

ALIGNMENT PINS

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**L Pins, T Pins, and
Jig Pins**



Clamping Pins



**Slotted Locator
Bushings**



Ball Lock Pins



Detent Pins



Expanding Pins

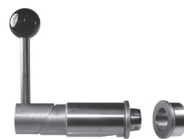


Cable

Also see:



Hand-Retractable Plungers
p. 176



Index Plungers
p. 185



Carr Lock® System
p. 355

L PINS, T PINS, JIG PINS AND CLAMPING PINS

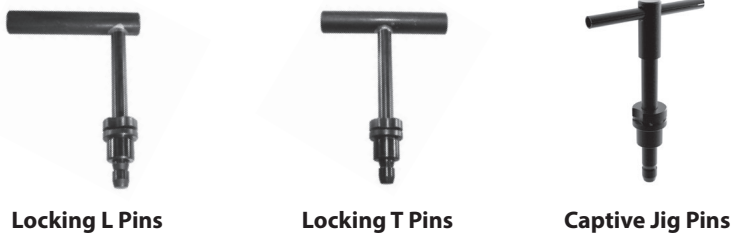
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L PINS, T PINS, AND JIG PINS



Standard Type

These L Pins, T Pins, Shoulder Pins, and Jig Pins are removable locating pins, precision ground for accurately aligning holes. Available in pin diameters from 1/8 to 3/4", including some number and letter sizes (4 to 20mm in metric), most in a choice of several pin lengths.



Captive Type

Similar to standard jig pins, except that the pin body is positively retained in a locking bushing. In fully retracted position, the bushing's spring clip snaps into the pin's groove. This holds the pin fully retracted by spring force and positively prevents removal. Spring pressure also holds the pin in intermediate extended positions, an advantage especially if the fixture is turned upside down. Available in pin diameters from 3/16 to 1/2" (6 to 12mm in metric), most in a choice of several pin lengths. Choice of standard or long bushing in most sizes, for installation in thinner or thicker plates.

CLAMPING PINS

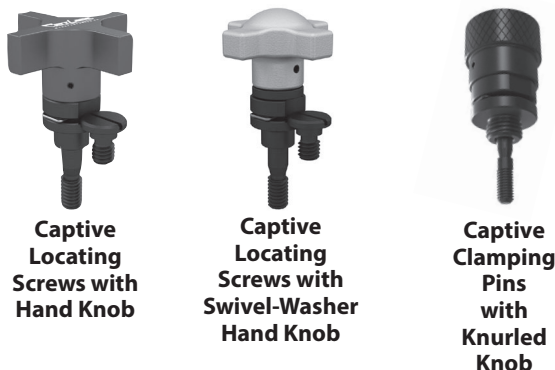


Standard Type

Clamping Pins are threaded alignment pins that can be used for locating and clamping, or clamping only, depending on extended screw length. Available in thread sizes from #10-32 to 1/2-13 (M6 to M12 in metric).

Captive Type

Captive clamping pins and locating screws can be used for locating and clamping, or for clamping only, by selecting the appropriate screw length. The locating screw's precision-ground body is positively retained in a locking bushing. In fully retracted position, the bushing's springclip snaps into the body's radial groove. This holds the screw fully retracted by spring force and positively prevents removal. Spring pressure also holds the screw in intermediate extended positions, an advantage especially if the fixture is turned upside down. Available in thread sizes from 1/4-20 to 1/2-13 (M6 to M12 in metric). Choice of standard or long bushing in most sizes, for installation in thinner or thicker plates.



L & T PINS

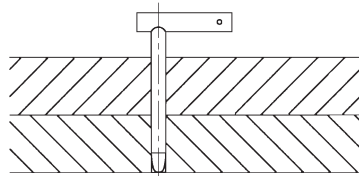
PIN: 1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
HANDLE: 1215 STEEL, BLACK OXIDE FINISH

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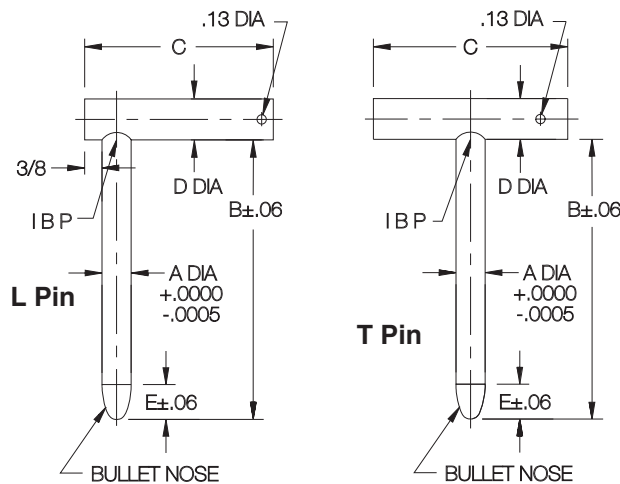


L Pin

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.



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

INCH

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	2-1/2	5/16	1/4		
CL-1-LP	CL-1-TP	3/16	.1875	3					
CL-21-LP	CL-21-TP			4					
CL-2-LP	CL-2-TP			6					
CL-3-LP	CL-3-TP	#11	.1910	3					
CL-23-LP	CL-23-TP			4					
CL-4-LP	CL-4-TP			6					
CL-43-LP	CL-43-TP	#10	.1935	3	2-1/2	3/8	3/8		
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	1/4	.2500	2					
CL-5-LP	CL-5-TP			3					
CL-25-LP	CL-25-TP			4					
CL-6-LP	CL-6-TP	F	.2570	6	7/16	1/2			
CL-17-LP	CL-17-TP			3					
CL-37-LP	CL-37-TP			4					
CL-45-LP	CL-45-TP	9/32	.2812	4			3	7/16	1/2
CL-39-LP	CL-39-TP	5/16	.3125	2			2-1/2		
CL-7-LP	CL-7-TP			3-1/2			3		
CL-27-LP	CL-27-TP			4					
CL-8-LP	CL-8-TP	3/8	.3750	6	3-1/2	1/2			
CL-40-LP	CL-40-TP			3			2-1/2		
CL-9-LP	CL-9-TP			4					
CL-29-LP	CL-29-TP	7/16	.4375	5	3-1/2	9/16	5/8		
CL-10-LP	CL-10-TP			6					
CL-30-LP	CL-30-TP			7					
CL-11-LP	CL-11-TP	1/2	.5000	4	3-1/2	5/8	5/8		
CL-31-LP	CL-31-TP			5					
CL-12-LP	CL-12-TP			6					
CL-32-LP	CL-32-TP	9/16	.5625	7	3-1/2	7/8	3/4		
CL-13-LP	CL-13-TP			4					
CL-14-LP	CL-14-TP			6					
CL-33-LP	CL-33-TP	5/8	.6250	7	3-1/2	7/8	3/4		
CL-34-LP	CL-34-TP			9					
CL-18-LP	CL-18-TP			4					
CL-19-LP	CL-19-TP	3/4	.7500	6	3-1/2	7/8	3/4		
CL-15-LP	CL-15-TP			6					
CL-35-LP	CL-35-TP			8					
CL-16-LP	CL-16-TP	8		6	3-1/2	7/8	3/4		
CL-36-LP	CL-36-TP			8					

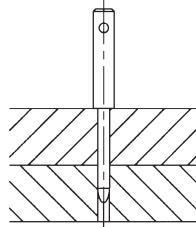
METRIC

PART NO.	A DIA (mm)	B (mm)	C (mm)	D DIA (mm)	E (mm)
CLM-4-LP	4	89	63.5	8	5
CLM-5-LP	5	76	63.5	8	5
CLM-50-LP	5	152	63.5	8	5
CLM-6-LP	6	76	63.5	9.5	6.5
CLM-60-LP	6	152	63.5	9.5	6.5
CLM-8-LP	8	89	76	11	11
CLM-80-LP	8	152	76	11	11
CLM-10-LP	10	76	63.5	12.5	11
CLM-100-LP	10	152	89	12.5	11
CLM-12-LP	12	102	89	16	11
CLM-120-LP	12	152	89	16	11
CLM-16-LP	16	152	89	22	17.5
CLM-160-LP	16	203	89	22	17.5
CLM-20-LP	20	152	89	22	17.5
CLM-200-LP	20	203	89	22	17.5

SHOULDER PINS

PIN: 1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
HANDLE: 1215 STEEL, BLACK OXIDE FINISH

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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

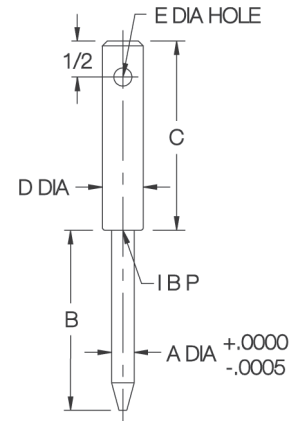
Removable locating pin with a straight handle, precision ground for accurately aligning holes. The handle is drilled for attaching a cable.

INCH

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	5/8		1/4	
CL-19-SP	1/2	.5000	3/4		5/16	

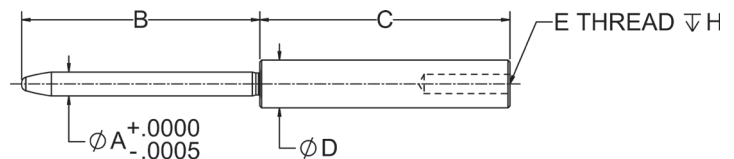
METRIC

PART NO.	A (mm)	B (mm)	C (mm)	D DIA (mm)	E (mm)
CLM-6-SP	6	65	66.5	12.5	6.5
CLM-8-SP	8	65	66.5	14	6.5
CLM-10-SP	10	100	66.5	16	6.5
CLM-12-SP	12	75	66.5	19	8



SHOULDER POTTING PINS

1144 STEEL, BLACK OXIDE FINISH



New item!

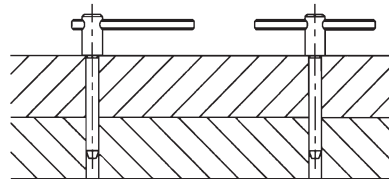
Shoulder Potting Pins are removable alignment pins used for positioning components to be potted in carbon-fiber composites. The precision-ground pin body and the handle are made from one solid piece of high-carbon steel. The handle end is tapped to allow using a pulling tool. Available in pin diameters from 1/8 to 1/2".

PART NO.	A DIA		B	C	D DIA	E THREAD	H
	NOMINAL	ACTUAL					
CL-225-SPP	1/8	.1250	2.50	2-5/8	1/2	1/4-20	3/4
CL-425-SPP	1/4	.2500	2.50	2-5/8	1/2	1/4-20	3/5
CL-525-SPP	5/16	.3125	2.50	2-5/8	5/8	1/4-20	3/6
CL-640-SPP	3/8	.3750	4.00	2-5/8	5/8	1/4-20	3/7
CL-840-SPP	1/2	.5000	4.00	2-5/8	3/4	1/4-20	3/8

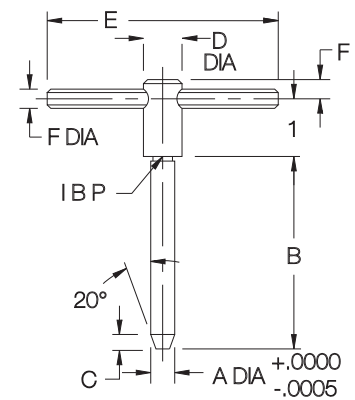
JIG PINS

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

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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.



INCH

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

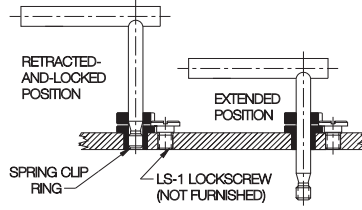
METRIC

PART NO.	A DIA (mm)		B (mm)	C (mm)	D DIA (mm)	E (mm)	F (mm)
	NOMINAL	ACTUAL					
CLM-6-JP	6	5.992	51	3.9	9.5	51	4.8
CLM-8-JP	8	7.988	63.5	4.8	12.5	76	6.5
CLM-10-JP	10	9.987	82.5	6.5	12.5	76	6.5
CLM-12-JP	12	11.986	101.5	7	14	76	6.5

LOCKING L PINS

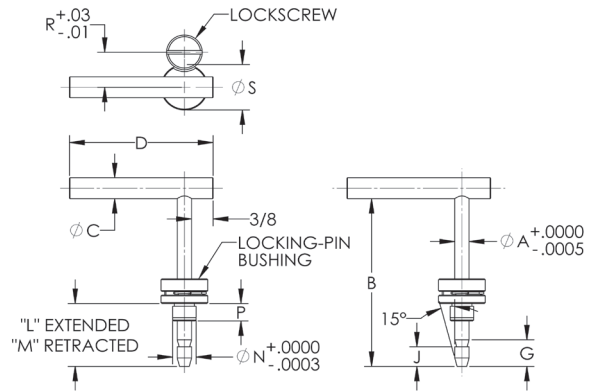
PIN: 1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 HANDLE: 1215 STEEL, BLACK OXIDE FINISH
 BUSHING: 8620 STEEL, CASE HARDENED, BLACK OXIDE FINISH

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Similar to a standard L Pin, except that the pin body is positively retained in a locking bushing. In fully retracted position, the bushing's spring clip snaps into the pin's radial groove. This holds the pin fully retracted by spring force and positively prevents removal. Spring pressure also holds the pin in intermediate extended positions, an advantage especially if the fixture is turned upside down. Available in pin diameters from 3/16 to 1/2" (6 to 12mm in metric), most in a choice of several pin lengths.

Locking-Pin Bushings are designed to press fit in a standard reamed hole. Secure with the included Lockscrew to positively hold the bushing in place. Shorter or longer bushings are available in most sizes, for thinner or thicker plates.



COMPLETE ASSEMBLY (INCH)

PART NO.	A DIA		B PIN LENGTH	P BUSHING LENGTH UNDER HEAD		C DIA	D	G	J	L	M	N DIA		R	S	L PIN (INCLUDED)	BUSHING (INCLUDED)	LOCKSCREW (INCLUDED)										
	NOMINAL	ACTUAL		NOMINAL	ACTUAL							NOMINAL	ACTUAL															
CL-1A-LLP-B	3/16	.1865	1-1/2	Standard	.31	5/16	2-1/2	.47	.35	1	.20	13/16	.4078	.62	13/16	CL-1A-LLP	CL-3-LPB	LS-1										
CL-1-LLP-B			3	Standard	.31					2-1/2						CL-1-LLP	CL-3-LPB											
CL-38-LLP-B	1/4	.2490	2	Standard	.31	3/8	2-1/2	.47	.35	1-1/2	.20	13/16	.4078	.62	13/16	CL-38-LLP	CL-4-LPB	LS-1										
CL-38-LLP-B-2				Long	.50					CL-4A-LPB																		
CL-5-LLP-B			3	Standard	.31					2-1/2						CL-5-LLP	CL-4-LPB											
CL-5-LLP-B-2				Long	.50					CL-4A-LPB																		
CL-25-LLP-B	4	.2490	4	Standard	.31	5/8	3	.47	.35	3-1/2	.20	1/2	.5017	.62	13/16	CL-25-LLP	CL-4-LPB	LS-1										
CL-25-LLP-B-2				Long	.50					CL-4A-LPB																		
CL-39-LLP-B-1	2	.3115	3-1/2	Standard	.31					5/8						3	.47		.35	1-1/2	.20	1/2	.5017	.62	13/16	CL-39-LLP	CL-5-LPB	LS-1
CL-39-LLP-B				Medium	.37															CL-5A-LPB								
CL-39-LLP-B-3				Long	.50	CL-5B-LPB																						
CL-7-LLP-B-1	5/16	.3115	3-1/2	Standard	.31	5/8	3	.47	.35	3	.20	1/2	.5017	.62	13/16	CL-7-LLP	CL-5-LPB	LS-1										
CL-7-LLP-B				Medium	.37					CL-5A-LPB																		
CL-7-LLP-B-3				Long	.50					CL-5B-LPB																		
CL-8-LLP-B-1	6	.3115	6	Standard	.31	5/8	3	.47	.35	5-1/2	.20	1/2	.5017	.62	13/16	CL-8-LLP	CL-5-LPB	LS-1										
CL-8-LLP-B				Medium	.37					CL-5A-LPB																		
CL-8-LLP-B-3				Long	.50					CL-5B-LPB																		
CL-40A-LLP-B-1	3/8	.3740	2	Standard	.31	5/8	3-1/2	.47	.35	1-1/2	.20	5/8	.6267	.62	13/16	CL-40A-LLP	CL-6-LPB	LS-1										
CL-40A-LLP-B				Long	.50					CL-6A-LPB																		
CL-9-LLP-B-1			4	Standard	.31					3-1/2						CL-9-LLP	CL-6-LPB											
CL-9-LLP-B				Long	.50					CL-6A-LPB																		
CL-10-LLP-B-1	6	.3740	6	Standard	.31	5/8	3-1/2	.47	.35	5-1/2	.20	3/4	.7518	.75	1-1/16	CL-10-LLP	CL-6-LPB	LS-1										
CL-10-LLP-B				Long	.50					CL-6A-LPB																		
CL-13A-LLP-B-1	2	.4990	2	Standard	.50					5/8						3-1/2	.47		.35	1-1/2	.20	3/4	.7518	.75	1-1/16	CL-13A-LLP	CL-8-LPB	LS-1
CL-13A-LLP-B				Long	.75															CL-8A-LPB								
CL-13-LLP-B-1	4	.4990	4	Standard	.50	5/8	3-1/2	.47	.35	3-1/2	.20	3/4	.7518	.75	1-1/16	CL-13-LLP	CL-8-LPB	LS-1										
CL-13-LLP-B				Long	.75					CL-8A-LPB																		
CL-14-LLP-B-1	6	.4990	6	Standard	.50	5/8	3-1/2	.47	.35	5-1/2	.20	3/4	.7518	.75	1-1/16	CL-14-LLP	CL-8-LPB	LS-1										
CL-14-LLP-B				Long	.75					CL-8A-LPB																		

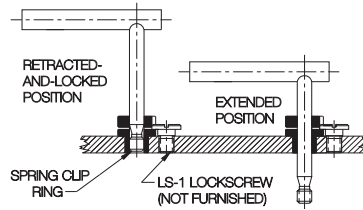
COMPLETE ASSEMBLY (METRIC)

CLM-6-LLP-B	6mm	.2352	3	Standard	.31	3/8	2-1/2	.47	.35	2-1/2	.20	10mm	.3952	.630	.87	CLM-6-LLP	CLM-6-LPB	LSM-3
CLM-8-LLP-B	8mm	.3140	3	Standard	.39	7/16	3-1/2	.47	.35	2-1/2	.20	13mm	.5135	.630	.87	CLM-8-LLP	CLM-8-LPB	LSM-3
CLM-10-LLP-B	10mm	.3927	3	Standard	.47	1/2	3-1/2	.47	.35	2-1/2	.20	16mm	.6316	.630	.87	CLM-10-LLP	CLM-10-LPB	LSM-3
CLM-12-LLP-B	12mm	.4715	4	Standard	.71	5/8	3-1/2	.47	.35	3-1/2	.20	20mm	.7892	.709	1.02	CLM-12-LLP	CLM-12-LPB	LSM-3

LOCKING T PINS

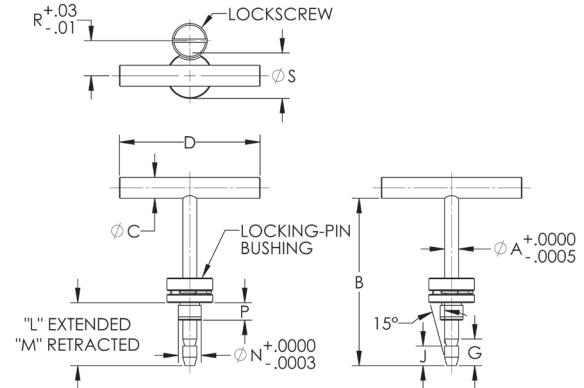
PIN: 1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 HANDLE: 1215 STEEL, BLACK OXIDE FINISH
 BUSHING: 8620 STEEL, CASE HARDENED, BLACK OXIDE FINISH

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Similar to a standard T Pin, except that the pin body is positively retained in a locking bushing. In fully retracted position, the bushing's spring clip snaps into the pin's radial groove. This holds the pin fully retracted by spring force and positively prevents removal. Spring pressure also holds the pin in intermediate extended positions, an advantage especially if the fixture is turned upside down. Available in pin diameters from 3/16 to 1/2" (6 to 12mm in metric), most in a choice of several pin lengths.

Locking-Pin Bushings are designed to press fit in a standard reamed hole. Secure with the included Lockscrew to positively hold the bushing in place. Shorter or longer bushings are available in most sizes, for thinner or thicker plates.



