

Locate & Hold - Pins, Cables & Accessories

Wide Assortment of
Round & Relieved Pins



EXPANDING DIAMETER
PINS Pg D10



LOCK PIN ASSY
Pg D7



L-PINS
Pg D5



FERRULES
Pg D15



SPLIT KEY/TAG RINGS
Pg D12



RADIUS NOSE PINS Pg D19



SAFETY PINS Pg D18



FLOATING
LOCATOR PIN
BUSHINGS
Pg D2



DOWEL PINS Pg D26



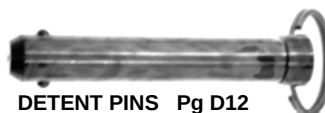
BALL LOCK KEY PIN
ASSEMBLIES Pg D13



CABLE ASSEMBLIES Pg D16



PLAIN ALIGNMENT PINS Pg D5



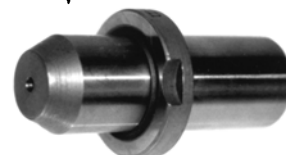
DETENT PINS Pg D12



JIG GAGE PINS Pg D4



POSITIVE BALL LOCK
FLANGE PINS Pg D17



LOCK SCREW LOCATING
PINS Pg D32



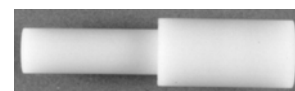
PRESS FIT LOCATING PINS
Pg D33



FLANGELESS LOCATING
PINS Pg D31



FLANGELESS BOEING
LOCATING PINS Pg D37



PLASTIC STEP-DOWN
PINS Pg D38



TOOLING PADS Pg D42



CONE PIN
LOCATORS Pg D36



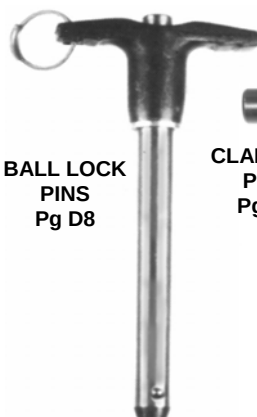
SPRING PLUNGERS
Pg D25



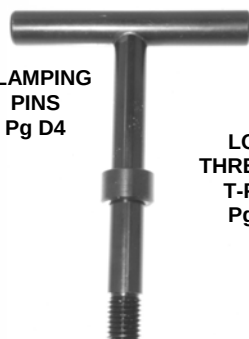
BULLET NOSE
DOWELS Pg D36



RUBBER MOLD
PINS Pg D27



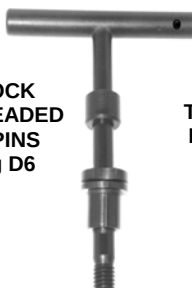
BALL LOCK
PINS
Pg D8



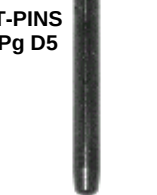
CLAMPING
PINS
Pg D4



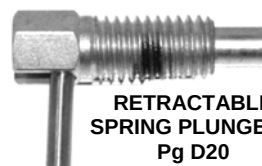
PULL RING PLUNGERS
Pg D21



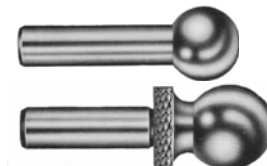
LOCK
THREADED
T-PINS
Pg D6



T-PINS
Pg D5



RETRACTABLE
SPRING PLUNGERS
Pg D20



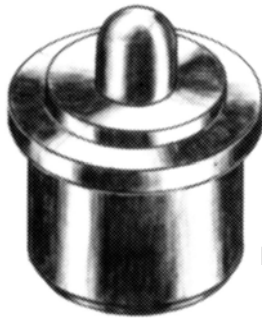
TOOLING BALLS Pg D40



PREMIUM TOOLING BALLS Pg D43

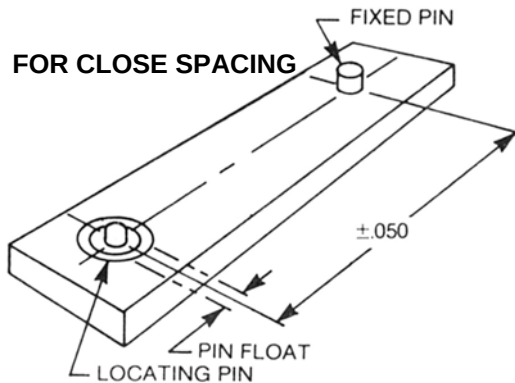
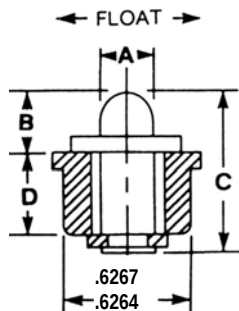
Floating Locator Pin Bushings

Locator Pin Bushings



**FLOATING
LOCATOR PIN
BUSHINGS — TYPE I**

FOR CLOSE SPACING



TYPE I 5/8" O.D.

UNITED FLOATING LOCATOR PINS DESIGNED TO:

- Hold fixture locations with $\pm .050$
- Ideal for master tool coordination
- Used in place of diamond relieved locating pins
- Eliminate jig boring
- Numerical control tooling

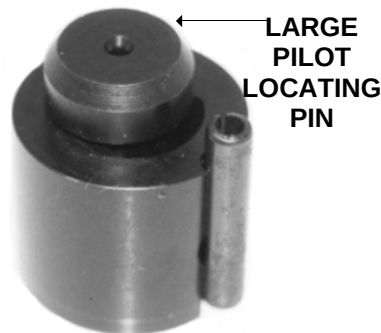
BOEING (MACAIR) TYPE I		5/8" O.D.		
TYPE I PART NO.	A +.0000 - .0005	B	C	D
UDB-974904	.2495	9/32	47/64	3/8
UDB-974905	.3120	9/32	47/64	3/8
UDB-974906	.3745	5/16	49/64	3/8
UDB-974908	.4995	7/16	57/64	3/8
UDB-974909	.5620	7/16	57/64	3/8
UDB-974910	.6245	1/2	57/64	3/8
UDB-975004	.2495	9/32	1-11/32	1"
UDB-975005	.3120	9/32	1-11/32	1"
UDB-975006	.3745	5/16	1-3/8	1"
UDB-975008	.4995	7/16	1-1/2	1"
UDB-975009	.5620	7/16	1-1/2	1"
UDB-975010	.6245	1/2	1-9/16	1"

FLOATING LOCATOR PIN BUSHINGS — TYPE II

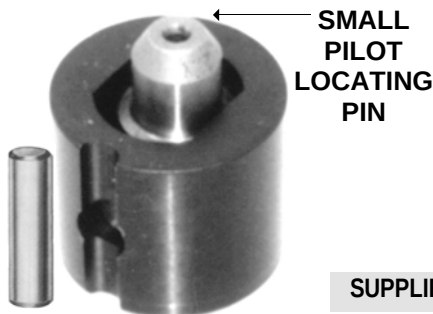
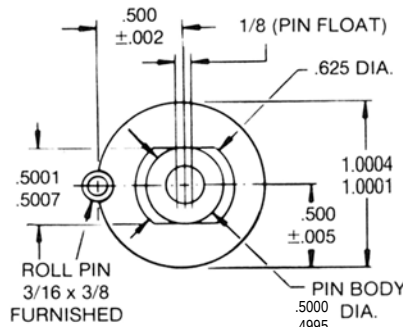
USE WITH DOWEL PIN OR OTHER ROLL PINS

May be used with common dowel pin of appropriate diameter to serve as a fixed master locating pin. Replaces Diamond Pins in metal fixtures. Drill 3/16 hole for Roll Pin. Allow $+.0003$ to $+.0005$ for press fit. See below.

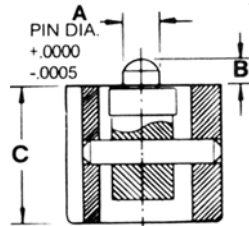
Special floating pin diameters can be supplied upon request.



**LARGE
PILOT
LOCATING
PIN**



**SMALL
PILOT
LOCATING
PIN**



ALL 1" O.D.

**HARDENED
STEEL
RC-58-62
PRECISION
GROUND**

SUPPLIED WITH ROLL PIN.

BOEING (MACAIR) TYPE II		1" O.D.	
TYPE II PART NO.	A PILOT +.0000 - .0005	B PILOT HEIGHT	C LENGTH
UDB-984904	.2500	.200	.400
UDB-984905	.3125	.200	.400
UDB-984906	.3750	.220	.400
UDB-984908	.5000	.250	.400
UDB-984910	.6250	.250	.400
UDB-985004	.2500	.200	.900
UDB-985005	.3125	.200	.900
UDB-985006	.3750	.220	.900
UDB-985008	.5000	.250	.900
UDB-985010	.6250	.250	.900

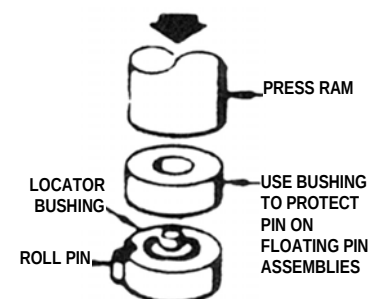
TYPE II ALL 1" O.D.

EASY TO INSTALL

1. Drill ream 3/16 hole for roll pin.
2. Bore installation hole to provide a light press fit for Locator Bushing. $.0003$ to $.0005$ should suffice.
3. Start Locator and Roll Pin (furnished with assembly) as shown and press assembly flush with top of plate.

Roll Pin establishes precise alignment between slotted hole and layout axis.

UNITED Helps You Pin It Down!



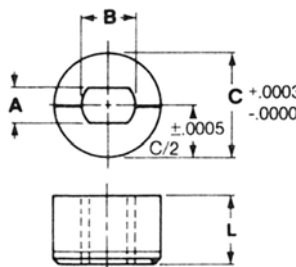
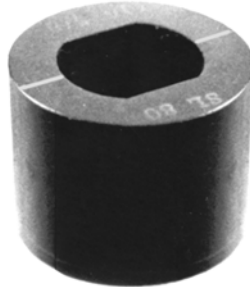
Locations are Simplified

PRESS FIT SLOT LOCATOR BUSHINGS FOR METAL TOOLING

Slot Locator Bushings

UNITED PART NO.	A	B	C +.0003 -.0000	L
SL-24-8-1/8	.1251 .1257	.250	.3751	1/2
SL-28-8-#30	.1286 .1291	.250	.4375	1/2
SL-28-12-#30	.1286 .1291	.250	.4376	3/4
SL-32-8-#20	.1611 .1617	.250	.5001	1/2
SL-32-8-#20	.1611 .1617	.312	.5001	1/2
SL-36-8-#20	.1611 .1617	.375	.5626	1/2
SL-32-8-3/16	.1876 .1882	.375	.5001	1/2
SL-32-8-#10	.1936 .1941	.375	.5001	1/2
SL-48-8-3/16	.1876 .1882	.375	.7501	1/2
SL-48-8-1/4	.2501 .2507	.375	.7501	1/2
SL-48-8-F	.2571 .2577	.375	.7501	1/2
SL-48-8-5/16	.3126 .3132	.437	.7501	1/2
SL-64-8-1/4	.2501 .2507	.375	1.0001	1/2
SL-64-8-5/16	.3126 .3132	.437	1.0001	1/2
SL-64-8-3/8	.3751 .3757	.500	1.0001	1/2
SL-64-8-1/2	.5001 .5007	.625	1.0001	1/2
SL-64-16-1/2	.5001 .5007	.625	1.0001	1"
SL-80-16-5/8	.6251 .6257	.750	1.2501	1"
SL-96-16-3/4	.7501 .7510	.875	1.5001	1"
SL-96-16-7/8	.8751 .8760	1.000	1.5001	1"
SL-96-16-1"	1.0001 1.0010	1.0625	1.5001	1"

SL Without Roll Pin



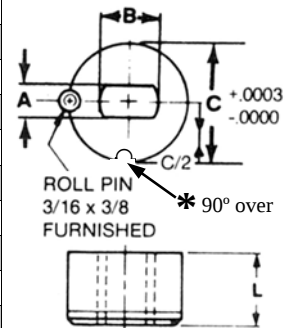
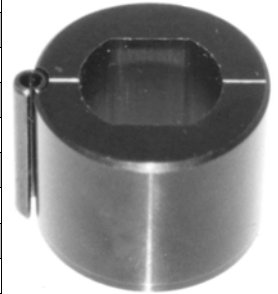
Face is Scribed to Align.

ROLL PIN NOT REQUIRED

UNITED's Slot Locator Bushings provide precision part location while only having to maintain a $\pm .050$ tooling tolerance.

NEW PART NO.	OLD PART NO.	A	B	C +.0003 -.0000	L
UDB-974924	SLR-28-8-#30	.1286 .1292	.250	.4376	.5 *
UDB-974926	SLR-28-8-#30	.1286 .1292	.250	.4371	.5 *
UDB-974930	SLR-32-8-#20	.1611 .1617	.250	.5001	.5 *
UDB-974932	SLR-32-8-#20	.1611 .1617	.312	.5001	.5 *
UDB-974934	SLR-36-8-#20	.1611 .1617	.375	.5626	.5 *
UDB-974942	3/16	.1876 .1882	.312	.7501	.4
UDB-974942B	SLR-48-8-3/16	.1876 .1882	.312	.7501	.5
UDB-974943	1/4	.2501 .2507	.375	.7501	.4
UDB-974943B	SLR-48-8-1/4	.2501 .2507	.375	.7501	.5
UDB-974943C	SLR-48-8-F	.2571 .2577	.375	.7501	.5
UDB-974944	1/4	.2501 .2507	.375	1.0001	.4
UDB-974944B	SLR-64-8-1/4	.2501 .2507	.375	1.0001	.5
UDB-974944C	SLR-64-8-F	.2571 .2577	.375	1.0001	.5
UDB-974945	5/16	.3126 .3132	.437	1.0001	.4
UDB-974945B	SLR-64-8-5/16	.3126 .3132	.500	1.0001	.5
UDB-974946	3/8	.3751 .3757	.500	1.0001	.4
UDB-974946B	SLR-64-8-3/8	.3751 .3757	.500	1.0001	.5
UDB-974948	1/2	.5001 .5007	.625	1.0001	.4
UDB-974948B	SLR-64-8-1/2	.5001 .5007	.625	1.0001	.5
UDB-975048	1/2	.5001 .5007	.625	1.0001	.9
UDB-975048B	SLR-64-16-1/2	.5001 .5007	.625	1.0001	1"
UDB-975054	5/8	.6251 .6257	.750	1.2501	.9
UDB-975054B	SLR-80-16-5/8	.6251 .6257	.750	1.2501	1"
UDB-975056	SLR-96-16-3/4	.7501 .7510	.812	1.5001	1"
UDB-975064	SLR-96-16-7/8	.8751 .8760	1.000	1.5001	1"
UDB-975068	SLR-96-16-1"	1.0001 1.0010	1.062	1.5001	1"

SLR With Roll Pin



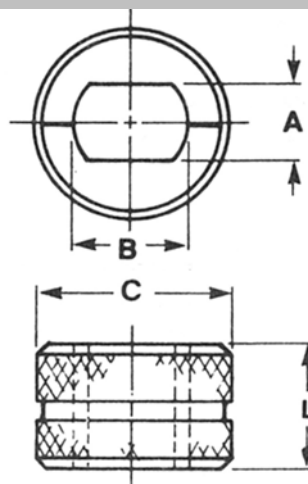
Roll Pins align with Scribe Lines EXCEPT on

* UDB-974924 THRU UDB-974934 where Pins are Perpendicular.

* ROLL PINS 90° from Scribe Line.

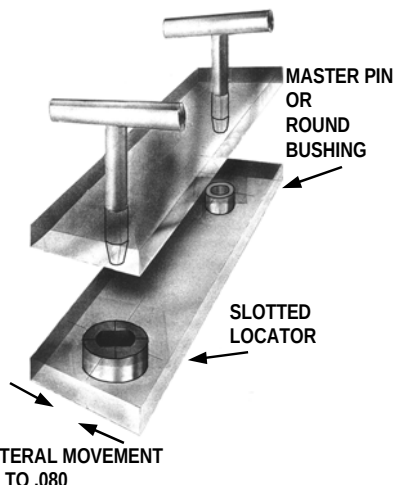
UNITED PART NO.	A	B	C	L
SLN-24-8-1/8	.1251 .1261	.250	.375	1/2
SLN-28-8-#30	.1286 .1296	.250	.437	1/2
SLN-28-12-#30	.1286 .1296	.250	.437	3/4
SLN-32-8-#20	.1611 .1621	.250	.515	1/2
SLN-32-8-#20	.1611 .1621	.312	.515	1/2
SLN-36-8-#20	.1611 .1621	.375	.565	1/2
SLN-36-8-3/16	.1876 .1886	.375	.565	1/2
SLN-36-8-#10	.1936 .1946	.375	.515	1/2
SLN-40-8-1/4	.2501 .2511	.375	.640	1/2
SLN-48-8-F	.2571 .2577	.375	.765	1/2
SLN-48-8-5/16	.3126 .3136	.437	.765	1/2
SLN-56-8-3/8	.3751 .3761	.500	.890	1/2
SLN-64-8-1/2	.5001 .5011	.625	1.015	1/2
SLN-64-16-1/2	.5001 .5011	.625	1.015	1"
SLN-80-16-5/8	.6251 .6261	.750	1.265	1"
SLN-96-16-3/4	.7501 .7511	.875	1.515	1"
SLN-96-16-7/8	.8751 .8761	1.000	1.515	1"
SLN-96-16-1"	1.0001 1.0011	1.0625	1.515	1"

NURLOCK SLOT LOCATOR BUSHINGS FOR PLASTIC TOOLING

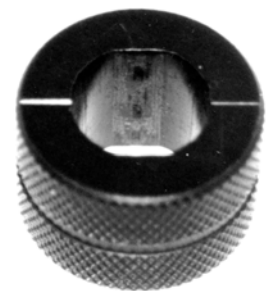


UNITED's SLN Slot Locator Bushing serves the same purpose as the Press Fit Locators above, except in Plastic Tooling Applications.

Dowels, "L" or "T" Pins may be used to locate.



SLN



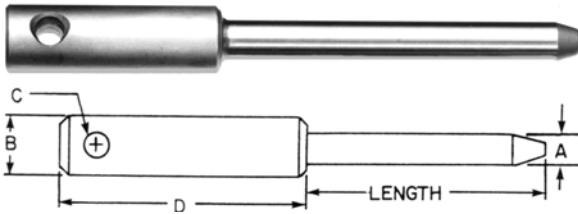
Line is Scribed on Face to Align.

