

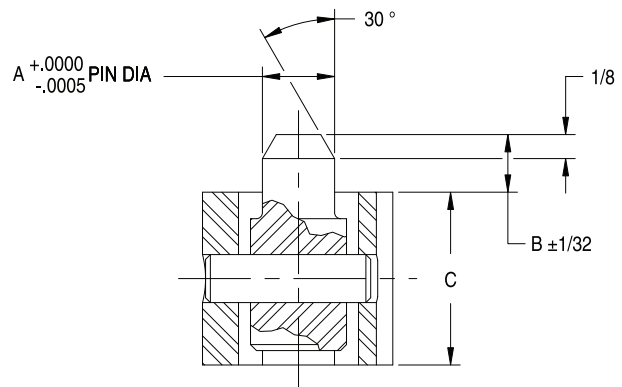
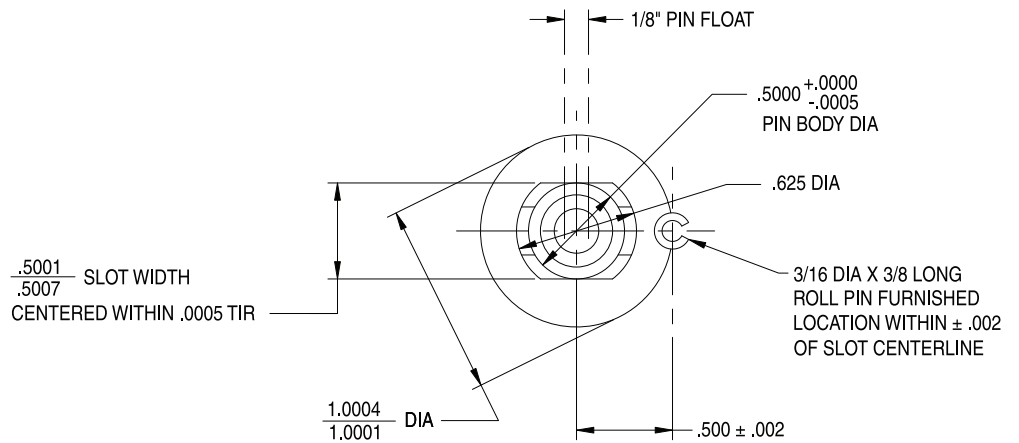
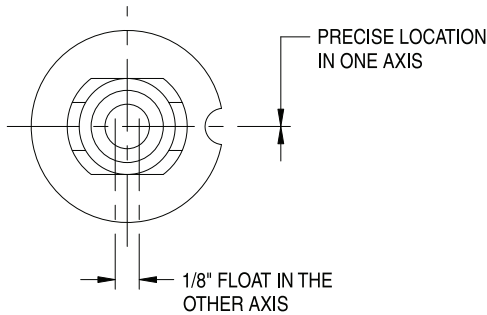
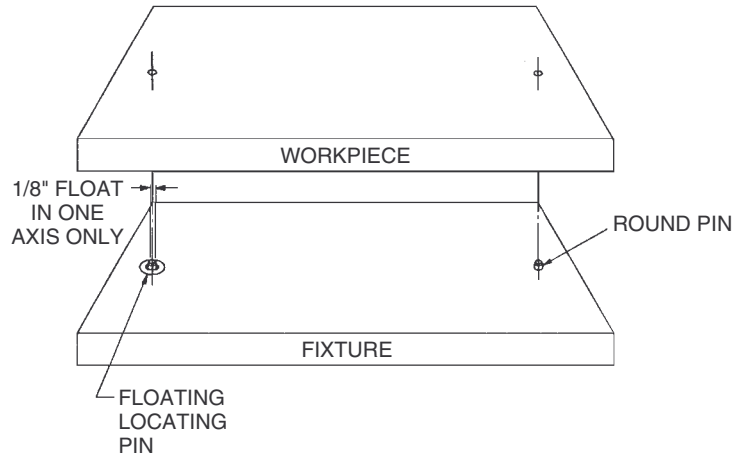
(Rev. 12-07)

# FLOATING LOCATING PINS

BODY: TOOL STEEL, HEAT TREATED, BLACK OXIDE FINISH  
 PIN: 1144 STEEL, HEAT TREATED, BLACK OXIDE FINISH



Provides precise location in one axis while allowing considerable float in the perpendicular axis. Use in conjunction with a Round Pin when loose workpiece-hole tolerances require more float than a Diamond Pin would allow. Special pin diameters (A dimensions) are available . . . please contact factory. Patent No. 3,381,554.



PART NO.	A DIA	B	C
CL-4-FLP	.2500	.300	.400
CL-4A-FLP			.900
CL-5-FLP	.3125	.300	.400
CL-5A-FLP			.900
CL-6-FLP	.3750	.300	.400
CL-6A-FLP			.900
CL-8-FLP	.5000	.300	.400
CL-8A-FLP			.900
CL-10-FLP	.6250	.310	.400
CL-10A-FLP			.900



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# ROUND & DIAMOND PINS

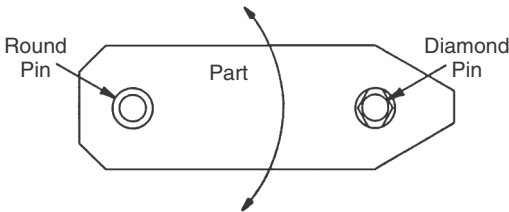
1144 STEEL, HEAT TREATED RC 50-55, BLACK OXIDE FINISH



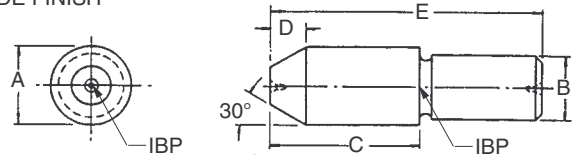
Round Pin



Diamond Pin



Round pins and diamond (relieved) pins are frequently used together to locate from holes in a workpiece. Diamond pins are relieved, to locate only radially around the round pin, avoiding redundant location. This prevents binding while loading and unloading the part, yet still maintains high accuracy. Note: Round pins also make excellent edge locators. Head and shank diameters are concentric to within .0005 TIR.



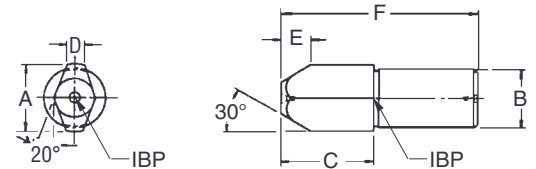
## ROUND PINS (USA)

PART NO.	A HEAD DIA		B SHANK DIA		C	D	E
	NOMINAL	ACTUAL	NOMINAL	ACTUAL			
CL-1-RP	1/4	.2495/.2492	3/16	.1878/.1876	11/32	3/32	3/4
CL-2-RP	5/16	.3120/.3117	1/4	.2503/.2501	13/32	1/8	7/8
CL-3-RP	3/8	.3745/.3742	5/16	.3128/.3126	1/2	1/8	1
CL-4-RP	7/16	.4370/.4367	3/8	.3753/.3751	19/32	5/32	1-1/4
CL-5-RP	1/2	.4995/.4992	7/16	.4378/.4376	21/32	1/2	1-3/8
CL-6-RP	9/16	.5620/.5617	1/2	.5003/.5001	3/4	3/16	1-1/2
CL-7-RP	5/8	.6240/.6237	9/16	.5628/.5626	27/32	7/32	1-3/4
CL-8-RP	11/16	.6865/.6862	5/8	.6253/.6251	29/32	1/2	2
CL-9-RP	3/4	.7490/.7487	11/16	.6885/.6880	1	1/4	2-1/8
CL-10-RP	13/16	.8115/.8112	3/4	.7510/.7505	1-3/32	9/32	2-1/4
CL-11-RP	7/8	.8740/.8737	13/16	.8135/.8130	1-5/32	1/2	2-1/2
CL-12-RP	15/16	.9365/.9362	7/8	.8760/.8755	1-1/4	5/16	2-3/4
CL-13-RP	1	.9985/.9980	15/16	.9385/.9380	1-5/16	3/8	2-7/8

## ROUND PINS (METRIC)

CLM-60-RP	6mm	.2357/.2354	5mm	.1972/.1970	11/32	3/32	3/4
CLM-80-RP	8mm	.3145/.3142	6mm	.2365/.2363	13/32	1/8	7/8
CLM-100-RP	10mm	.3932/.3929	8mm	.3153/.3151	1/2	1/8	1
CLM-120-RP	12mm	.4719/.4716	10mm	.3940/.3938	21/32	5/32	1-3/8
CLM-140-RP	14mm	.5507/.5504	12mm	.4727/.4725	3/4	3/16	1-1/2
CLM-160-RP	16mm	.6289/.6286	14mm	.5515/.5513	27/32	7/32	1-3/4
CLM-180-RP	18mm	.7077/.7074	16mm	.6302/.6300	29/32	1/2	2
CLM-200-RP	20mm	.7864/.7861	18mm	.7097/.7092	1-3/32	9/32	2-1/4