COMPLETE ASSEMBLY (INCH)

PART NO.	A DIA		B PIN LENGTH	P BUSHING LENGTH UNDER HEAD		C DIA	D	G	J	L	M	N DIA		R	S	T PIN (INCLUDED)	BUSHING (INCLUDED)	LOCKSCREW (INCLUDED)										
	NOMINAL	ACTUAL		NOMINAL	ACTUAL																							
CL-1A-LTP-B	3/16	.1865	1-1/2	Standard	.31	5/16	2-1/2	.47	.35	1	.20	13/16	.4078	.62	13/16	CL-1A-LTP	CL-3-LPB	LS-1										
CL-1-LTP-B			3	Standard	.31					2-1/2						CL-1-LTP	CL-3-LPB											
CL-38-LTP-B	1/4	.2490	2	Standard	.31	3/8	2-1/2	.47	.35	1-1/2	.20	13/16	.4078	.62	13/16	CL-38-LTP	CL-4-LPB	LS-1										
CL-38-LTP-B-2				Long	.50					CL-4A-LPB																		
CL-5-LTP-B			3	Standard	.31					2-1/2						CL-5-LTP	CL-4-LPB											
CL-5-LTP-B-2				Long	.50					CL-4A-LPB																		
CL-25-LTP-B	4	.2490	4	Standard	.31	5/16	3-1/2	.47	.35	3-1/2	.20	13/16	.62	13/16	CL-25-LTP	CL-4-LPB	LS-1											
CL-25-LTP-B-2				Long	.50					CL-4A-LPB																		
CL-39-LTP-B-1	2	.3115	2	Standard	.31					5/8					3	.47		.35	1-1/2	.20	1/2	.5017	.62	13/16	CL-39-LTP	CL-5-LPB	LS-1	
CL-39-LTP-B				Medium	.37														CL-5A-LPB									
CL-39-LTP-B-3				Long	.50	CL-5B-LPB																						
CL-7-LTP-B-1	3-1/2	.3115	3-1/2	Standard	.31	5/8	3	.47	.35		3	.20	1/2	.5017			.62		13/16						CL-7-LTP	CL-5-LPB		LS-1
CL-7-LTP-B				Medium	.37					CL-5A-LPB																		
CL-7-LTP-B-3				Long	.50					CL-5B-LPB																		
CL-8-LTP-B-1	6	.3115	6	Standard	.31					5/8	3-1/2				.47	.35		5-1/2		.20	1/2	.5017	.62	13/16	CL-8-LTP	CL-5-LPB	LS-1	
CL-8-LTP-B				Medium	.37	CL-5A-LPB																						
CL-8-LTP-B-3				Long	.50	CL-5B-LPB																						
CL-40A-LTP-B-1	2	.3740	2	Standard	.31	5/8	3-1/2	.47	.35			1-1/2	.20	5/8			.6267	.62	13/16						CL-40A-LTP	CL-6-LPB		LS-1
CL-40A-LTP-B				Long	.50					CL-6A-LPB																		
CL-9-LTP-B-1	4	.3740	4	Standard	.31					5/8	3-1/2	.47			.35	3-1/2				.20	5/8	.6267	.62	13/16	CL-9-LTP	CL-6-LPB	LS-1	
CL-9-LTP-B				Long	.50											CL-6A-LPB												
CL-10-LTP-B-1	6	.3740	6	Standard	.31	5/8	3-1/2	.47	.35				5-1/2	.20		5/8	.6267	.62	13/16						CL-10-LTP	CL-6-LPB		LS-1
CL-10-LTP-B				Long	.50								CL-6A-LPB															
CL-13A-LTP-B-1	2	.4990	2	Standard	.50					5/8	3-1/2	.47	.35		1-1/2					.20	3/4	.7518	.75	1-1/16	CL-13A-LTP	CL-8-LPB	LS-1	
CL-13A-LTP-B				Long	.75										CL-8A-LPB													
CL-13-LTP-B-1	4	.4990	4	Standard	.50	5/8	3-1/2	.47	.35					3-1/2	.20	3/4	.7518	.75	1-1/16						CL-13-LTP	CL-8-LPB		LS-1
CL-13-LTP-B				Long	.75									CL-8A-LPB														
CL-14-LTP-B-1	6	.4990	6	Standard	.50					5/8	3-1/2	.47	.35	5-1/2						.20	3/4	.7518	.75	1-1/16	CL-14-LTP	CL-8-LPB	LS-1	
CL-14-LTP-B				Long	.75									CL-8A-LPB														

COMPLETE ASSEMBLY (METRIC)

CLM-6-LTP-B	6mm	.2352	3	Standard	.31	3/8	2-1/2	.47	.35	2-1/2	.20	10mm	.3952	.630	.87	CLM-6-LTP	CLM-6-LPB	LSM-3
CLM-8-LTP-B	8mm	.3140	3	Standard	.39	7/16	3	.47	.35	2-1/2	.20	13mm	.5135	.630	.87	CLM-8-LTP	CLM-8-LPB	LSM-3
CLM-10-LTP-B	10mm	.3927	3	Standard	.47	1/2	3-1/2	.47	.35	2-1/2	.20	16mm	.6316	.630	.87	CLM-10-LTP	CLM-10-LPB	LSM-3
CLM-12-LTP-B	12mm	.4715	4	Standard	.71	5/8	3-1/2	.47	.35	3-1/2	.20	20mm	.7892	.709	1.02	CLM-12-LTP	CLM-12-LPB	LSM-3

CAPTIVE JIG PINS

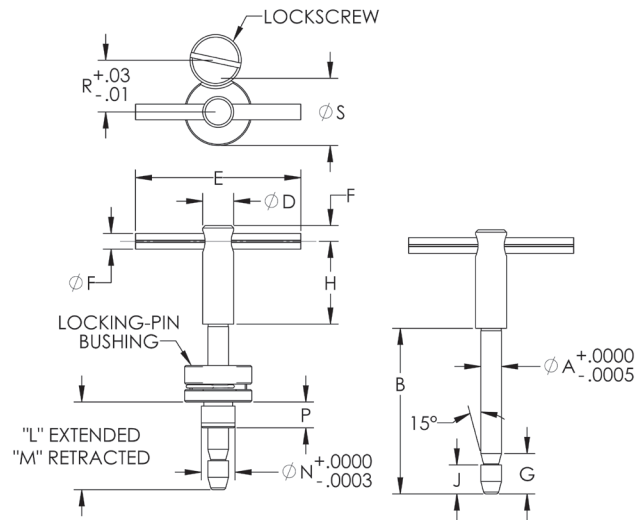
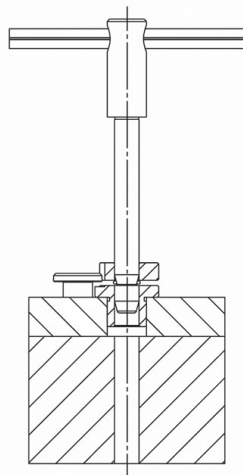
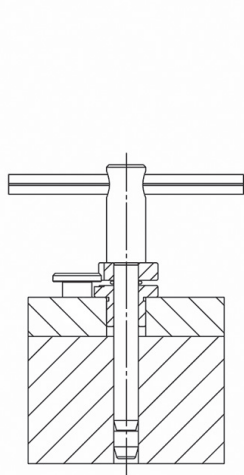
PIN: 1144 STEEL, HEAT TREATED, BLACK OXIDE FINISH
 HANDLE: SPRING STEEL, BLACK OXIDE FINISH
 BUSHING: 8620 STEEL, CASE HARDENED, BLACK OXIDE FINISH

1



Similar to a standard Jig Pin, except that the pin body is positively retained in a locking bushing. In fully retracted position, the bushing's spring clip snaps into the pin's groove. This holds the pin fully retracted by spring force and positively prevents removal. Spring pressure also holds the pin in intermediate extended positions, an advantage especially if the fixture is turned upside down. Like standard Jig Pins, Captive Jig pins have an integral shoulder to keep the handle raised. Available in pin diameters from 3/16 to 1/2". Made in USA.

Locking-Pin Bushings are designed to press fit in a standard reamed hole. Secure with the included Lockscrew to positively hold the bushing in place. Shorter or longer bushings are available in most sizes, for thinner or thicker plates.



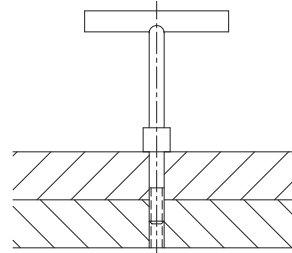
COMPLETE ASSEMBLY (INCH)

PART NO.	A DIA		B PIN LENGTH	P BUSHING LENGTH UNDER HEAD	C	D DIA	E	F	G	H	J	L	M	N DIA			S DIA	JIG PIN (INCLUDED)	BUSHING (INCLUDED)	LOCKSCREW (INCLUDED)	
	NOMINAL	ACTUAL												NOMINAL	ACTUAL	R					
CL-1-CJPA	3/16	.1872	1-7/8	Standard	.31	.35	3/8	2	3/16	.49	1	.35	1.40	.20	13/32	.4078	.62	13/16	CL-1-CJP	CL-3-LPB	LS-1
CL-2-CJPA	1/4	.2497	2	Standard	.31	.35	3/8	2	3/16	.49	1	.35	1.60	.20	13/32	.4078	.62	13/16	CL-2-CJP	CL-4-LPB	LS-1
CL-21-CJPA				Long	.50														CL-4A-LPB		
CL-31-CJPA	5/16	.3120	2-1/2	Standard	.31	.35	1/2	3	1/4	.49	1	.35	2.10	.20	1/2	.5017	.62	13/16	CL-3-CJP	CL-5-LPB	LS-1
CL-3-CJPA				Medium	.37														CL-5A-LPB		
CL-33-CJPA	3/8	.3745	3-1/4	Long	.50	.35	1/2	3	1/4	.49	1	.35	2.80	.20	5/8	.6267	.62	13/16	CL-4-CJP	CL-5B-LPB	LS-1
CL-41-CJPA				Standard	.31														CL-6-LPB		
CL-4-CJPA	1/2	.4995	4	Long	.50	.35	9/16	3	1/4	.49	1	.35	3.60	.20	3/4	.7518	.75	1-1/16	CL-4-CJP	CL-6A-LPB	LS-1
CL-51-CJPA				Standard	.50														CL-8-LPB		
CL-5-CJPA	1/2	.4995	4	Long	.75	.35	9/16	3	1/4	.49	1	.35	3.60	.20	3/4	.7518	.75	1-1/16	CL-5-CJP	CL-8A-LPB	LS-1
CL-5-CJPA				Standard	.50														CL-8-LPB		

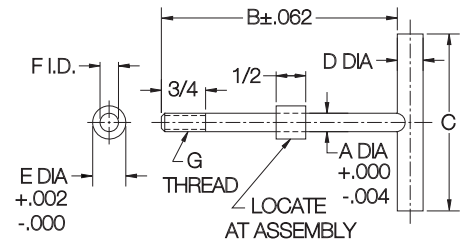
CLAMPING PINS

PIN: 1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 BUSHING: 1215 STEEL, BLACK OXIDE FINISH

1



These threaded alignment pins can be used for locating and clamping, or clamping only, depending on extended screw length. The clamping bushing is furnished separate from the pin, and must be welded in place at the proper length to suit the application. Available in thread sizes from #10-32 to 1/2-13 (M6 to M12 in metric).



INCH

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								#10-32
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

PART NO.	A DIA (mm)	B (mm)	C (mm)	D DIA (mm)	E DIA (mm)	F DIA (mm)	G THREAD	THREAD PITCH (mm)
CLM-6-CP	6	102	63.5	9.5	12.5	6.05	M6	1
CLM-8-CP	8	102	76	11	14.5	8.05	M8	1.25
CLM-10-CP	10	114	89	12.5	16	10.05	M10	1.5
CLM-12-CP	12	127	89	16	19	12.05	M12	1.75

LOCKING CLAMPING PINS

PIN: 1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 HANDLE: 1215 STEEL, BLACK OXIDE FINISH
 BUSHING: 8620 STEEL, CASE HARDENED, BLACK OXIDE FINISH

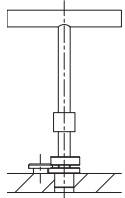
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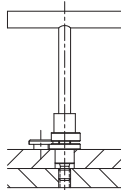
Locking Clamping Pins are similar to standard Clamping Pins, except that the pin body is positively retained in a locking bushing. In fully retracted position, the bushing's spring clip snaps into the pin's radial groove. This holds the pin fully retracted by spring force and positively prevents removal. Spring pressure also holds the pin in intermediate extended positions, an advantage especially if the fixture is turned upside down.

These threaded alignment pins can be used for locating and clamping, or for clamping only, depending on extended screw length. The upper bushing is furnished separate from the pin, and must be welded in place at the proper length to suit the application. Available in thread sizes from 1/4-20 to 1/2-13 (M6 to M12 in metric).

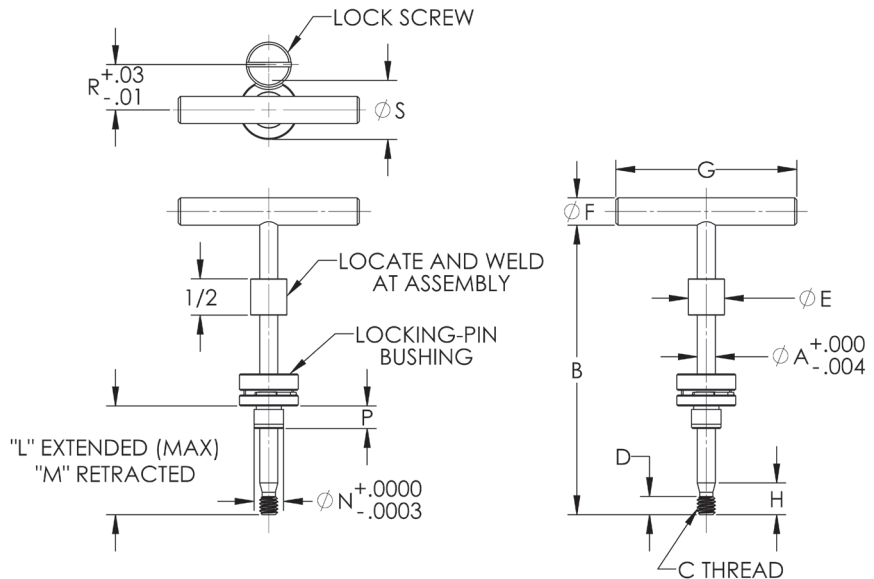
Locking-Pin Bushings are designed to press fit in a standard reamed hole. Secure with the included Lockscrew to positively hold the bushing in place. Shorter or longer bushings are available in most sizes, for thinner or thicker plates.



Retracted-and-locked position



Clamped position



COMPLETE ASSEMBLY (INCH)

PART NO.	A DIA		B PIN LENGTH	P BUSHING LENGTH UNDER HEAD		C THREAD	D	E DIA	F DIA	G	H	L	M	N DIA		R	S	CLAMPING PIN (INCLUDED)	BUSHING (INCLUDED)	LOCKSREW (INCLUDED)
	NOMINAL	ACTUAL		NOMINAL	ACTUAL									NOMINAL	ACTUAL					
CL-1-LCP-B	1/4	.2490	4	Standard	.31	1/4-20	1/4	1/2	3/8	2-1/2	.44	3	.10	13/32	.4078	.62	13/16	CL-1-LCP	CL-4-LPB	LS-1
CL-1-LCP-B-2				Long	.50														CL-4A-LPB	
CL-2-LCP-B-1	5/16	.3115	4	Standard	.31	5/16-18	5/16	9/16	7/16	3	.50	3	.16	1/2	.5017	.62	13/16	CL-2-LCP	CL-5-LPB	LS-1
CL-2-LCP-B				Medium	.37														CL-5A-LPB	
CL-2-LCP-B-3				Long	.50														CL-5B-LPB	
CL-3-LCP-B-1	3/8	.3740	4-1/2	Standard	.31	3/8-16	3/8	5/8	1/2	3-1/2	.57	3-1/2	.23	5/8	.6267	.62	13/16	CL-3-LCP	CL-6-LPB	LS-1
CL-3-LCP-B				Long	.50														CL-6A-LPB	
CL-4-LCP-B-1	1/2	.4990	5	Standard	.50	1/2-13	1/2	3/4	5/8	3-1/2	.69	4	.35	3/4	.7518	.75	1-1/16	CL-4-LCP	CL-8-LPB	LS-1
CL-4-LCP-B				Long	.75														CL-8A-LPB	

COMPLETE ASSEMBLY (METRIC)

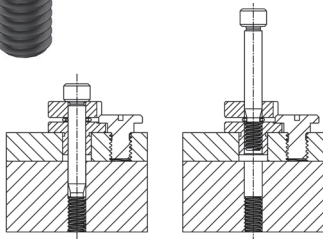
PART NO.	A DIA (mm)		B PIN LENGTH (mm)	P BUSHING LENGTH UNDER HEAD		C THREAD	THREAD PITCH (mm)	D (mm)	E DIA (mm)	F DIA (mm)	G (mm)	H (mm)	L (mm)	M (mm)	N DIA (mm)		R (mm)	S (mm)	CLAMPING PIN (INCLUDED)	BUSHING (INCLUDED)	LOCKSREW (INCLUDED)
	NOMINAL	ACTUAL		NOMINAL	ACTUAL										NOMINAL	ACTUAL					
CLM-6-LCP-B	6	5.975	102	Standard	8	M6	1	6	12.5	9.5	63.5	11	76	2.3	10	10.038	16	22	CLM-6-LCP	CLM-6-LPB	LSM-3
CLM-8-LCP-B	8	7.975	102	Standard	10	M8	1.25	8	14.5	11	76	14	76	4.1	13	13.043	16	22	CLM-8-LCP	CLM-8-LPB	LSM-3
CLM-10-LCP-B	10	9.975	114	Standard	12	M10	1.5	10	16	12.5	89	17	89	6.1	16	16.043	16	22	CLM-10-LCP	CLM-10-LPB	LSM-3
CLM-12-LCP-B	12	11.975	127	Standard	18	M12	1.75	12	19	16	89	20	102	8.1	20	20.046	18	26	CLM-12-LCP	CLM-12-LPB	LSM-3

CAPTIVE LOCATING SCREWS

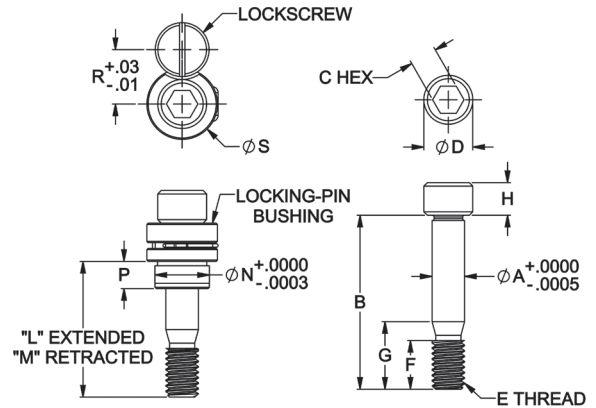
SCREW: 1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 LOCKING-PIN BUSHING: 8620 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 RETAINER CLIP: SPRING STEEL



Socket Head



Captive Locating Screws can be used for locating and clamping, or for clamping only, by selecting the appropriate screw length. The locating screw's precision-ground body is positively retained in a locking bushing. In fully retracted position, the bushing's spring clip snaps into the body's radial groove. This holds the screw fully retracted by spring force and positively prevents removal. Spring pressure also holds the screw in intermediate extended positions, an advantage especially if the fixture is turned upside down.