SLN used in PLASTIC TOOLING APPLICATIONS

Jig Gauge, Clamping & Sliding Handle Pins

Quality Pins

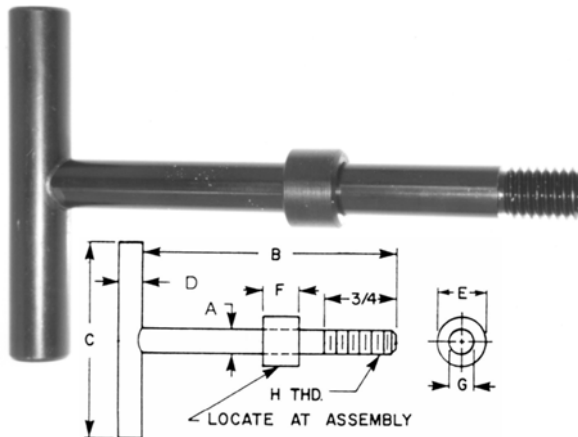
JIG GAUGE PIN



- Strong Solid One Piece Construction
- All Sizes and Location Requirements
- Easily Removable Jig Gauge Pin
- Can be ordered with Optional Cable installed for connection to your fixture—See Index for Cables.
- Hardened and precisely ground

UNITED PART NO.			A O.D. +.0000 -.0005		B	C	D
LENGTH = 2	LENGTH = 4	LENGTH = 6	NOMINAL	DECIMAL	O.D. SIZE	HOLE DIA	
UDB-574121	UDB-574123	UDB-574125	#13	.1850	1/2	5/16	3-1/2
UDB-574127	UDB-574129	UDB-574131	3/16	.1875	1/2	5/16	3-1/2
UDB-574139	UDB-574141	UDB-574143	#11	.1910	1/2	5/16	3-1/2
UDB-574145	UDB-574147	UDB-574149	#10	.1935	1/2	5/16	3-1/2
UDB-574241	UDB-574243	UDB-574245	D	.2460	1/2	5/16	3-1/2
UDB-575001	UDB-575003	UDB-575005	1/4	.2500	5/8	5/16	3-1/2
UDB-575079	UDB-575081	UDB-575083	5/16	.3125	5/8	5/16	3-1/2
UDB-575145	UDB-575147	UDB-575149	3/8	.3750	5/8	5/16	3-1/2
UDB-575199	UDB-575201	UDB-575203	7/16	.4375	5/8	5/16	3-1/2
UDB-575223	UDB-575225	UDB-575227	1/2	.5000	5/8	5/16	3-1/2
LENGTH = 4	LENGTH = 6	LENGTH = 8					
UDB-576043	UDB-576045	UDB-576047	5/8	.6250	7/8	3/8	3-1/2
UDB-576091	UDB-576093	UDB-576095	3/4	.7500	7/8	3/8	3-1/2
UDB-576139	UDB-576141	UDB-576143	7/8	.8750	1-1/4	3/8	3-1/2
UDB-576187	UDB-576189	UDB-576191	1	1.0000	1-1/4	3/8	3-1/2

CLAMPING PIN



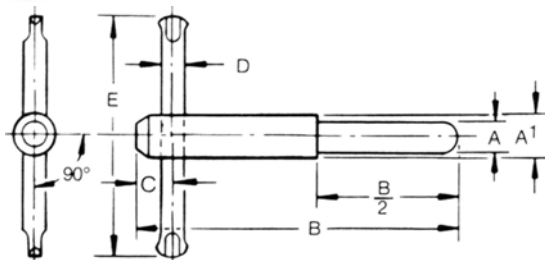
- Used for clamping various thicknesses of material by adjusting the Collar or Bushing and brazing it in position.
- Will hold multiple layers of material.
- Hardened and precisely ground — Black Oxide finish

UNITED PART NO.	A +.000 -.003	B +.06	C ± .06	D ± .025	E ± .025	F ± .062	G +.002 -.000	H THD
UDB-579200	.193	3.0	1.50	1/4	3/8	1/2	.203	10-24
UDB-579201	.249	4.0	2.5	3/8	1/2	1/2	.252	1/4-20
UDB-579203	.312	4.0	3.0	7/16	9/16	1/2	.315	5/16-18
UDB-579205	.374	4.5	3.5	1/2	5/8	1/2	.378	3/8-16
UDB-579207	.499	5.0	3.5	5/8	3/4	1/2	.503	1/2-13
UDB-579209	.499	7.0	3.5	5/8	3/4	1/2	.503	1/2-13
UDB-579210	.624	5.5	3.5	7/8	7/8	1/2	.628	5/8-11
UDB-579212	.749	6.0	3.5	7/8	1	1/2	.753	3/4-10

SLIDING HANDLE T- PIN



T-PINS UDB-703645 thru UDB-703690 are straight, so $A^1 = A$.



UNITED PART NO.	A +.0000 -.0010	A¹	B ± 1/16	C ± 1/16	D ± .007	E ± 1/16
UDB-703601	.1562	.3750	3-1/2	3/8	3/16	2
UDB-703605	.1875	.3750	4	3/8	3/16	2
UDB-703610	.1875	.3750	6	3/8	3/16	2
UDB-703615	.1910	.3750	4	3/8	3/16	2
UDB-703620	.1910	.3750	6	3/8	3/16	2
UDB-703625	.2500	.3750	4	3/8	3/16	2-1/2
UDB-703630	.2500	.3750	6	3/8	3/16	2-1/2
UDB-703635	.3125	.3750	4	3/8	3/16	3
UDB-703640	.3125	.3750	6	3/8	3/16	3
UDB-703645	.3750	.3750	5	3/8	3/16	3
UDB-703647	.3750	.3750	6	3/8	3/16	3
UDB-703650	.3750	.3750	7	3/8	3/16	3
UDB-703655	.4375	.4375	5	3/8	7/32	3
UDB-703660	.4375	.4375	7	3/8	7/32	3
UDB-703664	.5000	.5000	6	3/8	1/4	3
UDB-703665	.5000	.5000	7	3/8	1/4	3
UDB-703670	.5000	.5000	9	3/8	1/4	3
UDB-703680	.6250	.6250	8	1/2	3/8	3
UDB-703689	.7500	.7500	6	1/2	7/16	3
UDB-703690	.7500	.7500	8	1/2	7/16	3

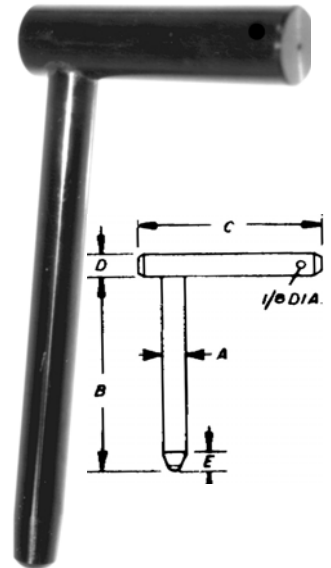
With Alignment

L and T Pins

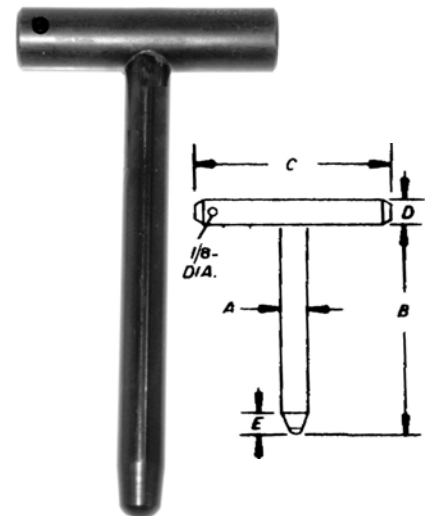
L and T Pins

UNITED's L and T Pins align precisely and remove easily in jigs and fixtures. Determine your working area and select the appropriate L or T Pin. Order an optional cable installed to connect your Pin to the jig or fixture. Special Pin diameters available to 2-1/2 inches. Plain Pin available for use where handle is an obstruction. Heat Treated Steel — Black Oxide Finish. Refer to Pages D14-D16 for cables.

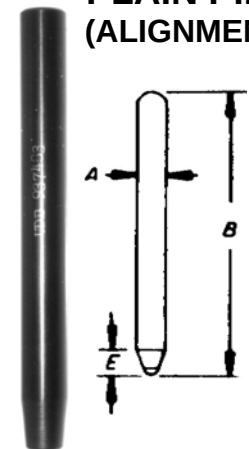
L-PINS



T-PINS



PLAIN PINS (ALIGNMENT)



L-PIN PART NO.	T-PIN PART NO.	PLAIN PIN PART NO.	A +0000 -0005	B	C	D	E	NOMINAL SIZE
UDB-937010	UDB-937210	UDB-937410	.1250	2-1/2	1-1/2	1/4	1/4	1/8
UDB-937012	UDB-937212	UDB-937412	.1562	3-1/2	2-1/2	5/16	1/4	5/32
UDB-937012A			.1855	4	2-1/2	5/16	1/4	#13
UDB-937013		UDB-937413	.1860	2-1/2	2-1/2	5/16	1/4	#13
UDB-937014		UDB-937414	.1860	5	2-1/2	5/16	1/4	#13
UDB-937015	UDB-937215	UDB-937415	.1875	3	2-1/2	5/16	1/4	3/16
UDB-937017	UDB-937217	UDB-937417	.1875	4	2-1/2	5/16	1/4	3/16
UDB-937020	UDB-937220	UDB-937420	.1875	6	2-1/2	5/16	1/4	3/16
UDB-937022		UDB-937422	.1895	2-1/2	2-1/2	5/16	1/4	#12
UDB-937021			.1890	4	2-1/2	5/16	1/4	#12
UDB-937023		UDB-937423	.1895	5	2-1/2	5/16	1/4	#12
UDB-937025	UDB-937225	UDB-937425	.1910	3	2-1/2	5/16	1/4	#11
UDB-937027	UDB-937227	UDB-937427	.1910	4	2-1/2	5/16	1/4	#11
UDB-937030	UDB-937230	UDB-937430	.1910	6	2-1/2	5/16	1/4	#11
UDB-937032	UDB-937232	UDB-937432	.1925	3	2-1/2	5/16	1/4	#10
UDB-937035	UDB-937235	UDB-937435	.1960	3	2-1/2	5/16	1/4	#9
UDB-937036			.2480	4	2-1/2	3/8	3/8	1/4
UDB-937037		UDB-937437	.2485	2-1/2	2-1/2	3/8	3/8	1/4
UDB-937038		UDB-937438	.2485	5	2-1/2	3/8	3/8	1/4
UDB-937039	UDB-937239	UDB-937439	.2500	2	2-1/2	3/8	3/8	1/4
UDB-937040	UDB-937240	UDB-937440	.2500	3	2-1/2	3/8	3/8	1/4
UDB-937041	UDB-937241	UDB-937441	.2500	4	2-1/2	3/8	3/8	1/4
UDB-937045	UDB-937245	UDB-937445	.2500	6	2-1/2	3/8	3/8	1/4
UDB-937047			.2550	4	2-1/2	3/8	3/8	F
UDB-937050	UDB-937250	UDB-937450	.2570	3	2-1/2	3/8	3/8	F
UDB-937051	UDB-937251	UDB-937451	.2570	4	2-1/2	3/8	3/8	F
UDB-937051A			.2750	4	2-1/2	3/8	3/8	J
UDB-937051B			.3105	4	2-1/2	3/8	3/8	5/16
UDB-937052		UDB-937452	.3110	2-1/2	2-1/2	3/8	3/8	5/16
UDB-937053		UDB-937453	.3110	5	2-1/2	3/8	3/8	5/16
UDB-937054	UDB-937254	UDB-937454	.3125	2	3	7/16	1/2	5/16
UDB-937055	UDB-937255	UDB-937455	.3125	3-1/2	3	7/16	1/2	5/16
UDB-937057	UDB-937257	UDB-937457	.3125	4	3	7/16	1/2	5/16
UDB-937060	UDB-937260	UDB-937460	.3125	6	3	7/16	1/2	5/16
UDB-937061A			.3730	4	3-1/2	1/2	1/2	3/8
UDB-937061		UDB-937461	.3735	3	3-1/2	1/2	1/2	3/8
UDB-937062		UDB-937462	.3735	5	3-1/2	1/2	1/2	3/8
UDB-937063	UDB-937263	UDB-937463	.3750	3	3-1/2	1/2	1/2	3/8
UDB-937065	UDB-937265	UDB-937465	.3750	4	3-1/2	1/2	1/2	3/8
UDB-937067	UDB-937267	UDB-937267	.3750	5	3-1/2	1/2	1/2	3/8
UDB-937070	UDB-937270	UDB-937470	.3750	6	3-1/2	1/2	1/2	3/8
UDB-937071	UDB-937271	UDB-937471	.3750	7	3-1/2	1/2	1/2	3/8
UDB-937072			.4355	4	3-1/2	9/16	1/2	7/16
UDB-937073		UDB-937473	.4360	5	3-1/2	9/16	1/2	7/16
UDB-937075	UDB-937275	UDB-937475	.4375	4	3-1/2	9/16	1/2	7/16
UDB-937077	UDB-937277	UDB-937477	.4375	5	3-1/2	9/16	1/2	7/16
UDB-937080	UDB-937280	UDB-937480	.4375	6	3-1/2	9/16	1/2	7/16
UDB-937081	UDB-937281	UDB-937481	.4375	7	3-1/2	9/16	1/2	7/16
UDB-937082			.4980	4	3-1/2	5/8	5/8	1/2
UDB-937083		UDB-937483	.4985	4-1/2	3-1/2	5/8	5/8	1/2
UDB-937084		UDB-937484	.4985	7	3-1/2	5/8	5/8	1/2
UDB-937085	UDB-937285	UDB-937485	.5000	4	3-1/2	5/8	5/8	1/2
UDB-937090	UDB-937290	UDB-937490	.5000	6	3-1/2	5/8	5/8	1/2
UDB-937091	UDB-937291	UDB-937491	.5000	7	3-1/2	5/8	5/8	1/2
UDB-937093	UDB-937293	UDB-937493	.5000	9	3-1/2	5/8	5/8	1/2
UDB-937095	UDB-937295	UDB-937495	.5625	4	3-1/2	5/8	5/8	9/16
UDB-937100	UDB-937300	UDB-937500	.5625	6	3-1/2	5/8	5/8	9/16
UDB-937103		UDB-937503	.6235	5	3-1/2	7/8	3/4	5/8
UDB-937103A			.6230	6	3-1/2	7/8	3/4	5/8
UDB-937104		UDB-937504	.6235	7	3-1/2	7/8	3/4	5/8
UDB-937105	UDB-937305	UDB-937505	.6250	6	3-1/2	7/8	3/4	5/8
UDB-937107	UDB-937307	UDB-937507	.6250	8	3-1/2	7/8	3/4	5/8
UDB-937108			.7480	6	3-1/2	7/8	3/4	3/4
UDB-937109		UDB-937509	.7485	8	3-1/2	7/8	3/4	3/4
UDB-937110	UDB-937310	UDB-937510	.7500	6	3-1/2	7/8	3/4	3/4
UDB-937113	UDB-937313	UDB-937513	.7500	8	3-1/2	7/8	3/4	3/4

Lock Pins and Bushings

Lock Pin Threaded Clamp Pins & Pin & Bushing Assemblies

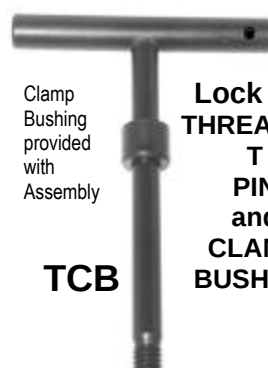
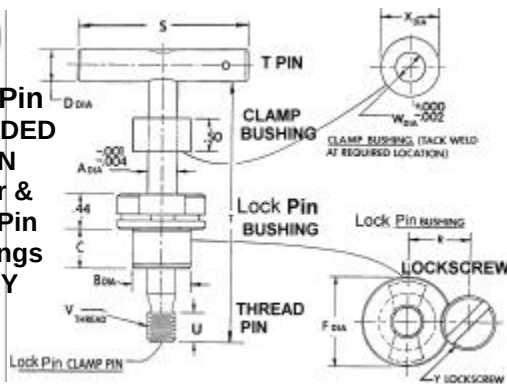
ACCURATE - TOUGH - HARDENED and GROUND - BLACK OXIDE FINISH



Clamp Bushing provided with Assembly

TCBA

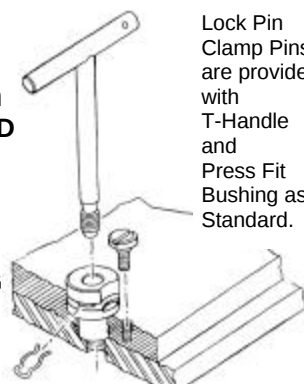
Lock Pin
THREADED
T PIN
Collar &
Lock Pin
Bushings
ASSY



Clamp Bushing provided with Assembly

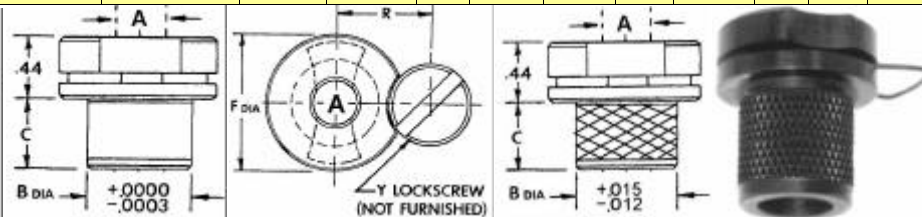
TCB

Lock Pin
THREADED
T PIN
and
CLAMP
BUSHING



Lock Pin Clamp Pins are provided with T-Handle and Press Fit Bushing as Standard.

Lock Pin CLAMP PINS			PIN DIA.	BUSH. O.D.	BUSH. I.D.	HANDLE DIA.	BUSH. HD	DIM. RA-	HANDLE LEN	PIN LEN	CLAMP BUSH O.D.	CLAMP BUSH I.D.	NC THD	THRD LEN	SPRING	LOCK SCRE
T PIN THREAD	T PIN & CLAMP	LOCK PIN-	A NOM. .001	B +.0000	C	D	F	R	S	T	X	W	V	U	X	Y NOT
UDB-939802-TCBA	UDB-939802-TCB	UDB-936559-B	.2500	.4078	.31	.38	.812	.62	2.5	4.0	.50	.252	1/4-20	.25	SR-2	LS-1
UDB-939806-TCBA	UDB-939806-TCB	UDB-936561-B			.50											
UDB-939812-TCBA	UDB-939812-TCB	UDB-936569-B			.31											
UDB-939814-TCBA	UDB-939814-TCB	UDB-936571-B	.3125	.5017	.38	.43	.812	.62	3.0	4.0	.56	.315	5/16-18	.31	SR-3	LS-1
UDB-939816-TCBA	UDB-939816-TCB	UDB-936573-B			.50											
UDB-939822-TCBA	UDB-939822-TCB	UDB-936579-B	.3750	.6267	.31	.50	.812	.62	3.5	4.5	.62	.378	3/8-16	.38	SR-4	LS-1
UDB-939826-TCBA	UDB-939826-TCB	UDB-936581-B			.50											
UDB-939834-TCBA	UDB-939834-TCB	UDB-936587-B	.5000	.7518	.50	.62	1.060	.75	3.5	5.0	.75	.503	1/2-13	.50	SR-5	LS-1
UDB-939836-TCBA	UDB-939836-TCB	UDB-936589-B			.75											



Lock Pin- 'BN' BUSHINGS are KNURLED for PLASTIC ADD 'N' to BUSHING for KNURLED O.D. for PLASTIC TOOLING

Lock Pin - 'B' BUSHINGS are STANDARD PRESS FIT

Lock Pin T PIN & BUSHING ASSY FEATURES:

- 1 Positive Pin retention even when inverted
- 2 No chains or cables required
- 3 Component parts easily replaced if worn or broken
- 4 The Pin End positioned inside the bushing clears the work piece when loading or unloading.

Lock Pin BUSHINGS: 'B' PRESS FIT — 'BN' for PLASTIC, POTTED

ALL BUSHINGS PROVIDED WITH SPRING RETAINERS

NOM PIN	ACTUAL PIN	BUSHING PART NO.	A I.D. +.0004 .0000	B O.D. +.0000 .0003	C LEN	F HD O.D.	R DIM	NOM PIN	ACTUAL PIN	BUSHING PART NO.	A I.D. +.0004 .0000	B O.D. +.0000 .0003	C LEN	F HD O.D.	R DIM
3/16	.1865	UDB-936551-B	.1868	.4078	.31	.81	.62	3/8	.3740	UDB-936575-B	.3743	.6267	.31	.81	.62
3/16	.1875	UDB-936553-B	.1878					3/8	.3740	UDB-936577-B			.50		
1/4	.2490	UDB-936555-B	.2493	.4078	.31	.81	.62	3/8	.3750	UDB-936579-B	.3753	.6267	.31	.81	.62
1/4	.2490	UDB-936557-B			.50			3/8	.3750	UDB-936581-B			.50		
1/4	.2500	UDB-936559-B	.2503	.4078	.31	.81	.62	1/2	.4990	UDB-936583-B	.4993	.7518	.50	1.06	.75
1/4	.2500	UDB-936561-B			.50			1/2	.4990	UDB-936585-B			.75		
5/16	.3115	UDB-936563-B			.31			1/2	.5000	UDB-936587-B	.5003	.7518	.50	1.06	.75
5/16	.3115	UDB-936565-B	.3118	.5017	.38	.81	.62	1/2	.5000	UDB-936589-B			.75		
5/16	.3115	UDB-936567-B			.50			3/4	.7480	UDB-936591-B	.7483	1.0018	.75	1.42	.92
5/16	.3125	UDB-936569-B			.31			3/4	.7490	UDB-936593-B	.7493		.75		
5/16	.3125	UDB-936571-B	.3128	.5017	.38	.81	.62	1	.9980	UDB-936595-B	.9983	1.3772	1.00	1.81	1.11
5/16	.3125	UDB-936573-B			.50			1	.9990	UDB-936597-B	.9993		1.00		

If Slip Fit Bushings (nominal -.0002) are required, specify 'B-SF' with Part Number.

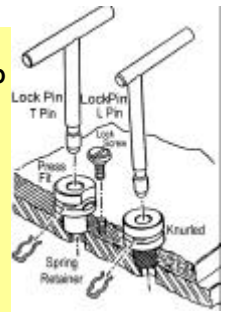
Clamp Pins and Assemblies

When Lock Pins are retracted inside the Lock Pin Bushing, the Spring Retainer positively locks in the pin's groove. The Lock Pin stays in fixture and can't get lost! Lock Pins hold position without cables or chains until they are changed. Special two-action Lock Pins are available on request.