## DIAMOND PINS (USA)



PART NO.	A HEAD DIA			B SHANK DIA		C	D	E	F			
	X (Tight)	Y (Medium)	Z (Loose)	NOMINAL	ACTUAL							
CL-1-DPX	CL-1-DPY	CL-1-DPZ	1/4	.2493/.2490	.2485/.2482	.2470/.2467	3/16	.1878/.1876	11/32	.062	3/32	3/4
CL-2-DPX	CL-2-DPY	CL-2-DPZ	5/16	.3118/.3115	.3110/.3107	.3095/.3092	1/4	.2503/.2501	13/32	.078	1/8	7/8
CL-3-DPX	CL-3-DPY	CL-3-DPZ	3/8	.3743/.3740	.3735/.3732	.3720/.3717	5/16	.3128/.3126	1/2	.093	1/8	1
CL-4-DPX	CL-4-DPY	CL-4-DPZ	7/16	.4368/.4365	.4360/.4357	.4345/.4342	3/8	.3753/.3751	19/32	.109	5/32	1-1/4
CL-5-DPX	CL-5-DPY	CL-5-DPZ	1/2	.4993/.4990	.4985/.4982	.4970/.4967	7/16	.4378/.4376	21/32	.125	1/2	1-3/8
CL-6-DPX	CL-6-DPY	CL-6-DPZ	9/16	.5615/.5610	.5595/.5590	.5575/.5570	1/2	.5003/.5001	3/4	.140	3/16	1-1/2
CL-7-DPX	CL-7-DPY	CL-7-DPZ	5/8	.6240/.6235	.6220/.6215	.6200/.6195	9/16	.5628/.5626	27/32	.156	7/32	1-3/4
CL-8-DPX	CL-8-DPY	CL-8-DPZ	11/16	.6865/.6860	.6845/.6840	.6825/.6820	5/8	.6253/.6251	29/32	.172	1/2	2
CL-9-DPX	CL-9-DPY	CL-9-DPZ	3/4	.7490/.7485	.7470/.7465	.7450/.7445	11/16	.6885/.6880	1	.187	1/4	2-1/8
CL-10-DPX	CL-10-DPY	CL-10-DPZ	13/16	.8115/.8110	.8095/.8090	.8075/.8070	3/4	.7510/.7505	1-3/32	.203	9/32	2-1/4
CL-11-DPX	CL-11-DPY	CL-11-DPZ	7/8	.8740/.8735	.8720/.8715	.8700/.8695	13/16	.8135/.8130	1-5/32	.219	1/2	2-1/2
CL-12-DPX	CL-12-DPY	CL-12-DPZ	15/16	.9365/.9360	.9345/.9340	.9325/.9320	7/8	.8760/.8755	1-1/4	.234	5/16	2-3/4
CL-13-DPX	CL-13-DPY	CL-13-DPZ	1	.9980/.9972	.9960/.9952	.9920/.9912	15/16	.9385/.9380	1-5/16	.250	3/8	2-7/8

## DIAMOND PINS (METRIC)

CLM-60-DPX	CLM-60-DPY	CLM-60-DPZ	6mm	.2355/.2352	.2347/.2344	.2332/.2329	5mm	.1972/.1970	11/32	.062	3/32	3/4
CLM-80-DPX	CLM-80-DPY	CLM-80-DPZ	8mm	.3143/.3140	.3135/.3132	.3120/.3117	6mm	.2365/.2363	13/32	.078	1/8	7/8
CLM-100-DPX	CLM-100-DPY	CLM-100-DPZ	10mm	.3930/.3927	.3922/.3919	.3907/.3904	8mm	.3153/.3151	1/2	.093	1/8	1
CLM-120-DPX	CLM-120-DPY	CLM-120-DPZ	12mm	.4717/.4714	.4709/.4706	.4694/.4691	10mm	.3940/.3938	21/32	.125	5/32	1-3/8
CLM-140-DPX	CLM-140-DPY	CLM-140-DPZ	14mm	.5502/.5497	.5482/.5477	.5462/.5457	12mm	.4727/.4725	3/4	.140	3/16	1-1/2
CLM-160-DPX	CLM-160-DPY	CLM-160-DPZ	16mm	.6289/.6284	.6269/.6264	.6249/.6244	14mm	.5515/.5513	27/32	.156	7/32	1-3/4
CLM-180-DPX	CLM-180-DPY	CLM-180-DPZ	18mm	.7077/.7072	.7057/.7052	.7037/.7032	16mm	.6302/.6300	29/32	.172	1/2	2
CLM-200-DPX	CLM-200-DPY	CLM-200-DPZ	20mm	.7864/.7859	.7844/.7839	.7824/.7819	18mm	.7097/.7092	1-3/32	.203	9/32	2-1/4



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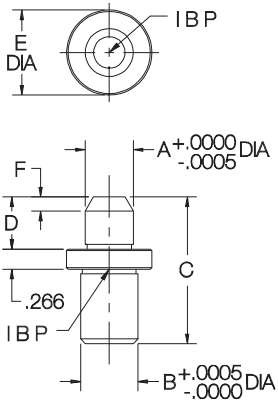
(Rev. 4-07)

# ROUND & DIAMOND LOCATING PINS

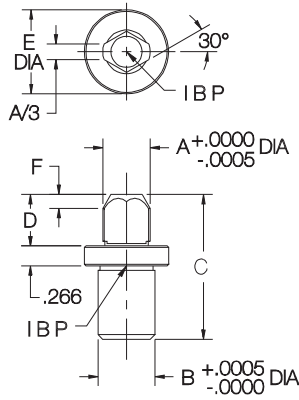
1144 STEEL, HEAT TREATED RC 50-55, BLACK OXIDE FINISH



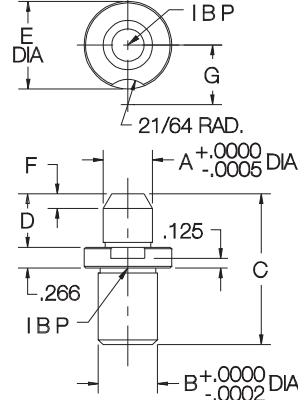
**Press-Fit Type Round Pin**



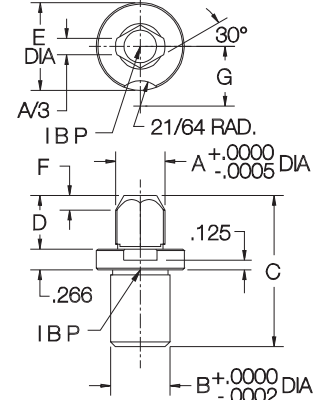
**Press-Fit Type Diamond Pin**



**Lockscrew-Type Round Pin**

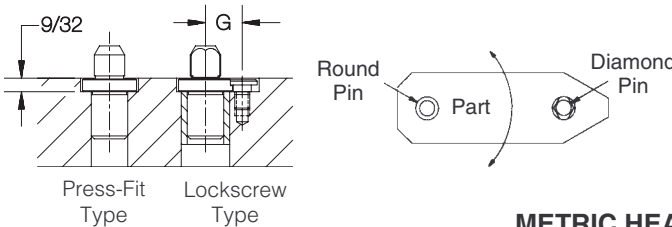


**Lockscrew-Type Diamond Pin**



Similar in function to the Round and Diamond Pins on page 176, except with a wider selection of head diameters. The added shoulder also resists forces from above, even when the head diameter is smaller than the shank diameter.

Available either with a press-fit shank for permanent installation, or a slip-fit shank and lockscrew slot for renewable installation. Each nominal head diameter is available in a choice of two fits: medium or tight. Head and shank diameters are concentric to within .0005 TIR.



Order liner bushings and lock screws separately. See table below for proper sizes. (See drill-bushing catalog section for additional dimensions).

Special Head Diameters

Special head diameters (A dimensions) are readily available in any of the four standard shank diameters:

- 5 = 5/16" shank (.1150-.3180 head dia)
- 8 = 1/2" shank (.2780-.5040 head dia)
- 12 = 3/4" shank (.4640-.7540 head dia)
- 16 = 1" shank (.7140-1.0040 head dia)

Example: For a press-fit round pin with a 1/2-inch shank and A=.4000 inches, order CL-8-RPT-.4000.