SOCKET HEAD - COMPLETE ASSEMBLY (INCH)

PART NO.	A DIA		B SCREW LENGTH	P BUSHING LENGTH UNDER HEAD	C	D DIA	E THREAD	F	G	H	L	M	N DIA		R	S DIA	LOCATING SCREW (INCLUDED)	BUSHING (INCLUDED)	LOCKSCREW (INCLUDED)																												
	NOMINAL	ACTUAL											NOMINAL	ACTUAL																																	
CL-4-CLSA-1.25	1/4	.2490	1-1/4	Standard	3/16	3/8	1/4-20	.40	.59	1/4	.81	.25	13/32	.4078	.62	13/16	CL-4-CLS-1.25	CL-4-LPB	LS-1																												
CL-42-CLSA-1.25				Long														.50		CL-4A-LPB																											
CL-4-CLSA-1.75			Standard	.31														CL-4-LPB																													
CL-42-CLSA-1.75	1-3/4		1-3/4	Long													1/4	15/32	5/16-18	.47	.65	5/16	1.31	.32	1/2	.5017	.62	13/16	CL-4-CLS-1.75	CL-4A-LPB	LS-1																
CL-5-CLSA-1.38				Standard																										.31		CL-5-LPB															
CL-52-CLSA-1.38			Medium	.37																										CL-5A-LPB																	
CL-53-CLSA-1.38	5/16	.3115	1-3/8	Long	1/4	15/32	5/16-18	.47	.65	5/16	1.31	.32	1/2	.5017	.62	13/16													CL-5-CLS-1.38	CL-5B-LPB	LS-1																
CL-5-CLSA-1.75				Standard																										.31		CL-5-LPB															
CL-52-CLSA-1.75			Medium	.37																										CL-5A-LPB																	
CL-53-CLSA-1.75	5/16	.3115	1-3/4	Long													1/4	15/32	5/16-18	.47	.65	5/16	1.31	.32	1/2	.5017	.62	13/16	CL-5-CLS-1.75	CL-5B-LPB	LS-1																
CL-5-CLSA-3.00				Standard																										.31		CL-5-LPB															
CL-52-CLSA-3.00			Medium	.37																										CL-5A-LPB																	
CL-53-CLSA-3.00	5/16	.3115	3	Long	1/4	15/32	5/16-18	.47	.65	5/16	2.56	.32	1/2	.5017	.62	13/16													CL-5-CLS-3.00	CL-5B-LPB	LS-1																
CL-6-CLSA-1.50				Standard																										.31		CL-6-LPB															
CL-62-CLSA-1.50			Long	.50																										CL-6A-LPB																	
CL-6-CLSA-1.75	3/8	.3740	1-1/2	Standard													5/16	9/16	3/8-16	.56	.75	3/8	1.06	.41	5/8	.6267	.62	13/16	CL-6-CLS-1.50	CL-6-LPB	LS-1																
CL-62-CLSA-1.75				Long																										.50		CL-6A-LPB															
CL-6-CLSA-2.00			Standard	.31																										CL-6-LPB																	
CL-62-CLSA-2.00			Long	.50	CL-6A-LPB																																										
CL-6-CLSA-3.00			2		2	Standard	5/16	9/16	3/8-16	.56	.75	3/8	1.56	.41	5/8	.6267													.62	13/16		CL-6-CLS-2.00	CL-6-LPB	LS-1													
CL-62-CLSA-3.00						Long																											.50		CL-6A-LPB												
CL-6-CLSA-3.00	3		3	Standard	5/16	9/16											3/8-16	.56	.75	3/8	2.56	.41	5/8	.6267	.62	13/16	CL-6-CLS-3.00	CL-6-LPB			LS-1																
CL-62-CLSA-3.00				Long																								.50				CL-6A-LPB															
CL-8-CLSA-1.50	1/2	.4990	1-1/2	Standard																								3/8				3/4	1/2-13		.75	.93	1/2	1.06	.60	3/4	.7518	.75	1-1/16	CL-8-CLS-1.50	CL-8-LPB	LS-1	
CL-82-CLSA-1.50				Long																							.75																		CL-8A-LPB		
CL-8-CLSA-2.00			2				2	Standard	3/8	3/4	1/2-13	.75	.93	1/2	1.56	.60											3/4		.7518	.75				1-1/16											CL-8-CLS-2.00		CL-8-LPB
CL-82-CLSA-2.00								Long																																				.75			CL-8A-LPB
CL-8-CLSA-3.00			3		3	Standard	3/8	3/4									1/2-13	.75	.93	1/2	2.56	.60	3/4	.7518	.75	1-1/16					CL-8-CLS-3.00													CL-8-LPB			LS-1
CL-82-CLSA-3.00						Long																																						.75	CL-8A-LPB		

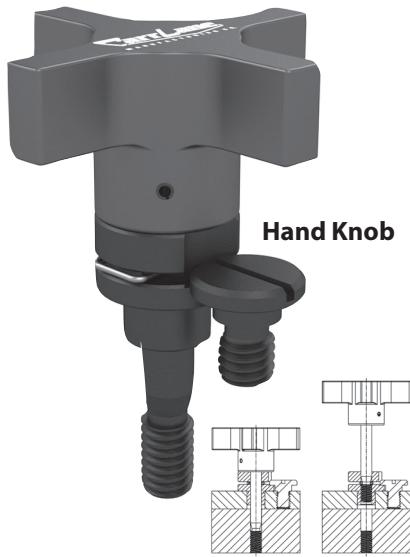
SOCKET HEAD - COMPLETE ASSEMBLY (METRIC)

CLM-6-CLSA-30	6mm	.2352	1.18	Standard	.31	5mm	.39	M6	.39	.56	.24	.71	.15	10mm	.3952	.630	.87	CLM-6-CLS-30	CLM-6-LPB	LSM-3
CLM-8-CLSA-35	8mm	.3140	1.38	Standard	.39	6mm	.51	M8	.47	.66	.31	1.30	.29	13mm	.5135	.630	.87	CLM-8-CLS-35	CLM-8-LPB	LSM-3
CLM-8-CLSA-45			1.77															CLM-8-CLS-45		
CLM-8-CLSA-75			2.95															CLM-8-CLS-75		
CLM-10-CLSA-40	10mm	.3927	1.57	Standard	.47	8mm	.63	M10	.55	.76	.39	1.10	.45	16mm	.6316	.630	.87	CLM-10-CLS-40	CLM-10-LPB	LSM-3
CLM-10-CLSA-50			1.97															CLM-10-CLS-50		
CLM-10-CLSA-75			2.95															CLM-10-CLS-75		
CLM-12-CLSA-50	12mm	.4715	1.97	Standard	.71	10mm	.71	M12	.79	1.02	.47	1.50	.68	20mm	.7892	.709	1.02	CLM-12-CLS-50	CLM-12-LPB	LSM-3
CLM-12-CLSA-60			2.36															CLM-12-CLS-60		
CLM-12-CLSA-75			2.95															CLM-12-CLS-75		

CAPTIVE LOCATING SCREWS

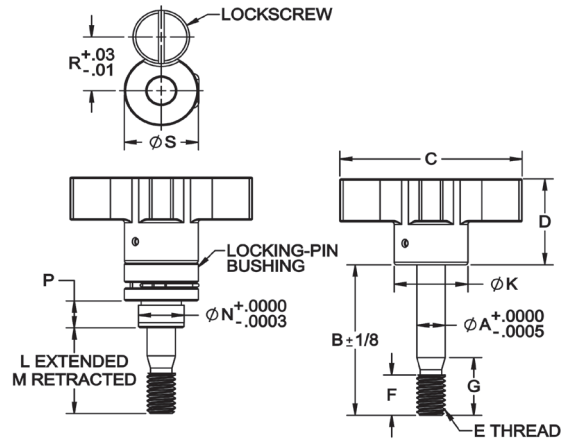
SCREW: 1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 WASHER: 1010 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 LOCKING-PIN BUSHING: 8620 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH. RETAINER CLIP: SPRING STEEL

1



Hand Knob

These Captive Locating Screws have an integral hand knob for tightening by hand. Captive Locating Screws can be used for locating and clamping, or for clamping only, by selecting the appropriate screw length. The locating screw's precision-ground body is positively retained in a locking bushing. In fully retracted position, the bushing's spring clip snaps into the body's radial groove. This holds the screw fully retracted by spring force and positively prevents removal. Spring pressure also holds the screw in intermediate extended positions, an advantage especially if the fixture is turned upside down. **Patent no. 10,393,159**



HAND KNOB — COMPLETE ASSEMBLY (INCH)

PART NO.	A DIA		B	P BUSHING LENGTH UNDER HEAD		C	D	E THREAD	F	G	K DIA	L	M	N DIA		R	S DIA	LOCATING SCREW (INCLUDED)	BUSHING (INCLUDED)	LOCKScrew (INCLUDED)
	NOMINAL	ACTUAL		NOMINAL	ACTUAL									NOMINAL	ACTUAL					
CL-4-CSHKA-1.25	1/4	.2490	1-1/4	Standard	.31	1.8	1.1	1/4-20	.40	.59	3/4	.81	.25	13/32	.4078	.62	13/16	CL-4-CSHK-1.25	CL-4-LPB	LS-1
CL-42-CSHKA-1.25				Long	.50														CL-4A-LPB	
CL-4-CSHKA-1.75			1-3/4	Standard	.31							CL-4-LPB								
CL-42-CSHKA-1.75				Long	.50							CL-4A-LPB								
CL-5-CSHKA-1.38	5/16	.3115	1-3/8	Standard	.31	1.8	1.1	5/16-18	.47	.65	3/4	.94	.32	1/2	.5017	.62	13/16	CL-5-CSHK-1.38	CL-5-LPB	LS-1
CL-52-CSHKA-1.38				Medium	.37														CL-5A-LPB	
CL-53-CSHKA-1.38			1-3/4	Long	.50							CL-5B-LPB								
CL-5-CSHKA-1.75				Standard	.31							CL-5-LPB								
CL-52-CSHKA-1.75			3	Medium	.37							CL-5A-LPB								
CL-53-CSHKA-1.75				Long	.50							CL-5B-LPB								
CL-5-CSHKA-3.00			3	Standard	.31							CL-5-LPB								
CL-52-CSHKA-3.00				Medium	.37							CL-5A-LPB								
CL-53-CSHKA-3.00	Long	.50	CL-5B-LPB																	
CL-6-CSHKA-1.50	3/8	.3740	1-1/2	Standard	.31	2.1	1.4	3/8-16	.56	.75	1	1.06	.41	5/8	.6267	.62	13/16	CL-6-CSHK-1.50	CL-6-LPB	LS-1
CL-62-CSHKA-1.50				Long	.50														CL-6A-LPB	
CL-6-CSHKA-2.00			2	Standard	.31							CL-6-LPB								
CL-62-CSHKA-2.00				Long	.50							CL-6A-LPB								
CL-6-CSHKA-3.00			3	Standard	.31							CL-6-LPB								
CL-62-CSHKA-3.00				Long	.50							CL-6A-LPB								
CL-8-CSHKA-1.50	1/2	.4990	1-1/2	Standard	.50	2.1	1.4	1/2-13	.75	.93	1	1.06	.60	3/4	.7518	.75	1-1/16	CL-8-CSHK-1.50	CL-8-LPB	LS-1
CL-82-CSHKA-1.50				Long	.75														CL-8A-LPB	
CL-8-CSHKA-2.00			2	Standard	.50							CL-8-LPB								
CL-81-CSHKA-2.00				Long	.75							CL-8A-LPB								
CL-8-CSHKA-3.00			3	Standard	.50							CL-8-LPB								
CL-82-CSHKA-3.00				Long	.75							CL-8A-LPB								

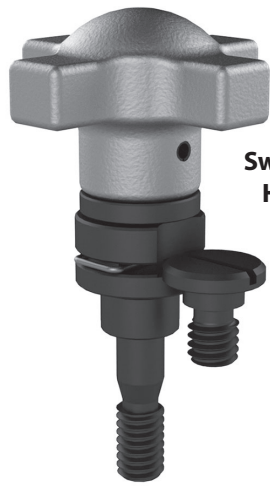
HAND KNOB — COMPLETE ASSEMBLY (METRIC)

CLM-6-CSHKA-30	6mm	.2352	1.18	Standard	.31	1.8	1.1	M6	.39	.56	3/4	.71	.15	10mm	.3952	.630	.87	CLM-6-CSHK-30	CLM-6-LPB	LSM-3
CLM-8-CSHKA-35	8mm	.3140	1.38	Standard	.39	1.8	1.1	M8	.47	.66	3/4	.91	.29	13mm	.5135	.630	.87	CLM-8-CSHK-35	CLM-8-LPB	LSM-3
CLM-8-CSHKA-45			1.77									2.48						CLM-8-CSHK-45		
CLM-8-CSHKA-75			2.95									2.48						CLM-8-CSHK-75		
CLM-10-CSHKA-40			1.57									1.10						CLM-10-CSHK-40		
CLM-10-CSHKA-50	10mm	.3927	1.97	Standard	.47	2.1	1.4	M10	.55	.75	1	1.50	.45	16mm	.6316	.630	.87	CLM-10-CSHK-50	CLM-10-LPB	LSM-3
CLM-10-CSHKA-75			2.95									2.48						CLM-10-CSHK-75		
CLM-12-CSHKA-50			1.97									1.50						CLM-12-CSHK-50		
CLM-12-CSHKA-60	12mm	.4715	2.36	Standard	.71	2.1	1.4	M12	.79	1.02	1	1.89	.68	20mm	.7892	.709	1.02	CLM-12-CSHK-60	CLM-12-LPB	LSM-3
CLM-12-CSHKA-75			2.95									2.48						CLM-12-CSHK-75		

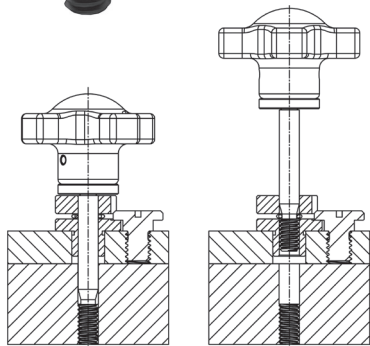
CAPTIVE LOCATING SCREWS

SCREW: 1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 WASHER: 1010 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH
 LOCKING-PIN BUSHING: 8620 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH.
 RETAINER CLIP: SPRING STEEL

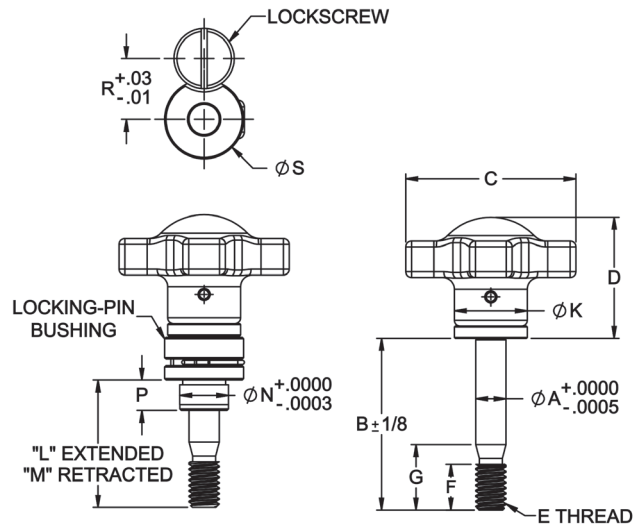
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Swivel Washer Hand Knob



These Captive Locating Screws have an integral hand knob with a rotating swivel washer, which provides smooth clamping with consistent force. Captive Locating Screws can be used for locating and clamping, or for clamping only, by selecting the appropriate screw length. The locating screw's precision-ground body is positively retained in a locking bushing. In fully retracted position, the bushing's spring clip snaps into the body's radial groove. This holds the screw fully retracted by spring force and positively prevents removal. Spring pressure also holds the screw in intermediate extended positions, an advantage especially if the fixture is turned upside down. **Patent no. 10,393,159**



SWIVEL WASHER HAND KNOB — COMPLETE ASSEMBLY (INCH)

PART NO.	A DIA		B	C	D	E THREAD	F	G	K DIA	L	M	N DIA		P	R	S DIA	LOCATING SCREW (INCLUDED)	BUSHING (INCLUDED)	LOCKSCREW (INCLUDED)
	NOMINAL	ACTUAL										NOMINAL	ACTUAL						
CL-4-CLSSHA-1.25	1/4	.2490	1-1/4	1.75	1.33	1/4-20	.40	.59	3/4	.81	.25	13/32	.4078	.31	.62	13/16	CL-4-CLSSH-1.25	CL-4-LPB	LS-1
CL-5-CLSSHA-1.38	5/16	.3115	1-3/8	1.75	1.34	5/16-18	.47	.65	3/4	.94	.32	1/2	.5017	.31	.62	13/16	CL-5-CLSSH-1.38	CL-5-LPB	LS-1
CL-5-CLSSHA-1.75			1-3/4							1.31							CL-5-CLSSH-1.75		
CL-5-CLSSHA-3.00			3							2.56							CL-5-CLSSH-3.00		
CL-6-CLSSHA-1.50	3/8	.3740	1-1/2	2.13	1.47	3/8-16	.56	.75	1	1.06	.41	5/8	.6267	.31	.62	13/16	CL-6-CLSSH-1.50	CL-6-LPB	LS-1
CL-6-CLSSHA-2.00			2							1.56							CL-6-CLSSH-2.00		
CL-6-CLSSHA-3.00			3							2.56							CL-6-CLSSH-3.00		
CL-8-CLSSHA-1.50	1/2	.4990	1-1/2	2.13	1.53	1/2-13	.75	.93	1	1.06	.60	3/4	.7518	.50	.75	1-1/16	CL-8-CLSSH-1.50	CL-8-LPB	LS-1
CL-8-CLSSHA-2.00			2							1.56							CL-8-CLSSH-2.00		
CL-8-CLSSHA-3.00			3							2.56							CL-8-CLSSH-3.00		

SWIVEL WASHER HAND KNOB — COMPLETE ASSEMBLY (METRIC)

PART NO.	A DIA		B	C	D	E THREAD	F	G	K DIA	L	M	N DIA		P	R	S DIA	LOCATING SCREW (INCLUDED)	BUSHING (INCLUDED)	LOCKSCREW (INCLUDED)
	NOMINAL	ACTUAL										NOMINAL	ACTUAL						
CLM-6-CLSSHA-30	6mm	.2352	1.18	1.8	1.33	M6	.39	.56	3/4	.71	.15	10mm	.3952	.31	.630	.87	CLM-6-CLSSH-30	CLM-6-LPB	LSM-3
CLM-8-CLSSHA-35	8mm	.3140	1.38	1.8	1.34	M8	.47	.66	3/4	.91	.29	13mm	.5135	.39	.630	.87	CLM-8-CLSSH-35	CLM-8-LPB	LSM-3
CLM-8-CLSSHA-45			1.77							1.30							CLM-8-CLSSH-45		
CLM-8-CLSSHA-75			2.95							2.48							CLM-8-CLSSH-75		
CLM-10-CLSSHA-40			1.57							1.10							CLM-10-CLSSH-40		
CLM-10-CLSSHA-50	10mm	.3927	1.97	2.1	1.47	M10	.55	.76	1	1.50	.45	16mm	.6316	.47	.630	.87	CLM-10-CLSSH-50	CLM-10-LPB	LSM-3
CLM-10-CLSSHA-75			2.95							2.48							CLM-10-CLSSH-75		
CLM-12-CLSSHA-50			1.97							1.50							CLM-12-CLSSH-50		
CLM-12-CLSSHA-60	12mm	.4715	2.36	2.1	1.53	M12	.79	1.02	1	1.89	.68	20mm	.7892	.71	.709	1.02	CLM-12-CLSSH-60	CLM-12-LPB	LSM-3
CLM-12-CLSSHA-75			2.95							2.48							CLM-12-CLSSH-75		

CAPTIVE CLAMPING PINS

KNOB: 8620 STEEL, CASE HARDENED, BLACK OXIDE FINISH
 PIN BODY: 1215 STEEL, CARBURIZE HARDENED, BLACK OXIDE FINISH

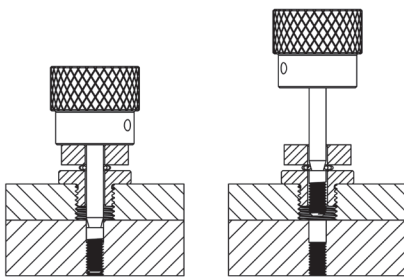
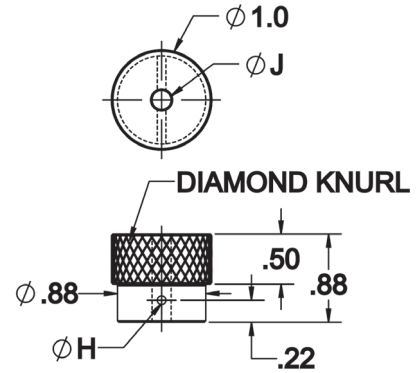
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Assembly with Knurled Knob

These Captive Clamping Pins have a knurled knob for tightening by hand and a pin body that is positively retained in a locking bushing. In fully retracted position, the bushing's spring clip snaps into the pin's radial groove. This holds the pin fully retracted by spring force. These pins also incorporate a positive thread stop (the .10"-long unthreaded portion with a square shoulder, above the threads) to positively prevent screwing the pin past the spring clip. Spring pressure also holds the pin in intermediate extended positions, an advantage especially if the fixture is turned upside down. Available in fine-thread sizes from #10-32 to 3/8-24.

These clamping pins must be ordered as three separate items: (1) Knurled Knob with roll pin; (2) Pin Body; (3) Locking-Pin Bushing. The Pin Body must be cut to length and pinned by the customer to suit the specific application (3" maximum A dimension). For dimensions and specifications of Locking-Pin Bushings, see opposite page.



KNURLED KNOB WITH ROLL PIN (INCH)

PART NO.	KNOB DIA	H DIA	J DIA
CL-190-CPKK	1	1/16	.190
CL-250-CPKK		3/32	.250
CL-313-CPKK		3/32	.313
CL-375-CPKK		1/8	.375

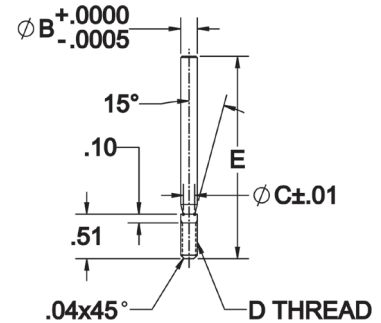
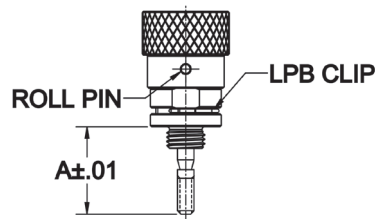


Knurled Knob with Roll Pin

Pin Body

Locking-Pin Bushing

ASSEMBLY EXAMPLE



PIN BODY (INCH)

PART NO.	A MAX	B DIA		C DIA	D THREAD	E
		NOMINAL	ACTUAL			
CL-190-CCPT-3.000	3.000	#10	.1890	.13	#10-32	4.32
CL-250-CCPT-3.000		1/4	.2490	.17	1/4-28	
CL-313-CCPT-3.000		5/16	.3115	.21	5/16-24	
CL-375-CCPT-3.000		3/8	.3740	.26	3/8-24	

LOCKING-PIN BUSHINGS (INCH)

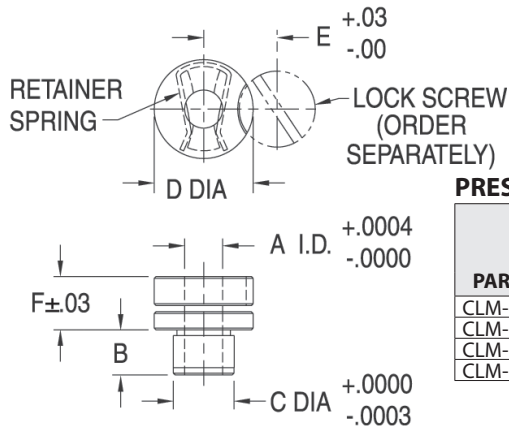
PART NO. STANDARD PRESS-FIT BUSHING	PART NO. OVERSIZE PRESS-FIT BUSHING	PART NO. OVERSIZE THREADED BUSHING	FOR PIN BODY DIA
—	—	CL-3-TLPB-OS	#10
CL-4-LPB	CL-4-LPB-OS	CL-4-TLPB-OS	1/4
CL-5-LPB	CL-5-LPB-OS	CL-5-TLPB-OS	5/16
CL-6-LPB	CL-6-LPB-OS	CL-6-TLPB-OS	3/8

LOCKING-PIN BUSHINGS

PRESS FIT: 8620 STEEL, CASE HARDENED, BLACK OXIDE FINISH
 THREADED: 1215 STEEL, CARBURIZE HARDENED, BLACK OXIDE FINISH



Press Fit



Locking-Pin Bushings are equipped with a retainer spring clip on the inside diameter. These bushings are used with all types of locking/captive pins and locating screws. Available for pin diameters 3/16 to 1/2" (6 to 12mm in metric). Some bushings are available in a choice of lengths, to suit thinner or thicker plates. Several bushing sizes are optionally available with an oversize ID (.040" larger), for applications with multiple pins where additional clearance is desired to prevent binding. Locking-Pin Bushings are designed to press fit in a standard reamed hole. Secure with a Lockscrew to positively hold the bushing in place – order separately as part number LS-1 (inch) or LSM-3 (metric).