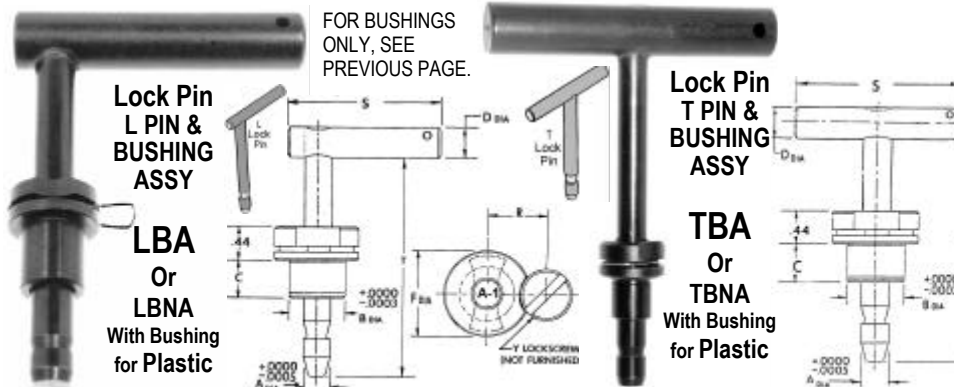
Lock Pin Assemblies

Lock Pins and Bushings conform to nearly every standard from Boeing UT-7039E-G-H to MDC-TD CTS-110C-D and Lockheed-GD DS-613-614.

Manufactured from high quality heat treated steel with corrosion resistant black oxide finish.



Standard metal tooling bushing is Press Fit. Slip Fit available on request. Bushing I.D.s are +.0001 +.0005 (A-1).

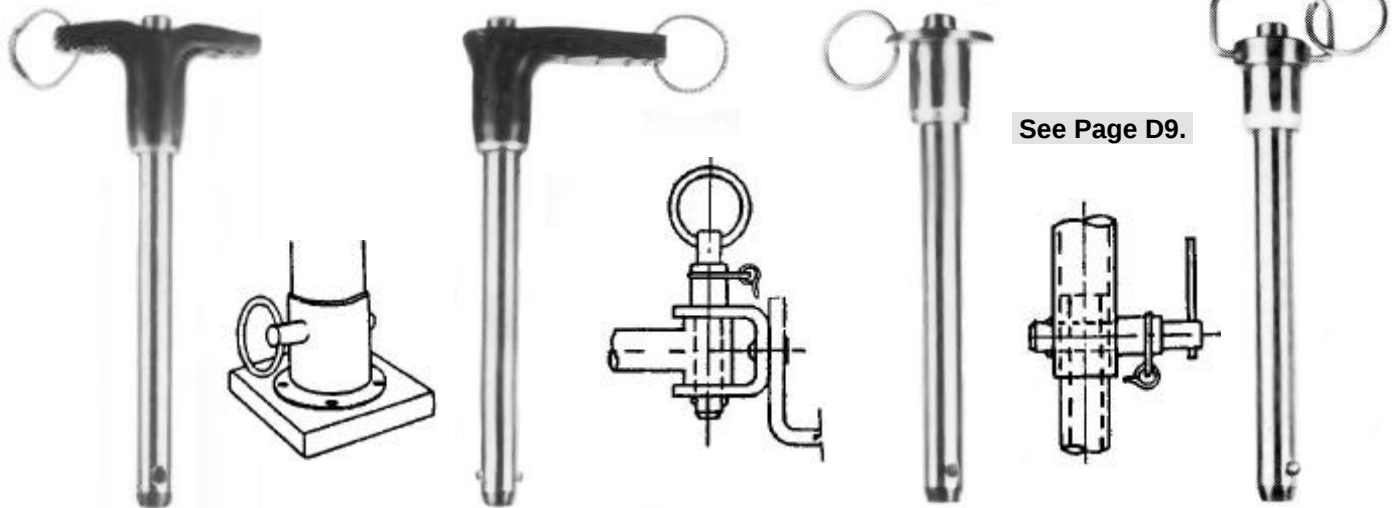


L PIN & BUSH ASSEMBLY (ADD BUSHING LENGTH)	L LOCK PIN ONLY	T PIN & BUSH ASSEMBLY (ADD BUSHING LENGTH)	T LOCK PIN ONLY	(SAME FOR L or T) BUSHING ONLY (ADD N FOR PLASTIC)	PIN O.D. .0005 A	BUSH I.D. +.0004 A-1	BUSH O.D. B +.0000 .0003	BUSH LENGTH C	HANDLE O.D. D	HEAD DIA F	RADIUS R	HANDLE LENGTH S	PIN LENGTH T	SPRING RET R X	LOCK SCRW Y
UDB-938806-LBA	UDB-938806-L	UDB-939006-TBA	UDB-939006-T	ADD BUSHING LENGTH TO ASSEMBLY NUMBER									1.5		
UDB-938808-LBA	UDB-938808-L	UDB-939008-TBA	UDB-939008-T	UDB-936551-B	.1865	.1868	.4078	.31	.31	.81	.62	2.5	3.0	SR-1	LS-1
UDB-938810-LBA	UDB-938810-L	UDB-939010-TBA	UDB-939010-T										6.0		
UDB-938812-LBA	UDB-938812-L	UDB-939012-TBA	UDB-939012-T	UDB-936553-B	.1875	.1878	.4078	.31	.31	.81	.62	2.5	2.0	SR-1	LS-1
UDB-938814-LBA	UDB-938814-L	UDB-939014-TBA	UDB-939014-T										4.0		
UDB-938820-LBA	UDB-938820-L	UDB-939020-TBA	UDB-939020-T										2.0		
UDB-938822-LBA	UDB-938822-L	UDB-939022-TBA	UDB-939022-T	UDB-936555-B	.2490	.2493	.4078	.31	.38	.81	.62	2.5	3.0	SR-2	LS-1
UDB-938824-LBA	UDB-938824-L	UDB-939024-TBA	UDB-939024-T	UDB-936557-B				.50					4.0		
UDB-938826-LBA	UDB-938826-L	UDB-939026-TBA	UDB-939026-T										6.0		
UDB-938828-LBA	UDB-938828-L	UDB-939028-TBA	UDB-939028-T	UDB-936559-B	.2500	.2503	.4078	.31	.38	.81	.62	2.5	2.0	SR-2	LS-1
UDB-938830-LBA	UDB-938830-L	UDB-939030-TBA	UDB-939030-T	UDB-936561-B				.50					4.0		
UDB-938836-LBA	UDB-938836-L	UDB-939036-TBA	UDB-939036-T										2.0		
UDB-938838-LBA	UDB-938838-L	UDB-939038-TBA	UDB-939038-T	UDB-936563-B				.31					3.5		
UDB-938840-LBA	UDB-938840-L	UDB-939040-TBA	UDB-939040-T	UDB-936565-B	.3115	.3118	.5017	.38	.44	.81	.62	2.5	4.0	SR-3	LS-1
UDB-938842-LBA	UDB-938842-L	UDB-939042-TBA	UDB-939042-T	UDB-936567-B				.50					6.0		
UDB-938844-LBA	UDB-938844-L	UDB-939044-TBA	UDB-939044-T										7.0		
UDB-938846-LBA	UDB-938846-L	UDB-939046-TBA	UDB-939046-T	UDB-936569-B	.3125	.3128	.5017	.31	.44	.81	.62	2.5	2.0	SR-3	LS-1
UDB-938848-LBA	UDB-938848-L	UDB-939048-TBA	UDB-939048-T	UDB-936571-B				.38					4.0		
				UDB-936573-B				.50							
UDB-938854-LBA	UDB-938854-L	UDB-939054-TBA	UDB-939054-T	UDB-936575-B				.31					2.0		
UDB-938856-LBA	UDB-938856-L	UDB-939056-TBA	UDB-939056-T	UDB-936577-B	.3740	.3743	.6267	.50	.50	.81	.62	3.5	4.0	SR-5	LS-1
UDB-938858-LBA	UDB-938858-L	UDB-939058-TBA	UDB-939058-T										6.0		
UDB-938860-LBA	UDB-938860-L	UDB-939060-TBA	UDB-939060-T	UDB-936579-B	.3750	.3753	.6267	.31	.50	.81	.62	3.5	2.0	SR-5	LS-1
UDB-938862-LBA	UDB-938862-L	UDB-939062-TBA	UDB-939062-T	UDB-936581-B				.50					4.0		
UDB-938868-LBA	UDB-938868-L	UDB-939068-TBA	UDB-939068-T	UDB-936583-B				.50					2.0		
UDB-938870-LBA	UDB-938870-L	UDB-939070-TBA	UDB-939070-T	UDB-936585-B	.4990	.4993	.7518	.75	.63	1.06	.75	3.5	4.0	SR-6	LS-1
UDB-938872-LBA	UDB-938872-L	UDB-939072-TBA	UDB-939072-T										6.0		
UDB-938874-LBA	UDB-938874-L	UDB-939074-TBA	UDB-939074-T	UDB-936587-B	.5000	.5003	.7518	.50	.63	1.06	.75	3.5	4.0	SR-6	LS-1
				UDB-936589-B				.75							
UDB-938880-LBA	UDB-938880-L	UDB-939080-TBA	UDB-939080-T	UDB-936591-B	.7480	.7483	1.0018	.75	1.00	1.42	.92	3.5	6.0	SR-7	LS-1
UDB-938882-LBA	UDB-938882-L	UDB-939082-TBA	UDB-939082-T	UDB-936593-B	.7490	.7493	1.0018	.75	1.00	1.42	.92	3.5	4.0	SR-7	LS-1
UDB-938884-LBA	UDB-938884-L	UDB-939084-TBA	UDB-939084-T										6.0		
UDB-938890-LBA	UDB-938890-L	UDB-939090-TBA	UDB-939090-T	UDB-936595-B	.9980	.9983	1.3772	1.00	1.25	1.81	1.11	4.0	8.0	SR-8	LS-1
UDB-938892-LBA	UDB-938892-L	UDB-939092-TBA	UDB-939092-T	UDB-936597-B	.9990	.9993	1.3772	1.00	1.25	1.81	1.11	4.0	6.0	SR-8	LS-1
UDB-938894-LBA	UDB-938894-L	UDB-939094-TBA	UDB-939094-T										8.0		

Ball Lock Pins

UNITED Single Acting Pins

BALL LOCK PINS



T-HANDLE

L-HANDLE

B-BUTTON HANDLE

R-RING HANDLE

UNITED'S STRONGER QUICK RELEASE BALL LOCK PINS

Features:

- Simple
- Safe
- Economical
- Tough
- Fast
- Positive Locking
- Available in 3/16" to 1" sizes
- Eliminate Nuts and Bolts
- Meets all Military Specs
- Cast Aluminum Alloy Handles
- 4130 Heat Treated Alloy Steel Spindles and Shanks

L = L-Handle T = T-Handle
R = Ring Handle B = Button Handle

BALL LOCK PINS are used to temporarily replace nut and bolt combinations in high tensile strength applications. They are a *must* where fast assembly and take-down is required.

Tools are unnecessary for insertion and/or removal.

Styles T, L and B are inventoried with tough cast aluminum handles.

Style R ring handles are stocked in carbon steel.

AVAILABLE IN STAINLESS STEEL.
TO ORDER, SPECIFY S IN PART NO.

AVAILABLE WITH 1, 2 OR 4 BALLS.
STANDARD HAS 2 BALLS.
OTHERS ARE SPECIALS.

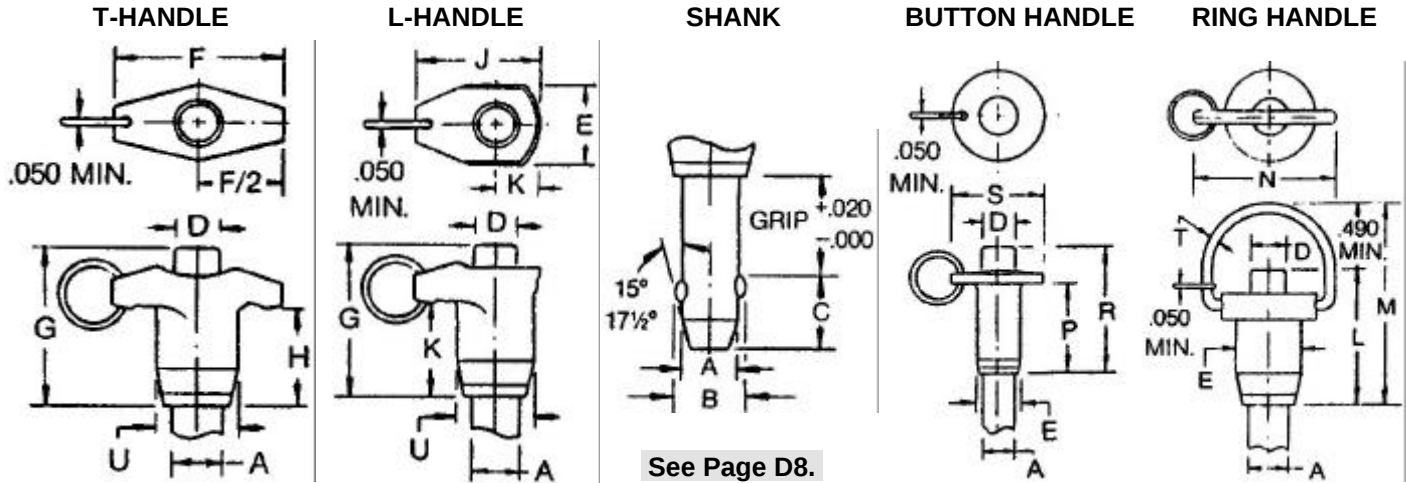
ORDERING EXAMPLE: **UDB - 12 - BLP - T - 2.5 - S - C**
 UNITED PREFIX —
 DIA in 1/16th's (3/4) —
 SINGLE ACTING —
 HANDLE STYLE —
 GRIP LENGTH —
 CRES —
 CABLE ATTACHMENT —

UNITED PART NO.	NOM. PIN DIA.	GRIP LENGTH IN INCHES — FOR PART NO. SUFFIX ABOVE — SEE ALSO PAGE D9.											
		1/2	1"	1-1/2	2"	2-1/2	3"	3-1/2	4"	4-1/2	5"	5-1/2	6"
UDB-3-BLP	3/16		-1.0		-2.0		-3.0		-4.0		-5.0		-6.0
UDB-4-BLP	1/4	-0.5	-1.0	-1.5	-2.0	-2.5	-3.0	-3.5	-4.0				
UDB-5-BLP	5/16		-1.0	-1.5	-2.0	-2.5	-3.0	-3.5	-4.0	-4.5	-5.0	-5.5	-6.0
UDB-6-BLP	3/8	-0.5	-1.0	-1.5	-2.0	-2.5	-3.0	-3.5	-4.0	-4.5	-5.0	-5.5	-6.0
UDB-7-BLP	7/16		-1.0		-2.0		-3.0		-4.0		-5.0		-6.0
UDB-8-BLP	1/2	-0.5	-1.0	-1.5	-2.0	-2.5	-3.0	-3.5	-4.0	-4.5	-5.0	-5.5	-6.0
UDB-9-BLP	9/16				-2.0		-3.0		-4.0		-5.0		-6.0
UDB-10-BLP	5/8				-2.0	-2.5	-3.0	-3.5	-4.0	-4.5	-5.0	-5.5	-6.0
UDB-12-BLP	3/4				-2.0	-2.5	-3.0	-3.5	-4.0	-4.5	-5.0	-5.5	-6.0
UDB-14-BLP	7/8						-3.0		-4.0		-5.0		-6.0
UDB-16-BLP	1"						-3.0		-4.0		-5.0		-6.0

UNITED Single Acting Pins

Ball Lock Pins

BALL LOCK PIN DIMENSIONS



NOM. PIN DIA.	A		B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	DOUBLE SHEAR IN POUNDS	
	MAX.	MIN.	±.005	MAX	MIN	MIN	MAX	MAX	MIN	MAX	MIN	MIN	MAX	MIN	MIN	MAX	MIN	MIN	MIN	STL	CRES
3/16	.1885	.1870	.220	.260	.250	.310	1.815	1.270	.800	1.800	.760	.730	1.450	1.060	.480	.830	.720	.105	.380	4,600	5,150
1/4	.2485	.2470	.289	.290	.250	.310	1.815	1.270	.800	1.800	.760	.730	1.500	1.060	.480	.830	.720	.105	.380	8,200	9,200
5/16	.3110	.3095	.375	.330	.250	.410	1.815	1.270	.800	1.800	.760	.830	1.650	1.060	.480	.930	.810	.105	.380	12,800	14,400
3/8	.3735	.3720	.440	.365	.300	.450	2.065	1.450	.850	2.030	.850	.940	1.650	1.060	.620	1.040	.875	.134	.510	18,400	20,600
7/16	.4360	.4345	.509	.380	.300	.550	2.065	1.470	.850	2.030	.850	.980	1.850	1.090	.620	1.160	.940	.134	.510	25,000	28,000
1/2	.4985	.4970	.594	.460	.435	.600	2.345	1.600	.885	2.360	.850	1.140	1.850	1.160	.720	1.190	1.300	.200	.630	32,800	36,800
9/16	.5610	.5595	.666	.510	.435	.680	2.345	1.600	.885	2.360	.850	1.140	2.030	1.160	.950	1.410	1.340	.200	.630	41,200	46,000
5/8	.6235	.6220	.750	.580	.450	.750	3.100	1.700	.980	3.070	.905	1.400	2.250	1.240	.950	1.500	1.530	.231	.810	51,200	57,000
3/4	.7485	.7470	.887	.670	.570	.865	3.100	1.720	1.030	3.070	.980	1.625	2.650	1.640	1.140	1.680	1.790	.231	.810	73,600	82,500
7/8	.8735	.8720	1.046	.760	.700	.980	3.520	2.170	1.310	3.700	1.200	1.875	3.000	1.640	1.270	1.985	2.120	.231	1.120	100,000	112,500
1"	.9985	.9970	1.219	.890	.750	1.175	3.520	2.170	1.310	3.700	1.200	2.000	3.100	1.640	1.490	2.140	2.120	.231	1.180	131,000	147,500

MATERIALS AND SPECIFICATIONS

PART	ALLOY STEEL	CORROSION RESISTANT
SHANK and SPINDLE	4130 Alloy Steel per MIL-T-6736 & MIL-S-6758	Corrosion resistant steel 17-4 PH per AMS 5643 or PH 15-7 MO per AMS 5657 or equivalent
BALLS	Corrosion resistant steel 440-C per QQ-S-763, Rc 58-62	Corrosion resistant steel 440-C per QQ-S-763, Rc 58-62
BUTTON	Carbon steel per QQ-S-637 or 2024 Aluminum alloy per QQ-A-225/5	Corrosion resistant steel 303 per ASTM-A581 or aluminum alloy 2024 per QQ-A-225/5
'B' BUTTON HANDLE	Steel per QQ-S-637 or 2024 Aluminum alloy per QQ-A-225/5	Corrosion resistant steel 303 per ASTM-A581 or aluminum alloy 2024 per QQ-A-225/5
'T' HANDLE	Aluminum alloy casting per QQ-A-591	Aluminum alloy casting per QQ-A-591
'L' HANDLE	Aluminum alloy casting per QQ-A-591	Aluminum alloy casting per QQ-A-591
'R' HANDLE RING	Corrosion resistant steel 302 per QQ-W-423 or music wire per QQ-W-470	Corrosion resistant steel 302 per QQ-W-423
'R' HANDLE (HEAD)	Steel per QQ-S-637 or 2024 Aluminum alloy per QQ-A-225/5	Corrosion resistant steel 303 per ASTM-A582 aluminum alloy 2024 per QQ-A-225/5
SPRING	Music wire per QQ-W-470	Corrosion resistant steel type 302 per QQ-W-423
Attaching LINK	Carbon steel wire per QQ-W-428 or corrosion resistant steel 302 per QQ-W-423	Corrosion resistant steel 302 per QQ-W-423

HEAT TREATMENT

Alloy Steel	Shank & spindle 160/000/180,000 PSI per MIL-H-6875
Corrosion	Shank & spindle 17-4 PH, 190,000 PSI. Min per AMS 5643; PH 15-7 MO, 180,000 PSI Min per AMS 5657
Resistant Steel	

PROTECTIVE TREATMENT

Carbon & Alloy steel	Cadmium plate per QQ-P-416, Type II, Class 2
Corrosion Resistant Steel	Passivate per QQ-P-35
Aluminum Alloy	Anodize per MIL-A-8625

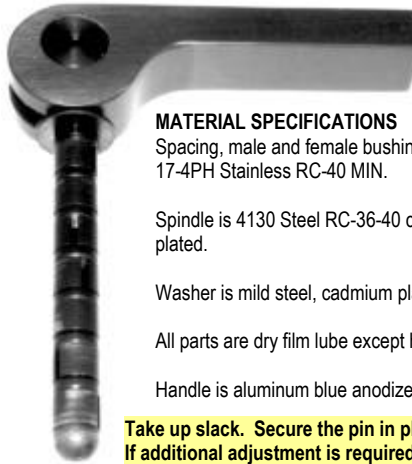
ORDERING EXAMPLE: UDB - 12 - BLP - T - 2.5 - S - C

UNITED PREFIX	_____
DIA in 1/16th's (3/4)	_____
SINGLE ACTING	_____
HANDLE STYLE	_____
GRIP LENGTH	_____
CRES	_____
CABLE ATTACHMENT	_____

Expanding Pins Adjustable Bushings

Adjustable Bushings Expanding Diameter Pins

EXPANDING DIAMETER PINS



MATERIAL SPECIFICATIONS

Spacing, male and female bushings are 17-4PH Stainless RC-40 MIN.