## METRIC HEAD DIAMETER

PRESS-FIT TYPE		LOCKSCREW TYPE		B SHANK DIA	A HEAD DIA		C	D	E DIA	F	G	LINER PART NO.	HEAD LINER PART NO.	LOCK-SCREW PART NO.
ROUND PIN PART NO.	DIAMOND PIN PART NO.	ROUND PIN PART NO.	DIAMOND PIN PART NO.		NOMINAL	ACTUAL								
CL-5-RPT-.2347	CL-5-DPT-.2347	CL-5-RLT-.2347	CL-5-DLT-.2347	5/16	6mm	.2347	1-3/16	7/16	5/8	3/32	33/64	L-32-8	HL-32-8	LS-1
CL-5-RPT-.2357	CL-5-DPT-.2357	CL-5-RLT-.2357	CL-5-DLT-.2357			.2357								
CL-8-RPT-.3130	CL-8-DPT-.3130	CL-8-RLT-.3130	CL-8-DLT-.3130		8mm	.3130								
CL-8-RPT-.3140	CL-8-DPT-.3140	CL-8-RLT-.3140	CL-8-DLT-.3140											
CL-8-RPT-.3917	CL-8-DPT-.3917	CL-8-RLT-.3917	CL-8-DLT-.3917	1/2	10mm	.3917	1-1/2	1/2	7/8	1/8	41/64	L-48-12	HL-48-12	
CL-8-RPT-.3927	CL-8-DPT-.3927	CL-8-RLT-.3927	CL-8-DLT-.3927			.3927								
CL-8-RPT-.4704	CL-8-DPT-.4704	CL-8-RLT-.4704	CL-8-DLT-.4704	12mm	.4704	1-15/16	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16		
CL-8-RPT-.4714	CL-8-DPT-.4714	CL-8-RLT-.4714	CL-8-DLT-.4714										.4714	
CL-12-RPT-.5492	CL-12-DPT-.5492	CL-12-RLT-.5492	CL-12-DLT-.5492	3/4	14mm	.5492	1-15/16	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16	
CL-12-RPT-.5502	CL-12-DPT-.5502	CL-12-RLT-.5502	CL-12-DLT-.5502			.5502								
CL-12-RPT-.6279	CL-12-DPT-.6279	CL-12-RLT-.6279	CL-12-DLT-.6279			.6279								
CL-12-RPT-.6289	CL-12-DPT-.6289	CL-12-RLT-.6289	CL-12-DLT-.6289			.6289								
CL-12-RPT-.7067	CL-12-DPT-.7067	CL-12-RLT-.7067	CL-12-DLT-.7067	1	16mm	.7067	2-5/8	1	1-1/2	9/32	61/64	L-88-22	HL-88-22	
CL-12-RPT-.7077	CL-12-DPT-.7077	CL-12-RLT-.7077	CL-12-DLT-.7077			.7077								
CL-16-RPT-.7854	CL-16-DPT-.7854	CL-16-RLT-.7854	CL-16-DLT-.7854	1	20mm	.7854	2-5/8	1	1-1/2	9/32	61/64	L-88-22	HL-88-22	
CL-16-RPT-.7864	CL-16-DPT-.7864	CL-16-RLT-.7864	CL-16-DLT-.7864			.7864								



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# ROUND & DIAMOND LOCATING PINS

## USA HEAD DIAMETER

PRESS-FIT TYPE		LOCKSCREW TYPE		B SHANK DIA	A HEAD DIA		C	D	E DIA	F	G	LINER PART NO.	HEAD LINER PART NO.	LOCK- SCREW PART NO.																																								
ROUND PIN PART NO.	DIAMOND PIN PART NO.	ROUND PIN PART NO.	DIAMOND PIN PART NO.		NOMINAL	ACTUAL																																																
CL-123-RPT	CL-123-DPT	CL-123-RLT	CL-123-DLT	5/16	1/8	.1235	1-3/16	7/16	5/8	3/32	33/64	L-32-8	HL-32-8																																									
CL-124-RPT	CL-124-DPT	CL-124-RLT	CL-124-DLT			.1245																																																
CL-154-RPT	CL-154-DPT	CL-154-RLT	CL-154-DLT		5/32	.1548									1-1/2	1/2	7/8	1/8	41/64	L-48-12	HL-48-12																																	
CL-155-RPT	CL-155-DPT	CL-155-RLT	CL-155-DLT			.1558																																																
CL-186-RPT	CL-186-DPT	CL-186-RLT	CL-186-DLT		3/16	.1860																	3/4	1	1-1/2	9/32	61/64	L-88-22	HL-88-22																									
CL-187-RPT	CL-187-DPT	CL-187-RLT	CL-187-DLT			.1870																																																
CL-217-RPT	CL-217-DPT	CL-217-RLT	CL-217-DLT		7/32	.2173																									2-5/8	1	1-1/2	9/32	61/64	L-88-22	HL-88-22																	
CL-218-RPT	CL-218-DPT	CL-218-RLT	CL-218-DLT			.2183																																																
CL-248-RPT	CL-248-DPT	CL-248-RLT	CL-248-DLT		1/4	.2485																																	1	1	1-1/2	9/32	61/64	L-88-22	HL-88-22									
CL-249-RPT	CL-249-DPT	CL-249-RLT	CL-249-DLT			.2495																																																
CL-279-RPT	CL-279-DPT	CL-279-RLT	CL-279-DLT		9/32	.2798																																									1	1	1-1/2	9/32	61/64	L-88-22	HL-88-22	
CL-280-RPT	CL-280-DPT	CL-280-RLT	CL-280-DLT			.2808																																																
CL-311-RPT	CL-311-DPT	CL-311-RLT	CL-311-DLT	5/16	.3110	1	1	1-1/2	9/32	61/64	L-88-22	HL-88-22																																										
CL-312-RPT	CL-312-DPT	CL-312-RLT	CL-312-DLT		.3120																																																	
CL-310-RPT	CL-310-DPT	CL-310-RLT	CL-310-DLT	1/2	5/16									.3105	1-1/2	1/2	7/8	1/8	41/64	L-48-12	HL-48-12																																	
CL-3115-RPT	CL-3115-DPT	CL-3115-RLT	CL-3115-DLT											.3115																																								
CL-341-RPT	CL-341-DPT	CL-341-RLT	CL-341-DLT		11/32									.3418									1-1/2	1/2	7/8	1/8	41/64	L-48-12	HL-48-12																									
CL-342-RPT	CL-342-DPT	CL-342-RLT	CL-342-DLT											.3428																																								
CL-373-RPT	CL-373-DPT	CL-373-RLT	CL-373-DLT		3/8									.3730																	1-1/2	1/2	7/8	1/8	41/64	L-48-12	HL-48-12																	
CL-374-RPT	CL-374-DPT	CL-374-RLT	CL-374-DLT											.3740																																								
CL-404-RPT	CL-404-DPT	CL-404-RLT	CL-404-DLT		13/32									.4043																									1-1/2	1/2	7/8	1/8	41/64	L-48-12	HL-48-12									
CL-405-RPT	CL-405-DPT	CL-405-RLT	CL-405-DLT											.4053																																								
CL-435-RPT	CL-435-DPT	CL-435-RLT	CL-435-DLT		7/16									.4355																																	1-1/2	1/2	7/8	1/8	41/64	L-48-12	HL-48-12	
CL-436-RPT	CL-436-DPT	CL-436-RLT	CL-436-DLT											.4365																																								
CL-466-RPT	CL-466-DPT	CL-466-RLT	CL-466-DLT		15/32	.4668	1-1/2	1/2	7/8	1/8	41/64	L-48-12	HL-48-12																																									
CL-467-RPT	CL-467-DPT	CL-467-RLT	CL-467-DLT			.4678																																																
CL-498-RPT	CL-498-DPT	CL-498-RLT	CL-498-DLT	1/2	.4980	1-1/2									1/2	7/8	1/8	41/64	L-48-12	HL-48-12																																		
CL-499-RPT	CL-499-DPT	CL-499-RLT	CL-499-DLT		.4990																																																	
CL-4980-RPT	CL-4980-DPT	CL-4980-RLT	CL-4980-DLT	3/4	1/2																	.4980	1-15/16	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16	LS-1																								
CL-4990-RPT	CL-4990-DPT	CL-4990-RLT	CL-4990-DLT																			.4990																																
CL-529-RPT	CL-529-DPT	CL-529-RLT	CL-529-DLT		17/32																	.5293									1-15/16	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16	LS-1																
CL-530-RPT	CL-530-DPT	CL-530-RLT	CL-530-DLT																			.5303																																
CL-560-RPT	CL-560-DPT	CL-560-RLT	CL-560-DLT		9/16																	.5605																	1-15/16	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16	LS-1								
CL-561-RPT	CL-561-DPT	CL-561-RLT	CL-561-DLT																			.5615																																
CL-591-RPT	CL-591-DPT	CL-591-RLT	CL-591-DLT		19/32																	.5918																									1-15/16	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16	LS-1
CL-592-RPT	CL-592-DPT	CL-592-RLT	CL-592-DLT																			.5928																																
CL-623-RPT	CL-623-DPT	CL-623-RLT	CL-623-DLT		5/8		.6230	1-15/16	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16								LS-1																																
CL-624-RPT	CL-624-DPT	CL-624-RLT	CL-624-DLT				.6240																																															
CL-654-RPT	CL-654-DPT	CL-654-RLT	CL-654-DLT		21/32	.6543	1-15/16								11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16	LS-1																																	
CL-655-RPT	CL-655-DPT	CL-655-RLT	CL-655-DLT			.6553																																																
CL-685-RPT	CL-685-DPT	CL-685-RLT	CL-685-DLT	11/16	.6855	1-15/16																	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16	LS-1																									
CL-686-RPT	CL-686-DPT	CL-686-RLT	CL-686-DLT		.6865																																																	
CL-716-RPT	CL-716-DPT	CL-716-RLT	CL-716-DLT	23/32	.7168																									1-15/16	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16	LS-1																	
CL-717-RPT	CL-717-DPT	CL-717-RLT	CL-717-DLT		.7178																																																	
CL-748-RPT	CL-748-DPT	CL-748-RLT	CL-748-DLT	3/4	.7480																																	1-15/16	11/16	1-1/8	3/16	49/64	L-64-16	HL-64-16	LS-1									
CL-749-RPT	CL-749-DPT	CL-749-RLT	CL-749-DLT		.7490																																																	
CL-7480-RPT	CL-7480-DPT	CL-7480-RLT	CL-7480-DLT	1	3/4																																									.7480	2-5/8	1	1-1/2	9/32	61/64	L-88-22	HL-88-22	
CL-7490-RPT	CL-7490-DPT	CL-7490-RLT	CL-7490-DLT																																											.7490								
CL-779-RPT	CL-779-DPT	CL-779-RLT	CL-779-DLT		25/32			.7793	2-5/8	1	1-1/2	9/32	61/64	L-88-22								HL-88-22																																
CL-780-RPT	CL-780-DPT	CL-780-RLT	CL-780-DLT					.7803																																														
CL-810-RPT	CL-810-DPT	CL-810-RLT	CL-810-DLT		13/16		.8105	2-5/8							1	1-1/2	9/32	61/64	L-88-22	HL-88-22																																		
CL-811-RPT	CL-811-DPT	CL-811-RLT	CL-811-DLT				.8115																																															
CL-841-RPT	CL-841-DPT	CL-841-RLT	CL-841-DLT		27/32	.8418	2-5/8																1	1-1/2	9/32	61/64	L-88-22	HL-88-22																										
CL-842-RPT	CL-842-DPT	CL-842-RLT	CL-842-DLT			.8428																																																
CL-873-RPT	CL-873-DPT	CL-873-RLT	CL-873-DLT		7/8	.8730																								2-5/8	1	1-1/2	9/32	61/64	L-88-22	HL-88-22																		
CL-874-RPT	CL-874-DPT	CL-874-RLT	CL-874-DLT			.8740																																																
CL-904-RPT	CL-904-DPT	CL-904-RLT	CL-904-DLT		29/32	.9043																																2-5/8	1	1-1/2	9/32	61/64	L-88-22	HL-88-22										
CL-905-RPT	CL-905-DPT	CL-905-RLT	CL-905-DLT			.9053																																																
CL-935-RPT	CL-935-DPT	CL-935-RLT	CL-935-DLT	15/16	.9355	2-5/8																																									1	1-1/2	9/32	61/64	L-88-22	HL-88-22		
CL-936-RPT	CL-936-DPT	CL-936-RLT	CL-936-DLT		.9365																																																	
CL-966-RPT	CL-966-DPT	CL-966-RLT	CL-966-DLT	31/32	.9668				2-5/8	1	1-1/2	9/32	61/64	L-88-22								HL-88-22																																
CL-967-RPT	CL-967-DPT	CL-967-RLT	CL-967-DLT		.9678																																																	
CL-998-RPT	CL-998-DPT	CL-998-RLT	CL-998-DLT	1	.9980			2-5/8							1	1-1/2	9/32	61/64	L-88-22	HL-88-22																																		
CL-999-RPT	CL-999-DPT	CL-999-RLT	CL-999-DLT		.9990																																																	