PRESS FIT (INCH)

PART NO.	A DIA		B	C DIA		D DIA	E	F	MATCHING P BUSHING FOR BOTTOM PLATE		
	NOMINAL	ACTUAL		NOMINAL	ACTUAL						
CL-3-LPB	3/16	.1868	.31	13/32	.4078	13/16	.62	.44	P-26-6-.1865		
CL-4-LPB	1/4	.2493	.31								
CL-4A-LPB			.50								P-26-6-.2490
CL-5-LPB			.31	1/2	.5017				P-32-6-.3115		
CL-5A-LPB	5/16	.3118	.37								
CL-5B-LPB			.50								
CL-6-LPB			.31	5/8	.6267	P-40-8-.3740					
CL-6A-LPB	3/8	.3743	.50								
CL-8-LPB			.50	3/4	.7518	1-1/16	.75	P-48-12-.4990			
CL-8A-LPB	1/2	.4993	.75								

PRESS FIT (METRIC)

PART NO.	A DIA (mm)		B LENGTH UNDER HEAD (mm)	C DIA (mm)		D DIA (mm)	E (mm)	F (mm)	LOCKSCREW (ORDER SEPARATELY)	
	NOMINAL	ACTUAL		NOMINAL	ACTUAL					
CLM-6-LPB	6	5.982	Standard	8	10	10.038	22	16	12	LSM-3
CLM-8-LPB	8	7.982	Standard	10	13	13.043	22	16	12	LSM-3
CLM-10-LPB	10	9.982	Standard	12	16	16.043	22	16	12	LSM-3
CLM-12-LPB	12	11.982	Standard	18	20	20.046	26	18	12	LSM-3

PRESS FIT, WITH OVERSIZE ID (INCH)

PART NO.	A DIA		B	C DIA		D DIA	E	F	MATCHING P BUSHING FOR BOTTOM PLATE
	NOMINAL	ACTUAL		NOMINAL	ACTUAL				
CL-4-LPB-OS	1/4	.2643	.31	13/32	.4078	13/16	.62	.44	—
CL-5-LPB-OS	5/16	.3268	.31	1/2	.5017	13/16	.62	.44	—
CL-6-LPB-OS	3/8	.3893	.31	5/8	.6267	13/16	.62	.44	—
CL-8-LPB-OS	1/2	.5143	.50	3/4	.7518	1-1/16	.75	.44	—

PRESS FIT, WITH OVERSIZE ID (METRIC)

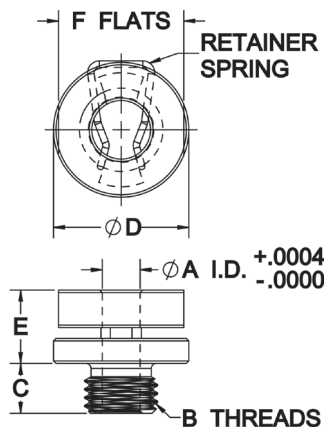
PART NO.	A DIA (mm)		B LENGTH UNDER HEAD (mm)	C DIA (mm)		D DIA (mm)	E (mm)	F (mm)	LOCKSCREW (ORDER SEPARATELY)	
	NOMINAL	ACTUAL		NOMINAL	ACTUAL					
CLM-6-LPB-OS	6	7	Standard	8	10	10.038	22	16	12	LSM-3
CLM-8-LPB-OS	8	9	Standard	10	13	13.043	22	16	12	LSM-3
CLM-10-LPB-OS	10	11	Standard	12	16	16.043	22	16	12	LSM-3
CLM-12-LPB-OS	12	13	Standard	18	20	20.046	26	18	12	LSM-3

Also available in threaded version!

Locking-Pin Bushings are now optionally available with a threaded OD, for installation in a tapped hole. This version is designed for use with clamping pins in non-locating applications, with an ID size .040" over nominal size.



Threaded



THREADED, WITH OVERSIZE ID (INCH)

PART NO.	A DIA		B THREAD	C	D DIA	E	F
	NOMINAL	ACTUAL					
CL-3-TLPB-OS	3/16	.2268	7/16-20	.300	.81	.44	3/4
CL-4-TLPB-OS	1/4	.2893	1/2-20				
CL-5-TLPB-OS	5/16	.3518	9/16-18	.350	1.06	1	
CL-6-TLPB-OS	3/8	.4143	5/8-18				
CL-8-TLPB-OS	1/2	.5393	3/4-16				

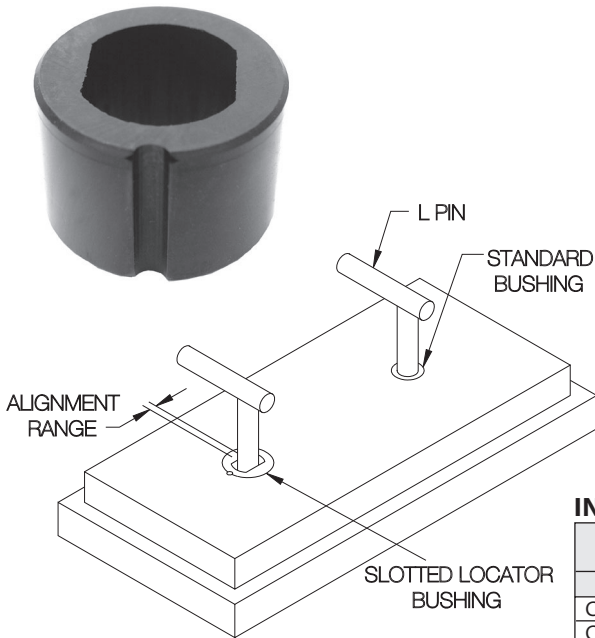
THREADED, WITH OVERSIZE ID (METRIC)

PART NO.	A DIA NOMINAL (mm)	A DIA ACTUAL OVERSIZE (mm)	B THREAD	THREAD PITCH (mm)	C (mm)	D DIA (mm)	E (mm)	F (mm)
CLM-6-TLPB-OS	6	7	M12x1.25	1.25	7.6	22	12	20
CLM-8-TLPB-OS	8	9	M16x1.5	1.5	7.6	22	12	20
CLM-10-TLPB-OS	10	11	M18x1.5	1.5	8.9	22	12	20
CLM-12-TLPB-OS	12	13	M20x1.5	1.5	8.9	26	12	24

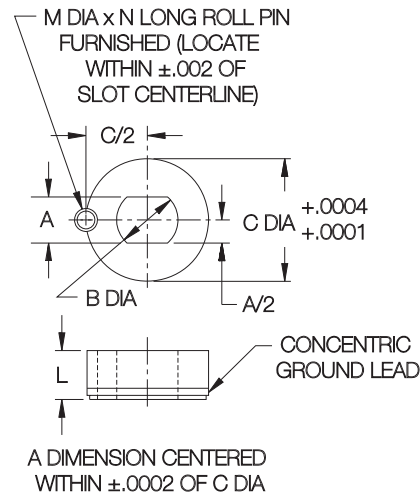
SLOTTED LOCATOR BUSHINGS

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

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Use with L Pins, T Pins, Shoulder Pins, or Carr 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.**



INCH

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	1/4	.2501/.2507	.375	.7500	.40		
CL-4A-SLLB	—				1.0000			
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	1.0000	.40		
CL-6-SLLB	CL-6-SLLB-S	3/8	.3751/.3757	.500	1.0000	.40		
CL-8A-SLLB	CL-8A-SLLB-S	1/2	.5001/.5007	.625		1.0000		
CL-8-SLLB	—							
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	.98		
CL-14-SLLB	—	7/8	.8751/.8760	1.000	1.5000	.98		
CL-16-SLLB	—	1	1.0001/1.0010	1.062	1.5000	.98		

METRIC

PART NO. Steel	Stainless Steel	PIN DIA (mm)	A (mm)	B DIA (mm)	C DIA (mm)	L (mm)	M DIA (mm)	N (mm)
CLM-5-SLLB	—	5	5.003 / 5.028	8	20	9	5	8
CLM-6-SLLB	CLM-6-SLLB-S	6	6.003 / 6.028	9	20	9	5	8
CLM-8-SLLB	CLM-8-SLLB-S	8	8.003 / 8.028	11	24	9	5	8
CLM-10-SLLB	CLM-10-SLLB-S	10	10.003 / 10.028	13	24	9	5	8
CLM-12-SLLB	CLM-12-SLLB-S	12	12.003 / 12.028	15	24	14	5	8
CLM-16-SLLB	CLM-16-SLLB-S	16	16.003 / 16.028	18	30	12	5	8
CLM-20-SLLB	CLM-20-SLLB-S	20	20.003 / 20.028	22	36	19	5	8
CLM-25-SLLB	CLM-25-SLLB-S	25	25.003 / 25.028	27	40	19	5	8

CARBIDE (INCH)

PART NO.	PIN DIA	A	B DIA	C DIA	L	M DIA	N
CL-4-CSLB	1/4	.2501/.2507	.375	.7500	.40	3/16	3/8
CL-5-CSLB	5/16	.3126/.3132	.437				
CL-6-CSLB	3/8	.3751/.3757	.500				
CL-8A-CSLB	1/2	.5001/.5007	.625				

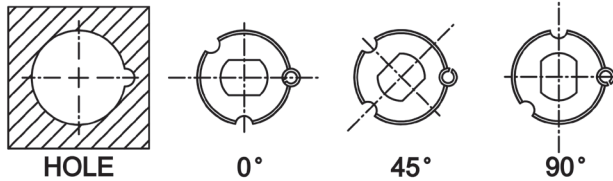
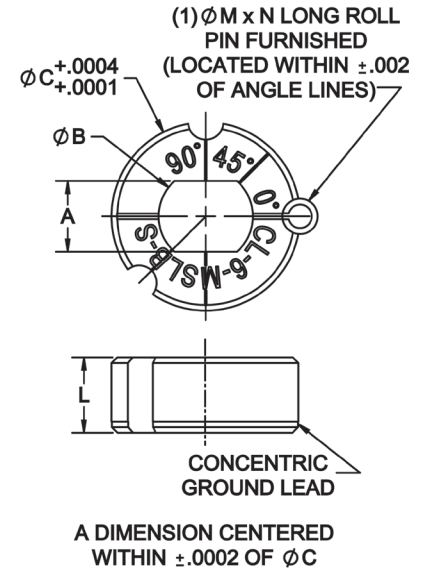
MULTI-ANGLE SLOTTED LOCATOR BUSHINGS

440C STAINLESS STEEL, HEAT TREATED, PASSIVATED



New item!

Slotted Locator Bushings can be used with many types of alignment pins and locating pins to align two holes without binding. The multi-angle version shown here can be installed normally (0°) or at a 90° or 45° angle in the same mounting hole without machining a different pin location. Slotted Locator Bushings have a tight tolerance in one direction and full relief in the perpendicular direction. Available for pin diameters from 1/4 to 1/2", in hardened 440C stainless steel. To install, first drill and ream the small hole for the roll pin, then bore the large bushing hole to provide .0003-.0005" press fit. Press in the bushing and roll pin simultaneously for accurate orientation.



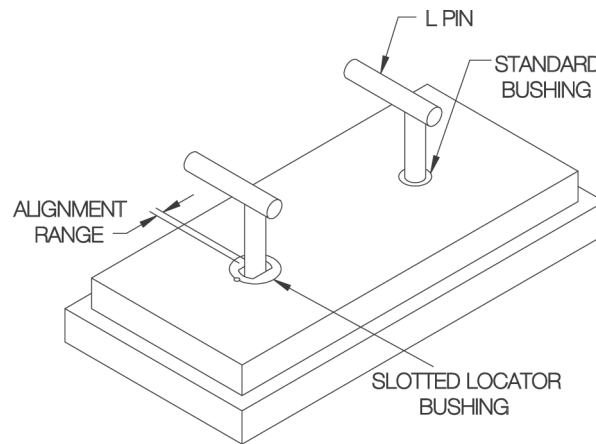
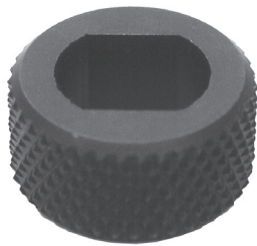
Multi-Angle Slotted Locator Bushings can be installed normally (0°) or at a 90° or 45° angle in the same mounting hole without machining a different pin location.

INCH

PART NO.	PIN DIA	A	B DIA	C DIA	L	M DIA	N
CL-4-MSLB-S	1/4	.2501 / .2507	.375	.7500	.40	3/16	3/8
CL-5-MSLB-S	5/16	.3126 / .3132	.437	1.0000			
CL-6-MSLB-S	3/8	.3751 / .3757	.500	1.0000			
CL-8A-MSLB-S	1/2	.5001 / .5007	.625	1.0000			

KNURLED SLOTTED LOCATOR BUSHINGS

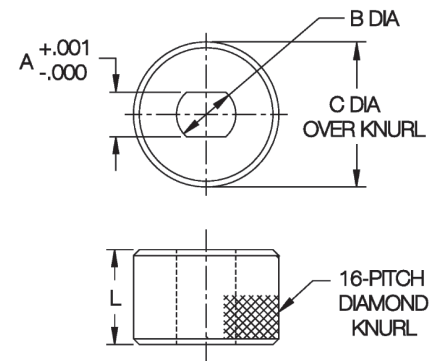
TOOL STEEL, HEAT TREATED RC 58-62, BLACK OXIDE FINISH



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.

INCH

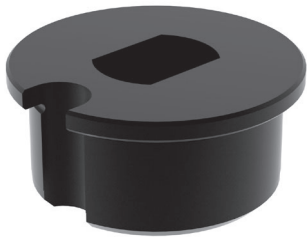
PART NO.	PIN DIA	A	B DIA	C DIA	L
CL-30-SLLB	3/16	.188	.312	.565	1/2
CL-40-SLLB	1/4	.250	.375	.640	
CL-50-SLLB	5/16	.313	.437	.765	
CL-60-SLLB	3/8	.375	.500	.890	
CL-80-SLLB	1/2	.500	.625	1.015	



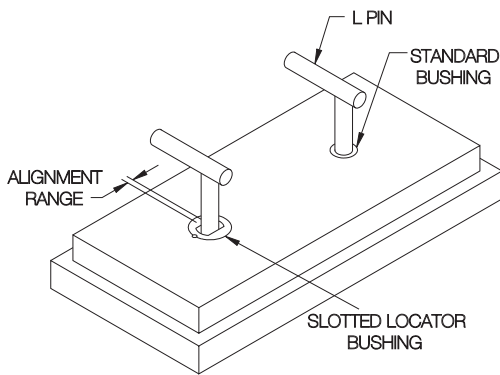
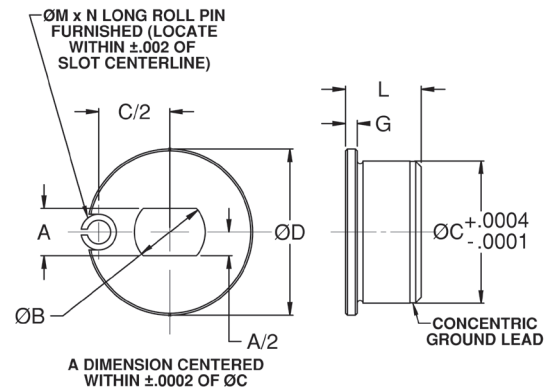
HEADED SLOTTED LOCATOR BUSHINGS

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

1



Slotted Locator Bushings can be used with many types of alignment pins and locating pins to align two holes without binding. Precision bushing with a tight tolerance in one direction and full relief in the perpendicular direction. Many sizes are optionally available in hardened 440C stainless steel as well as carbide. Made in USA.



STEEL (INCH)

PART NO.	PIN DIA	A	B DIA	C DIA	D DIA	G	L	M DIA	N
CL-3-HSLB	3/16	.1876/.1882	.312	.7500	.875	.0625	.40	3/16	3/8
CL-4-HSLB	1/4	.2501/.2507	.375						
CL-4A-HSLB									
CL-5-HSLB	5/16	.3126/.3132	.437	1.0000	1.125		.90		
CL-6-HSLB	3/8	.3751/.3757	.500						
CL-8-HSLB	1/2	.5001/.5007	.625						
CL-8B-HSLB									

STAINLESS STEEL (INCH)

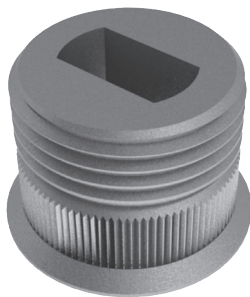
PART NO.	PIN DIA	A	B DIA	C DIA	D DIA	G	L	M DIA	N
CL-3-HSLB-S	3/16	.1876/.1882	.312	.7500	.875	.0625	.40	3/16	3/8
CL-4-HSLB-S	1/4	.2501/.2507	.375						
CL-4A-HSLB-S									
CL-5-HSLB-S	5/16	.3126/.3132	.437	1.0000	1.125		.90		
CL-6-HSLB-S	3/8	.3751/.3757	.500						
CL-8-HSLB-S	1/2	.5001/.5007	.625						
CL-8B-HSLB-S									

SLOTTED LOCATOR TEMPLATE BUSHINGS

BUSHING: 1144 STEEL, CARBURIZED-HARDENED
RETAINER RING: ALUMINUM



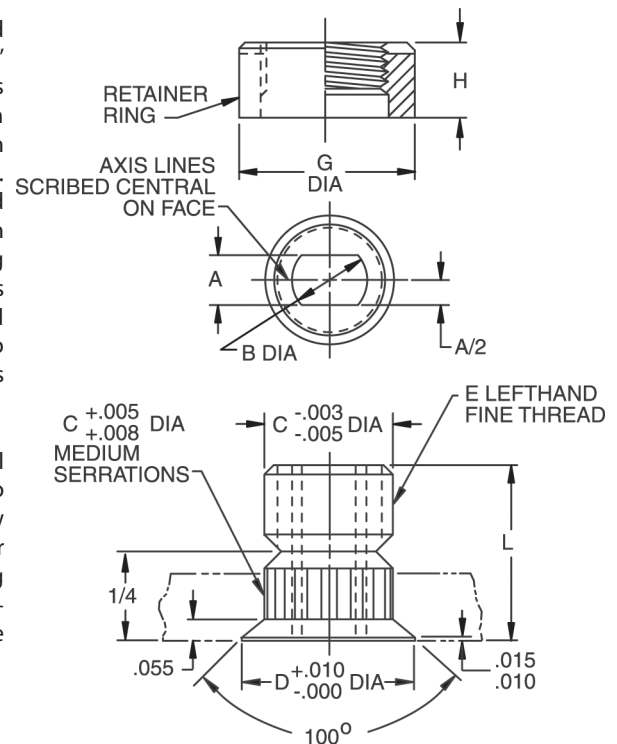
Retainer Ring



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.



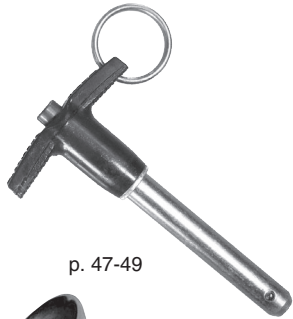
INCH

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-48-5	.126-.188		5/16
								TTR-48-3	.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-48-5	.126-.188		5/16
								TTR-48-3	.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-48-5	.126-.188		5/16
								TTR-48-3	.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-64-5	.126-.188		5/16
								TTR-64-3	.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-64-5	.126-.188		5/16
								TTR-64-3	.189-.375		3/16

BALL LOCK PINS

1

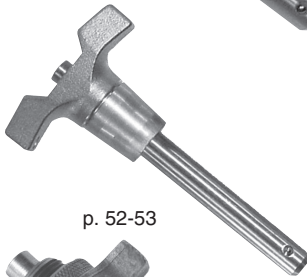
TECHNICAL INFORMATION



p. 47-49



p. 50-51



p. 52-53



p. 54-55



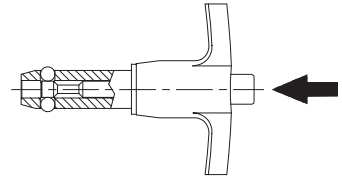
p. 56-57



p. 58-59

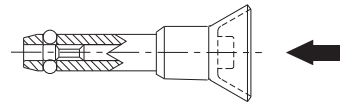
BALL LOCK PINS

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.