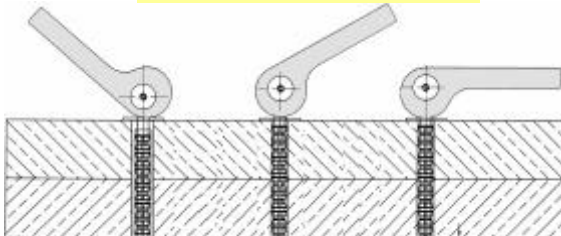
Spindle is 4130 Steel RC-36-40 cadmium plated.

Washer is mild steel, cadmium plated.

All parts are dry film lube except hex nut.

Handle is aluminum blue anodized.

Take up slack. Secure the pin in place. If additional adjustment is required, remove set screw and turn cam handle.



1 LOCATE 2 ADJUST 3 LOCK

Install loose to max length.

Spindle to protrude max thru hole.

Tighten and secure in place.

UNITED EXPANDING PINS and ADJUSTABLE BUSHINGS will expand up to .006 inches to tighten the hole into which it is inserted.

This is an assembly of split male and female bushings and spacers on a central spindle. They expand and contract together as the handle depresses and/or retracts.

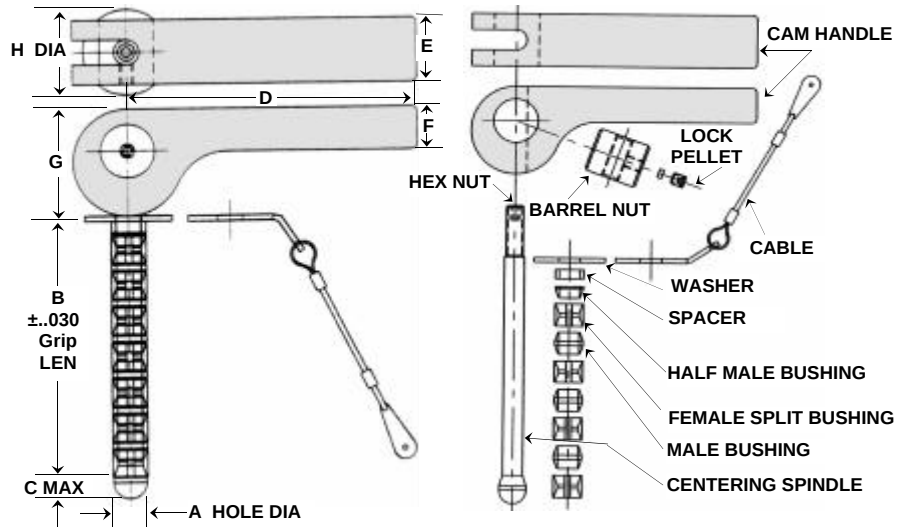
Expanding Pin has excellent shear strength. It is comparable to a solid pin.

Diameters of 1/4 to 1 inches are available from 1/2 to 4 inches in length. They install easily in blind or thru holes.

Socket in hex pin is for adjustment. Maximum length is total expanded bushing

All Split Bushings must be contained inside the hole before tightening.

CONFORMS TO UT-7043

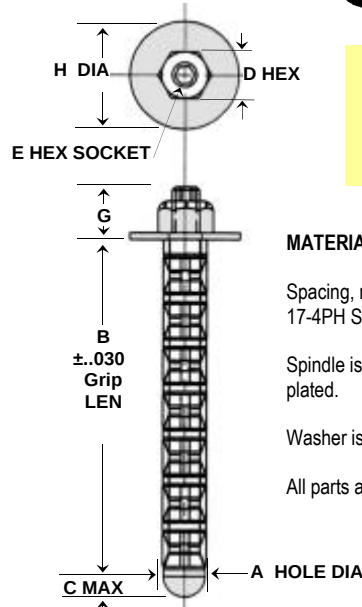
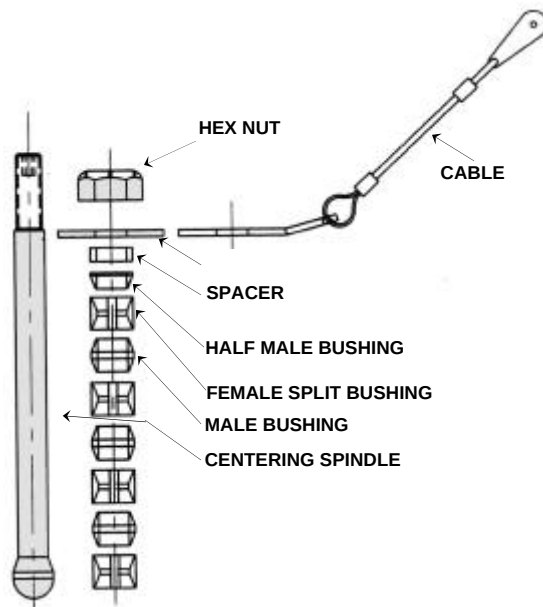


UNITED PART NO.	A DIA O.D NOM	A DIA MIN	A DIA MAX	B LEN	C PRO-TRUSION	D WIDTH	E	F	G	H DIA	DOUBLE SHEAR STRENGTH IN LBS.
UDB-EP-16-08				.50							
UDB-EP-16-12				.75							
UDB-EP-16-16	1/4	.250	.254	1.00	1/4	2-3/8	1/2	5/16	13/16	1/2	4,000
UDB-EP-16-24				1.50							
UDB-EP-16-32				2.00							
UDB-EP-16-48				3.00							
UDB-EP-20-16				1.00							
UDB-EP-20-32	5/16	.312	.317	2.00	5/16	3-1/4	5/8	1/2	1.31	7/8	6,300
UDB-EP-20-48				3.00							
UDB-EP-24-08				.50							
UDB-EP-24-12				.75							
UDB-EP-24-16	3/8	.375	.380	1.00	3/8	4-1/2	3/4	1/2	1.31	7/8	9,000
UDB-EP-24-24				1.50							
UDB-EP-24-32				2.00							
UDB-EP-24-48				3.00							
UDB-EP-32-08				.50							
UDB-EP-32-16				1.00							
UDB-EP-32-24	1/2	.500	.505	1.50	1/2	4-1/2	7/8	1/2	1.31	1"	16,100
UDB-EP-32-32				2.00							
UDB-EP-32-48				3.00							
UDB-EP-40-08				.50							
UDB-EP-40-16				1.00							
UDB-EP-40-24	5/8	.625	.630	1.50	5/8	4-1/2	1"	1/2	1.31	1-1/4	25,100
UDB-EP-40-32				2.00							
UDB-EP-40-48				3.00							
UDB-EP-48-16				1.00							
UDB-EP-48-32	3/4	.750	.757	2.00	3/4	6"	1-1/16	3/4	2.09	1-3/8	36,200
UDB-EP-48-48				3.00							
UDB-EP-48-64				4.00							
UDB-EP-64-16				1.00							
UDB-EP-64-32	1"	1.000	1.010	2.00	1"	8"	1-1/4	3/4	2.09	1-5/8	64,300
UDB-EP-64-48				3.00							
UDB-EP-64-64				4.00							

Hex Head Expanding Pins with Adjustable Dia. Bushings

UDB-EPH Expanding
Pin Hex Head

EXPANDING PIN



MATERIAL SPECIFICATIONS

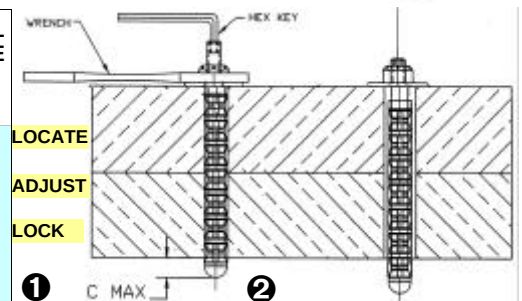
Spacing, male and female bushings are 17-4PH Stainless RC-40 MIN.

Spindle is 4130 Steel RC-36-40 cadmium plated.

Washer is mild steel, cadmium plated.

All parts are dry film lube except hex nut.

UNITED PART NO.	A DIA O.D NOM	A DIA MIN	A DIA MAX	B LEN	C PRO- TRUSION	D HEX NUT	E HEX SOCKET	G HEAD	H DIA WASHER	DOUBLE SHEAR STRENGTH IN LBS.	INSTALL TORQUE FT/LBS
UDB-EPH-16-08	1/4	.250	.254	.50	1/4	7/16	3/32	.39	.67	4,000	3
UDB-EPH-16-12				.75							
UDB-EPH-16-16				1.00							
UDB-EPH-16-24				1.50							
UDB-EPH-16-32				2.00							
UDB-EPH-16-48				3.00							
UDB-EPH-20-16	5/16	.312	.317	1.00	5/16	1/2	3/32	.40	.67	6,300	3
UDB-EPH-20-32				2.00							
UDB-EPH-20-48				3.00							
UDB-EPH-24-08	3/8	.375	.380	.50	3/8	9/16	3/16	.49	.67	9,000	7.5
UDB-EPH-24-12				.75							
UDB-EPH-24-16				1.00							
UDB-EPH-24-24				1.50							
UDB-EPH-24-32				2.00							
UDB-EPH-24-48				3.00							
UDB-EPH-32-08	1/2	.500	.505	.50	1/2	3/4	7/8	.71	.92	16,100	29
UDB-EPH-32-16				1.00							
UDB-EPH-32-24				1.50							
UDB-EPH-32-32				2.00							
UDB-EPH-32-48				3.00							
UDB-EPH-40-08	5/8	.625	.630	.50	5/8	15/16	1/4	.90	1.22	25,100	83
UDB-EPH-40-16				1.00							
UDB-EPH-40-24				1.50							
UDB-EPH-40-32				2.00							
UDB-EPH-40-48				3.00							
UDB-EPH-48-16	3/4	.750	.757	1.00	3/4	1-1/16	1/4	1.02	1.35	36,200	121
UDB-EPH-48-32				2.00							
UDB-EPH-48-48				3.00							
UDB-EPH-48-64				4.00							
UDB-EPH-64-16				1.00	1"	1-7/16	1/4	1.23	1.47	64,300	375
UDB-EPH-64-32	1"	1.000	1.010	2.00							
UDB-EPH-64-48				3.00							
UDB-EPH-64-64				4.00							



1. Install loose. Insert to max length. Adjust to pre-tighten position.
2. Hold Hex Key stationary in socket to tighten Hex Nut. Secure and expand up to .006.

UNITED HEX HEAD EXPANDING PINS with ADJUSTABLE DIAMETER BUSHINGS will expand up to .006 inches to tighten the hole into which it

This is an assembly of split male and female bushings and spacers on a central spindle. They expand and contract together as the handle depresses and

Expanding Pin has excellent shear strength. It is comparable to a solid

Diameters of 1/4 to 1 inches are available from 1/2 to 4 inches in length .

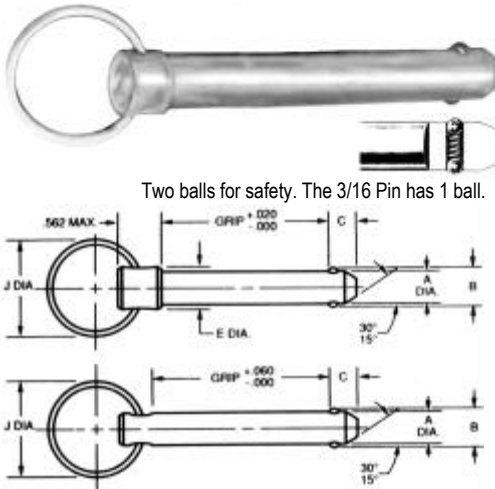
Socket in hex pin is for adjustment. Maximum length is total expanded

All Split Bushings must be contained inside the hole before tightening.

Detent Rings Cable Rings

Ball Lock Detent Pins Spring Loaded, Shoulder & Plain

DETENT PINS



Two balls for safety. The 3/16 Pin has 1 ball.

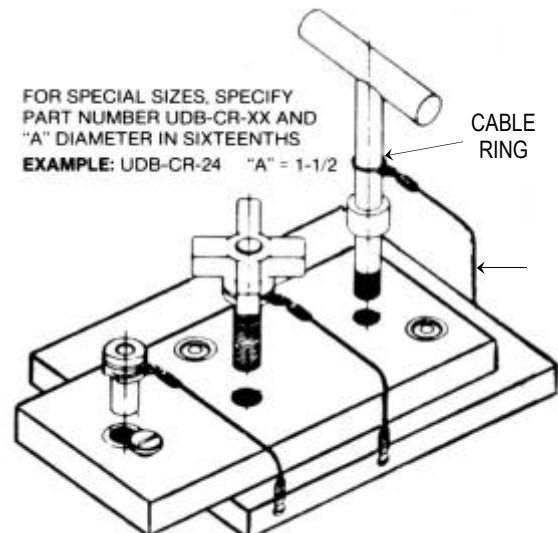
1. SHANKS: A-4130 CRM ALLOY STEEL PER MIL-8-6758 OR EQUAL M.T. TO 160-180,000 PSI
B-STRESSPROOF STEEL 125,000 PSI
S-303 STAINLESS STEEL 90,000 PSI
2. RINGS-302 STAINLESS STEEL
3. BALLS-440C STAINLESS STEEL PER QQ-S-763 RC 58-62
4. ACTUATOR-(300 SERIES CRES PER QQ-W-423 STD) ADD "R" FOR SILICONE RUBBER
5. CAD. PLATE ALL STEEL PARTS PER QQ-P-416 TYPE I OR II CLASS 3
6. #3 DIAMETER PIN HAS ONE BALL ONLY
7. SUBSTITUTE STYLES, MATERIALS, AND OR DIMENSIONS ON REQUEST

SAMPLE CALLOUT

UDB-4-BLP-4.1-S-R

- ACTUATOR MATERIAL ADD R FOR SILICONE RUBBER
- SHANK MATERIAL
- GRIP IN 1/10 INCHES
- SHANK DIAMETER IN 1/16's

AVAILABLE WITH ONE OR TWO BALLS-TWO BALLS STANDARD.
SPRING LOADED BALLS ALLOW PIN TO BE INSERTED IN HOLE, BUT
PREVENT PIN FROM FALLING OUT EVEN IN INVERTED POSITION.
AVAILABLE WITH DIAMETERS UP TO 4.0
STAINLESS STEEL PRICED AS SPECIAL

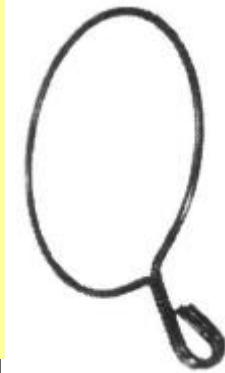


TYPICAL APPLICATION CABLE AND CABLE RINGS

'DEP' SUFFIXES: D FOR DETENT RING; S FOR SHOULDER; P FOR PLAIN

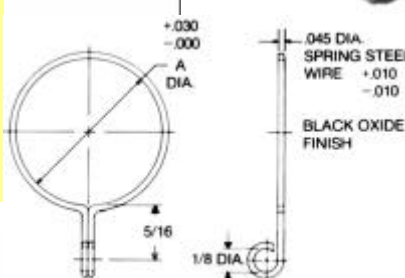
UNITED 'DEP' PART NO.	NOMINAL DIAMETER	A	+ .000 - .003	B MIN	C MAX	D NOM	E NOM	F NOM
UDB-3DEPX-XX	3/16	.1885		.200	.329	.312	1.000	.080
UDB-4DEPX-XX	1/4	.2480		.280	.344	.375	1.000	.080
UDB-5DEPX-XX	5/16	.3105		.360	.359	.438	1.000	.080
UDB-6DEPX-XX	3/8	.3735		.430	.390	.500	1.120	.093
UDB-7DEPX-XX	7/16	.4355		.495	.469	.563	1.120	.093
UDB-8DEPX-XX	1/2	.4980		.570	.516	.625	1.120	.093
UDB-9DEPX-XX	9/16	.5605		.645	.593	.688	1.120	.093
UDB-10DEPX-XX	5/8	.6230		.720	.762	.750	1.120	.093
UDB-12DEPX-XX	3/4	.7480		.860	.750	.875	1.620	.125
UDB-14DEPX-XX	7/8	.8730		1.100	.859	1.000	1.620	.125
UDB-16DEPX-XX	1"	.9980		1.160	.984	1.125	1.620	.125

CABLE RINGS

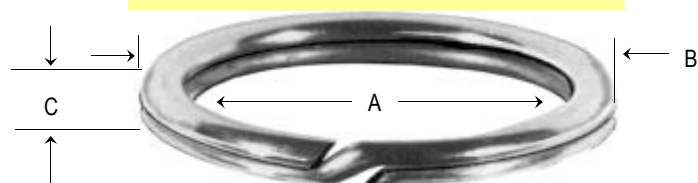


UNITED PART NO. (16ths)	A INCH DIAMETER	A METRIC DIAMETER
UDB-CR02	1/8	3 mm
UDB-CR03	3/16	4 & 5 mm
UDB-CR04	1/4	6 & 7 mm
UDB-CR05	5/16	8 mm
UDB-CR06	3/8	9 & 10 mm
UDB-CR07	7/16	11 mm
UDB-CR08	1/2	12 & 13 mm
UDB-CR09	9/16	14 & 15 mm
UDB-CR10	5/8	16 mm
UDB-CR11	11/16	17 & 18 mm
UDB-CR12	3/4	19 & 20 mm
UDB-CR13	13/16	21 mm

UNITED PART NO. (16ths)	A INCH DIAMETER	A METRIC DIAMETER
UDB-CR14	7/8	22 or 23 mm
UDB-CR15	15/16	24 mm
UDB-CR16	1"	25 & 26 mm
UDB-CR17	1-1/16	27 mm
UDB-CR18	1-1/8	28 & 29 mm
UDB-CR19	1-3/16	30 & 31 mm
UDB-CR20	1-1/4	32 mm
UDB-CR21	1-5/16	33 & 34 mm
UDB-CR22	1-3/8	35 mm
UDB-CR23	1-7/16	36 & 37 mm
UDB-CR24	1-1/2	38 mm



SPLIT KEY/TAG RINGS

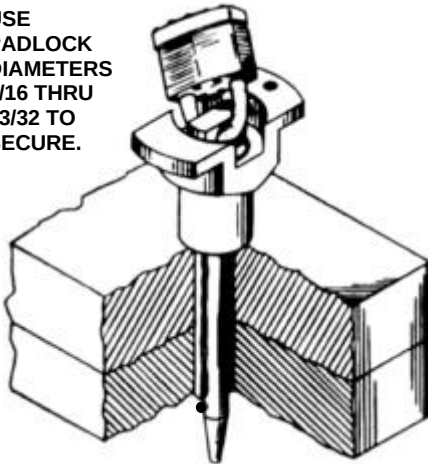


UNITED PART NO. ALLOY STEEL	UNITED PART NO. STAINLESS	A I. D.	B O. D.	C THICKNESS	WIRE SIZE
UDB-SR-08-AS	UDB-SR-08-SS	.526	.670	.105	.072
UDB-SR-12-AS	UDB-SR-12-SS	.802	.970	.110	.084
UDB-SR-16-AS	UDB-SR-16-SS	1.062	1.250	.130	.094
UDB-SR-20-AS	UDB-SR-20-SS	1.264	1.480	.142	.108
UDB-SR-26-AS	UDB-SR-26-SS	1.6355	1.865	.175	.115

UNITED Ball Lock Key Pin Assemblies

Ball Locking Key Pin Assemblies

USE
PADLOCK
DIAMETERS
5/16 THRU
13/32 TO
SECURE.



QUICK RELEASE SAFETY BALL LOCK KEY PINS

STAINLESS 300 SERIES BALLS, PIN, SPINDLE and
BUTTON. ALUMINUM HANDLE.