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(Rev. 9-09)

# BULLET-NOSE DOWELS

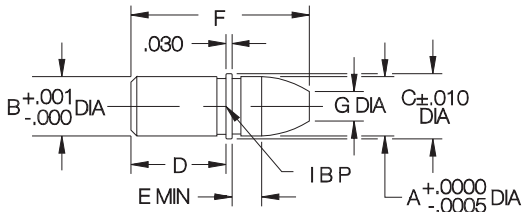
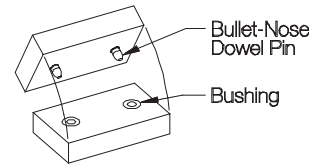
1144 STEEL, HEAT TREATED RC 50-62, BLACK OXIDE FINISH



Dowel Pin

Bushing

Precision locating pin often used with a matching bushing to align two pieces of a fixture. The pin's head and shank diameters are concentric to within .0005 TIR. The bushing's ID and OD are concentric to within .0003 TIR.



## DOWEL PINS (USA)

PART NO.	A HEAD DIA		B SHANK DIA		C DIA	D	E	F	G DIA
	NOMINAL	ACTUAL	NOMINAL	ACTUAL					
CL-1-BND	1/4	.2499	1/4	.2510	.280	1/2	.12	.90	1/8
CL-2-BND	5/16	.3124	5/16	.3135	.344		.15	.94	5/32
CL-3-BND	3/8	.3749	3/8	.3760	.407		.18	1.03	3/16
CL-4-BND	1/2	.4999	1/2	.5010	.532		.18	1.09	1/4

## DOWEL PINS (METRIC)

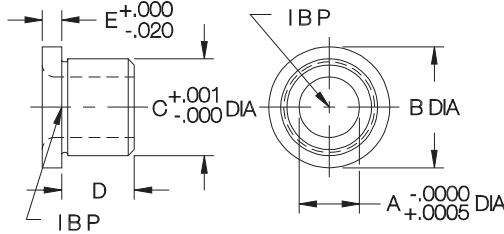
PART NO.	A DIA		B DIA		C DIA	D	E	F	G DIA
	NOMINAL	ACTUAL	NOMINAL	ACTUAL					
CLM-60-BND	6mm	.2361	6mm	.2372	.276	.47	.12	.86	.12
CLM-80-BND	8mm	.3149	8mm	.3160	.354		.15	.91	.16
CLM-100-BND	10mm	.3936	10mm	.3947	.433		.19	.98	.20
CLM-120-BND	12mm	.4723	12mm	.4734	.512		.19	1.06	.24

## BUSHINGS (USA)

PART NO.	A DIA		B DIA	C DIA		D	E
	NOMINAL	ACTUAL		NOMINAL	ACTUAL		
CLB-1000	1/4	.2501	.625	1/2	.5002	3/8	.100
CLB-2000	5/16	.3126	.750	5/8	.6253	1/2	
CLB-3000	3/8	.3751	.875	3/4	.7504	5/8	
CLB-4000	1/2	.5001	.875	3/4	.7504	5/8	

## BUSHINGS (METRIC)

PART NO.	A DIA		B DIA	C DIA		D	E
	NOMINAL	ACTUAL		NOMINAL	ACTUAL		
CLM-60-B	6mm	.2363	.512	10mm	.3939	.276	.118
CLM-80-B	8mm	.3151	.591	12mm	.4726		
CLM-100-B	10mm	.3938	.709	15mm	.5909	.354	
CLM-120-B	12mm	.4725	.866	18mm	.7091	.472	



# CONE LOCATOR PINS

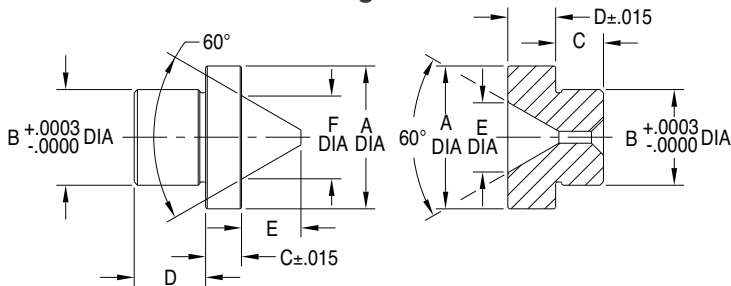
12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



Pin

Bushing

Medium-accuracy locating pin that compensates for misalignment to allow quick assembly of two fixture pieces.



## PINS

PART NO.	A DIA	B DIA	C	D	E	F DIA
CL-7-CLP	1	.7515		9/16	1/2	.676

## BUSHINGS

PART NO.	A DIA	B DIA	C	D	E DIA	GAP BETWEEN HEADS WITH PIN & BUSHING ASSEMBLED
CL-7-CLB	1	.7515	3/8	3/8	.616	.043-.061



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# BULLET-NOSE PINS

1144 STEEL, HEAT TREATED RC 50-62, BLACK OXIDE FINISH



**Bullet-Nose Round Pin**



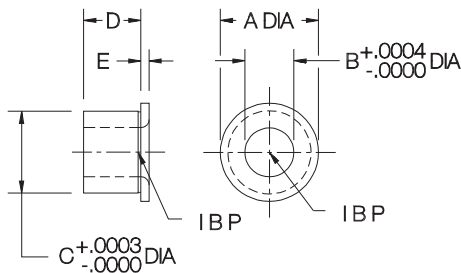
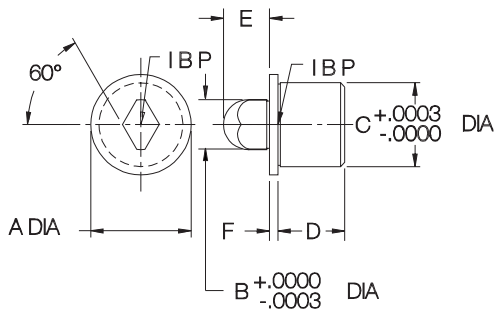
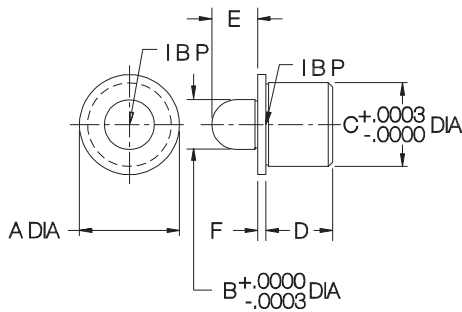
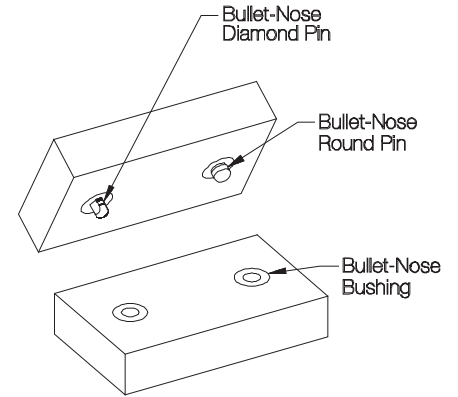
**Bullet-Nose Diamond Pin**



**Bushing**

Bullet-nose round pins and diamond pins are often used together (with matching bushings) to align two pieces of a fixture. The diamond pin is relieved, to locate only *radially* around the round pin, avoiding redundant location. This prevents binding, yet still maintains high accuracy.