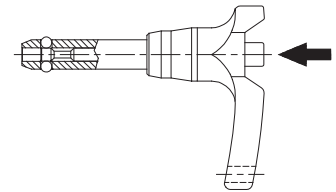
MARINE BALL LOCK PINS

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).



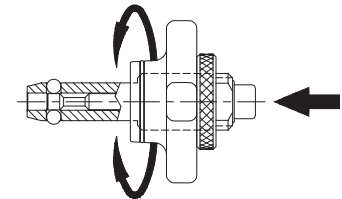
HEAVY-DUTY BALL LOCK PINS

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 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).



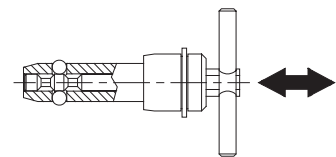
ADJUSTABLE BALL LOCK PINS

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).



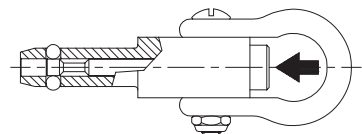
DOUBLE-ACTING BALL LOCK PINS

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.



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).



BALL LOCK PINS

STRENGTH DATA (INCH)

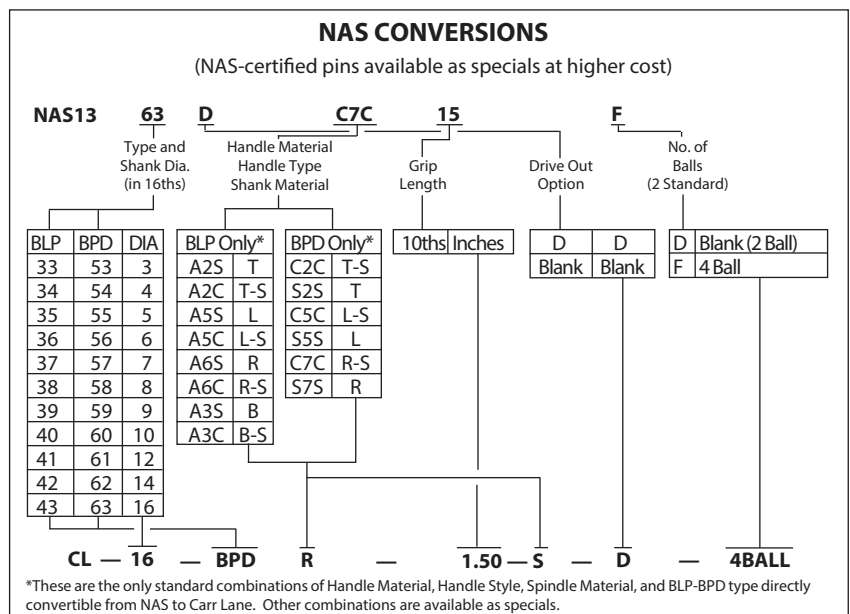
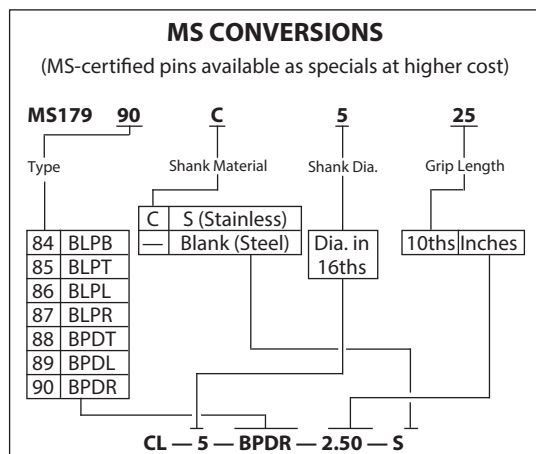
NOM. DIA	ALLOWABLE HOLE DIA		BLP, BPD, ABP APPROXIMATE PULL OUT STRENGTH (LBS)	BLP, BPD, ABP, LFP CALCULATED DOUBLE SHEAR STRENGTH (LBS)***		DEP CALCULATED DOUBLE SHEAR STRENGTH (LBS)***		BLP, BPD APPROX. WEIGHT (OUNCES)		DEP INSERTION/REMOVAL FORCE (LBS)	
	MAX	MIN		STEEL	STAINLESS	STEEL	STAINLESS	HANDLE	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)

NOM. DIA	ALLOWABLE 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
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

**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

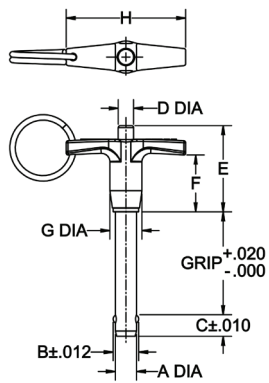


BALL LOCK PINS

1



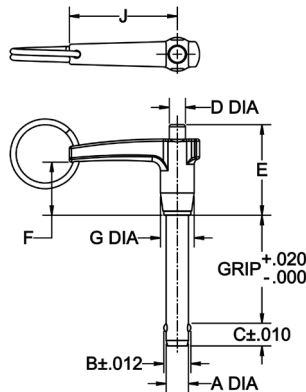
T Handle



BLPT



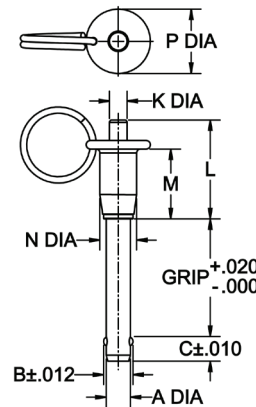
L Handle



BLPL



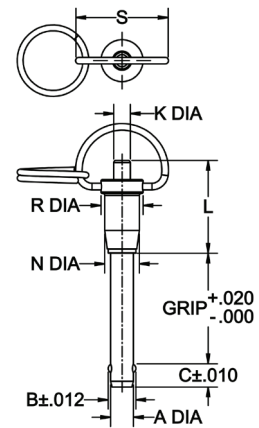
Button Handle



BLPB



Ring Handle



BLPR

INCH

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	.22	1.26	.78	.47	1.75	1.50	.22	1.26	.89	.47	.82	.57	1.13
CL- 5-BLPx-x.xx	5/16	.3110/.3095	.375	.315	.22	1.26	.78	.47	1.75	1.50	.22	1.26	.89	.47	.82	.57	1.13
CL- 6-BLPx-x.xx	3/8	.3735/.3720	.438	.350	.27	1.47	.94	.59	2.00	1.62	.27	1.47	1.02	.59	1.00	.69	1.13
CL- 7-BLPx-x.xx	7/16	.4360/.4345	.508	.365	.27	1.47	.94	.59	2.00	1.62	.27	1.47	1.02	.59	1.00	.69	1.13
CL- 8-BLPx-x.xx	1/2	.4985/.4970	.592	.445	.39	1.61	1.06	.75	2.25	1.88	.39	1.61	1.08	.75	1.31	.82	1.33
CL- 9-BLPx-x.xx	9/16	.5610/.5595	.666	.495	.39	1.61	1.06	.75	2.25	1.88	.39	1.61	1.08	.75	1.31	.82	1.33
CL-10-BLPx-x.xx	5/8	.6235/.6220	.750	.565	.50	1.81	1.06	.93	3.00	2.50	.50	1.81	1.25	.93	1.56	1.01	1.33
CL-12-BLPx-x.xx	3/4	.7485/.7470	.886	.655	.50	1.81	1.06	.93	3.00	2.50	.50	1.81	1.25	.93	1.56	1.01	1.33
CL-14-BLPx-x.xx	7/8	.8735/.8720	1.044	.745	.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-16-BLPx-x.xx	1	.9985/.9970	1.217	.875	.71	2.07	1.25	1.31	3.50	2.90	.71	2.07	1.49	1.31	2.16	1.41	1.90

METRIC

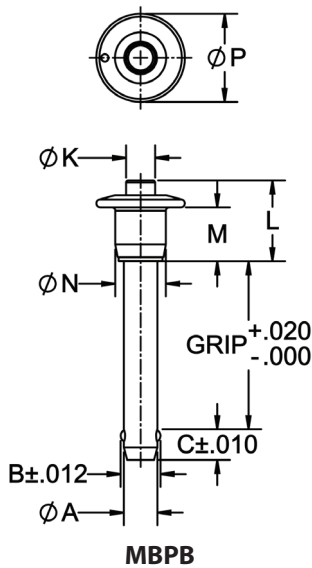
BASIC PART NO.	A DIA (mm)	A DIA ACTUAL (mm)	B (mm)	C (mm)	D DIA (mm)	E (mm)	F (mm)	G DIA (mm)	H (mm)
CLM-5-BLPx-xx	5	4.96 / 4.92	5.38	6.22	5.5	32	20	12	44.5
CLM-6-BLPx-xx	6	5.96 / 5.92	7.06	6.99	5.5	32	20	12	44.5
CLM-8-BLPTx-xx	8	7.96 / 7.92	9.42	8.00	5.5	32	20	12	44.5
CLM-10-BLPTx-xx	10	9.96 / 9.92	11.91	8.89	7	37.5	24	15	51
CLM-12-BLPx-xx	12	11.96 / 11.92	14.40	11.30	7	37.5	24	15	51
CLM-16-BLPx-xx	16	15.96 / 15.92	19.00	14.35	12.5	46	27	23.5	76
CLM-20-BLPx-xx	20	19.96 / 19.92	24.08	20.19	12.5	46	27	23.5	76

MARINE BALL LOCK PINS

1



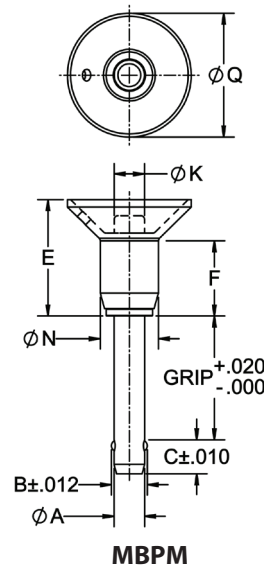
Button Handle (B)



MBPB



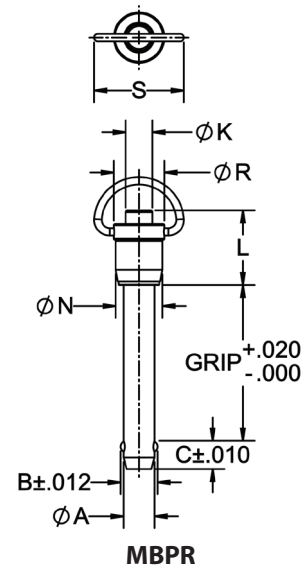
Recessed Button Handle (M)



MBPM



Ring Handle (R)



MBPR

INCH

BASIC PART NO.	A DIA		B	C	K DIA	L	M	N DIA	P DIA
	NOMINAL	ACTUAL							
CL-3-MBPB	3/16 (#10)	.1885 / .1870	.219	.245	.25	.81	.56	.47	.79
CL-4-MBPB	1/4	.2485 / .2470	.290	.275	.25	.81	.56	.47	.79
CL-5-MBPB	5/16	.3110 / .3095	.375	.315	.25	.92	.65	.47	.88
CL-6-MBPB	3/8	.3735 / .3720	.438	.350	.31	.98	.65	.59	1.00
CL-8-MBPB	1/2	.4985 / .4970	.592	.455	.44	1.20	.80	.75	1.31
CL-10-MBPB	5/8	.6235 / .6220	.750	.565	.50	1.56	1.00	.93	1.56
CL-12-MBPB	3/4	.7485 / .7470	.886	.655	.50	1.56	1.00	.93	1.56

METRIC

PART NO.	A DIA (mm)		GRIP LENGTH (mm)	B (mm)	C (mm)	K DIA (mm)	L (mm)	M (mm)	N (mm)	P DIA (mm)
	NOMINAL	ACTUAL								
CLM-5-MBPx-xx-S	5	4.96 / 4.92	20	5.38	6.22	5.5	20.5	14	12	20
CLM-5-MBPx-xx-S	5	4.96 / 4.92	25	5.38	6.22	5.5	20.5	14	12	20
CLM-6-MBPx-xx-S	6	5.96 / 5.92	15	7.06	6.99	5.5	20.5	14	12	20
CLM-6-MBPx-xx-S	6	5.96 / 5.92	40	7.06	6.99	5.5	20.5	14	12	20
CLM-6-MBPx-xx-S	6	5.96 / 5.92	50	7.06	6.99	5.5	20.5	14	12	20
CLM-6-MBPx-xx-S	6	5.96 / 5.92	60	7.06	6.99	5.5	20.5	14	12	20
CLM-10-MBPx-xx-S	10	9.96 / 9.92	30	11.91	8.89	7	25	16.5	15	25.5
CLM-12-MBPx-xx-S	12	11.96 / 11.92	50	14.40	11.30	10	30.5	20.5	19	33.5

HEAVY-DUTY BALL LOCK PINS

1



T Handle



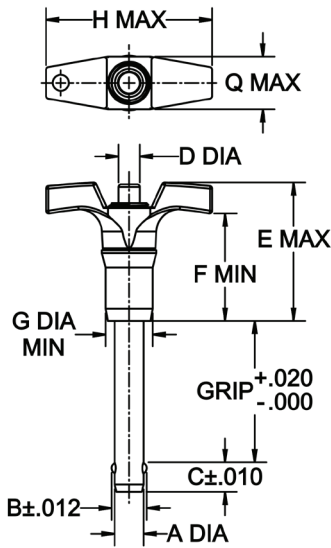
L Handle



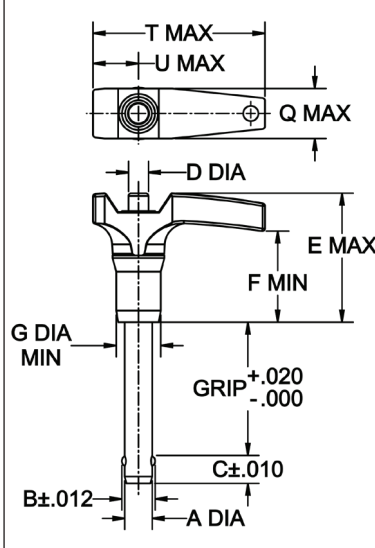
Button Handle



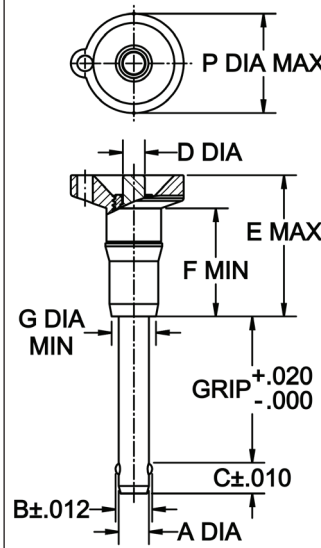
Ring Handle



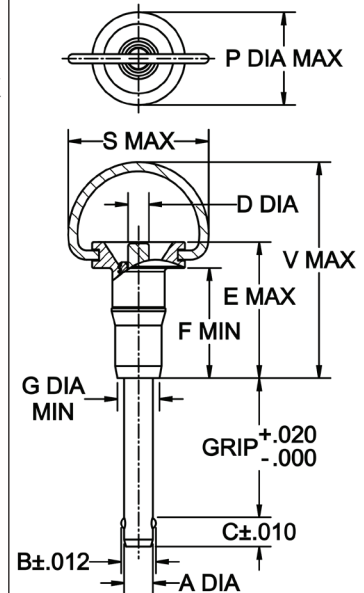
BLHT



BLHL



BLHB



BLHR

INCH

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	1.52	.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		1.52	.70	.38	1.82	1.07	.63	1.56	1.95	.54	2.13
CL-5-BLHx-x.xx-S	5/16	.3110/.3095	.375	.315		1.52	.70	.38	1.82	1.07	.63	1.56	1.95	.54	2.13
CL-6-BLHx-x.xx-S	3/8	.3735/.3720	.440	.350	.30	1.47	.85	.51	2.35	1.39	.80	2.00	2.51	.70	2.34
CL-7-BLHx-x.xx-S	7/16	.4360/.4345	.509	.365		1.47	.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		1.47	.85	.51	2.35	1.39	.80	2.00	2.51	.70	2.34

METRIC

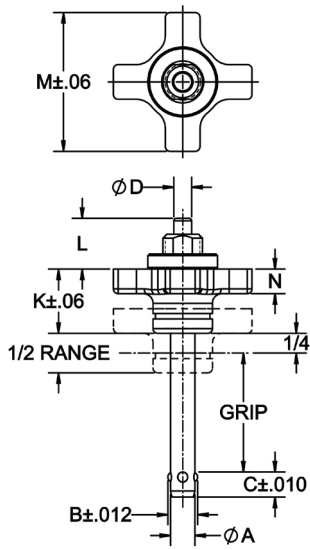
CLM-5-BLHx-xx-S	5mm	.1954/.1939	.210	.245	.25	.39	.70	.38	1.82	1.07	.63	1.56	1.95	.54	2.13
CLM-6-BLHx-xx-S	6mm	.2347/.2332	.275	.275		.39	.70	.38	1.82	1.07	.63	1.56	1.95	.54	2.13
CLM-8-BLHx-xx-S	8mm	.3135/.3120	.371	.315		.39	.70	.38	1.82	1.07	.63	1.56	1.95	.54	2.13
CLM-10-BLHx-xx-S	10mm	.3922/.3907	.467	.350	.30	.37	.85	.51	2.35	1.39	.80	2.00	2.51	.70	2.34
CLM-12-BLHx-xx-S	12mm	.4709/.4694	.569	.445		.37	.85	.51	2.35	1.39	.80	2.00	2.51	.70	2.34

ADJUSTABLE BALL LOCK PINS

1



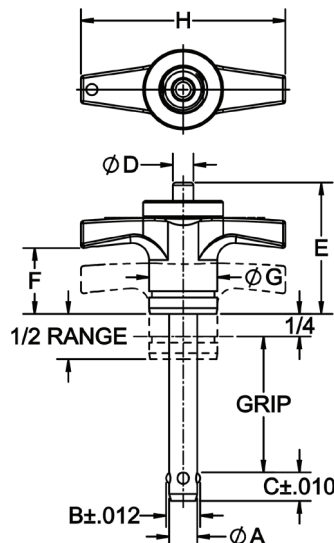
Knob Handle



ABPK



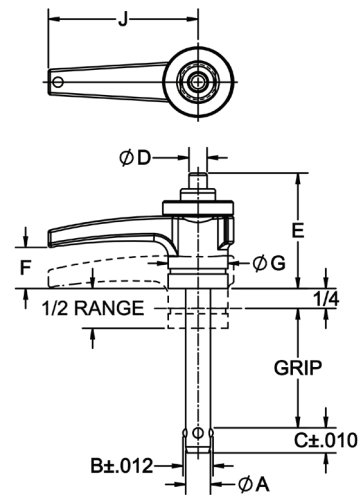
T Handle



ABPT



L Handle



ABPL

INCH

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-S	1/4	.2485/.2470	.290	.275	.22	1.51	1.06	.75	2.25	1.87	.88	.58	1.75	.38
CL-5-ABPx-x.xx-S	5/16	.3110/.3095	.375	.315		1.45								
CL-6-ABPx-x.xx-S	3/8	.3735/.3720	.438	.350	.27	1.48	1.06	.93	3.00	2.50	.88	.63	2.12	.44
CL-7-ABPx-x.xx-S	7/16	.4360/.4345	.508	.365										
CL-8-ABPx-x.xx-S	1/2	.4985/.4970	.592	.445	.39	1.55	1.06	.93	3.00	2.50	1.00	.55	2.12	.44
CL-9-ABPx-x.xx-S	9/16	.5610/.5595	.666	.495										
CL-10-ABPx-x.xx-S	5/8	.6235/.6220	.750	.565	.50	2.07	1.25	1.31	3.50	2.87	1.25	1.13	2.75	.50
CL-12-ABPx-x.xx-S	3/4	.7485/.7470	.886	.655										
CL-14-ABPx-x.xx-S	7/8	.8735/.8720	1.044	.745	.71	2.34	1.62	1.50	4.30	4.00	1.62	1.00	4.00	.75
CL-16-ABPx-x.xx-S	1	.9985/.9970	1.217	.875										

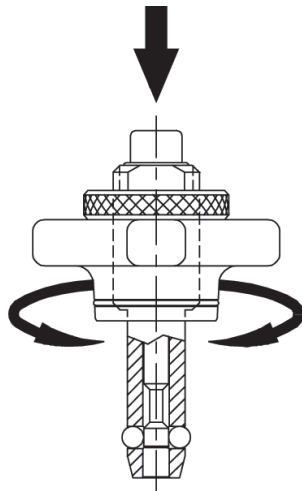
METRIC

BASIC PART NO.	A DIA (mm)		B (mm)	C (mm)	D DIA (mm)	K (mm)	L (mm)	M (mm)	N (mm)
	NOMINAL	ACTUAL							
CLM-6-ABPx-xx-S	6	5.96 / 5.92	7.06	6.99	5.5	20.5	16.5	44.5	9.5
CLM-8-ABPx-xx-S	8	7.96 / 7.92	9.42	8.00	5.5	20.5	19	44.5	9.5
CLM-10-ABPx-xx-S	10	9.96 / 9.92	11.91	8.89	7	22.5	18.5	54	11
CLM-12-ABPx-xx-S	12	11.96 / 11.92	14.40	11.30	7	25.5	18.5	54	11
CLM-16-ABPx-xx-S	16	15.96 / 15.92	19.00	14.35	12.5	32	28.5	70	12.5
CLM-20-ABPx-xx-S	20	19.96 / 19.92	24.08	20.19	12.5	51	25.5	70	12.5

ADJUSTABLE BALL LOCK PINS

SHANK: 17-4PH STAINLESS STEEL, HEAT TREATED RC 40 MIN, PASSIVATED;
 SPINDLE: 17-4PH STAINLESS STEEL, PASSIVATED;
 T & L HANDLE: ALUMINUM ALLOY, BLACK FINISH; KNOB HANDLE: 319 ALUMINUM ALLOY;
 HEAD & LOCKNUT: 300-SERIES STAINLESS STEEL, PASSIVATED; BUTTON: ALUMINUM ALLOY, ANODIZED;
 SPRING: 302 STAINLESS STEEL; BALLS: 440C STAINLESS STEEL

1

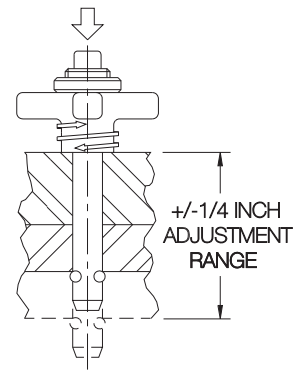


These Ball Lock Pins have an adjustable grip length. They can be used for clamping, or simply to provide a variable grip length. The threaded handle turns to provide a +/- 1/4" clamping range or adjustment range. When used just for variable grip length (not for clamping), the handle can be secured with 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 stainless steel only.