UDB-754400 Series

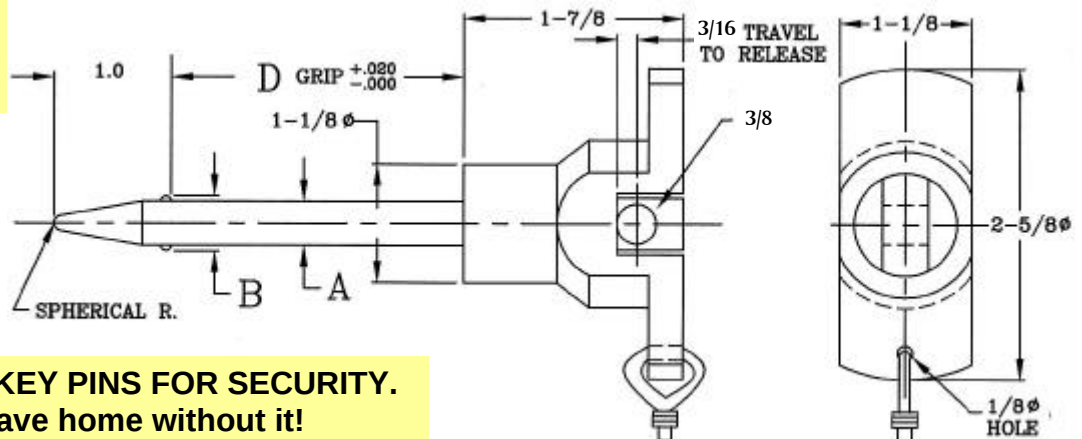
LOCKS IN PLACE WITH PAD LOCK AND KEY.
PREVENTS UNAUTHORIZED REMOVAL.

Shouldered Handle prevents accidental



Important!
Use 5/16 Ø MIN to 13/32
Ø MAX of Padlock
Diameter.

Refer to Section D,
Pages D18 and D19,
For specifications of
Cables, Rings, Tabs,
Flags and other
Accessories.



USE BALL LOCK KEY PINS FOR SECURITY.
You can't leave home without it!

Designed for holding fixtures in Transportation Racks, for Landing Gear Lock Down when the aircraft is grounded, and for their maintenance or storage.

For vehicle and automotive transport racking.

Used in boat security. Perfect for fence and gate security.

Used extensively for securing plant, motor and electric carts and multi-carts.

UNITED Quick Release Safety Ball Lock Key Pins provide industrial maintenance security.

ADD 'D' LENGTH TO PART NO. EXAMPLE: UDB-754406-4

Seven Diameters Available				Add 'D' Length to Part No.				D LENGTH $+.020$ INCHES XXX Standard Stocked Sizes. Other sizes available on request.											
BALL LOCK KEY PIN PART NO.	A DIA NOM.	A DIA ACTUAL MAX	A DIA ACTUAL MIN	B +.015	2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	6-1/2					
UDB-754406-xxx	3/8	.3745	.3730	.438	X		X		X		X		X						
UDB 754407-	7/16	.4360		.508	X		X		X		X		X						
UDB- -xxx	1/2		.4970	.592															
-754409 xxx		.5610	.5695		X		X		X		X		X						
UDB 754410-	5/8	.6235		.750															
-754412 xxx		.7485	.7470				X		X		X		X						
UDB- -xxx	7/8		.8720	1.044			X		X		X		X						

Cables and Assemblies

Cables and Accessories

Nylon Coated Galvanized Steel

#2 – #3 – #4

or Stainless.

Cut to length or per Cable Chart.

Please specify length in inches and tenths of an inch.

Length tolerances are $\pm 1/4"$ (up to 24").

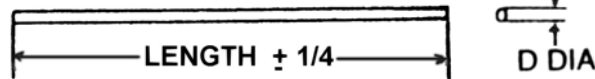
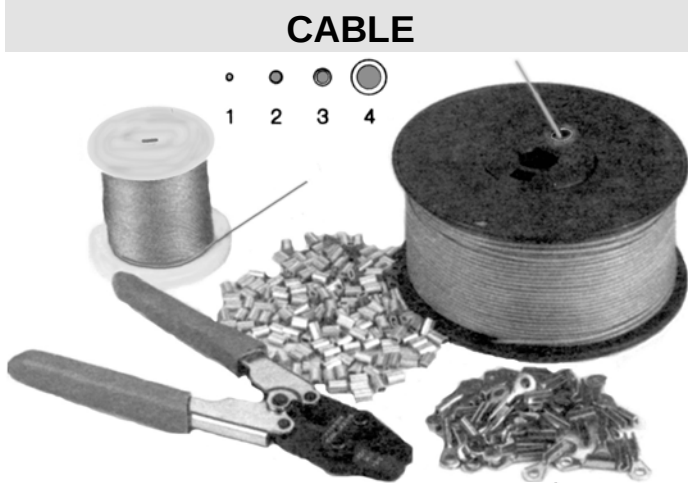
Four Diameters are available in Steel.

Stainless is Special Order.

Add 'SC' after Part No. for Stainless Cable: UDB-X-SC-XX.X

C = CABLE CA = CABLE ASSEMBLY

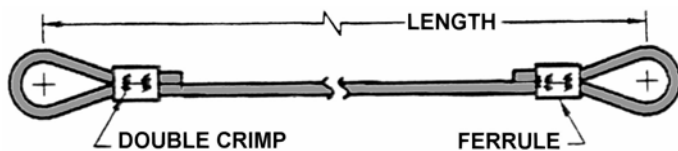
** 10 FEET OR 3 METERS MINIMUM LENGTH



UNITED
Strength
And
Longevity

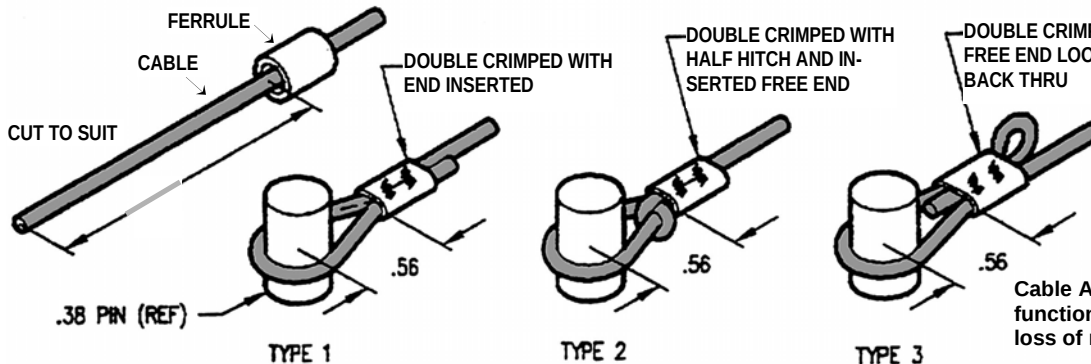
LENGTH INCHES	LENGTH METRIC	LENGTH FEET **	LENGTH METER **	1000 FT ROLLS	D DIA COATED	D DIA UNCOATED	CONSTRUC- TION	BREAKING STRENGTH - LBS
UDB-1-C-XX.X	UDB-1-C-XXX MM	UDB-1-C-XX FT	UDB-1-C-XX M	UDB-1-C- 1000 FT	.044	.024	1 x 7	80
UDB-2-C-XX.X	UDB-2-C-XXX MM	UDB-2-C-XX FT	UDB-2-C-XX M	UDB-2-C- 1000 FT	.062	.047	7 x 7	270
UDB-3-C-XX.X	UDB-3-C-XXX MM	UDB-3-C-XX FT	UDB-3-C-XX M	UDB-3-C- 1000 FT	.094	.062	7 x 7	480
UDB-4-C-XX.X	UDB-4-C-XXX MM	UDB-4-C-XX FT	UDB-4-C-XX M	UDB-4-C- 1000 FT	.187	.125	7 x 19	800

CA — CABLE ASSEMBLIES



STOCK CABLE ASSEMBLIES				BREAKING STRENGTH IN LBS	FERRULE SIZES		
ASSEMBLY PART NO.	LEN INCH	X LEN	CABLE		FERRULE PART NO.	ØA	ØB C
UDB-710108	8.0	3.8	.062 – .067	270	UDB-2F	.138	.213 .335
UDB-710112	12.0	3.8	.062 – .067	270	UDB-2F	.138	.213 .335
UDB-710118	18.0	4.0	.092 – .094	480	UDB-3F	.185	.276 .374
UDB-710124	24.0	4.0	.092 – .094	480	UDB-3F	.185	.276 .374
UDB-710136	36.0	4.0	.092 – .094	480	UDB-3F	.185	.276 .374

CABLE ASSEMBLY APPLICATIONS



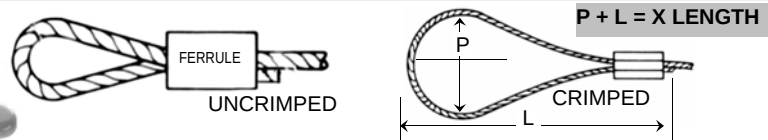
LENGTH IS
EQUAL TO FREE
LENGTH
BEFORE
ASSEMBLY.
See formula
below.

Cable Assemblies from stock. The function of cables is to prevent the loss of removable parts.

MANUAL CABLE CRIMPERS



UDB-CT-1



UNITED Cable Crimpers

Are designed for comfort and sure manual crimping. Measurements imprinted on Crimpers. Strong and Long Lasting. Use to crimp all ferrules on to nylon coated cables.

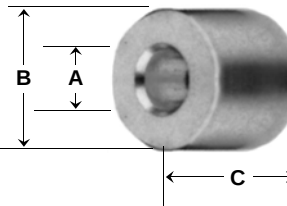
Ferrules, Terminals, S-Hooks, Attachment Rings, Cable Tabs

Ferrules – Terminals Tabs–Rings – S-Hooks

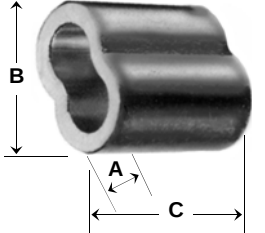
DOUBLE FERRULE	SINGLE FERRULE	CABLE DIA NOM. DECIMAL	FITS CABLE SPECIFY LEN	A I. D. ± .007 FD FIG 8- 2 HOLES	B O.D. ± .007 FD WIDE x HT	C LEN ± .020
	UDB-1-F	3/64 – .044	UDB-1-C-XX.X	.094	.154	.315
UDB-1-FD		3/64 – .044	UDB-1FD-C-XX.X	.055	.144 x.201	.390
	UDB-2-F	1/16 – .063	UDB-2-C-XX.X	.138	.213	.335
UDB-2-FD		1/16 – .063	UDB-2FD-C-XX.X	.070	.175 x.217	.375
	UDB-3-F	1/16 – .063	UDB-3-C-XX.X	.185	.276	.374
UDB-3-FD		3/32 – .094	UDB-3FD-C-XX.X	.070	.175 x.217	.375
	UDB-4-F	3/32 – .094	UDB-4-C-XX.X	.138	.213	.591
UDB-4-FD		1/16 – .063	UDB-4FD-C-XX.X	.121	.281 x.188	.501
	UDB-5-F	3/32 – .094	UDB-5-C-XX.X	.185	.276	.827
UDB-5-FD		3/32 – .094	UDB-5FD-C-XX.X	.121	.281 x.188	.501
	UDB-6-F	3/16 – .188	UDB-6-C-XX.X	.378	.520	1.260
UDB-6-FD		3/16 – .188	UDB-6FD-C-XX.X	.188	.352 x.564	.564

F – FD FERRULES

SINGLE FERRULES AND STOP SLEEVES



DOUBLE OR DUAL FERRULES



COPPER — ALUMINUM

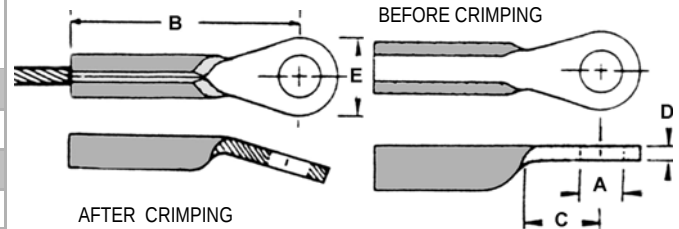
GREATER CRIMPING AREA

STEEL STAMPED MINIATURE EYE TERMINALS

TO MOUNT UNITED
CABLE ASSEMBLIES

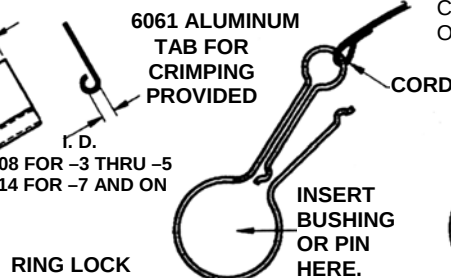
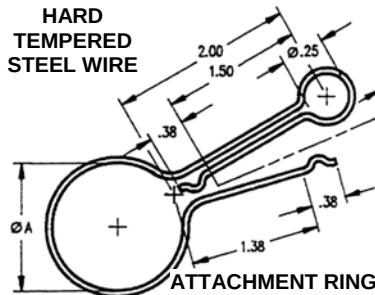
TERM EYE TERMINALS

TERMINAL PART NO.	FITS CABLE NOM ACTUAL	A DIA.	B FLANGE THICKNESS	C LENGTH EYE CENTER	D	E
UDB-TERM-1	3/64 – .044	.190	.716	.268	.063	.321
UDB-TERM-2	1/16 – .063	.260	.950	.335	.063	.439
UDB-TERM-3	3/32 – .094	.375	1.31	.450	.093	.750
UDB-TERM-4	3/16 – .188	.501	2.40	.490	.190	1.000



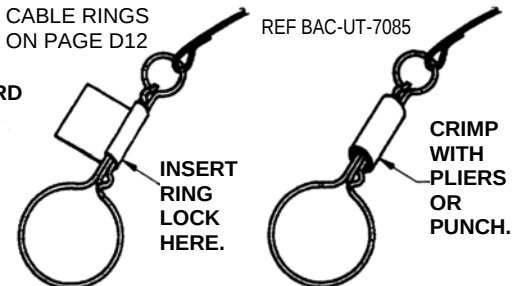
DESIGNED FOR USE ON SF BUSHINGS, L and T BALL LOCK PINS

AR ATTACHMENT RINGS



CABLE RINGS
ON PAGE D12

REF BAC-UT-7085



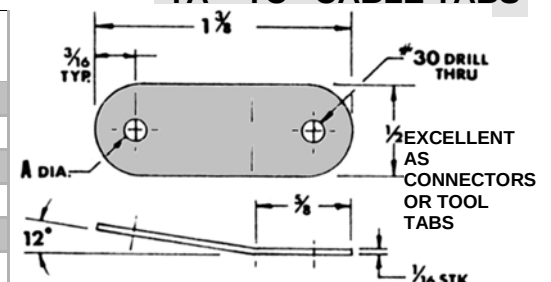
#6 TO #20 GAGE SIZE DEPENDENT

RING PART NO. (16ths)	ØA	RING PART NO. (16ths)	ØA
UDB-AR006	3/8	UDB-AR018	1-1/8
UDB-AR008	1/2	UDB-AR020	1-1/4
UDB-AR010	5/8	UDB-AR022	1-3/8
UDB-AR012	3/4	UDB-AR126	1-5/8
UDB-AR014	7/8	UDB-AR134	2-1/8
UDB-AR016	1"	UDB-AR142	2-5/8

ALUMINUM OR STAINLESS TABS

TAB PART NO.	MATERIAL	A OPEN HOLE DIA
UDB-TA-4	ALUM ALLOY	.130
UDB-TC-4	CRES 302	.130
UDB-TA-6	ALUM ALLOY	.195
UDB-TC-6	CRES 302	.195
UDB-TA-8	ALUM ALLOY	.281
UDB-TC-8	CRES 302	.281

TA – TC CABLE TABS



STEEL 'S' HOOKS TO ATTACH ACCESSORIES WITH LOW LOAD LIMITS

S-HOOK PART NO.	TRADE SIZE NUMBER	WIRE SIZE INCHES	INSIDE LEN INCHES	LBS PER 100 PIECES	LOAD LIMIT LBS	KGS.
UDB-20-SH	20	.080	27/32	5/16	16	7
UDB-21-SH	21	.080	11/16	1/4	16	7
UDB-40-SH	40	.134	1"	1"	42	19
UDB-72-SH	72	.225	1-1/2	4-3/4	130	59

NO. 40

SH S – HOOKS



NO. 21



NO. 20



DO NOT USE FOR OVERHEAD LIFTING.

UDB Cable Assemblies

Cable Assemblies

For material, types and sizes, see pages D12, D14 and D15.

UNITED Cable Assemblies are strong, efficient, flexible, economical! They prevent the loss of removable fixture parts. UDB Cables are light blue or clear nylon coated flexible stranded wire. We have eleven types of cable, four cable diameters and minimum cable assembly length is three inches. All cable assemblies are prefixed CA.

Type 1		Loop to fit. One end open.
Type 2		Loops to fit. Both ends.
Type 3		CR — Ring to fit. Other end open.
Type 4		CR — Ring to fit. Loop to fit other end.
Type 5		CR — Rings to fit. Both ends.
Type 6		AR — Ring to fit. Other end open.
Type 7		AR — Ring to fit. Loop to fit other end.
Type 8		AR — Rings to fit. Both ends.
Type 9		TRM — Terminals to fit. Other end open.
Type 10		TRM — Terminals to fit. Loop other end.
Type 11		TRM — Terminals to fit. Both ends.

UDB ORDERING EXAMPLE:



UDB — 11 — 2 — CA — 24.5 — TRM-2 — TA-4

Type Assembly _____
 Cable Size _____
 Cable Assembly _____
 Cable Length inches _____
 Left Ring Type and I. D. in 16ths _____
 or Right Ring Type and I. D. in 16ths _____
 Cable Tab Number _____
 Select Letter from one below: _____

L = Ferrule is to be left uncrimped on left end.
 R = Ferrule is to be left uncrimped on right end.
 LR = Ferrule is to be left uncrimped on left and right ends.

UNITED
OFFERS
THE
GREATEST
SELECTION
IN
CABLES AND
CABLING
ASSEMBLIES.

**YOU CAN
ORDER ANY
COMBINATION
YOU NEED!**

REFER TO PAGES
D12, D14, D15.

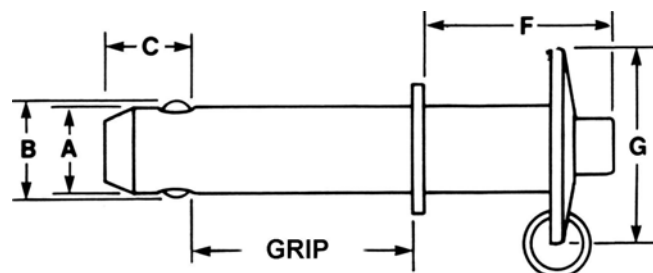
Positive Ball Lock Pins

QUICK RELEASE PUSH BUTTON FLANGE PINS

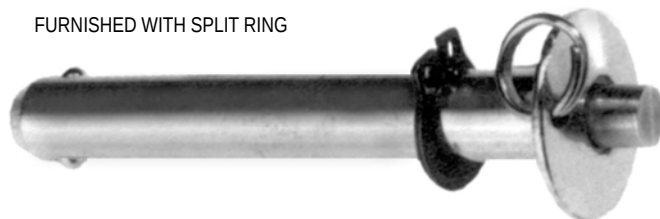
POSITIVE LOCK Flange Pins have a **PUSH BUTTON** that starts ball action or retraction. This locking design has **QUICK RELEASE** and **SECURE FASTENING**! The quick release allows ease of removal and the double ball action design maintains retention.

Positive Ball Lock Flange Pins

POSITIVE BALL LOCK FLANGE PINS



FURNISHED WITH SPLIT RING



UNITED BALL LOCK PINS WITH FLANGE — BLPF

This Unique Design incorporates a formed One-Piece Body and One-Piece Spindle.

Pin can be modified to shorter length by adding additional grooves and moving stop clip.

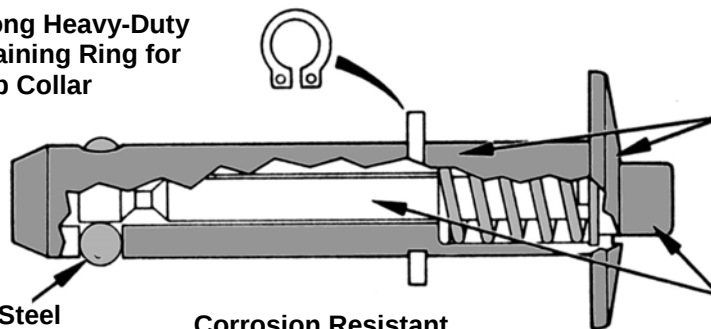
Strong Heavy-Duty Retaining Ring for Stop Collar

440C Stainless Steel Balls
Hardened to Rc 58-62

Corrosion Resistant
Zinc/Yellow Chromate
Finish

One-Piece Formed
Head and Body
Alloy Steel
Heat Treated

One-Piece Formed
Push Button and
Spindle



Heat Treated Alloy Steel for durability and long lasting strength with Zinc and Yellow Chromate finish. Other finishes available.