The pin's shank diameter and the bushing's OD are the same size to allow boring the installation hole in both fixture pieces at the same time, for greater accuracy. The pin's head and shank diameters are concentric to within .0005 TIR. The bushing's ID and OD are concentric to within .0003 TIR.



## ROUND PINS (USA)

PART NO.	A DIA	B HEAD DIA		C SHANK DIA		D	E	F
		NOMINAL	ACTUAL	NOMINAL	ACTUAL			
CL-8-BND	9/16	1/4	.2499	13/32	.4075	3/8	7/32	1/16
CL-9-BND	5/8	5/16	.3124	1/2	.5014	3/8	9/32	
CL-10-BND	3/4	3/8	.3748	5/8	.6265	1/2	11/32	13/32
CL-11-BND	7/8	1/2	.4998	3/4	.7515			
CL-12-BND	1-1/8	3/4	.7498	1	1.0015	3/4	9/16	1/8
CL-13-BND	1-1/2	1	.9998	1-3/8	1.3768	3/4	3/4	

## ROUND PINS (METRIC)

CLM-6-BRP	.512	6mm	.2361	10mm	.3950	.35	.24	.079
CLM-8-BRP	.591	8mm	.3149	12mm	.4738		.28	
CLM-10-BRP	.709	10mm	.3935	15mm	.5921	.43	.35	
CLM-12-BRP	.866	12mm	.4722	18mm	.7102		.39	

## DIAMOND PINS (USA)

CL-8-BDP	9/16	1/4	.2499	13/32	.4075	3/8	7/32	1/16
CL-9-BDP	5/8	5/16	.3124	1/2	.5014	3/8	9/32	
CL-10-BDP	3/4	3/8	.3748	5/8	.6265	1/2	11/32	13/32
CL-11-BDP	7/8	1/2	.4998	3/4	.7515			
CL-12-BDP	1-1/8	3/4	.7498	1	1.0015	3/4	9/16	1/8
CL-13-BDP	1-1/2	1	.9998	1-3/8	1.3768	3/4	3/4	

## DIAMOND PINS (METRIC)

CLM-6-BDP	.512	6mm	.2361	10mm	.3950	.35	.24	.079
CLM-8-BDP	.591	8mm	.3149	12mm	.4738		.28	
CLM-10-BDP	.709	10mm	.3935	15mm	.5921	.43	.35	
CLM-12-BDP	.866	12mm	.4722	18mm	.7102		.39	

## BUSHINGS (USA)

PART NO.	A DIA	B DIA		C DIA		D	E
		NOMINAL	ACTUAL	NOMINAL	ACTUAL		
CLB-8000	9/16	1/4	.2501	13/32	.4075	7/16	1/16
CLB-9000	5/8	5/16	.3126	1/2	.5014		
CLB-10000	3/4	3/8	.3751	5/8	.6265	1/2	1/8
CLB-11000	7/8	1/2	.5001	3/4	.7515		
CLB-12000	1-1/8	3/4	.7502	1	1.0015	11/16	1/8
CLB-13000	1-1/2	1	1.0002	1-3/8	1.3768		

## BUSHINGS (METRIC)

CLM-6-B	.512	6mm	.2363	10mm	.3950	.31	.079
CLM-8-B	.591	8mm	.3151	12mm	.4738		
CLM-10-B	.709	10mm	.3938	15mm	.5921	.39	
CLM-12-B	.866	12mm	.4725	18mm	.7102		



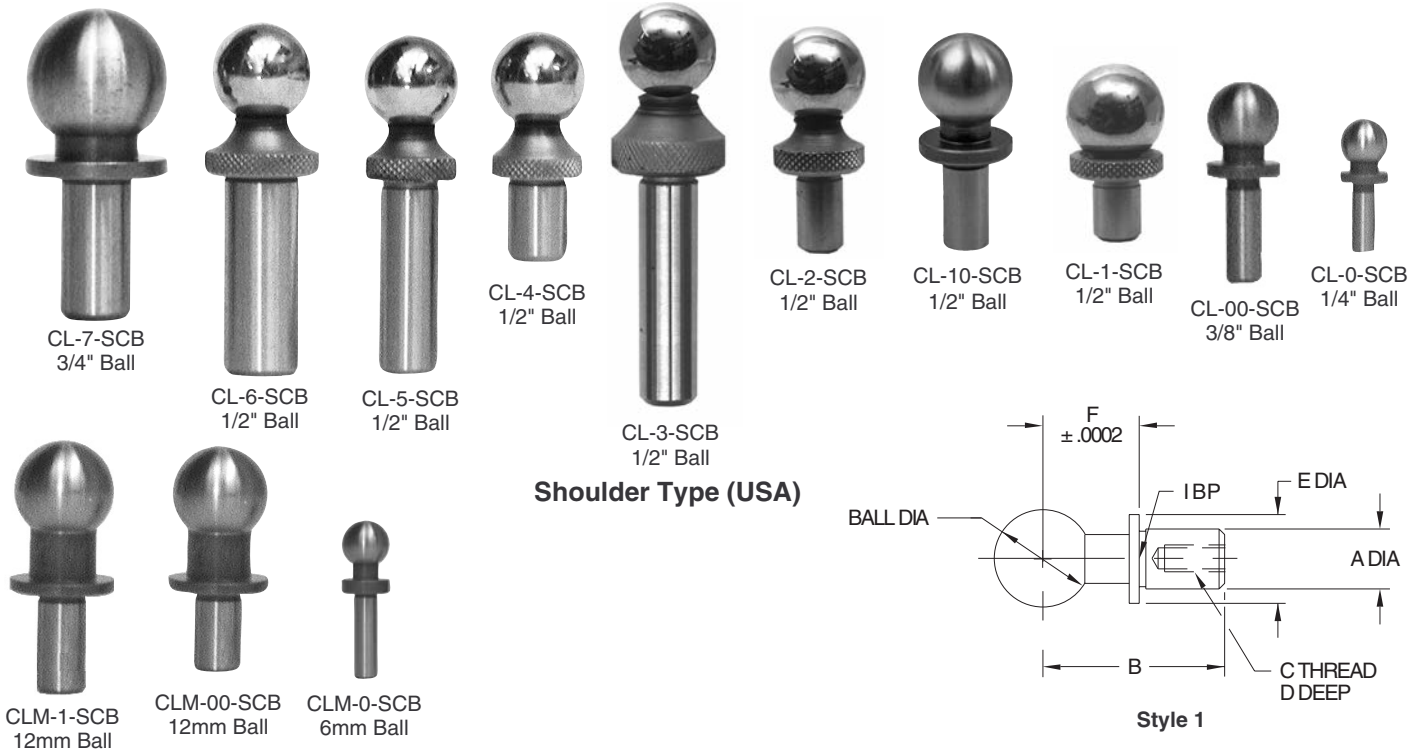
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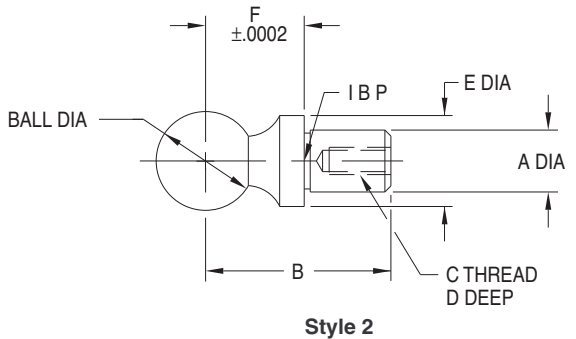
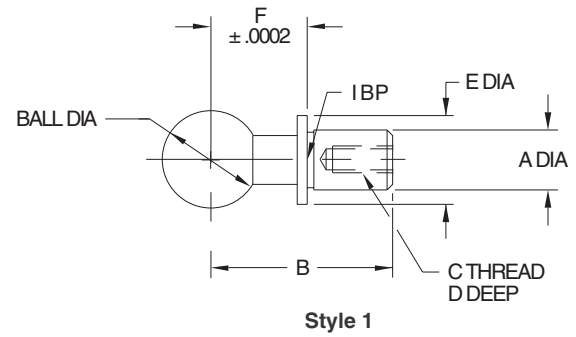
(Rev. 12-07)

# CONSTRUCTION BALLS

52100 STEEL BALL, HEAT TREATED RC 54-56, 1018 STEEL SHANK  
OR ALL 1144 STEEL, HEAT TREATED RC 54-56



## Shoulder Type (USA)



## Shoulder Type (Metric)

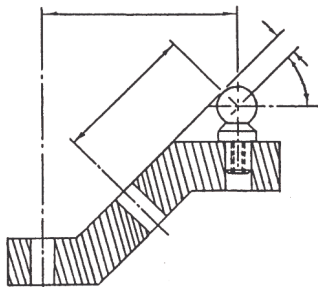
Precision tooling ball used as a reference point for critical inspection, layout, and machining operations. Shoulder type has a precision height-reference shoulder to locate the ball in three dimensions. Concentricity between ball and shank is .0002" TIR. Available with ball diameters from 1/4 to 3/4" (6 to 12mm in metric), in various shank diameters and lengths. Note: Catalog photos are actual size.