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).

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.

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



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

STOCK GRIP LENGTHS (INCH)

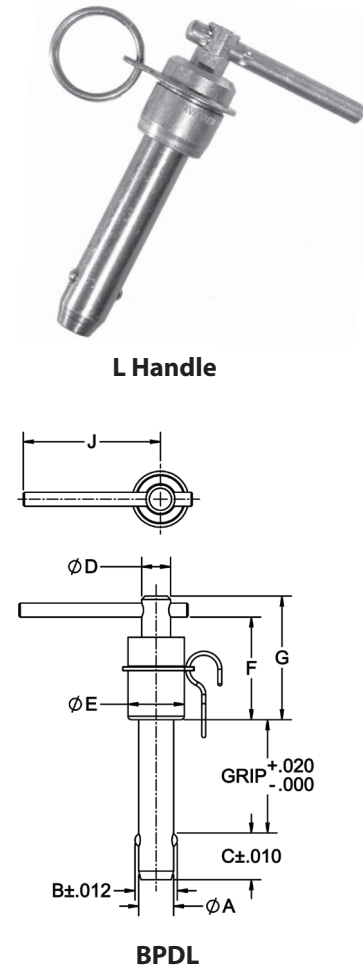
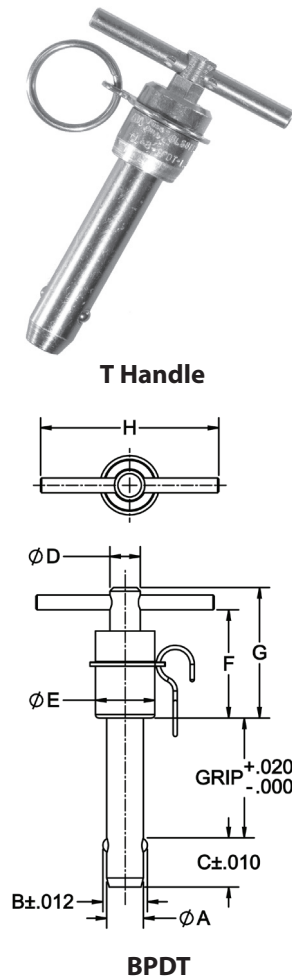
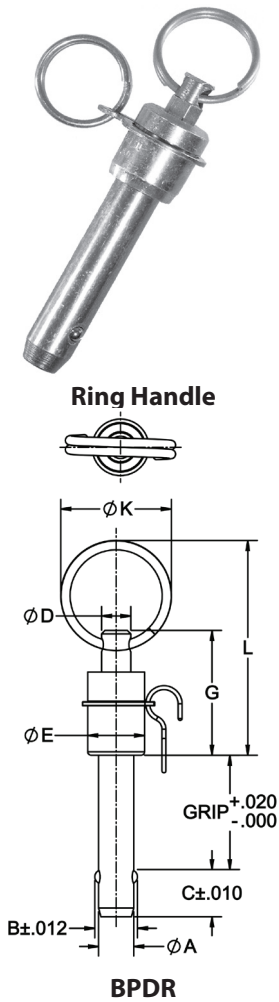
PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (INCHES)																												
		0.50		0.75		1.00		1.25		1.50		1.75		2.00		2.50		3.00		3.50		4.00		4.50		5.00		6.00		
		K	T	L	K	T	L	K	T	L	K	T	L	K	T	L	K	T	L	K	T	L	K	T	L	K	T	L	K	T
CL-4-ABPx-x.xx-S	1/4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-5-ABPx-x.xx-S	5/16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-6-ABPx-x.xx-S	3/8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-8-ABPx-x.xx-S	1/2			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-9-ABPx-x.xx-S	9/16					•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-10-ABPx-x.xx-S	5/8							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-12-ABPx-x.xx-S	3/4									•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-14-ABPx-x.xx-S	7/8											•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-16-ABPx-x.xx-S	1													•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

STOCK GRIP LENGTHS (METRIC)

PART NO.	NOMINAL SHANK DIA	GRIP LENGTH (mm)																													
		20		30		40		50																							
		K	T	L	K	T	L	K	T	L																					
CLM-6-ABPx-x.xx-S	6mm	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
CLM-8-ABPx-x.xx-S	8mm	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CLM-10-ABPx-x.xx-S	10mm			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

DOUBLE-ACTING BALL LOCK PINS

1



INCH

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-S	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-S	1/4	.2485/.2470	.290	.415	.25	1/2	.86	1.06	1-15/16	1-7/16			.14							
CL-5-BPDx-x.xx-S	5/16	.3110/.3095	.375	.485										.31	11/16	.97	1.24	2-3/16	1-19/32	.18
CL-6-BPDx-x.xx-S	3/8	.3735/.3720	.438	.565	.43	13/16	1.14	1.44	2-7/16	1-3/4			.26							
CL-7-BPDx-x.xx-S	7/16	.4360/.4345	.508	.725																
CL-8-BPDx-x.xx-S	1/2	.4985/.4970	.592	.886	.765	15/16	1.13	1.43	2-7/16	1-3/4	2.44									
CL-9-BPDx-x.xx-S	9/16	.5610/.5595	.666	.925								.925	1-1/4	1.47	1.77	2-25/32	2-3/16	2.79		
CL-10-BPDx-x.xx-S	5/8	.6235/.6220	.750	1.075																
CL-12-BPDx-x.xx-S	3/4	.7485/.7470	.886	.765									.28							
CL-14-BPDx-x.xx-S	7/8	.8735/.8720	1.044	.925									.28							
CL-16-BPDx-x.xx-S	1	.9985/.9970	1.217	1.075									.30							

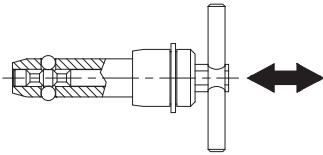
METRIC

BASIC PART NO.	A DIA (mm)		B (mm)	C (mm)	D DIA (mm)	E DIA (mm)	G (mm)	K DIA (mm)	L (mm)	M (mm)
	NOMINAL	ACTUAL								
CLM-5-BPDx-xx-S	5	4.96 / 4.92	5.38	9.78	5	11	26	25.5	47	3
CLM-6-BPDx-xx-S	6	5.96 / 5.92	7.06	9.78	5	11	26	25.5	47	3
CLM-8-BPDx-xx-S	8	7.96 / 7.92	9.42	10.54	6.5	12.5	26	25.5	47	3.5
CLM-10-BPDx-xx-S	10	9.96 / 9.92	11.91	12.32	6.5	16	27	25.5	47	4
CLM-12-BPDx-xx-S	12	11.96 / 11.92	14.40	14.35	8	17.5	31.5	25.5	50	4.5
CLM-16-BPDx-xx-S	16	15.96 / 15.92	19.00	18.42	11	20.5	36.5	33.5	62	6.5
CLM-20-BPDx-xx-S	20	19.96 / 19.92	24.08	23.50	14	28.5	40.5	33.5	66.5	7

DOUBLE-ACTING BALL LOCK PINS

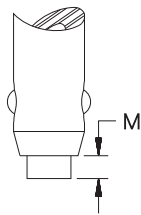
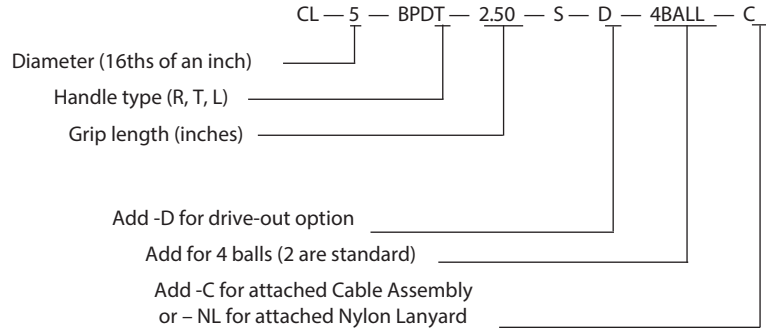
SHANK: 17-4PH STAINLESS STEEL, HEAT TREATED RC 40 MIN, PASSIVATED
 SPINDLE: 17-4PH STAINLESS STEEL, PASSIVATED
 HEAD, BUTTON & HANDLE: 300-SERIES STAINLESS STEEL, PASSIVATED
 SPRING & RING: 302 STAINLESS STEEL
 BALLS: 440C STAINLESS STEEL

1



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 in stainless steel only.

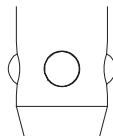
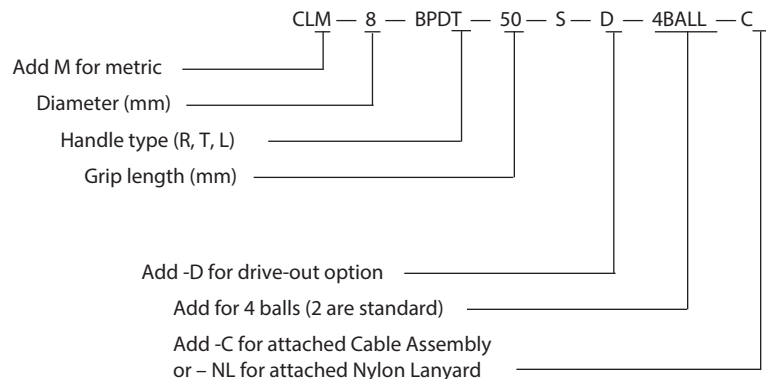
Ordering Example (INCH):



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).

Ordering Example (METRIC):



4-Ball Option

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

The optional attached Cable Assembly (-C) is 12" long (part no. CL-82-KA-12.0 if ordered separately), while the optional attached Nylon Lanyard (-NL) is 10" long (part no. CL-1-NL-10 if ordered separately). Both have an eyelet at the free end for a #10 or M5 attachment screw.

LIFTING PINS

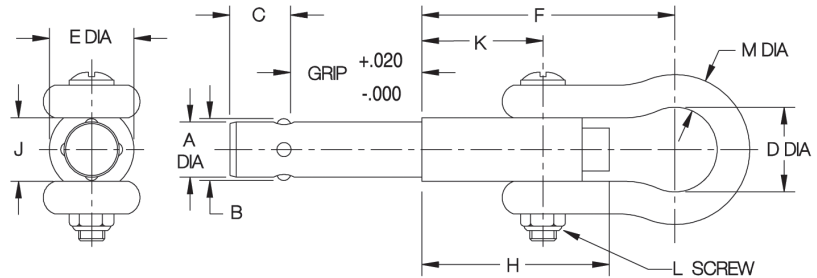
SHANK: 17-4PH STAINLESS STEEL, HEAT TREATED RC 40 MIN; SPINDLE: 17-4PH STAINLESS STEEL;
 SHACKLE: FORGED STEEL PER RR-C271, ZINC PLATED CLEAR CHROMATE; BUTTON: 303 STAINLESS STEEL;
 CAP SCREW, NUT, AND BUSHING: 300-SERIES STAINLESS STEEL; SPRING: 302 STAINLESS STEEL; BALLS: 440C STAINLESS STEEL

1



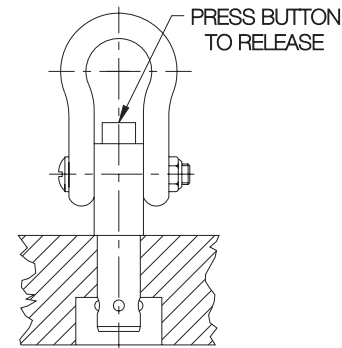
Stainless Steel

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. INFO+: See safety precautions on page 74.

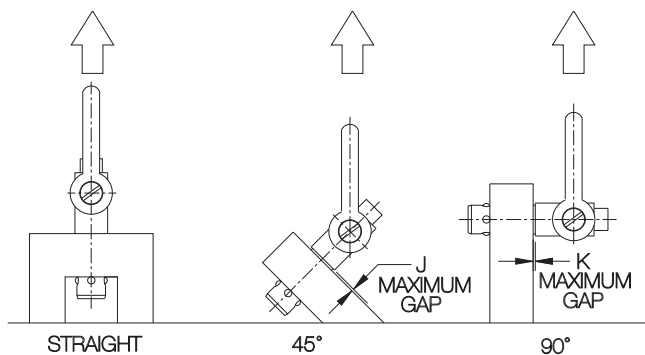


STAINLESS STEEL (INCH)

PART NO.	A DIA	GRIP	B	C	D DIA	E DIA	F	H	J	K	L	M DIA
CL-4-LFP-0.25-S	1/4 .2470/.2485	0.25	.287	.333	9/16	9/16	2.45	1.50	1/2	7/8	M6	3/16
CL-4-LFP-0.50-S		0.50										
CL-4-LFP-1.00-S		1.00										
CL-4-LFP-1.50-S		1.50										
CL-4-LFP-2.00-S		2.00										
CL-6-LFP-0.25-S	3/8 .3720/.3735	0.25	.438	.425	11/16	3/4	2.85	1.60	9/16	15/16	5/16-18	1/4
CL-6-LFP-0.50-S		0.50										
CL-6-LFP-1.00-S		1.00										
CL-6-LFP-1.50-S		1.50										
CL-6-LFP-2.00-S		2.00										
CL-6-LFP-3.00-S		3.00										
CL-8-LFP-0.50-S	1/2 .4970/.4985	0.50	.593	.519	13/16	13/16	3.15	1.80	11/16	1	3/8-16	5/16
CL-8-LFP-1.00-S		1.00										
CL-8-LFP-1.50-S		1.50										
CL-8-LFP-2.00-S		2.00										
CL-8-LFP-3.00-S		3.00										
CL-12-LFP-0.50-S	3/4 .7470/.7485	0.50	.887	.707	1-1/8	1-1/8	4.05	2.20	15/16	1-1/4	1/2-13	7/16
CL-12-LFP-1.00-S		1.00										
CL-12-LFP-2.00-S		2.00										
CL-12-LFP-3.00-S		3.00										
CL-16-LFP-0.50-S	1 .9970/.9985	0.50	1.217	.957	1-1/4	1-3/8	4.55	2.75	1-1/8	1-1/2	M8	1/2
CL-16-LFP-1.00-S		1.00										
CL-16-LFP-2.00-S		2.00										



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-S	210	170	120	.031	.037	.254	.250
CL-6-LFP-x.xx-S	520	520	350	.036	.042	.379	.375
CL-8-LFP-x.xx-S	980	900	770			.505	.500
CL-12-LFP-x.xx-S	2200	2200	2000	.041	.047	.757	.750
CL-16-LFP-x.xx-S	2900	2800	2500	.046	.052	1.010	1.000

* 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.

LIFTING PINS

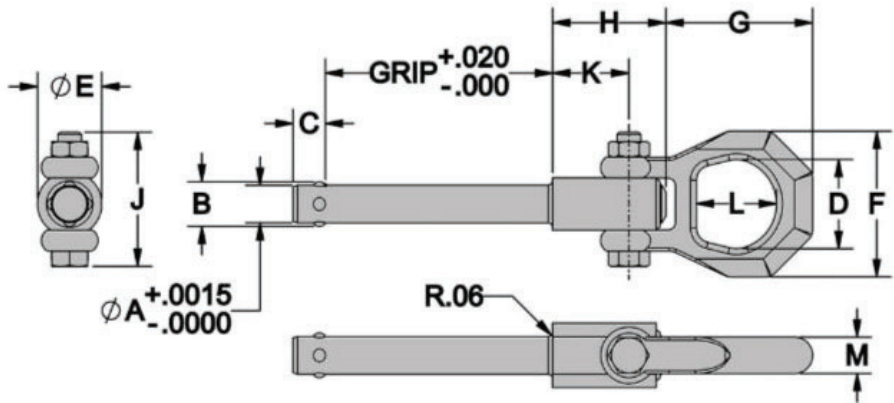
SHANK: ALLOY STEEL, HEAT TREATED, MANGANESE PHOSPHATE FINISH; SPINDLE: ALLOY STEEL, MANGANESE PHOSPHATE FINISH;
 SHACKLE: ALLOY STEEL, HEAT TREATED, MANGANESE PHOSPHATE FINISH; BUTTON: ALUMINUM ALLOY, RED ANODIZED;
 CAP SCREW, NUT, AND BUSHING: STEEL, ZINC PLATED CLEAR CHROMATE; SPRING: STAINLESS STEEL; BALLS: 440C STAINLESS STEEL

1

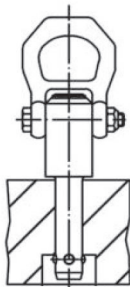


Alloy Steel

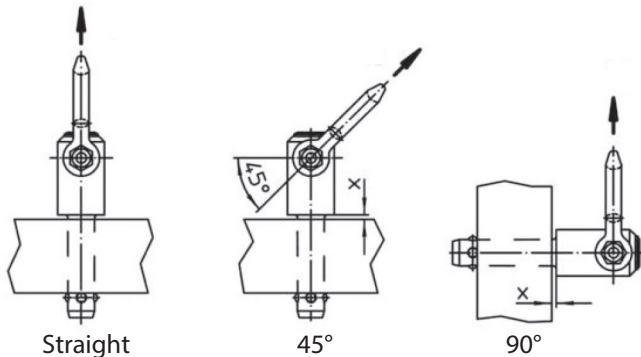
A single-acting ball lock pin with a solid, one-piece body and four balls for high tension loads. Positive locking until released by pushing the button. Sturdy forged shackle for heavy lifting. Manganese phosphate finish provides excellent lubricity and corrosion resistance. INFO+: See safety precautions on page 74.



ALLOY STEEL (INCH)



PART NO.	A DIA		GRIP LENGTH	B	C	D	E DIA	F	G	H	J	K	L	M
	NOMINAL	ACTUAL												
CL-4-LFPM-0.50	1/4	.2470/.2485	0.50	.29	.33									
CL-4-LFPM-1.00			1.00											
CL-4-LFPM-1.50			1.50											
CL-6-LFPM-0.50	3/8	.3720/.3735	0.50	.44	.40	1.18	0.85	1.93	1.94	1.50	2.06	1.01	1.06	0.37
CL-6-LFPM-1.00			1.00											
CL-6-LFPM-1.50			1.50											
CL-6-LFPM-2.00			2.00											
CL-8-LFPM-1.50	1/2	.4970/.4985	1.50	.59	.44									
CL-8-LFPM-2.00			2.00											
CL-8-LFPM-3.00			3.00											



TECHNICAL DATA

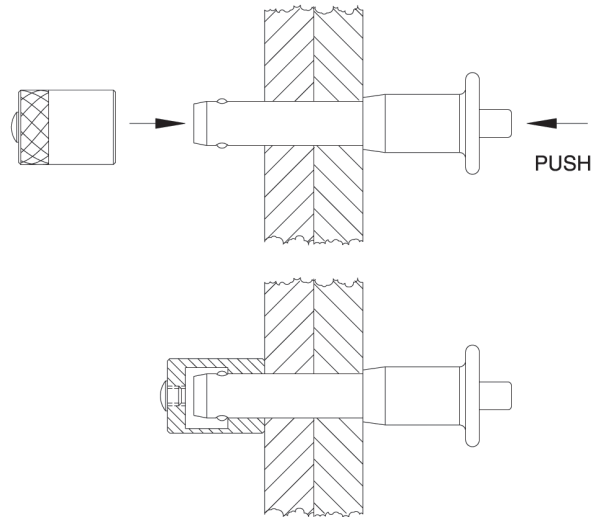
PART NO.	LOAD CAPACITY (LBS)*			X		RECOMMENDED HOLE DIA	
	STRAIGHT	45°	90°	MIN	MAX	MAX	MIN
CL-4-LFPM-X.XX	210	170	110	.06	.20	.254	.250
CL-6-LFPM-X.XX	600	540	470		.39	.379	.375
CL-8-LFPM-X.XX	790	630	630		.59	.505	.500

* 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.

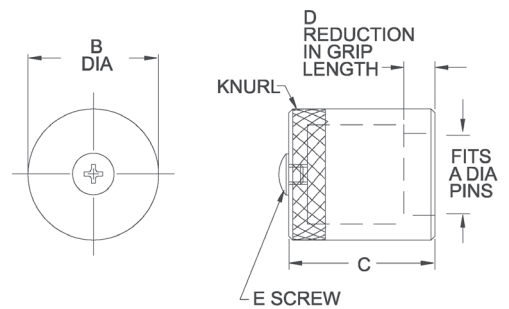
BALL LOCK RECEIVER CAPS

300+ SERIES STAINLESS STEEL, PASSIVATED

1



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 3/16 to 1" (5 to 20mm in metric). 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).



