-92-KA	CL-92-SKA	—	—	—	—	
10	#10 TERMINAL	PLAIN	—	CL-102-KA	CL-102-SKA	—	—	—	—	
11	TAB	TAB	CL-111-KA	CL-112-KA	CL-112-SKA	CL-113-KA	CL-113-SKA	—	—	
12	TAB	LOOP	CL-121-KA	CL-122-KA	CL-122-SKA	CL-123-KA	CL-123-SKA	—	—	
13	TAB	CABLE RING	CL-131-KA	CL-132-KA	CL-132-SKA	CL-133-KA	CL-133-SKA	—	—	
14	TAB	PLAIN	CL-141-KA	CL-142-KA	CL-142-SKA	CL-143-KA	CL-143-SKA	—	—	



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# CABLE ASSEMBLIES



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# CABLE

GALVANIZED STEEL OR STAINLESS STEEL, NYLON COATED (GREEN)



Cable Sizes

High-strength stranded wire cable with a green nylon coating. Choice of four cable diameters. Cable size 1 is made of stainless steel. Sizes 2, 3, and 4 are available in either galvanized steel or stainless steel. Cable is available in cut pieces (inch or mm), in bulk lengths, (feet or meters, 10 ft/ 3m minimum), or in 1000-ft rolls. Cut pieces are held to a  $\pm 1/4"$  length tolerance up to 24" long. Examples:

- CL-2-C-12.0 (Cut piece, #2 cable, 12" long)
- CL-2-C-350MM (Cut piece, #2 cable, 350mm long)
- CL-2-C-25FT (Bulk length, #2 cable, 25' long)
- CL-2-C-10M (Bulk length, #2 cable, 10 meters long)
- CL-2-C-1000FT (1000 ft roll, #2 cable)



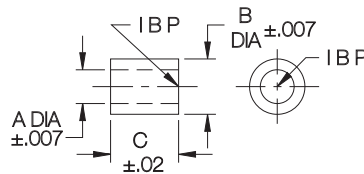
CABLE SIZE	MATERIAL	PART NO. CUT PIECES		PART NO. BULK LENGTHS		PART NO. 1000-FT ROLLS	D DIA		CONSTRUCTION	BREAKING STRENGTH (LBS)
		INCHES	MM	FT	METERS		COATED	UNCOATED		
1	STAINLESS	CL-1-C-xx.x	CL-1-C-xxxMM	CL-1-C-xxFT	CL-1-C-xxM	CL-1-C-1000FT	.044	.024	1x7	80
2	STEEL	CL-2-C-xx.x	CL-2-C-xxxMM	CL-2-C-xxFT	CL-2-C-xxM	CL-2-C-1000FT	.062	.047	7x7	270
	STAINLESS	CL-2-SC-xx.x	CL-2-SC-xxxMM	CL-2-SC-xxFT	CL-2-SC-xxM	CL-2-SC-1000FT				
3	STEEL	CL-3-C-xx.x	CL-3-C-xxxMM	CL-3-C-xxFT	CL-3-C-xxM	CL-3-C-1000FT	.094	.062	7x7	480
	STAINLESS	CL-3-SC-xx.x	CL-3-SC-xxxMM	CL-3-SC-xxFT	CL-3-SC-xxM	CL-3-SC-1000FT				
4	STEEL	CL-4-C-xx.x	CL-4-C-xxxMM	CL-4-C-xxFT	CL-4-C-xxM	CL-4-C-1000FT	.187	.125	7x19	800
	STAINLESS	CL-4-SC-xx.x	CL-4-SC-xxxMM	CL-4-SC-xxFT	CL-4-SC-xxM	CL-4-SC-1000FT				

# FERRULES

COPPER, ELECTRO TIN PLATED



Ferrules are for crimping on our nylon-coated cable to make a loop. Ferrules may be slightly elliptical (precrimped) at our option. Available for all four standard cable sizes. Extra-long ferrules are available for #2 and #3 cable, to allow double crimping.



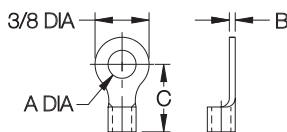
PART NO.	FITS CABLE	A	B	C
CL-1-F	SIZE 1	.094	.154	.315
CL-2-F	SIZE 2	.138	.213	.335
CL-4-F				.591
CL-3-F	SIZE 3	.185	.276	.374
CL-5-F				.827
CL-6-F	SIZE 4	.378	.520	1.260

# TERMINALS

COPPER, ELECTRO TIN PLATED



Terminals are for crimping on our nylon-coated cable, to allow attaching the end with a screw. Available for #2 and #3 cable.



PART NO.	FITS CABLE	A		B	C
		A DIA	SCREW SIZE		
CL-.194-TERM-2	SIZE 2	.21	#10 (or M5)	.041	15/32
CL-.129-TERM	SIZE 3	.21	#10 (or M5)	.041	19/32
CL-.194-TERM					



## MANUFACTURING CO.

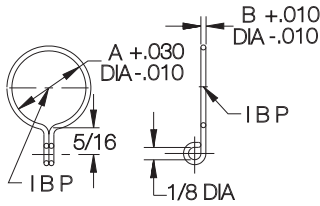
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# CABLE RINGS

SPRING STEEL WIRE, BLACK OXIDE FINISH



Cable Rings allow attaching Cable Assemblies to a diameter or radial groove. Can be used with cable sizes #1, #2, and #3. Available in steel or stainless steel.