## SHOULDER TYPE (USA)

PART NO.	BALL DIA		A DIA		B	C	D	E DIA	F	STYLE
	NOMINAL	ACTUAL	NOMINAL	ACTUAL						
CL-0-SCB	1/4	.2502/.2498	1/8	.1250/.1246	.56	—	—	.25	.2000	1
CL-00-SCB	3/8	.3752/.3748	3/16	.1875/.1871	.75	—	—	.37	.3000	
CL-1-SCB	1/2	.5000/.4997	1/4	.2500/.2497	.63	#6-32	1/4	.46	.3125	2
CL-10-SCB				.2500/.2496	.94	—	—		.4000	
CL-2-SCB				.2500/.2497	.94	#6-32	5/16		.5000	
CL-3-SCB			5/16	.3125/.3122	1.50	—	—	.46	.5000	2
CL-4-SCB				.3125/.3122	.94	#6-32	5/16	.46	.5000	
CL-5-SCB	3/4	.7502/.7498	3/8	.3750/.3747	1.50	—	—	.56	.5000	1
CL-6-SCB				.3750/.3746	1.25	—	—	.75	.5000	
CL-7-SCB										

## SHOULDER TYPE (METRIC)

CLM-0-SCB	6mm	.2364/.2360	3mm	.1181/.1177	.47	—	—	.24	.2362 (6mm)	1
CLM-00-SCB	12mm	.4726/.4722	6mm	.2362/.2358	.87	—	—	.47	.4724 (12mm)	
CLM-1-SCB					.98	M3.5	.24			



Shoulder-Type Construction Balls provide a reference point in three dimensions.



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# CONSTRUCTION BALLS

52100 STEEL BALL, HEAT TREATED RC 54-56, 1018 STEEL SHANK  
OR ALL 1144 STEEL, HEAT TREATED RC 54-56



CL-5-CB  
1/2" Ball



CL-3-CB  
1/2" Ball



CL-1-CB  
1/2" Ball



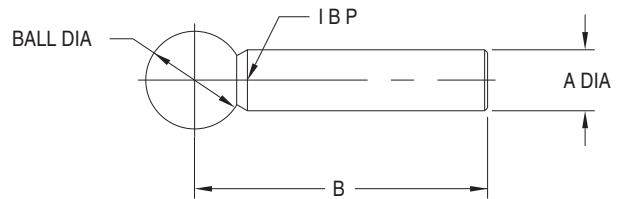
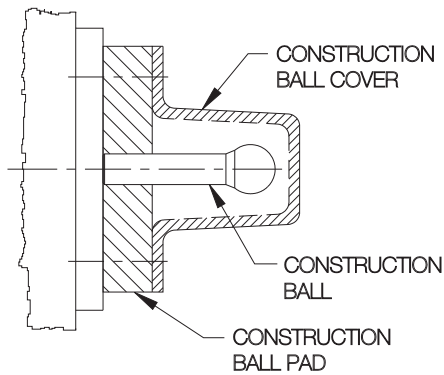
CL-00-CB  
3/8" Ball



CL-0-CB  
1/4" Ball

**Adjustable Type**

Precision tooling ball used as a reference point for critical inspection, layout, and machining operations. Adjustable type has no shoulder, so it can be set at any desired height then locked with a setscrew. Concentricity between ball and shank is .0002" TIR. Available with ball diameters from 1/4 to 1/2", in various shank diameters and lengths. Note: Catalog photos are actual size.



Style 1 — One Piece Construction

Style 2 — Two-Piece Welded Construction

### ADJUSTABLE TYPE (USA)

PART NO.	BALL DIA		A DIA		B	STYLE
	NOMINAL	ACTUAL	NOMINAL	ACTUAL		
CL-0-CB	1/4	.2502/.2498	1/8	.1250/.1246	.56	1
CL-00-CB	3/8	.3752/.3748	3/16	.1875/.1871	.75	
CL-1-CB	1/2	.5000/.4997	1/4	.2500/.2497	1.50	2
CL-3-CB			5/16	.3125/.3122		
CL-5-CB			3/8	.3750/.3747		



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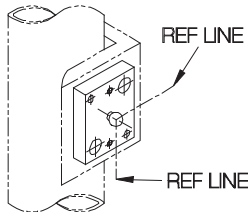
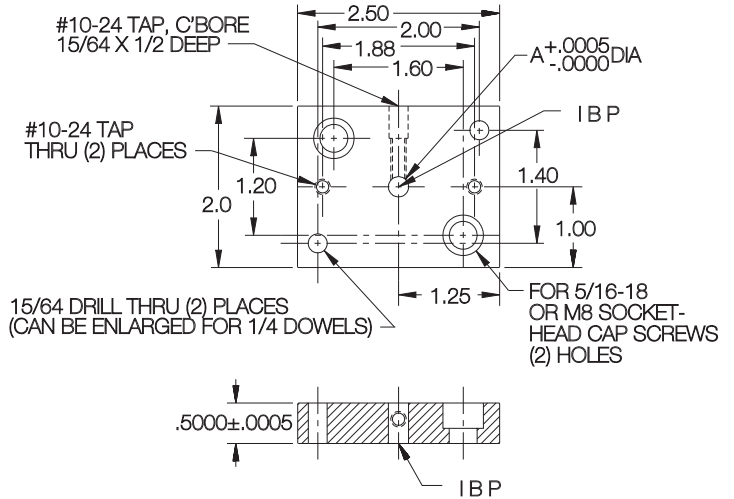
(Rev. 7-06)

# CONSTRUCTION-BALL PADS

1018 STEEL, BLACK OXIDE FINISH



Mounting block for adjustable-type Construction Balls. Adjust to desired height, then lock with a setscrew. The two #10-24 holes allow mounting a Construction Ball Cover (see below) to protect the Construction Ball.



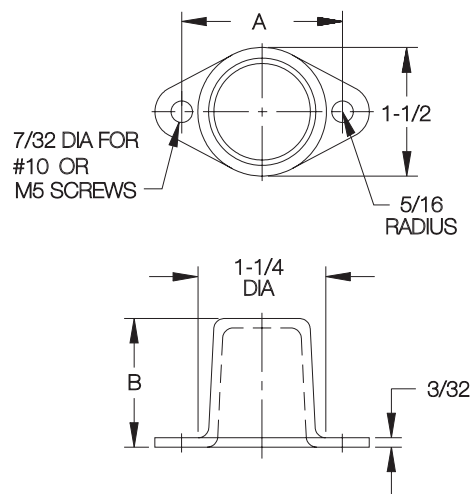
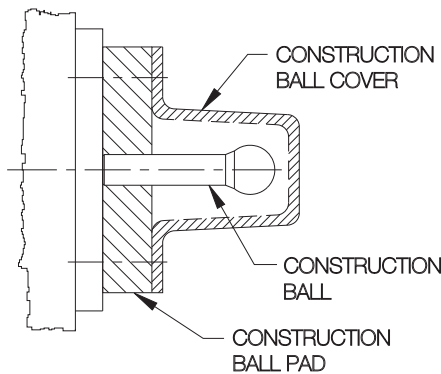
PART NO.	A	DIA
CL-1-CBP	.2500	

# CONSTRUCTION-BALL COVERS

ZINC DIE CASTING



Sturdy cover that protects a Construction Ball from damage after installation.



PART NO.	A	B
CL-2-COVER	1-7/8	1-1/2

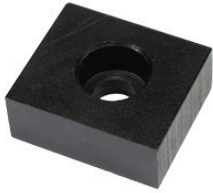


**MANUFACTURING CO.**

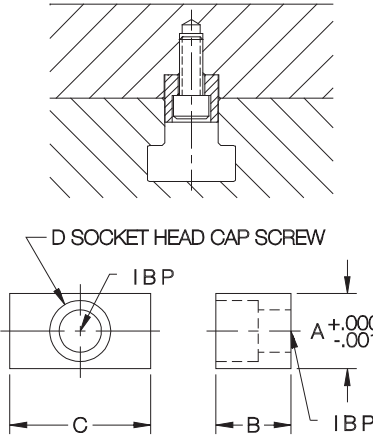
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# FIXTURE KEYS

1018 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



Standard key for fixtures slotted to mount on one specific machine table. Depth of slot in fixture should be 1/2 of B dimension.