Receiver Caps are tapped to allow fastening the eyelet end of a standard Ball Lock Pin Cable Assembly (12" long) or Nylon Lanyard (10" long), and include a fastening screw.

INCH

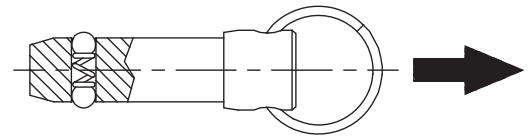
PART NO.	A DIA	B DIA	C	D	E
CL-3-BLR-S	3/16 (#10)	.50	.72	1/4	#10-32
CL-4-BLR-S	1/4	.50	.81		
CL-5-BLR-S	5/16	.63	.81		
CL-6-BLR-S	3/8	.75	1.16	1/2	
CL-7-BLR-S	7/16	.75	1.16		
CL-8-BLR-S	1/2	.88	1.25		
CL-9-BLR-S	9/16	.88	1.25		
CL-10-BLR-S	5/8	1.00	1.31		
CL-12-BLR-S	3/5	1.25	1.45		
CL-14-BLR-S	7/8	1.50	1.48		
CL-16-BLR-S	1	1.50	1.69		

METRIC

PART NO.	A DIA (mm)	B DIA (mm)	C (mm)	D (mm)	E THREAD
CLM-5-BLR-S	5	12.5	24	10	M5
CLM-6-BLR-S	6	12.5	24	10	M5
CLM-8-BLR-S	8	16	25	10	M5
CLM-10-BLR-S	10	19	26	10	M5
CLM-12-BLR-S	12	22	29	10	M5
CLM-16-BLR-S	16	25	32	10	M5
CLM-20-BLR-S	20	32	38	10	M5

DETENT PINS

SHANK & HEAD: 300-SERIES STAINLESS STEEL, PASSIVATED; SPRING & RING: 302 STAINLESS STEEL; BALLS: 440C STAINLESS STEEL



1

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

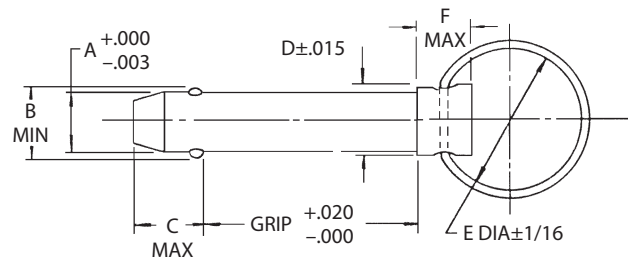
The optional attached Cable Assembly (-C) is 12" long (part no. CL-82-KA-12.0 if ordered separately), while the optional attached Nylon Lanyard (-NL) is 10" long (part no. CL-1-NL-10 if ordered separately). Both have an eyelet at the free end for a #10 or M5 attachment screw.

Ordering Example (INCH):

CL - 4 - DEP - 1.50 - S - C
 Diameter (16ths of an inch) | Grip length (inches) | Add -C for attached Cable Assembly or -NL for attached Nylon Lanyard

Ordering Example (Metric):

CLM - 6 - DEP - 50 - S - C
 Add M for metric | Diameter (mm) | Grip length (mm) | Add -C for attached Cable Assembly or -NL for attached Nylon Lanyard



INCH

PART NO.	A DIA		B	C	D DIA	E DIA	F	STOCK GRIP LENGTH (INCHES)														
	NOMINAL	ACTUAL						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-DEP-x.xx-S	3/16(#10)	.1880	.217	.250	.375	1.00	.562	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
CL-4-DEP-x.xx-S	1/4	.2480	.280	.344	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-5-DEP-x.xx-S	5/16	.3105	.360	.359	.438			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-6-DEP-x.xx-S	3/8	.3730	.430	.390	.500			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-8-DEP-x.xx-S	1/2	.4980	.570	.516	.625			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-10-DEP-x.xx-S	5/8	.6230	.720	.672	.750			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-12-DEP-x.xx-S	3/4	.7480	.860	.750	.875			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CL-16-DEP-x.xx-S	1	.9980	1.16	.984	1.125	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		

METRIC

PART NO.	A DIA		B	C	D DIA	E DIA	F	STOCK GRIP LENGTH (mm)						
	NOMINAL	ACTUAL						15	20	25	30	40	50	
CLM-6-DEP-x.xx-S	6mm	.2342	.266	.344	.375	1.00	.562	•	•			•	•	
CLM-8-DEP-x.xx-S	8mm	.3130	.363	.359	.438			•	•			•	•	
CLM-10-DEP-x.xx-S	10mm	.3917	.451	.390	.500			•	•			•	•	
CLM-12-DEP-x.xx-S	12mm	.4704	.540	.516	.563			•	•			•	•	

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 quick-release alignment pin with a solid shank and spring-loaded locking balls. This type of Detent Pin has a ring instead of a solid shoulder, for applications where exact grip length is not important. Locking balls hold the pin in place by spring force (not positive locking like a Ball Lock Pin). Simply push the pin to insert, and pull to remove. Available in standard pin diameters from 3/16 to 1/2", in stainless steel only. Note: 3/16" pins have only one locking ball instead of two due to their small size. Available from stock in many standard grip lengths, with other grip lengths available as specials. Optionally available with an attached Cable Assembly (-C) or an attached Nylon Lanyard (-NL).

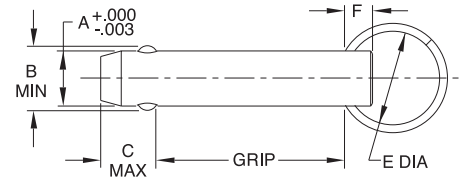
1



Ordering Example (INCH):

CL-4- MDP -1.50 -S - C

Diameter (16ths of an inch) ————
 Grip length (inches) ————
 Add -C for attached Cable Assembly
 or -NL for attached Nylon Lanyard

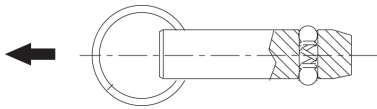


DIMENSIONS (INCH)

PART NO.	A DIA		B	C	E DIA	F DIA
	NOMINAL	ACTUAL				
CL-3-MDP-x.xx-S	3/16 (#10)	.1880	.200	.329	1.00	.25
CL-4-MDP-x.xx-S	1/4	.2480	.280	.344		
CL-5-MDP-x.xx-S	5/16	.3105	.360	.359		
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 (INCH)

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	X				
CL-4-MDP-x.xx-S	1/4	X	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	X
CL-8-MDP-x.xx-S	1/2			X	X	X	X	X		X	X	X	X	X



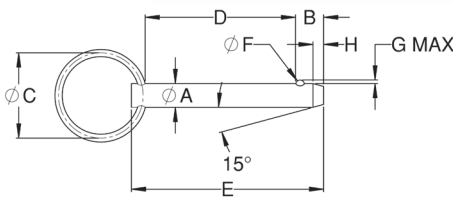
ECONOMY DETENT PINS

SHANK: MILD STEEL, ZINC PLATED CLEAR CHROMATE
 RING: STEEL SPRING WIRE, ZINC PLATED CLEAR CHROMATE
 SPRING & BALLS: STEEL

Economical quick-release alignment pin with a solid steel shank and one spring-loaded locking ball. This type of Detent Pin has a ring instead of a solid shoulder, for applications where exact grip length is not important. Locking ball holds the pin in place by spring force (not positive locking like a Ball Lock Pin). Simply push the pin to insert, and pull to remove. Available in standard pin diameters 3/16", 1/4", 5/16", and 1/2", in the standard grip lengths listed below. Optionally available with an attached Cable Assembly (-C) or an attached Nylon Lanyard (-NL). For other diameters and grip lengths, see above for Marine Detent Pins (the stainless steel version of this pin).



INCH



PART NO.	A DIA		B	C DIA	D GRIP LENGTH	E	F DIA	G	H
	NOMINAL	ACTUAL							
CL-3-EDP-1.00	3/16	.1855 / .1880	.23	7/8	1.00	1.37	3/32	.028	.08
CL-4-EDP-1.25	1/4	.2480 / .2505	.28	1	1.25	1.67	1/8	.038	.09
CL-4-EDP-1.50					1.50	1.92			
CL-5-EDP-1.00	5/16	.3105 / .3130	.34	1	1.00	1.53	5/32	.047	.13
CL-8-EDP-1.50	1/2	.4980 / .5005	.52	1-1/4	1.50	2.25	1/4	.075	.17
CL-8-EDP-2.00					2.00	2.75			

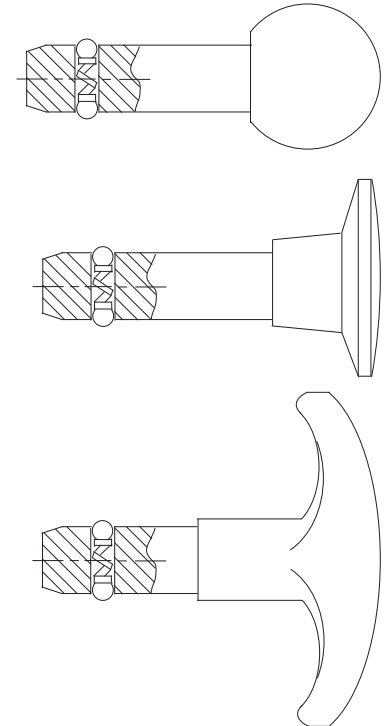
THREADED DETENT PINS

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

1



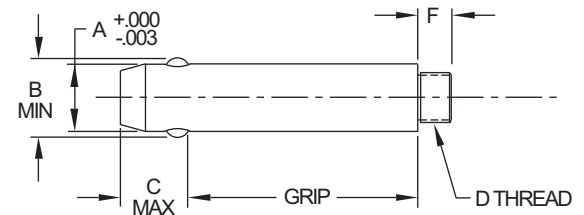
Threaded Detent Pins are solid alignment pins with a ground shank and a threaded end for a knob handle. Two locking balls hold the pin in place by spring force. Simply push to insert, and pull to remove. The threaded end accepts virtually any type of knob handle (order separately — available in steel, 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-diameter 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).



INFO+: For a wide selection of knob handles to fit these Threaded Detent Pins, see pages 152-159.

INCH

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	1/4						
CL-4-TDP-0.50-S	1/4		.2480	0.50				
CL-4-TDP-0.75-S				0.75				
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	1/4						
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	0.75	.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	3/8						
CL-6-TDP-0.75-S	3/8		.3730	0.75	.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	1/2						
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							



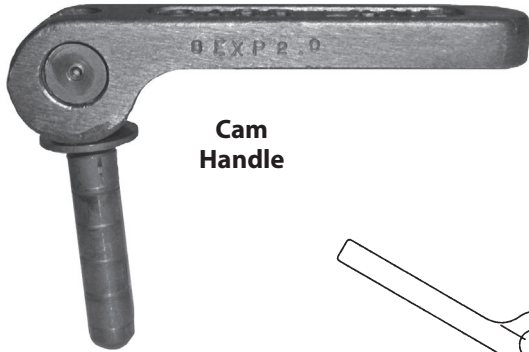
METRIC

PART NO.	A DIA (mm)		GRIP LENGTH (mm)	B (mm)	C (mm)	D THREAD	F (mm)
	NOMINAL	ACTUAL					
CLM-6-TDP-15-S	6	5.95	15	6.75	8.74	M5	6
CLM-6-TDP-20-S	6	5.95	20	6.75	8.74	M5	6
CLM-6-TDP-25-S	6	5.95	25	6.75	8.74	M5	6
CLM-6-TDP-30-S	6	5.95	30	6.75	8.74	M5	6
CLM-6-TDP-40-S	6	5.95	40	6.75	8.74	M5	6
CLM-6-TDP-50-S	6	5.95	50	6.75	8.74	M5	6
CLM-8-TDP-20-S	8	7.95	20	9.22	9.11	M6	10
CLM-8-TDP-25-S	8	7.95	25	9.22	9.11	M6	10
CLM-8-TDP-30-S	8	7.95	30	9.22	9.11	M6	10
CLM-8-TDP-40-S	8	7.95	40	9.22	9.11	M6	10
CLM-8-TDP-50-S	8	7.95	50	9.22	9.11	M6	10
CLM-10-TDP-20-S	10	9.95	20	11.45	9.90	M8	10
CLM-10-TDP-25-S	10	9.95	25	11.45	9.90	M8	10
CLM-10-TDP-30-S	10	9.95	30	11.45	9.90	M8	10
CLM-10-TDP-40-S	10	9.95	40	11.45	9.90	M8	10
CLM-10-TDP-50-S	10	9.95	50	11.45	9.90	M8	10

EXPANDING PINS

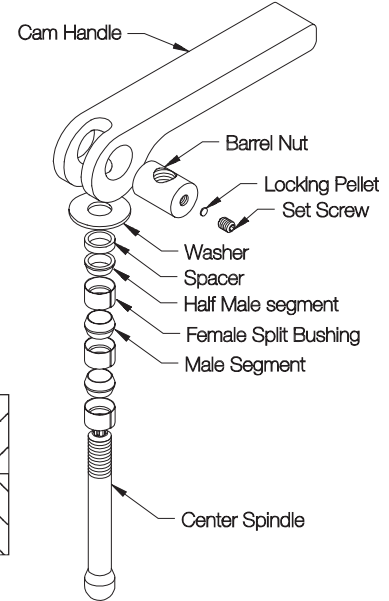
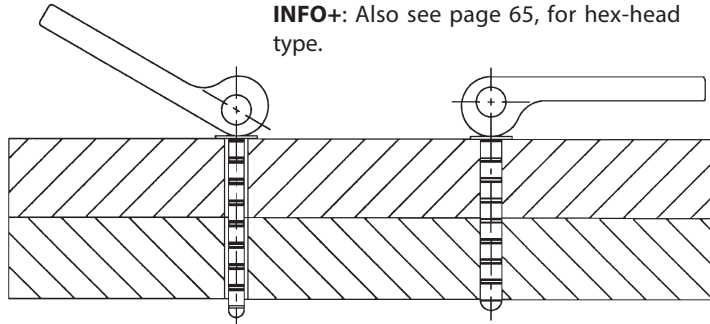
SPLIT BUSHINGS, MALE SEGMENTS, & SPACERS: 17-4PH STAINLESS STEEL, RC 40 MIN, PASSIVATED, DRY FILM LUBE
 CENTER SPINDLE: 17-4PH STAINLESS STEEL, RC 36-40, PASSIVATED, DRY FILM LUBE
 BARREL NUT & WASHER: 17-4PH STAINLESS STEEL, PASSIVATED, DRY FILM LUBE
 HANDLE: ALUMINUM ALLOY, POWDER COATED

1

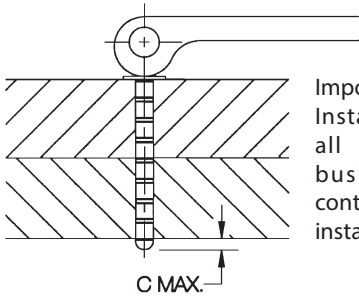


Cam Handle

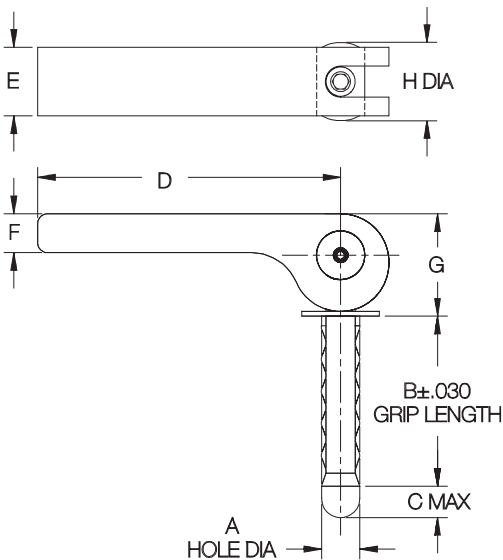
Precision alignment pin that expands up to .006 inches to tighten up hole clearance. The pin is an assembly of female split bushings separated by male segments, on a center spindle, that expands when drawn together. This assembly provides excellent shear strength, comparable to a solid pin. Diameters from 1/4 to 3/4" are available in several standard lengths. Pins can be installed in through holes or blind holes. **INFO+**: Also see page 65, 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 set screw and turn the cam handle.



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



CAM HANDLE

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-1.00	3/8	.375	.380	1.00	3/8	4-1/2	1	1/2	1.12	1	9,000
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-1.00	5/8	.625	.630	1.00	5/8	4-1/2	1	1/2	1.31	1	25,100
CL-10-EXP-1.50				1.50							
CL-10-EXP-2.00				2.00							
CL-10-EXP-3.00				3.00							
CL-12-EXP-2.00	3/4	.750	.757	2.00	3/4	6	1-1/4	3/4	2.09	1-1/4	36,200
CL-12-EXP-3.00				3.00							
CL-12-EXP-4.00				4.00							

* 2:1 Safety Factor

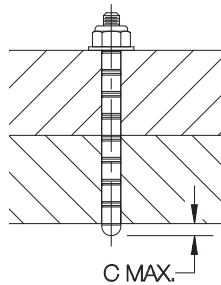
EXPANDING PINS

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

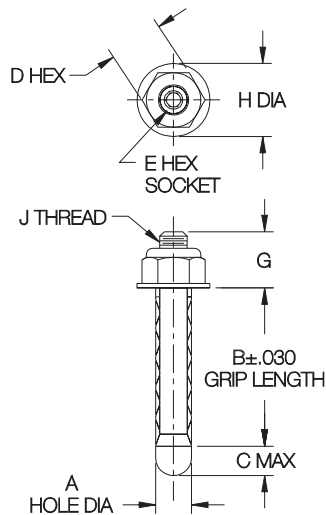
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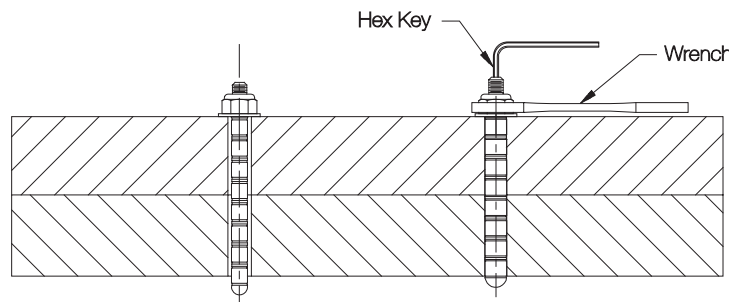
Hex Head



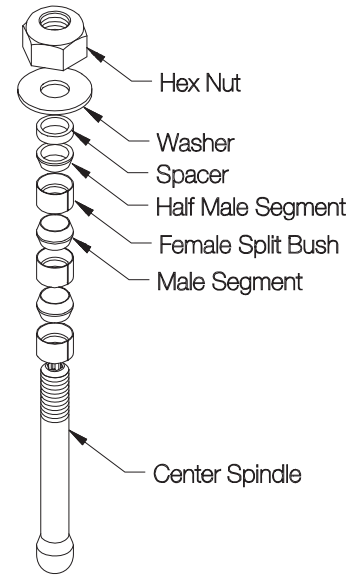
Important: Install pin so that all split bushings are contained in the installation hole.



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 3/4" are available in several standard lengths. Pins can be installed in through holes or blind holes. **INFO+**: Also see page 64, 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.



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-1.00	3/8	.375	.380	1.00	3/8	7/16	1/8	.49	.67	1/4-28	9,000	7.5
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-1.00	5/8	.625	.630	1.00	5/8	3/4	1/4	.90	1.22	1/2-20	25,100	83
CL-10-EXPH-1.50				1.50								
CL-10-EXPH-2.00				2.00								
CL-10-EXPH-3.00	3.00											
CL-12-EXPH-2.00	3/4	.750	.757	2.00	3/4	7/8	1/4	1.02	1.35	9/16-18	36,200	121
CL-12-EXPH-3.00				3.00								
CL-12-EXPH-4.00				4.00								

* 2:1 Safety Factor

CABLE ASSEMBLIES

INFO+: SEE PAGES 67-68 FOR MATERIAL SPECIFICATIONS

1

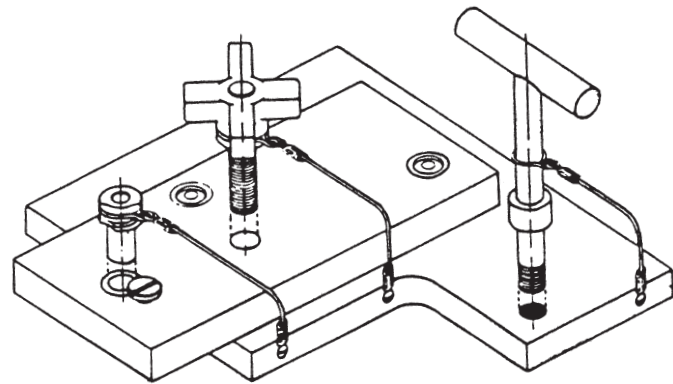


Cable Assemblies are ideal for attaching removable tooling components. High-strength stranded wire cable with a green nylon coating. These versatile attachment cables are available with various loops, Cable Rings, Terminals, and Cable Tabs.