PART NO. STEEL	PART NO. STAINLESS	A DIA	B WIRE DIA	
			STEEL	STAINLESS
CL-2-KR	CL-2-SKR	1/8 (also 3mm)	.045	.062
CL-3-KR	CL-3-SKR	3/16 (also 4&5mm)		
CL-4-KR	CL-4-SKR	1/4 (also 6&7mm)		
CL-5-KR	CL-5-SKR	5/16 (also 8mm)		
CL-6-KR	CL-6-SKR	3/8 (also 9&10mm)		
CL-7-KR	CL-7-SKR	7/16 (also 11mm)		
CL-8-KR	CL-8-SKR	1/2 (also 12&13mm)		
CL-9-KR	CL-9-SKR	9/16 (also 14&15mm)		
CL-10-KR	CL-10-SKR	5/8 (also 16mm)		
CL-11-KR	CL-11-SKR	11/16 (also 17&18mm)		
CL-12-KR	CL-12-SKR	3/4 (also 19&20mm)		
CL-13-KR	CL-13-SKR	13/16 (also 21mm)		
CL-14-KR	CL-14-SKR	7/8 (also 22 or 23mm)		
CL-15-KR	CL-15-SKR	15/16 (also 24mm)		
CL-16-KR	CL-16-SKR	1 (also 25&26mm)		
CL-17-KR	CL-17-SKR	1-1/16 (also 27mm)		
CL-18-KR	CL-18-SKR	1-1/8 (also 28&29mm)		
CL-19-KR	CL-19-SKR	1-3/16 (also 30&31mm)		
CL-20-KR	CL-20-SKR	1-1/4 (also 32mm)		
CL-21-KR	CL-21-SKR	1-5/16 (also 33&34mm)		
CL-22-KR	CL-22-SKR	1-3/8 (also 35 mm)		
CL-23-KR	CL-23-SKR	1-7/16 (also 36&37mm)		
CL-24-KR	CL-24-SKR	1-1/2 (also 38mm)		

# CABLE TABS

ALUMINUM: 6061 ALUMINUM ALLOY, CLEAR ANODIZED. STAINLESS: 300-SERIES STAINLESS STEEL, PASSIVATED

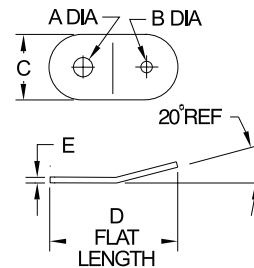
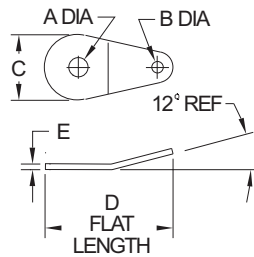


Teardrop



Rectangular

Cable Tabs attach to our nylon-coated cable, to allow attaching the end with a screw. Can be used with cable sizes #1, #2, and #3. Available in two shapes, teardrop and rectangular. Available in aluminum and stainless steel.



## TEARDROP

PART NO. ALUMINUM	PART NO. STAINLESS STEEL	FITS CABLE	A		B DIA	C	D	E
			DIA	SCREW SIZE				
CL-.129-TAB-A	CL-.129-TAB-S	SIZES 1 TO 3	.13	#5 (or M3)	.13	.69	1.31	.06
CL-.194-TAB-A	CL-.194-TAB-S		.20	#10 (or M4)				
CL-.281-TAB-A	CL-.281-TAB-S		.28	1/4 (or M6)				

## RECTANGULAR

PART NO. ALUMINUM	PART NO. STAINLESS STEEL	FITS CABLE	A		B DIA	C	D	E
			DIA	SCREW SIZE				
CL-.129-TABR-2-A	CL-.129-TABR-2-S	SIZES 1 TO 2	.13	#5 (or M3)	.09	1/2	1.14	.06
CL-.194-TABR-2-A	CL-.194-TABR-2-S		.20	#10 (or M4)				
CL-.281-TABR-2-A	CL-.281-TABR-2-S		.28	1/4 (or M6)				
CL-.194-TABR-3-A	CL-.194-TABR-3-S	SIZES 1 TO 3	.20	#10 (or M4)	.19	1/2	1.14	.06
CL-.281-TABR-3-A	CL-.281-TABR-3-S		.28	1/4 (or M6)				

# CRIMPING TOOLS

STEEL WITH PLASTIC HANDGRIPS



Plier tool for manually crimping ferrules on our nylon-coated cable. Crimps ferrules on either #1 or #2 cable. Heavier cable sizes require power crimping and should be ordered finish-crimped from the factory whenever possible.

PART NO.	FOR CABLE	FOR FERRULES
CL-1-CT	SIZE 1 SIZE 2	CL-1-F CL-2-F CL-4-F



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