## USA

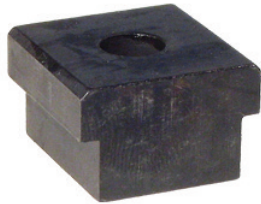
PART NO.	TABLE SLOT SIZE	A	B	C	D
CL-1-FK	1/2	.5000	1/2	3/4	1/4-20
CL-2-FK	9/16	.5625			
CL-3-FK	5/8	.6250		1	5/16-18
CL-4-FK	11/16	.6875			
CL-5-FK	3/4	.7500			
CL-6-FK	13/16	.8125		1-1/4	
CL-7-FK	1-1/16	1.0625			

## METRIC

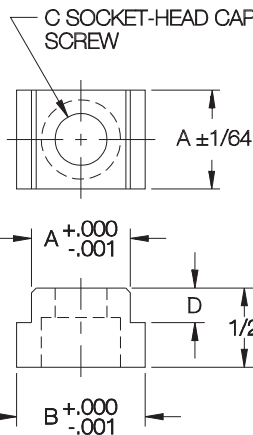
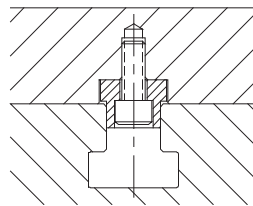
CLM-12-FK	12mm	.4724	.315	.787	M5
CLM-14-FK	14mm	.5512	.394	.866	M6
CLM-16-FK	16mm	.6299			
CLM-18-FK	18mm	.7087			
CLM-20-FK	20mm	.7874			

# STEP FIXTURE KEYS

MILD STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



Adapts a key-slotted fixture or vise to machine tables with a different slot size. Available for US or metric slots. Top and bottom of key are centered within .0005 of each other.



## USA FIXTURE SLOTS

PART NO.	FIXTURE SLOT SIZE	A	TABLE SLOT SIZE	B	C	D
CL-8-SFK-437	1/2	.5000	7/16	.4375	1/4 or M6	9/32
CL-8-SFK-562			9/16	.5625		
CL-8-SFK-625			5/8	.6250		7/32
CL-8-SFK-687			11/16	.6875		
CL-8-SFK-12			12mm	.4724		9/32
CL-8-SFK-14			14mm	.5512		
CL-8-SFK-16			16mm	.6299		7/32
CL-8-SFK-18			18mm	.7087		
CL-9-SFK-437	9/16	.5625	7/16	.4375	1/4 or M6	9/32
CL-9-SFK-500			1/2	.5000		
CL-9-SFK-625			5/8	.6250		7/32
CL-9-SFK-12			12mm	.4724		
CL-9-SFK-14			14mm	.5512		9/32
CL-9-SFK-16	16mm	.6299				
CL-10-SFK-500	5/8	.6250	1/2	.5000	5/16 or M8	9/32
CL-10-SFK-562			9/16	.5625		
CL-10-SFK-687			11/16	.6875		7/32
CL-10-SFK-750			3/4	.7500		
CL-10-SFK-812			13/16	.8125		9/32
CL-10-SFK-12			12mm	.4724		
CL-10-SFK-14			14mm	.5512		7/32
CL-10-SFK-16			16mm	.6299		
CL-10-SFK-18			18mm	.7087		
CL-10-SFK-20			20mm	.7874		
CL-11-SFK-562	11/16	.6875	9/16	.5625	5/16 or M8	9/32
CL-11-SFK-625			5/8	.6250		
CL-11-SFK-750			3/4	.7500		7/32
CL-11-SFK-812			13/16	.8125		
CL-11-SFK-12			16mm	.6299		9/32
CL-11-SFK-18			18mm	.7087		
CL-11-SFK-20			20mm	.7874		
CL-12-SFK-625	3/4	.7500	5/8	.6250	5/16 or M8	9/32
CL-12-SFK-687			11/16	.6875		
CL-12-SFK-812			13/16	.8125		7/32
CL-12-SFK-18			18mm	.7087		
CL-12-SFK-20			20mm	.7874		
CL-13-SFK-687	13/16	.8125	11/16	.6875	5/16 or M8	9/32
CL-13-SFK-750			3/4	.7500		
CL-13-SFK-18			18mm	.7087		
CL-13-SFK-20			20mm	.7874		

## METRIC FIXTURE SLOTS

PART NO.	FIXTURE SLOT SIZE	A	TABLE SLOT SIZE	B	C	D
CL-20-SFK-500	20mm	.7874	1/2	.5000	1/4 or M6	9/32
CL-20-SFK-562			9/16	.5625		
CL-20-SFK-625			5/8	.6250		7/32
CL-20-SFK-687			11/16	.6875		
CL-20-SFK-750			3/4	.7500		9/32
CL-20-SFK-812			13/16	.8125		
CL-20-SFK-16			16mm	.6299		
CL-20-SFK-18			18mm	.7087		



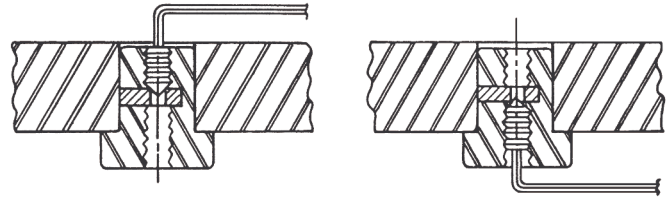
## MANUFACTURING CO.

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

(Rev. 7-06)

# SURE-LOCK™ FIXTURE KEYS

12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH

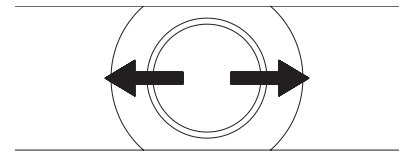


Lock in place from above or below using a hex wrench.

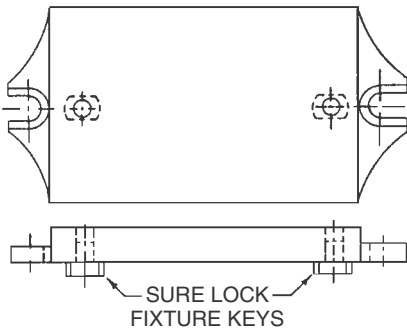
Perfect fixture key for most applications. Keys are interchangeable because they all fit in a 5/8 reamed hole. Allows mounting any fixture on any machine simply by switching keys. Eliminates the need to slot fixtures. Concentricity .0005 TIR or better. Available for US or metric machine-table slots.

## USA

PART NO.	TABLE SLOT SIZE	A	B	C	D
CL-375-SLFK	3/8	.3750			
CL-437-SLFK	7/16	.4375	1/2	3/8	.23
CL-500-SLFK	1/2	.5000			
CL-5000-SLFK			3/4	7/16	.41
CL-562-SLFK	9/16	.5625	1/2	3/8	.23
CL-5625-SLFK			3/4	7/16	.41
CL-625-SLFK	5/8	.6250	1/2	3/8	.23
CL-6250-SLFK			3/4	7/16	.41
CL-687-SLFK	11/16	.6875	1/2	3/8	.23
CL-6875-SLFK					
CL-7500-SLFK	3/4	.7500	3/4	7/16	.41
CL-8125-SLFK	13/16	.8125			

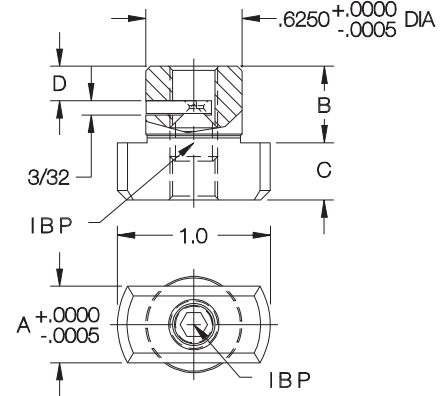


Patented locking action aligns fixture key perfectly with slot axis.



## METRIC

PART NO.	TABLE SLOT SIZE	A	B	C	D
CL-12-SLFK	12mm	.4724	1/2	3/8	.23
CL-14-SLFK	14mm	.5512			
CL-16-SLFK	16mm	.6299			
CL-18-SLFK	18mm	.7087	3/4	7/16	.41
CL-20-SLFK	20mm	.7874			
CL-22-SLFK	22mm	.8661			



# REAMED-HOLE FIXTURE KEYS

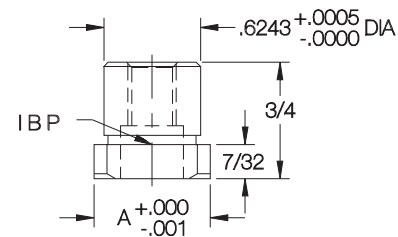
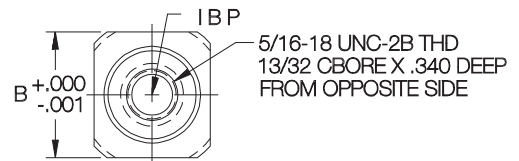
12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



Each key fits two different table slots by turning 90°. Install in a 5/8 reamed hole. Fasten from above with a 5/16–18 socket-head cap screw, or from below with a 1/4–20 socket-head cap screw. Concentricity .0005 or better.