UNITED BLPF PART NO.	A DIA NOM.	A DIA ACTUAL	B BALL	C CHAM- FER	F	G	1/2	3/4	1"	1-1/4	1-1/2	1-3/4	2"	2-1/4	2-1/2	3"	3-1/4	4"	DOUBLE SHEAR LBS.
LENGTHS OF STANDARD STOCK SIZES																			
UDB-BLPF-4-X.XX	1/4	.2455 .2485	.294 .289	.312	.870	.700	X	X	X	X	X								8,200
UDB-BLPF-5-X.XX	5/16	.3080 .3110	.380 .325	.312	.870	.800			X	X	X	X	X						12,800
UDB-BLPF-6-X.XX	3/8	.3705 .3735	.445 .440	.375	.900	.860			X	X	X	X	X	X	X				18,400
UDB-BLPF-8-X.XX	1/2	.4955 .4985	.599 .594	.437	1.125	1.000				X	X	X	X	X	X	X	X		32,800

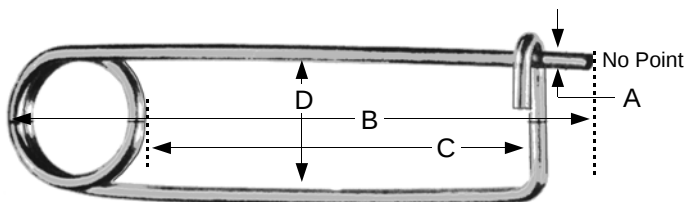
Safety Fast Pins

Safety Fast Pins

Unlimited Applications

SAFETY FAST PINS

Use for
Cord Holders, Metal Tag Holders,
Key Holders, Machine Tags, Job Identification Markers,
Tail Pins, Cable Pins, Cap Locks, Cover and Tarp Holders.

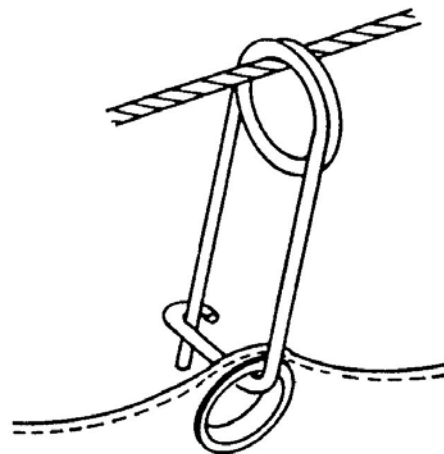
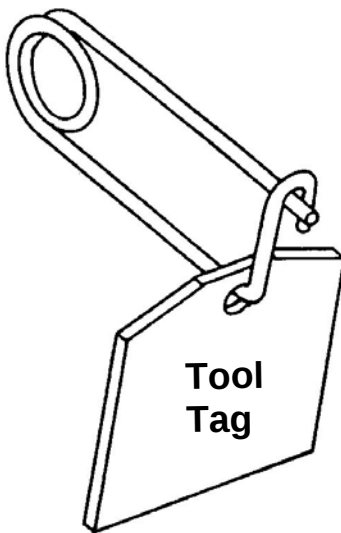
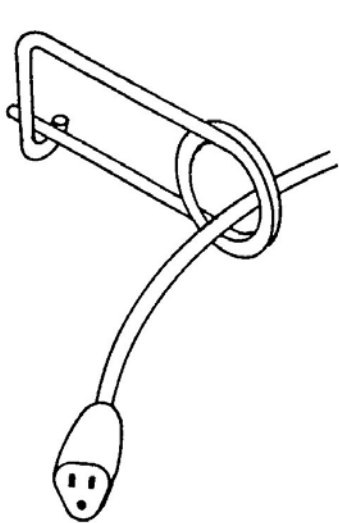


UNITED's Multi-Purpose Industrial Safety Pins satisfy most quick pinning requirements.

The large pins will couple a fork lift to a small trailer!
They help keep your electrical cords or hoses off the floor.

Send us your unique uses for these great pins.

Manufactured from durable spring steel and plated.



- **FAST**
- **SAFE**
- **STRONG**
- **LOW COST**

PART NO.	WIRE DIAMETER A	B	C	D
UDB-444401	.058	1-3/4	1-1/16	3/8
UDB-444402	.063	2-5/16	1-11/16	1/2
UDB-444403	.091	2-3/4	1-11/16	5/8
UDB-444404	.095	2-19/32	1-29/32	1/2
UDB-444405	.120	4-3/8	2-13/16	13/16
UDB-444406	.124	3-13/16	2-11/16	7/8
UDB-444407	.148	5-3/4	3-3/4	1-1/8
UDB-444408	.154	3-15/16	2-9/16	1-1/16

Rigging Pins and Warning Streamers

Rigging Pins & Warning Streamers

RIGGING PINS

Ordering Example:

UDB - 937945 - 2 - 4.2 - K - SP - WS

Warning Streamer
Safety Pin
Cable Attach
Length in inches
Type 1 or Type 2
Part No.

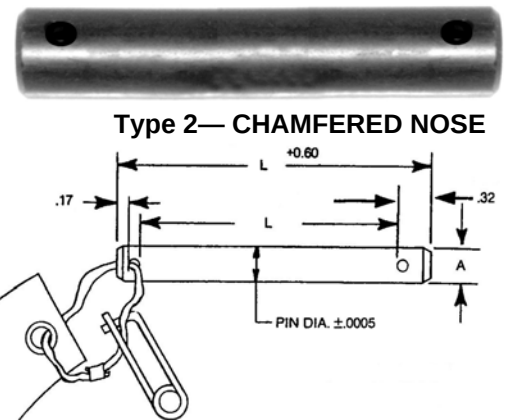
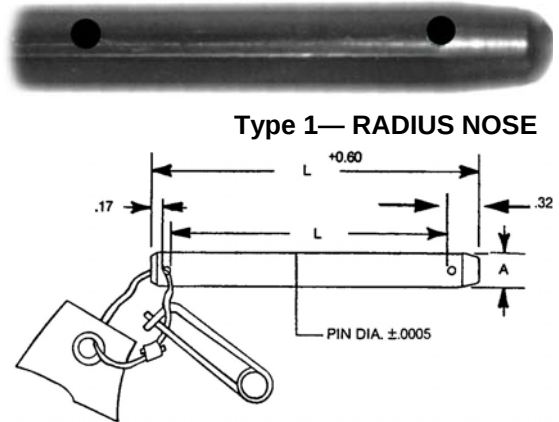
Send you Special Pin
Rigging Dimensions.

PART NO.	A ±.0005
UDB-937905	.1562
UDB-937910	.1875
UDB-937915	.2500
UDB-937920	.3125
UDB-937925	.3750
UDB-937930	.4375
UDB-937935	.5000
UDB-937940	.5625
UDB-937945	.6250
UDB-937950	.7500
UDB-937955	.8750
UDB-937960	1.000

UNITED's High Tensile Strength Rigging Pins are used to temporarily replace fasteners while aircraft is under repair.

Precision ground from 303 stainless.

Provided with Safety Pins, Cable, and Warning Streamers as required.



CUSTOMIZABLE WARNING STREAMERS

Ordering Example shown has 3" width & 60" length

UDB-WS - xxx - xxx - xxx - P/C (material)

Color
Streamer Length inches
Streamer Width inches

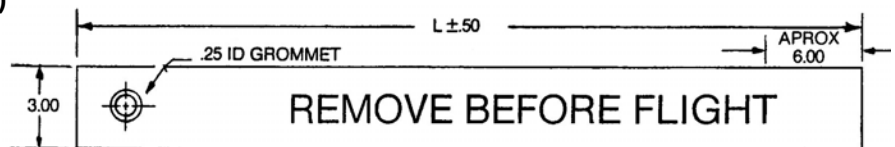
Part No.

MESSAGE & Letter Size: (Specify here)

**FOR USE WITH
RIGGING PINS, etc.**



UDB - WS - 3 - 60 - Red - P



MATERIAL:

Plastic Webbing or Cotton Webbing
Specify **P** (plastic) or **C** (cotton)
Includes Grommet

COLOR:

Red is default color, if not stated.
Specify if not RED. Alert Orange or
Other (Call for other color availability).

WORDING:

"Remove Before Flight" wording
shown in example above on one side
and has "Return to Shop X-XXXX"
on the other in 1" high letters.
Special wording available.

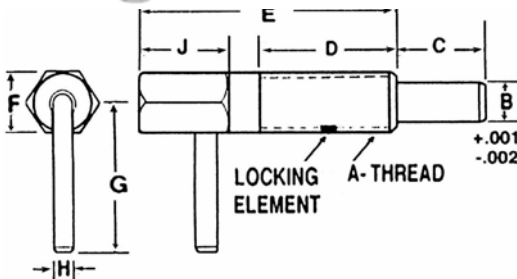
Spring Plungers and Pull Rings

L-Handle Hand Retractable Spring Plungers & Pull Rings



L- HANDLE HAND RETRACTABLE SPRING PLUNGERS—ALL U.S.A.

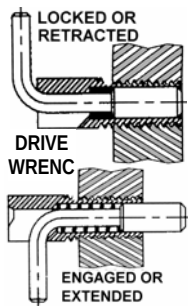
- ◆ Withdraws completely into body
- ◆ Locks in full retractable position when handle aligns with body slot
- ◆ Contains nylon patch locking element



LONG STROKE — STANDARD LENGTH — LOCKING PLUNGERS

UNITED STEEL PART NO.	UNITED STAINLESS PART NO.	LBS—END PRESSURE START FULL		A THREAD	B +.001 -.002	C TRAVEL	D THD LEN	E BODY LEN	F HEX	G HANDLE LEN	H PIN DIA	J HEX LEN
UDB-951962	UDB-951972	.50	2.50	1/4-20	.156	3/8	5/8	1-1/4	1/4	5/8	3/32	1/2
UDB-951964	UDB-951974	.75	3.75	3/8-16	.250	9/16	1-1/16	2"	3/8	15/16	9/64	11/16
UDB-951966	UDB-951976	1.00	5.00	1/2-13	.312	3/4	1-1/8	2-1/8	1/2	1-1/4	3/16	3/4
UDB-951968	UDB-951978	1.00	5.00	5/8-11	.375	1"	1-3/4	3"	5/8	1-5/16	3/16	1-1/16

To engage Plunger, turn handle to line up with slot in body. Plunger is slightly tapered for easy alignment. Quick-Release Drive Wrench allows rapid installation.



"SHORTY" PLUNGERS



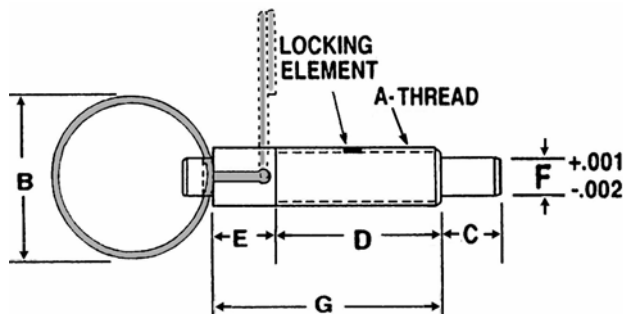
SHORT STROKE — SHORT LENGTH — LOCKING PLUNGERS

UNITED PART NO. STEEL	UNITED PART NO. STAINLESS	LBS—END PRESSURE START FULL		A THREAD	B +.001 -.002	C TRAVEL	D THD LEN	E BODY LEN	F HEX	G HANDLE LEN	H PIN DIA	J HEX LEN
UDB-951922	UDB-951923	.125	.50	1/4-20	.156	3/16	7/16	3/4	1/4	9/16	3/32	1/4
UDB-951924	UDB-951934	.25	1.25	3/8-16	.250	5/16	5/8	1-1/8	3/8	3/4	9/64	3/8
UDB-951926	UDB-951936	.50	2.00	1/2-13	.312	13/32	7/8	1-1/2	1/2	1"	3/16	1/2
UDB-951928	UDB-951938	.75	2.50	5/8-11	.375	1/2	1-1/8	1-7/8	5/8	1-3/16	3/16	5/8

PULL RING — HAND RETRACTABLE PLUNGERS—ALL U.S.A.



- ◆ Locks in retracted position when withdrawn completely into body
- ◆ Big Finger Ring provides easy access and convenient handling
- ◆ Fast Pull Action simplifies work in limited space applications



PULL RING — STANDARD LENGTH — LOCKING PLUNGERS

UNITED PART NO. STEEL	UNITED PART NO. STAINLESS	LBS—END PRESSURE START FULL		A THREAD	B RING DIA	C TRAVEL	D THD LEN	E LOCK LEN	F +.001 -.002	G BODY LENGTH
UDB-951762	UDB-951763	1.0	2.5	1/4-20	1"	1/4	13/16	5/16	.156	1-1/8
UDB-951764	UDB-951765	2.0	4.0	3/8-16	1-1/4	3/8	1-1/4	7/16	.250	1-11/16
UDB-951766	UDB-951767	2.5	5.0	1/2-13	1-3/8	1/2	1-7/16	9/16	.312	2"

Knurled Head Plungers and Big Finger Pull Rings

STEEL PLUNGERS and STAINLESS PLUNGERS

Knurled Plungers
and Short Pull Rings

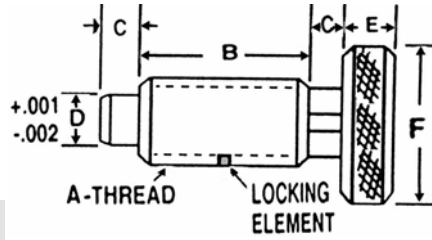
STEEL: Hardened Steel body
with 17-7 PH Stainless Spring

STAINLESS: Stainless Steel
300 Series body with 17-7 PH
Stainless Spring

BOTH are ZINC PLATED

End Pressures given in Pounds for U.
S.A. and in Kilograms for Metric

AVAILABLE IN U.S.A. OR METRIC



SUPER PLUNGER

KNURLED HEAD

Both Heavy and Light Pressure Styles

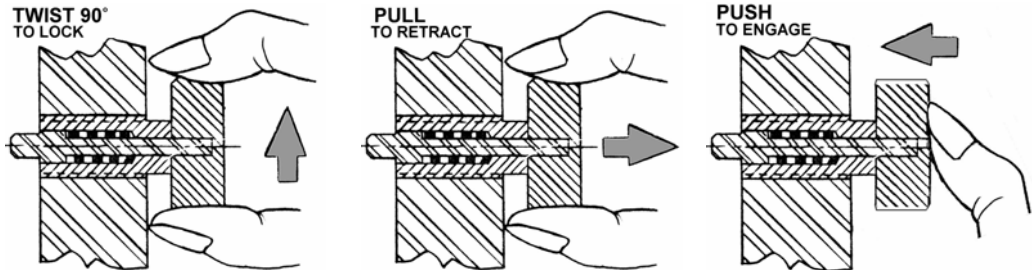
HEAVY PRESSURE				LIGHT PRESSURE — KNURLED HEAD LOCKING PLUNGERS											
UNITED STEEL PART NO.	STAINLESS STEEL300 PART NO.	LBS—END PRESSURE START		UNITED STEEL PART NO.	STAINLESS STEEL 300 Series PART NO.	LBS—END PRESSURE START FULL		A THREAD	B BODY LEN	C TRAVEL	D +.001 -.002	E HEAD THICK	F HEAD DIA	NET LBS PER 100	U. S. A. DIM.
UDB-951810	UDB-951820	1.0	5.0	UDB-951815	UDB-951825	.50	2.5	1/4-20	1/2	1/8	.124	1/4	1/2	3	
UDB-951811	UDB-951821	1.5	6.0	UDB-951816	UDB-951826	.75	3.0	5/16-18	5/8	3/16	.155	9/32	5/8	5	
UDB-951812	UDB-951822	1.5	8.0	UDB-951817	UDB-951827	.75	4.0	3/8-16	3/4	7/32	.186	5/16	3/4	7	
UDB-951813	UDB-951823	2.5	10.0	UDB-951818	UDB-951828	1.25	5.0	1/2-13	7/8	1/4	.249	3/8	1"	13	

HEAVY PRESSURE			LIGHT PRESSURE — KNURLED HEAD LOCKING PLUNGERS										
UNITED STEEL	KILOGRAMS—END PRESSURE START FULL		UNITED STEEL PART NO.	KILOGRMS—END PRESSURE START FULL		A THD CLASS 6G ISO	B BODY LEN	C TRAVEL	D +.001 -.002	E HEAD THICK	F HEAD DIA	NET LBS PER 100	M E T R I C DIMENSIONS
UDB-951830	.45	2.27	UDB-951835	.225	1.135	M6x1.0	12.5	3.17	3	6.3	12.7	3	
UDB-951831	.68	2.72	UDB-951836	.340	1.360	M8x1.25	16.0	4.75	4	7.0	15.8	5	
UDB-951832	.68	3.63	UDB-951837	.340	1.815	M10x1.5	19.0	5.50	5	7.9	19.0	7	
UDB-951833	1.13	4.54	UDB-951838	.565	2.270	M12x1.75	22.0	6.35	6	9.4	25.4	13	

Quick-Release Action

Manually retract and lock
Super Plunger.

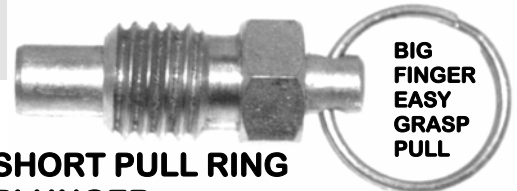
Pull back Knob and twist
to lock in retracted
position.



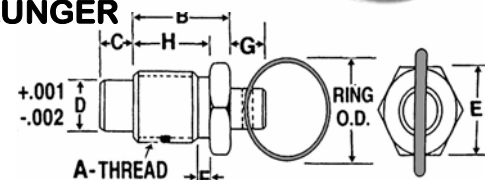
Slight taper on Super Plunger Tip allows instant alignment.

PULL RING — COMPACT — SHORT — SPRING LOADED PLUNGER
BIG FINGER RING for COMFORTABLE, FAST, PULL-EASY ACTION

PULL RING — NON-LOCKING SHORT PLUNGERS										
UNITED PART NO.	LBS—END PRESSURE START FULL	A THREAD	B BODY LEN	C TRAVEL	D +.001 -.002	E HEX	F THD RELIEF	G	H LENGTH	RING O.D.
UDB-951702	.50	2.0	1/4-20	7/16	3/16	.156	1/4	1/32	5/32	9/32
UDB-951704	.75	3.0	3/8-16	5/8	9/32	.250	3/8	1/8	3/16	7/16
UDB-951706	1.00	4.0	1/2-13	13/16	3/8	.312	1/2	5/32	1/4	9/16
UDB-951708	1.25	5.0	5/8-11	1"	7/16	.375	5/8	5/32	5/16	11/16



**SHORT PULL RING
PLUNGER**

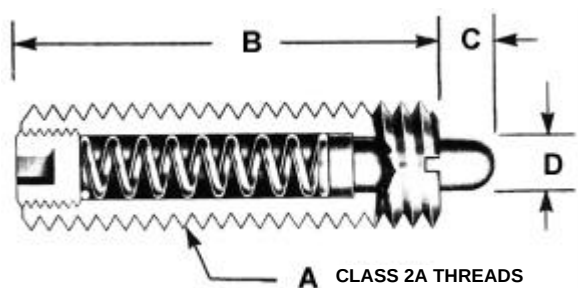


Pressure given in pounds. FULL Pressure = Force Lbs. required to move the Nose the distance given in Column C. Nose is chamfered at end, assuring easy alignment. USES: In Limited Space applications. Big Finger Ring makes holding the plunger back easy when changing the work piece.

Spring Plungers

Precision Spring Plungers

UNITED SPRING PLUNGERS



Available in two spring pressures

- Black Nose with Standard Pressure
- Silver Nose with Light Pressure

- Durability plus
- Positive spring tension
- Economical pricing
- Precise and sure tension
- Hardened for maximum wear
- Original equipment and machining applications:
 - Positioners
 - Locating Pins
 - Detents
 - Die ejectors
 - Wherever accurately controlled constant spring loads are required

STEEL NOSE BLACK — STANDARD END PRESSURE

FOR USE WHERE STRONG WORK LOAD REQUIRES HEAVY DUTY END PRESSURE



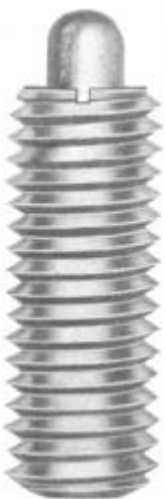
End Pressures are given in pounds.

Full or 100% pressures are the full force pounds to move the nose distance shown in Column C.