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 $\pm 1/4"$ up to 24" long. **INFO+**: See page 69-70 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 the next page:

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

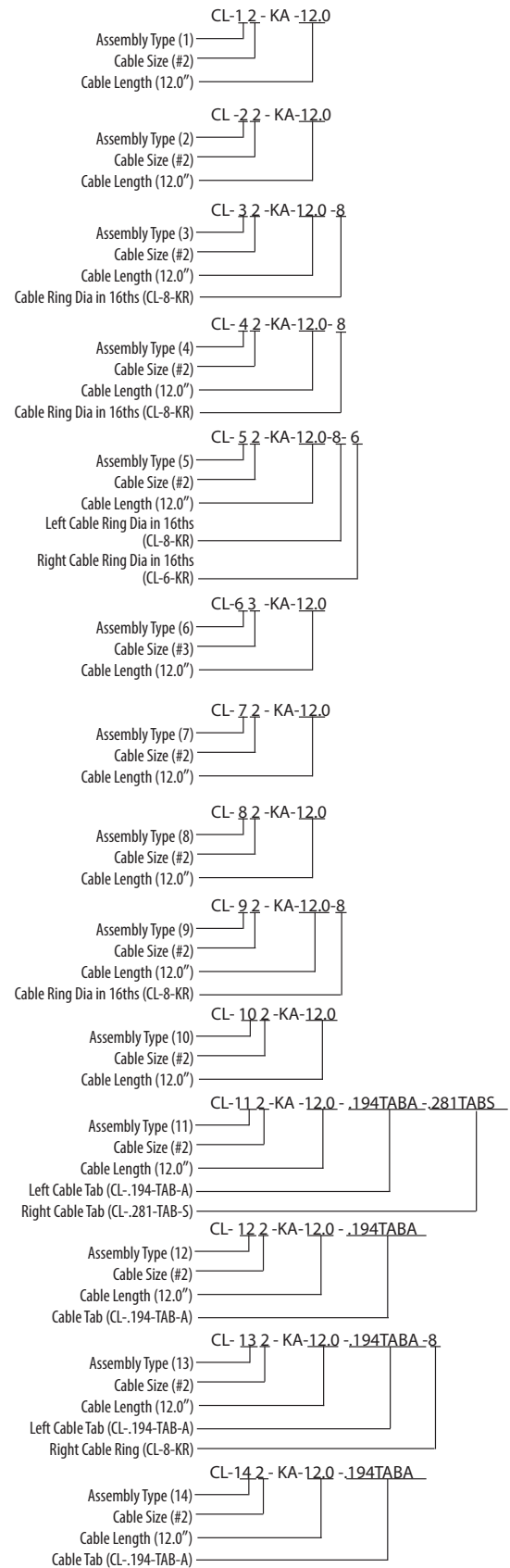
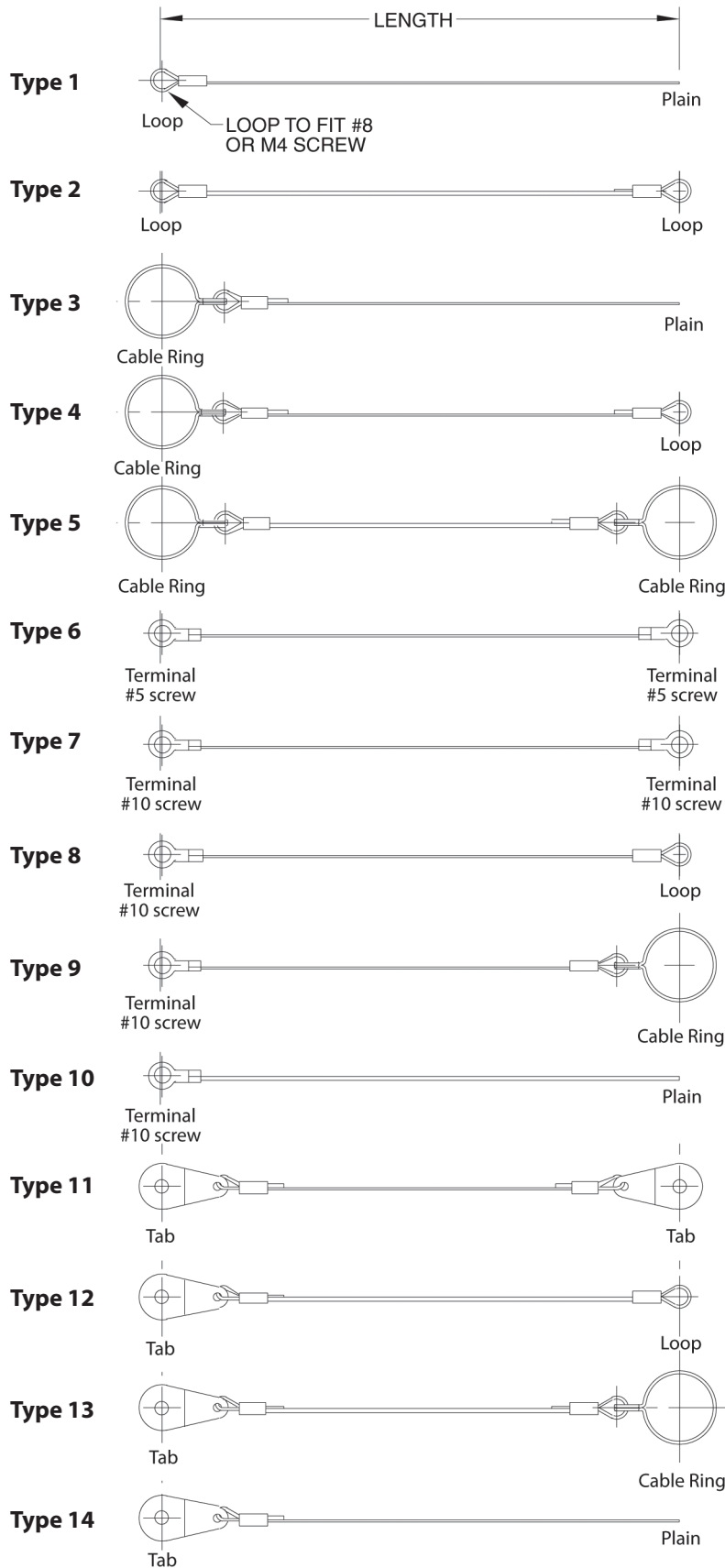


Cable Sizes

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	--	--	

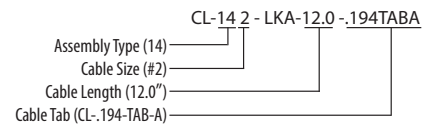
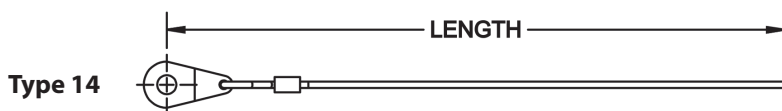
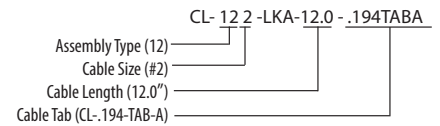
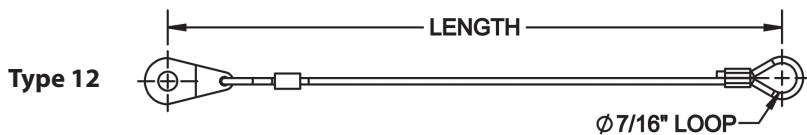
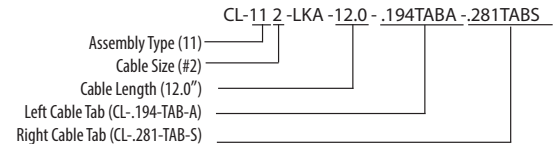
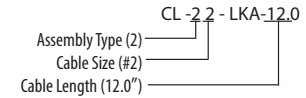
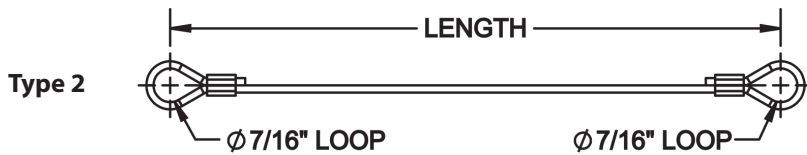
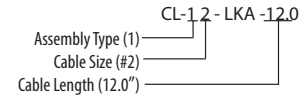
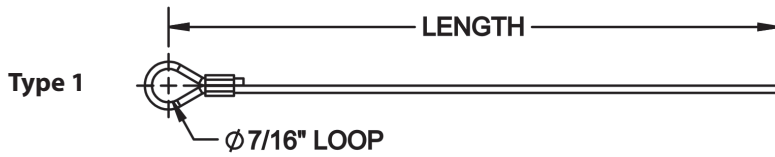
CABLE ASSEMBLIES

1



LOAD-RATED CABLE ASSEMBLIES

1



Load-Rated Cable Assemblies are ideal for applications with high pulling forces, where an extra-strong crimp is required. Please note that these cables are not designed for lifting applications, or where high impact forces occur. The high-strength stranded wire cable with a green nylon coating used for these assemblies is the same cable used for our standard cable assemblies. The difference is that Duplex Ferrules are used to achieve a stronger, precisely repeatable crimp. These ferrules require a specific crimping procedure, with a specific crimping tool and gauge to guarantee the assembly load rating. Load-Rated Cable Assemblies are available in two cable diameters, sizes #2 and #3.

BASIC PART NO.	CABLE SIZE (STEEL)	RATED LOAD (lbs)	ASSEMBLY TYPE	LEFT END	RIGHT END
CL-12-LKA	#2	100	1	LOOP	PLAIN
CL-22-LKA			2	LOOP	LOOP
CL-112-LKA			11	TAB	TAB
CL-122-LKA			12	TAB	LOOP
CL-142-LKA	#3	175	14	TAB	PLAIN
CL-13-LKA			1	LOOP	PLAIN
CL-23-LKA			2	LOOP	LOOP
CL-113-LKA			11	TAB	TAB
CL-123-LKA			12	TAB	LOOP
CL-143-LKA			14	TAB	PLAIN

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:

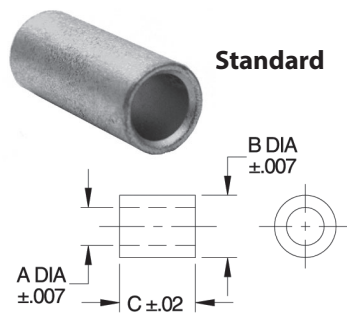
CL-2-C-12.0 (Cut piece, #2 cable, 12" long)



CABLE SIZE	MATERIAL	PART NO.	LENGTH	D DIA		CONSTRUCTION	BREAKING STRENGTH (LBS)
				COATED	WIRE		
1	STAINLESS STEEL	CL-1-C-50FT	50 Feet	.044	.024	1x7	80
		CL-1-C-100FT	100 Feet				
		CL-1-C-250FT	250 Feet				
		CL-1-C-500FT	500 Feet				
		CL-1-C-1000FT	1000 Feet				
2	STEEL	CL-2-C-50FT	50 Feet	.062	.047	7x7	270
		CL-2-C-100FT	100 Feet				
		CL-2-C-250FT	250 Feet				
		CL-2-C-500FT	500 Feet				
		CL-2-C-1000FT	1000 Feet				
	STAINLESS STEEL	CL-2-SC-50FT	50 Feet				
		CL-2-SC-100FT	100 Feet				
		CL-2-SC-250FT	250 Feet				
		CL-2-SC-500FT	500 Feet				
		CL-2-SC-1000FT	1000 Feet				
3	STEEL	CL-3-C-50FT	50 Feet	.094	.062	7x7	480
		CL-3-C-100FT	100 Feet				
		CL-3-C-250FT	250 Feet				
		CL-3-C-500FT	500 Feet				
		CL-3-C-1000FT	1000 Feet				
	STAINLESS STEEL	CL-3-SC-50FT	50 Feet				
		CL-3-SC-100FT	100 Feet				
		CL-3-SC-250FT	250 Feet				
		CL-3-SC-500FT	500 Feet				
		CL-3-SC-1000FT	1000 Feet				
4	STEEL	CL-4-C-50FT	50 Feet	.187	.125	7x19	800
		CL-4-C-100FT	100 Feet				
		CL-4-C-250FT	250 Feet				
		CL-4-C-500FT	500 Feet				
		CL-4-C-1000FT	1000 Feet				
	STAINLESS STEEL	CL-4-SC-50FT	50 Feet				
		CL-4-SC-100FT	100 Feet				
		CL-4-SC-250FT	250 Feet				
		CL-4-SC-500FT	500 Feet				
		CL-4-SC-1000FT	1000 Feet				

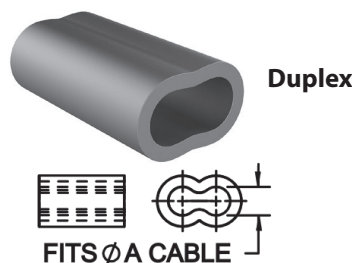
FERRULES

COPPER, ELECTRO TIN PLATED



Standard

Ferrules are used to crimp a loop on the end of our nylon-coated cable. These standard round Ferrules are available in four diameters to fit our four standard cable sizes. An extra-long version is optionally available for #2 and #3 cable sizes, to allow double crimping. Ferrules may be slightly elliptical (partially crimped) at our option.



Duplex

Duplex Ferrules are used exclusively to make our Load-Rated Cable Assemblies. These ferrules require a specific crimping procedure, with a specific crimping tool and gauge to guarantee the assembly load rating. Duplex Ferrules are available in two sizes, to fit #2 and #3 cable.

STANDARD FERRULES

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	SIZE 4	.378	.520	.827
CL-6-F				1.260

DUPLEX FERRULES

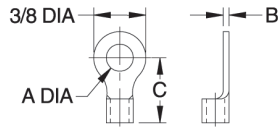
PART NO.	FITS CABLE		B LENGTH
	SIZE	A DIA	
CL-2-DF	#2	.062	3/8
CL-3-DF	#3	.094	3/8

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.



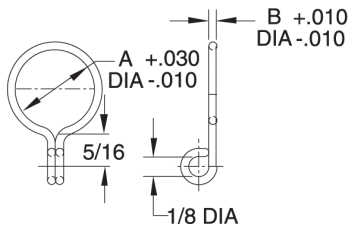
PART NO.	FITS CABLE	A		B	C
		A DIA	SCREW SIZE		
CL-.194-TERM-2	SIZE 2	.21	#10 (or M5)	.03	15/32
CL-.129-TERM	SIZE 3	.13	#5 (or M3)	.04	19/32
CL-.194-TERM		.21	#10 (or M5)	.04	

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

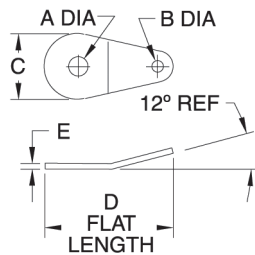


Teardrop



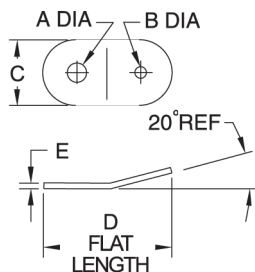
Rectangular

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	SIZES 1 TO 3	.28	1/4 (or M6)	.19	1/2	1.14	.06
CL-.194-TABR-3-A	CL-.194-TABR-3-S		.20	#10 (or M4)				
CL-.281-TABR-3-A	CL-.281-TABR-3-S		.28	1/4 (or M6)				

CRIMPING TOOLS

STEEL WITH PLASTIC HANDGRIPS



Standard

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.

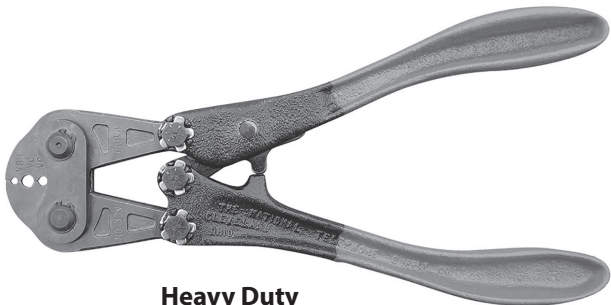
STANDARD CRIMPING TOOL

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

1

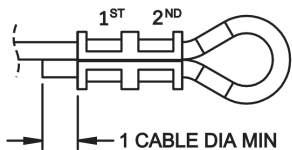
HEAVY-DUTY CRIMPING TOOLS

FORGED STEEL

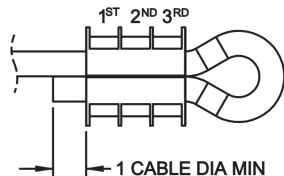


Heavy Duty

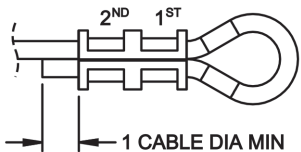
Heavy-Duty Crimping Tools are rugged hand tools engineered for the toughest field conditions. Manufactured from forged alloy steel with hardened working surfaces. These tools are designed to effectively crimp Duplex Ferrules by creating maximum holding around the wire, resulting in strong, reliable connections. Jaws have multiple marked pressing grooves to match the different ferrule sizes. CL-2-DF requires two crimps per ferrule, while CL-3-DF requires three crimps per ferrule.



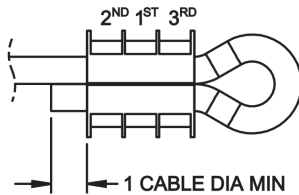
**Cable #2
Two Crimps**
(Sequence Option 1)



**Cable #3
Three Crimps**
(Sequence Option 1)



**Cable #2
Two Crimps**
(Sequence Option 2)



**Cable #3
Three Crimps**
(Sequence Option 2)



**Crimp Gauge
(Included with
Crimping Tool)**

HEAVY-DUTY CRIMPING TOOL

PART NO.	CRIMPING GROOVE IN JAWS
CL-2-CTDF	VB4 for Duplex Ferrule CL-2-DF VG for Duplex Ferrule CL-3-DF

NYLON LANYARDS

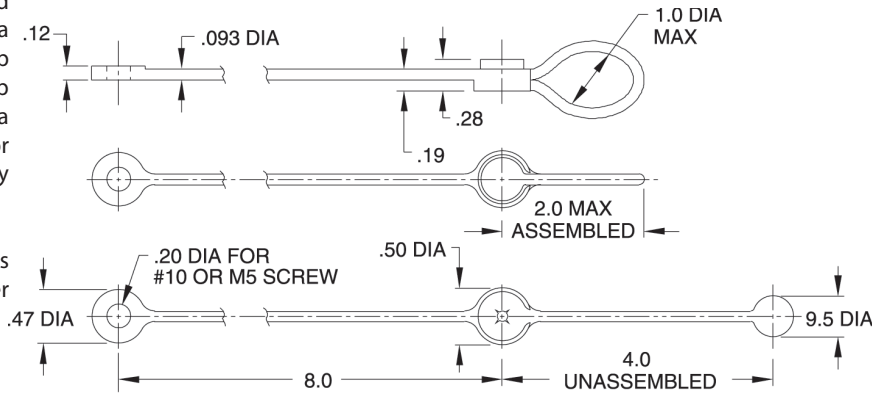
ZYTEL® HIGH-STRENGTH NYLON, BLACK

1



High-strength nylon lanyard with one eyelet end and one loop end. The eyelet end can be fastened with a screw. The loop end is supplied open – simply snap together to create a permanent assembly. Snap assembly allows on-site attachment without a crimping tool. These economical lanyards are ideal for applications where the attached item is occasionally removed, by cutting the lanyard, and replaced.

Available in one length (10" assembled). Eyelet accepts a #10 or M5 screw. A minimum pass-through diameter of 3/8" is required for attachment. Made in USA.



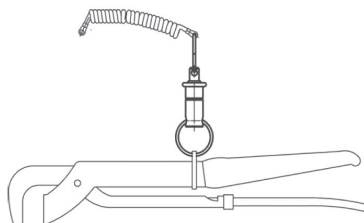
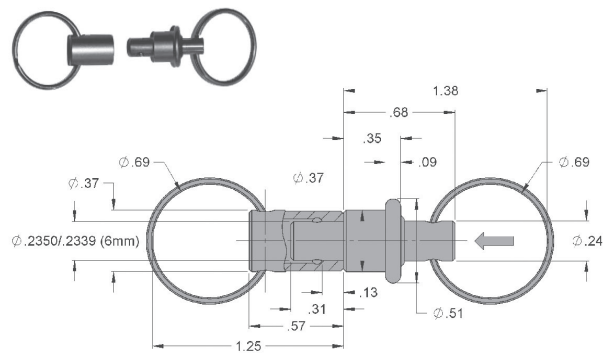
PART NO.	LANYARD DIA	LENGTH (ASSEMBLED)	EYELET	
			ID	FOR SCREW
CL-1-NL-10	.093	10	.20	#10 OR M5

BALL LOCK COUPLING RINGS

PIN AND RECEIVER: 303 STAINLESS STEEL
RINGS, SPRING, AND BALLS: STAINLESS STEEL



This tiny quick-release coupling assembly incorporates a rugged, high-quality Ball Lock Pin mechanism. Allows quick, reliable connection and disconnection of items attached to a cable assembly. Simply press the button to release. One half of the coupling ring is essentially a small Ball Lock Pin with a split ring through the push button; the other half is a mating receiver, also with a split ring through it. The coupling is positive locking until released by pushing the button, which moves the center spindle forward to allow the locking balls to retract. Made of 300-series stainless steel for excellent corrosion resistance. Note: photo at left is shown actual size.



PART NO.	PIN DIA	RATED LOAD CAPACITY (LBS)	MAXIMUM OPERATING TEMPERATURE
CLM-6-BLCR-S	6MM	7	480°F