## USA

PART NO.	TABLE SLOT SIZES	A	B
CL-1-RFK	5/8 and 11/16		.6875
CL-2-RFK	5/8 and 3/4	.6250	.7500
CL-3-RFK	5/8 and 13/16		.8125
CL-4-RFK	11/16 and 3/4	.6875	.7500
CL-5-RFK	11/16 and 13/16		.8125
CL-6-RFK	3/4 and 13/16	.7500	.8125



## MANUFACTURING CO.

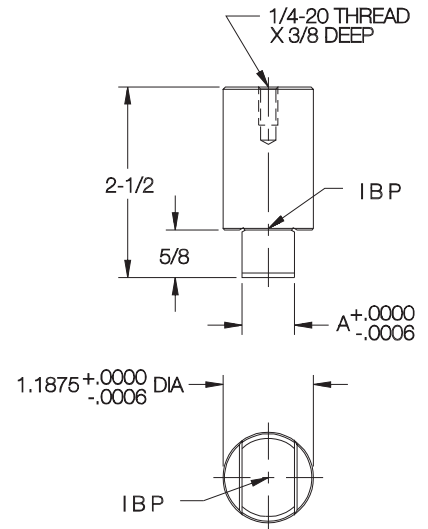
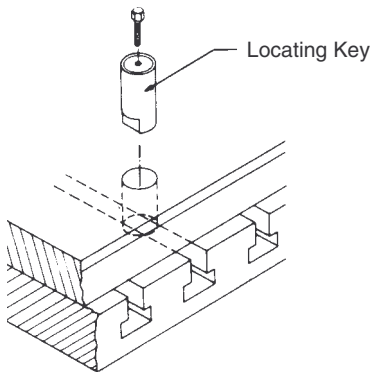
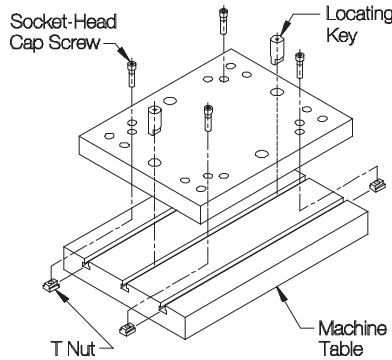
4200 Carr Lane Ct., P.O. Box 191970  
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 Web Site: www.carrlane.com

# LOCATING KEYS

1144 OR 1045 STEEL, HEAT TREATED, BLACK OXIDE FINISH



Standard removable-type fixture key for large fixtures. Can be inserted from above after placing fixture on machine, then removed again if desired after the fixture is fastened. Keeps bottom of fixture free of obstructions. Install in a 1-3/16" reamed hole. True position within .0005 or better.



**USA**

PART NO.	TABLE SLOT SIZE	A
CL-MF10-4406	9/16	.5625
CL-MF10-4407	5/8	.6250
CL-MF10-4408	11/16	.6875
CL-MF10-4409	3/4	.7500
CL-MF10-4411	13/16	.8125
CL-MF10-4410	7/8	.8750

**METRIC**

CL-MF10-4401	14mm	.5512
CL-MF10-4402	16mm	.6299
CL-MF10-4403	18mm	.7087
CL-MF10-4404	20mm	.7874
CL-MF10-4405	22mm	.8661

# SUBPLATE LOCATING KEYS

1144 STEEL, HEAT TREATED, BLACK OXIDE FINISH

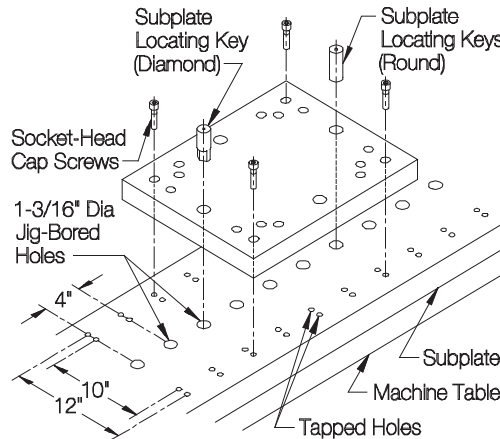


**Round**



**Diamond**

Subplate Locating Keys are the new standard for mounting quick-change fixture plates on a subplate. A round key and a diamond (relieved) key are used together for precise location without binding. Diamond Keys are marked on top to ensure proper orientation in the hole. Two standard diameters match standard fixture-key holes. This allows mounting the same fixture plate either on a subplate (3-axis location) or directly on a machine table (2-axis location). The 5/8"-diameter key fits in the same hole as a Sure-Lock™ Fixture Key, while the 1-3/16"-diameter key fits in the same hole as the Locating Keys shown above. The subplate hole pattern shown above allows mounting any size and combination of Rectangular Tooling Plates, either lengthwise or widthwise.

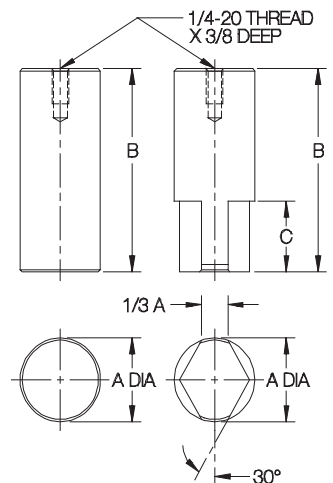


**ROUND**

PART NO.	A DIA		B	C
	NOMINAL	ACTUAL		
CL-10-SLKR	5/8	.6250/.6244	2-1/4	—
CL-19-SLKR	1-3/16	1.1875/1.1869	2-7/8	—

**DIAMOND**

CL-10-SLKD	5/8	.6250/.6244	2-1/4	1
CL-19-SLKD	1-3/16	1.1875/1.1869	2-7/8	1



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(Rev.10-07)

# PALLET FIXTURE KEYS

12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH

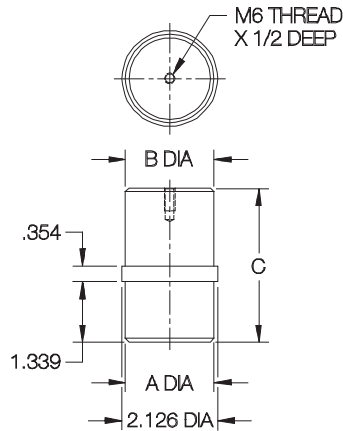


Center Pin

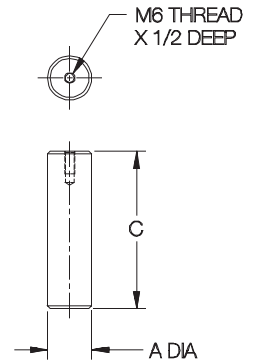


Radial Pin

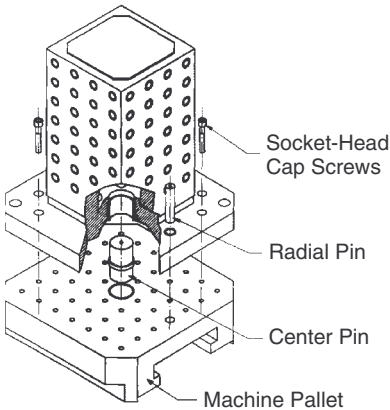
Fixture keys for mounting tooling plates and blocks on standard DIN pallets. Each pallet requires one center pin and one radial pin (for orientation). The radial pin is usually removed after fastening the pallet to the machine table.



Center Pin



Radial Pin



## CENTER PINS

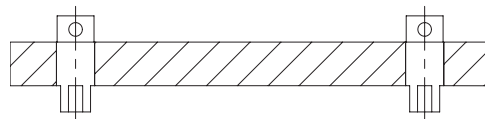
PART NO.	A DIA		B DIA		C
	NOMINAL	ACTUAL	NOMINAL	ACTUAL	
CLM-25-PFKC			25mm	.9839/.9835	2.87
CLM-30-PFKC	50mm	1.9681/1.9676	30mm	1.1808/1.1804	3.42
CLM-50-PFKC			50mm	1.9681/1.9676	

## RADIAL PINS

PART NO.	A DIA		C
	NOMINAL	ACTUAL	
CLM-20-PFKR	20mm	.7871/.7867	3.50
CLM-25-PFKR	25mm	.9839/.9835	4.92

# MILL FIXTURE KEYS

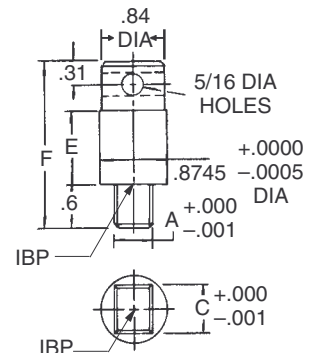
12L14 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



## USA

PART NO.	TABLE SLOT SIZES	A	C	E	F
CL-1-MFK-1	11/16 or 13/16	.6873	.8123	1.00	2.20
CL-1-MFK-2				3.20	4.40

Can be removed from above after mounting fixture on machine. Fits either 11/16 or 13/16 table slots by turning 90°. Install in a 7/8 reamed hole. Concentricity .0005 or better.



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