UNITED PLAIN	WITH NYLON INSERT	REF. NO	DIMENSIONS				END PRESSURE (LBS.)	
			A	B	C	D +.001 -.001	50% COMPRESSION	100% COMPRESSION
UDB-950005	UDB-950105	S-48	6-32	3/8	1/16	.046	1.3	1.6
UDB-950010	UDB-950110	S-48A	6-32	17/32	1/16	.046	3.0	4.5
UDB-950015	UDB-950115	S-50	8-32	5/8	3/32	.070	5.0	7.3
UDB-950020	UDB-950120	S-52	10-32	3/4	1/8	.093	7.0	11.1
UDB-950025	UDB-950125	S-54	1/4-20	3/4	1/8	.119	5.5	9.0
UDB-950030	UDB-950130	S-54A	1/4-20	1	5/32	.119	8.0	13.0
UDB-950035	UDB-950135	S-54B	1/4-28	1	5/32	.119	8.0	13.0
UDB-950040	UDB-950140	S-56	5/16-18	1	3/16	.135	9.0	15.0
UDB-950045	UDB-950145	S-58	3/8-16	1-1/8	3/16	.186	10.0	14.5
UDB-950050	UDB-950150	S-60	1/2-13	1-1/4	1/4	.248	12.0	17.4
UDB-950055	UDB-950155	S-62	5/8-11	1-1/2	5/16	.310	18.0	25.5
UDB-950060	UDB-950160	S-64	3/4-10	1-3/4	5/16	.374	22.0	37.3
UDB-950065	UDB-950165	S-66	1-8	2-13/32	1/2	.499	42.0	68.0

STEEL NOSE SILVER — LIGHT END PRESSURE

FOR USE WHERE LIGHT DUTY OPERATION REQUIRES FAST REPETITIVE PRESSURE



To install Plungers, we recommend a 90° countersink 1/32 larger than the major diameter of the mating thread.

That prevents damage and reduces the locking torque.

UNITED PLAIN	WITH NYLON INSERT	REF. NO	DIMENSIONS				END PRESSURE (LBS.)	
			A	B	C	D +.001 -.001	50% COMPRESSION	100% COMPRESSION
UDB-950210	UDB-950310	S-49	6-32	17/32	1/16	.046	1.0	1.5
UDB-950215	UDB-950315	S-51	8-32	5/8	3/32	.070	1.5	2.3
UDB-950220	UDB-950320	S-53	10-32	3/4	1/8	.093	2.0	2.7
UDB-950225	UDB-950325	—	1/4-20	3/4	1/8	.119	1.0	2.0
UDB-950230	UDB-950330	S-55	1/4-20	1	5/32	.119	2.5	4.0
UDB-950235	UDB-950335	S-55A	1/4-28	1	5/32	.119	2.5	4.0
UDB-950240	UDB-950340	S-57	5/16-18	1	3/16	.135	3.0	4.5
UDB-950245	UDB-950345	S-59	3/8-16	1-1/8	3/16	.186	5.0	7.2
UDB-950250	UDB-950350	S-61	1/2-13	1-1/4	1/4	.248	6.0	9.3
UDB-950255	UDB-950355	S-63	5/8-11	1-1/2	5/16	.310	7.0	10.5
* UDB-950260	UDB-950360	—	3/4-10	1-3/4	5/16	.374	11.0	16.0
* UDB-950265	UDB-950365	S-67	1-8	2-13/32	1/2	.499	17.5	31.0

* SPECIAL SIZES

Nylon Spring Plungers

USE NYLON NOSES TO PREVENT MARRING
BRASS, ALUMINUM OR COMPOSITES

Nylon Nose
Spring Plungers

Nylon Nose — Steel Body

STANDARD END PRESSURE — NYLON NOSE BLACK

NYLON — USE WITH SOFT MATERIALS TO PREVENT MARRING

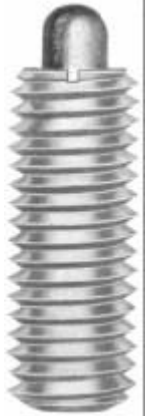
- High tensile strength
- Excellent wear resistance
- Reinforced for minimum deformation under force

Highly durable
**UNITED NYLON
SPRING PLUNGERS**

have many uses

- Positioning
- Ejecting
- Lifters
- Indexes
- Latches
- Detents

Black Oxide Body



STANDARD PRESSURE PLAIN	WITH NYLON INSERT	REF. NO	DIMENSIONS				END PRESSURE (LBS.) COMPRESSION	
			A	B	C	D +.000 -.002	50%	100%
UDB-950405	UDB-950455	NS-50	8-32	5/8	3/32	.070	5.0	7.3
UDB-950410	UDB-950460	NS-52	10-32	3/4	1/8	.093	7.0	11.1
UDB-950415	UDB-950465	NS-54	1/4-20	1	5/32	.119	8.0	13.0
UDB-950420	UDB-950470	NS-56	5/16-18	1	3/16	.135	9.0	15.0
UDB-950425	UDB-950475	NS-58	3/8-16	1-1/8	3/16	.186	10.0	14.5
UDB-950430	UDB-950480	NS-60	1/2-13	1-1/4	1/4	.248	12.0	17.4
UDB-950435	UDB-950485	NS-62	5/8-11	1-1/2	5/16	.310	18.0	25.5

Nylon Nose — Steel Body

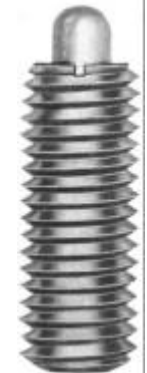
LIGHT END PRESSURE — NYLON NOSE SILVER

LIGHT END — FOR FAST REPETITIVE OPERATIONS

- Varied pressures
- Limited space applications
- Hardened for long wear
- Black Oxide finish
- Excellent for strippers or locators

**UNITED NYLON
SPRING PLUNGERS**

- Long travel
- No Mar bearing surface
- Various design options
- Corrosion resistance
- Black Oxide body



LITE PRESSURE PLAIN	WITH NYLON INSERT	REF. NO	DIMENSIONS				END PRESSURE (LBS.) COMPRESSION	
			A	B	C	D +.000 -.002	50%	100%
UDB-950505	UDB-950555	NS-51	8-32	5/8	3/32	.070	1.5	2.3
UDB-950510	UDB-950560	NS-53	10-32	3/4	1/8	.093	2.0	2.7
UDB-950515	UDB-950565	NS-55	1/4-20	1	5/32	.119	2.5	4.0
UDB-950520	UDB-950570	NS-57	5/16-18	1	3/16	.135	3.0	4.5
UDB-950525	UDB-950575	NS-59	3/8-16	1-1/8	3/16	.186	5.0	7.2
UDB-950530	UDB-950580	NS-61	1/2-13	1-1/4	1/4	.248	6.0	9.3
UDB-950535	UDB-950585	NS-63	5/8-11	1-1/2	5/16	.310	7.0	10.5

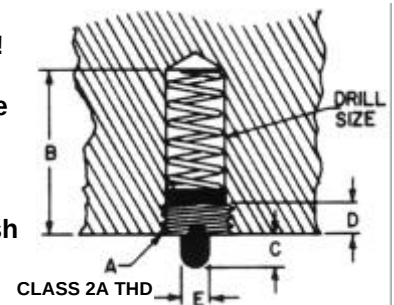
Steel Nose — Steel Body — Space Saver 'A'

BLIND HOLE MOUNTING — TYPE A

BLIND HOLE PART NO.	A	B	C	D	E ±.001	DRILL SIZE
UDB-950605	8-32 x 3/16	1/2	3/32	1/8	.069	#29
UDB-950610	10-32 x 3/16	5/8	1/8	5/32	.092	#21
UDB-950615	1/4-20 x 1/4	13/16	5/32	3/16	.118	#6
UDB-950620	5/16-18 x 5/16	13/16	3/16	7/32	.134	F
UDB-950625	3/8-16 x 5/16	7/8	3/16	7/32	.186	5/16
UDB-950630	1/2-13 x 7/16	1	1/4	1/4	.248	27/64
UDB-950635	5/8-11 x 1/2	1-5/16	5/16	5/16	.311	17/32
UDB-950640	3/4-10 x 5/8	1-3/8	5/16	3/8	.373	21/32

GREAT FOR
LIMITED SPACE!

- Hardened Steel for long wear life
- Excellent as locators or strippers
- Black Oxide finish
- Tough
- Wears well



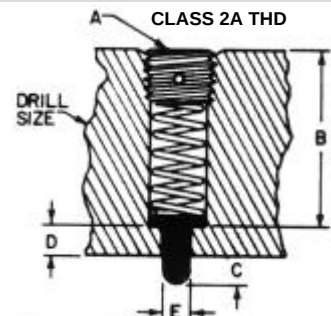
Steel Nose — Steel Body — Space Saver 'B'

THROUGH HOLE MOUNTING — TYPE B

THRU HOLE PART NO.	A	B	C	D	E ±.001	DRILL SIZE
UDB-950655	8-32 x 3/16	21/32	1/8	3/32	.069	#29
UDB-950660	10-32 x 3/16	3/16	5/32	1/8	.092	#21
UDB-950665	1/4-20 x 1/4	1-3/32	3/16	5/32	.118	#6
UDB-950670	5/16-18 x 5/16	1-3/16	7/32	3/16	.134	F
UDB-950675	3/8-16 x 5/16	1-9/32	7/32	3/16	.186	5/16
UDB-950680	1/2-13 x 7/16	1-3/8	1/4	1/4	.248	27/64
UDB-950685	5/8-11 x 1/2	1-13/16	5/16	5/16	.311	17/32
UDB-950690	3/4-10 x 5/8	2-1/8	3/8	5/16	.373	21/32

FROM The TOP of
a HOLE or DIE

- Nylon Nose
- Prevents vibration
- Prevents screw movement
- Easily installed
- Black Oxide



Ball Plunger Ball Plunger Detent

Compact Ball Plungers, Detents and Wrenches

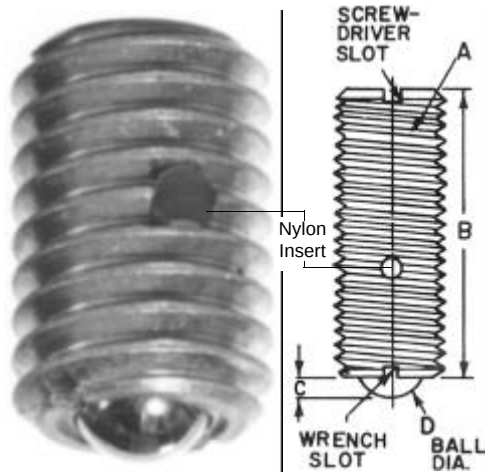
BALL PLUNGERS — Nylon Locking Element Holds Plunger Spring

Compact controlled end pressures eliminate side load problems.

Excellent for

- Positioning Levers
- Gear Shifting
- Automatic Indexing
- Torque Limiting

Fits perfectly in Ball Detent shown below.



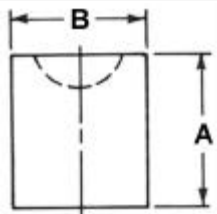
UNITED STEEL BALL PLUNGERS are Color Coded to indicate End Pressures.
 □SILVER — Light pressure □BLACK — Standard □GOLD — Heavy pressure

STAINLESS STEEL PART NO.	UNITED STEEL PART NO.	REF. NO.	STEEL COLOR CODE	END PRESSURE (POUNDS)	A ** Sizes less than 1/4-20	B	C	D BALL DIA	USED WITH THESE BALL DETENTS
* UDB-950850	UDB-950710	(SS) B-46	BLACK	1/2	4-48	.187	.020	.062	UDB-951005
* UDB-950855	UDB-950715	(SS) B-47	BLACK	3/4	5-40	.250	.020	.062	UDB-951005
* UDB-950860	UDB-950720	(SS) B-48	BLACK	1	6-40	.312	.023	.078	UDB-951010
* UDB-950865	UDB-950725	(SS) B-50	BLACK	1-1/4	8-36	.344	.025	.0937	UDB-951015
UDB-950870	UDB-950730	(SS) B-52	BLACK	3	10-32	.513	.025	.0937	UDB-951015
(STAINLESS SILVER)	UDB-950735	(SS) BL-52	SILVER	1-1/2	10-32	.513	.025	.0937	UDB-951015
	UDB-950740	(SS) BH-52	GOLD	5	10-32	.513	.025	.0937	UDB-951015
UDB-950875	UDB-950745	(SS) B-54	BLACK	7	1/4-20	.531	.035	.125	UDB-951020
(STAINLESS SILVER)	UDB-950750	(SS) BL-54	SILVER	4	1/4-20	.531	.035	.125	UDB-951020
	UDB-950755	(SS) BH-54	GOLD	12	1/4-20	.531	.035	.125	UDB-951020
UDB-950880	UDB-950760	(SS) B-56	BLACK	9	5/16-18	.578	.040	.156	UDB-951025
(STAINLESS SILVER)	UDB-950765	(SS) BL-56	SILVER	4-1/2	5/16-18	.578	.040	.156	UDB-951025
	UDB-950770	(SS) BH-56	GOLD	17	5/16-18	.578	.040	.156	UDB-951025
UDB-950885	UDB-950775	(SS) B-58	BLACK	10	3/8-16	.625	.048	.1875	UDB-951030
(STAINLESS SILVER)	UDB-950780	(SS) BL-58	SILVER	5	3/8-16	.625	.048	.1875	UDB-951030
	UDB-950785	(SS) BH-58	GOLD	21	3/8-16	.625	.048	.1875	UDB-951030
UDB-950890	UDB-950790	(SS) B-60	BLACK	12	1/2-13	.750	.072	.2813	UDB-951035
(STAINLESS SILVER)	UDB-950795	(SS) BL-60	SILVER	6	1/2-13	.750	.072	.2813	UDB-951035
	UDB-950800	(SS) BH-60	GOLD	30	1/2-13	.750	.072	.2813	UDB-951035
UDB-950895	UDB-950805	(SS) B-62	BLACK	18	5/8-11	.984	.096	.375	UDB-951040
(STAINLESS SILVER)	UDB-950810	(SS) BL-62	SILVER	9	5/8-11	.984	.096	.375	UDB-951040
	UDB-950815	(SS) BH-62	GOLD	50	5/8-11	.984	.096	.375	UDB-951040

* No Nylon Insert

** Sizes smaller than 1/4 - 20 have Screw Driver Slot only.

BALL PLUNGER DETENTS — Fit Our Ball Plungers



**UNITED
BALL
DETENTS**

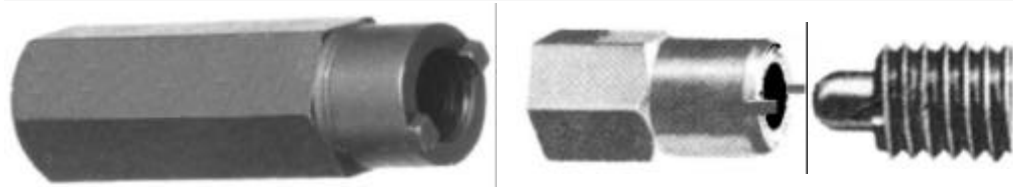
These Buttons are the perfect fit for our Ball Plungers!

UNITED BALL DETENTS are hardened and ground to diameters of + .0002 - .0000 for easy insertion into a reamed hole.

- Prevents part damage
- Provides a striker plate to take the wear of side loads

UNITED PART NO.	USED WITH THESE UNITED BALL PLUNGERS	A	B	+ .0002 - .0000
UDB-951005	UDB-950710 UDB-950715	1/8		.1075
UDB-951010	UDB-950720	1/8		.1175
UDB-951015	UDB-950725 UDB-950730 UDB-950735 UDB-950740	3/16		.1614
UDB-951020	UDB-950745 UDB-950750 UDB-950755	1/4		.2034
UDB-951025	UDB-950760 UDB-950765 UDB-950770	5/16		.2659
UDB-951030	UDB-950775 UDB-950780 UDB-950785	3/8		.3284
UDB-951035	UDB-950790 UDB-950795 UDB-950800	1/2		.4378
UDB-951040	UDB-950805 UDB-950810 UDB-950815	5/8		.5472

SPRING PLUNGER WRENCHES — For Fast Installation



UNITED SPRING PLUNGER WRENCHES speed the installation of BALL and SPRING PLUNGERS. Do not use screw drivers. Use correct plunger wrench to avoid costly spring damage.

The right tool for the right job!

UNITED PART NO.	NOMINAL THREAD SIZE OF PLUNGER
UDB-957200	#6
UDB-957205	#8
UDB-957210	#10
UDB-957215	1/4
UDB-957220	5/16
UDB-957225	3/8
UDB-957230	1/2
UDB-957235	5/8
UDB-957240	3/4
UDB-957245	1"

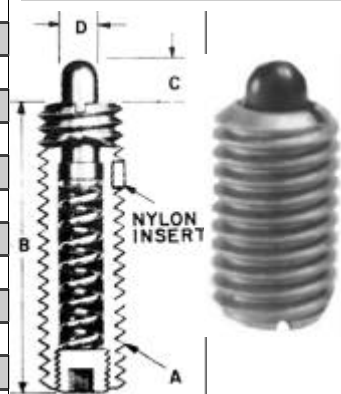
Short Plungers/Spring Stops

**"Shorty" Plungers
and Spring Stops**

1/2 LENGTH of STANDARD SPRING PLUNGERS

UNITED PART NO.		REF. NO.	END FORCE			DIMENSIONS			
STEEL NOSE	NYLON NOSE		NOM.	ACTUAL INITIAL LBS.	ACTUAL FINAL LBS.	A	B	C	D
UDB-950900	UDB-950950	M50	HEAVY	1-1/2	4-1/4	8-36	.437	.052	.070
UDB-950902	UDB-950952	M51	LIGHT	1/2	1-1/2	8-36	.437	.052	.070
UDB-950905	UDB-950955	M52	HEAVY	1-3/4	6-1/4	10-32	.468	.065	.093
UDB-950907	UDB-950957	M53	LIGHT	3/4	2-1/2	10-32	.468	.065	.093
UDB-950910	UDB-950960	M54	HEAVY	3	10-1/2	1/4-20	.531	.078	.119
UDB-950912	UDB-950962	M55	LIGHT	1	3-1/2	1/4-20	.531	.078	.119
UDB-950915	UDB-950965	M56	HEAVY	3-3/4	15-1/2	5/16-18	.562	.084	.135
UDB-950917	UDB-950967	M57	LIGHT	1-1/4	4	5/16-18	.562	.084	.135
UDB-950920	UDB-950970	M58	HEAVY	4-1/2	18-1/2	3/8-16	.625	.110	.186
UDB-950922	UDB-950972	M59	LIGHT	1-1/2	5	3/8-16	.625	.110	.186
UDB-950925	UDB-950975	M60	HEAVY	5	28	1/2-13	.750	.151	.248
UDB-950927	UDB-950977	M61	LIGHT	1-3/4	5-1/2	1/2-13	.750	.151	.248
UDB-950930	UDB-950980	M62	HEAVY	7	50	5/8-11	1.062	.215	.310
UDB-950932	UDB-950982	M63	LIGHT	2	8-1/2	5/8-11	1.062	.215	.310

"SHORTY" SPRING PLUNGERS

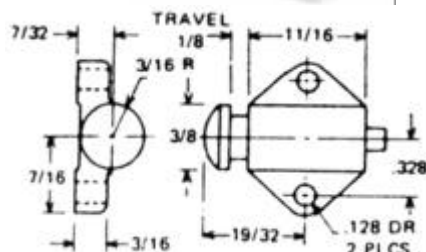


LIGHT FORCE STYLES ARE SPECIALS.

ROUND SPRING STOPS UDB-955000

ALUMINUM BODY

END PRESSURE 10 LBS.



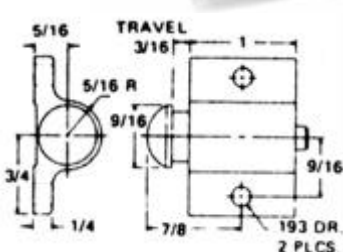
ROUND SPRING STOPS UDB-955015

ALUMINUM BODY

END PRESSURE 14 LBS.



STEEL UDB-955010



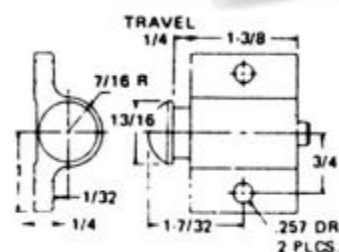
ROUND SPRING STOPS UDB-955025

ALUMINUM BODY

END PRESSURE 32 LBS.



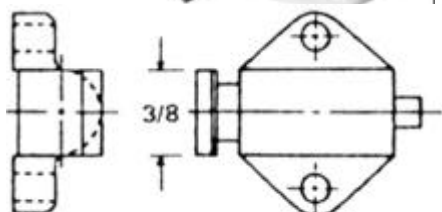
STEEL UDB-955020



SQUARE SPRING STOPS UDB-955050

ALUMINUM BODY

END PRESSURE 10 LBS.



See above for missing dimensions.

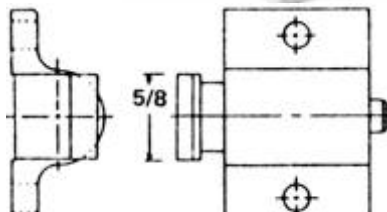
SQUARE SPRING STOPS UDB-955060

ALUMINUM BODY

END PRESSURE 14 LBS.



STEEL UDB-955055



See above for missing dimensions.

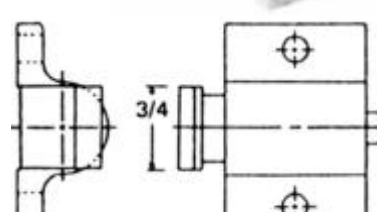
SQUARE SPRING STOPS UDB-955070

ALUMINUM BODY

END PRESSURE 32 LBS.



STEEL UDB-955065



See above for missing dimensions.

Rotary Cam Indexing Plungers

Rotary Cam Indexing Plungers

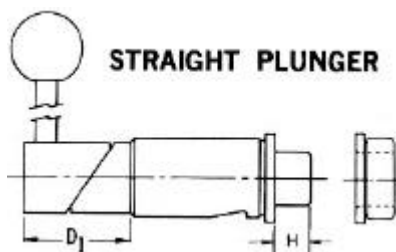
STRAIGHT MOUNT ROTARY CAM INDEX PLUNGERS

STANDARD MOUNT STYLE FEATURES A WHISTLE NOTCH TO PROVIDE THE SEAT FOR A LOCKING SET SCREW. *UNITED* RECOMMENDS SET SCREWS WITH NYLON INSERTS FOR THESE PLUNGERS. SET SCREWS MUST CONTACT BUT NOT EXERT PRESSURE AGAINST THE WHISTLE NOTCH.

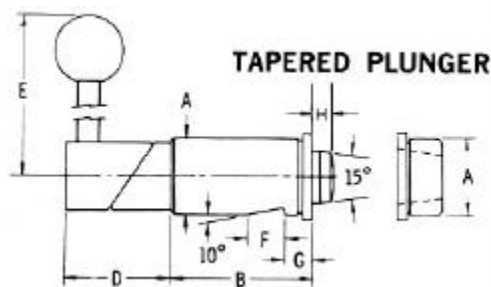


**STRAIGHT OR
TAPERED PLUNGER**

STRAIGHT MOUNT



STRAIGHT PLUNGER



TAPERED PLUNGER

PRECISION TOLERANCES TO PREVENT BINDING AND FOR LIGHT INTERFERENCE FIT

PLUNGER P/N		SPECIFY BUSHINGS SEPARATELY.										BUSHING P/N	
STRAIGHT	TAPERED	DIA.	A ^{a1:a2}	B	D	D1	E	F	G	H		STRAIGHT	TAPERED
UDB-922004*	UDB-922016*	1/2	.765	1-3/8	1-1/8	1-1/8	3"	7/16	5/16	5/16		UDB-922026*	UDB-922030*
UDB-922006#	UDB-922018#	1/2	.7515	1-3/8	1-1/8	1-1/8	3"	7/16	5/16	5/16		UDB-922028#	UDB-922032#
UDB-922104*	UDB-922116*	3/4	1.140	2"	1-5/8	1-1/2	3-1/2	9/16	3/8	13/32		UDB-922126*	UDB-922130*
UDB-922106#	UDB-922118#	3/4	1.1265	2"	1-5/8	1-1/2	3-1/2	9/16	3/8	13/32		UDB-922128#	UDB-922132#
UDB-922204*	UDB-922216*	3/4	1.515	2-1/4	2-1/8	1-7/8	4-1/2	11/16	7/16	7/16		UDB-922226*	UDB-922230*
UDB-922206#	UDB-922218#	3/4	1.5018	2-1/4	2-1/8	1-7/8	4-1/2	11/16	7/16	7/16		UDB-922228#	UDB-922232#
UDB-922304*		1-3/8	2.015	3"		2-1/8	5-3/4	3/4	1/2	7/8		UDB-922326*	

* A diameter of Plunger and Bushing tolerance is +.001, -.000.

A diameter of Plunger and Bushing finished tolerance is +.0003, -.0000.

**BOTH STANDARD AND
FLANGE MOUNT STYLES
FEATURE:**

PLUNGER BODY AND BUSHING WITH IDENTICAL OUTSIDE DIAMETERS SIMPLIFY JIG OR FIXTURE MANUFACTURE.

HANDLE ROTATION OF 180° RETRACTS THE PLUNGER COMPLETELY.

UNITED ROTARY CAM INDEXING AND LOCATING PLUNGERS AND BUSHINGS ARE HEAT TREATED, AND CAMS ARE HARDENED STEEL.

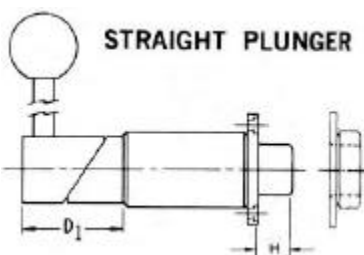
FLANGE MOUNT ROTARY CAM INDEX PLUNGERS

FLANGE MOUNT STYLE FOR INSTALLATIONS WHERE A CROSS HOLE WITH SET SCREW IS NOT PRACTICAL.

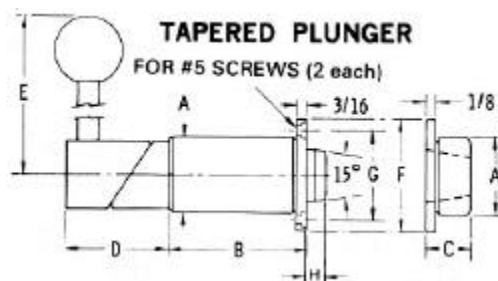


**STRAIGHT OR
TAPERED PLUNGER**

FLANGE MOUNT



STRAIGHT PLUNGER



TAPERED PLUNGER

FOR #5 SCREWS (2 each)

SPECIFY BUSHINGS SEPARATELY.

PLUNGER P/N		SPECIFY BUSHINGS SEPARATELY.										BUSHING P/N	
STRAIGHT	TAPERED	DIA.	A ^{a1:a2}	B	C	D	D1	E	F	G	H	STRAIGHT	TAPERED
UDB-922005*	UDB-922017*	1/2	.765	1-3/8	1/2	1-1/8	1-1/8	3"	1-5/16	1"	5/16	UDB-922027*	UDB-922031*
UDB-922007#	UDB-922019#	1/2	.7515	1-3/8	1/2	1-1/8	1-1/8	3"	1-5/16	1"	5/16	UDB-922029*	UDB-922033#
UDB-922105*	UDB-922117*	3/4	1.140	2"	5/8	1-5/8	1-1/2	3-1/2	1-11/16	1-3/8	13/32	UDB-922127*	UDB-922131*
UDB-922107#	UDB-922119#	3/4	1.1265	2"	5/8	1-5/8	1-1/2	3-1/2	1-11/16	1-3/8	13/32	UDB-922129#	UDB-922133#

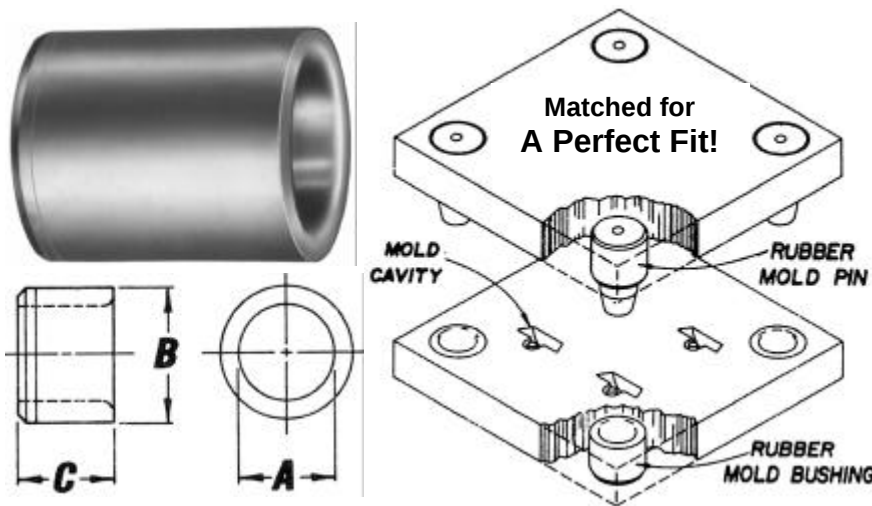
* A diameter of Plunger and Bushing tolerance is +.001, -.000.

A diameter of Plunger and Bushing finished tolerance is +.0003, -.0000.

**RELIEF OF TAPERED
STYLE PLUNGER
HELPS ELIMINATE
INACCURACY AND
MAKES FOR AN EASIER
RELEASE FROM
THE TAPERED BUSHING.**

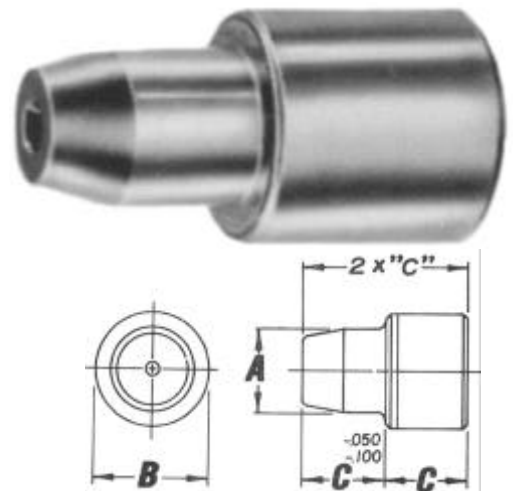
Rubber Mold Pins Rubber Mold Bushings

Rubber Mold Pins
and Bushings



RUBBER MOLD BUSHINGS

Features



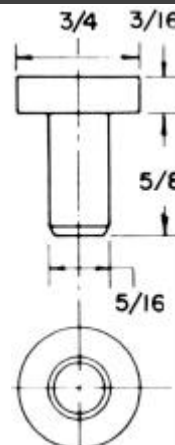
RUBBER MOLD PINS

Ground Diameters — Chamfered Leads — Full Entry Radii — Hardened to RC 61-65

A I.D. SIZES			B O.D. SIZES			C LENGTHS					
NOM.	PIN - ACTUAL	BUSHING - ACTUAL	NOM.	PIN - ACTUAL	BUSHING - ACTUAL	PINS		Part No.s BUSHINGS			
						1/2"	3/4"	1"	1/2"	3/4"	1"
5/16	.3120 - .3105	.3130 - .3145	1/2	.5019 - .5012	.5019 - .5012	RMP-32-8	RMP-32-12	RMP-32-16	RMB-32-8	RMB-32-12	RMB-32-16
3/8	.3745 - .3730	.3755 - .3770	5/8	.6269 - .6262	.6269 - .6262	RMP-40-8	RMP-40-12	RMP-40-16	RMB-40-8	RMB-40-12	RMB-40-16
1/2	.4995 - .4980	.5005 - .5020	3/4	.7520 - .7513	.7520 - .7513	RMP-48-8	RMP-48-12	RMP-48-16	RMB-48-8	RMB-48-12	RMB-48-16
5/8	.6245 - .6230	.6255 - .6270	7/8	.8770 - .8763	.8770 - .8763	RMP-56-8	RMP-56-12	RMP-56-16	RMB-56-8	RMB-56-12	RMB-56-16
3/4	.7495 - .7480	.7505 - .7520	1"	1.0020 - 1.0013	1.0020 - 1.0013	RMP-64-8	RMP-64-12	RMP-64-16	RMB-64-8	RMB-64-12	RMB-64-16
7/8	.8745 - .8730	.8755 - .8770	1-1/4	1.2522 - 1.2515	1.2522 - 1.2515	RMP-80-8	RMP-80-12	RMP-80-16	RMB-80-8	RMB-80-12	RMB-80-16
1"	.9995 - .9980	1.0005 - 1.0020	1-3/8	1.3774 - 1.3766	1.3774 - 1.3766	RMP-88-8	RMP-88-12	RMP-88-16	RMB-88-8	RMB-88-12	RMB-88-16

MOLD STOP PIN

HEAD THICKNESS
HAS .020" GRINDING



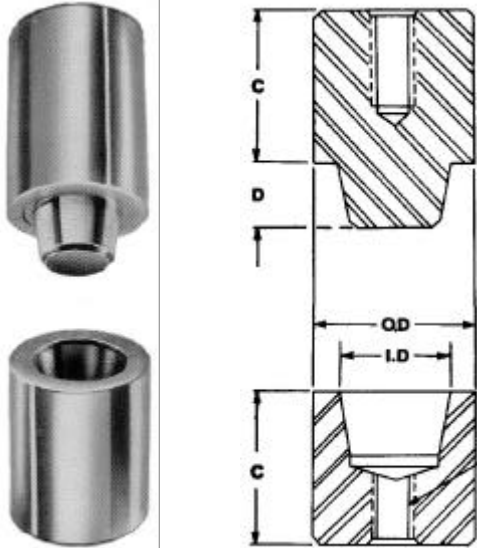
UDB-520600



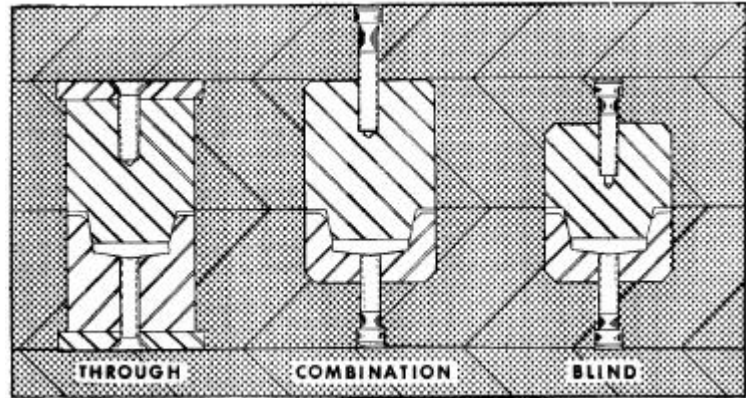
Tapered Locators

Tapered Locators and Shoulder Plates

TAPERED LOCATORS



ALIGN Mold Halves - Plates - Cavities - Cores



We recommend **six or more sets** for **large molds** using 1", 1-1/2" and 2" diameter Locators.

We recommend **four sets** for **medium molds** using 3/4" and 1" Locators.

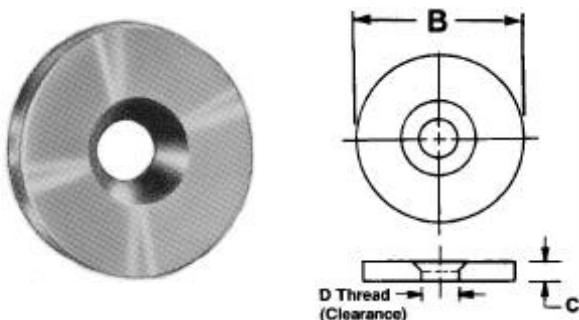
Two sets of 1/2" and 3/4" Locators are generally adequate for **small molds, cavities and cores**.

Use Shoulder Plates with thru hole construction. Accurate alignment is best achieved by line boring the two plates simultaneously. Blind installation hole construction is more difficult and must be machined with great care.

There is grind stock on the back face of both male and female Locators. Grind stock is also allowed in the front face of the female Locator, permitting final fitting at assembly. For ultimate precision grind the excess stock from the female front face. These Locators will then align simultaneously on the tapered diameters and faces.

I. D.	O. D.	THREAD	D	C	MALE PART NO.	FEMALE PART NO.	SET: MALE & FEMALE	USE SHOULDER PLATE
5/16	1/2	10 - 24	7/32	11/16	UDB-830411	UDB-840411	UDB-850411	UDB-841804
				7/8	UDB-830414	UDB-840414	UDB-850414	
				1-3/16	UDB-830419	UDB-840419	UDB-850419	
				1-3/8	UDB-830422	UDB-840422	UDB-850422	
1/2	3/4	1/4 - 20	5/16	11/16	UDB-830611	UDB-840611	UDB-850611	UDB-841806
				7/8	UDB-830614	UDB-840614	UDB-850614	
				1-3/16	UDB-830619	UDB-840619	UDB-850619	
				1-3/8	UDB-830622	UDB-840622	UDB-850622	
5/8	1"	1/4 - 20	3/8	11/16	UDB-830811	UDB-840811	UDB-850811	UDB-841808
				7/8	UDB-830814	UDB-840814	UDB-850814	
				1-3/16	UDB-830819	UDB-840819	UDB-850819	
				1-3/8	UDB-830822	UDB-840822	UDB-850822	
1"	1-1/2	5/16 - 18	1/2	1-1/8	UDB-831218	UDB-841218	UDB-851218	UDB-841812
				1-3/8	UDB-831222	UDB-841222	UDB-851222	
				1-5/8	UDB-831226	UDB-841226	UDB-851226	
1-1/2	2	5/16 - 18	1/2	1-1/8	UDB-831618	UDB-841618	UDB-851618	UDB-841816
				1-3/8	UDB-831622	UDB-841622	UDB-851622	
				1-5/8	UDB-831626	UDB-841626	UDB-851626	

SHOULDER PLATES



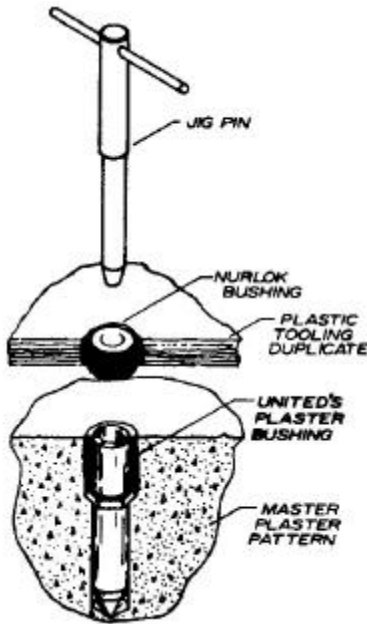
SHOULDER PLATES

PART NO.	D SCREW SIZE	B	C
UDB-841804	10 - 24	11/16	3/16
UDB-841806	1/4 - 20	1"	3/16
UDB-841808	1/4 - 20	1-3/16	3/16
UDB-841812	5/16 - 18	1-11/16	1/4
UDB-841816	5/16 - 18	2-3/16	1/4

Locating for Plastic Fixtures, Duplicates

Plaster Bushings Leader Pins

PLASTER BUSHINGS

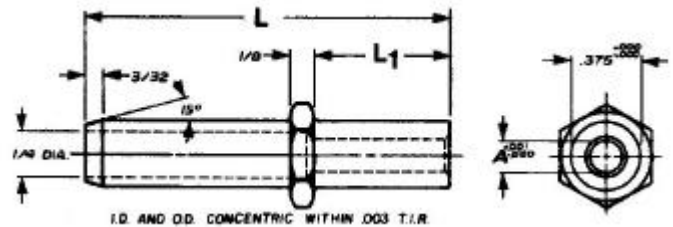


**EASY TRANSFER
TO
PLASTIC FIXTURES**

ALLOY STEEL
HEAT TREATED
BLACK OXIDE FINISH

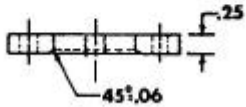
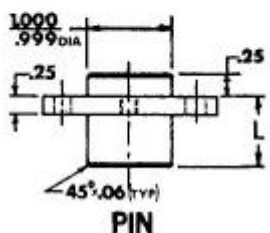
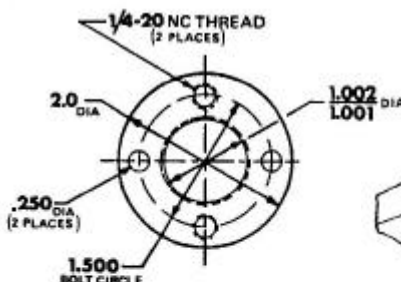
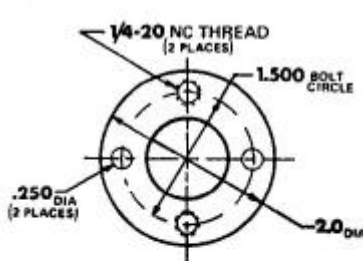
When master plaster patterns are used, Plaster Bushings provide easy transfer to plastic fixtures.

Locate a *UNITED* Nurlock drill bushing over the Plaster Bushing and insert proper jig pin. This guarantees accurate alignment while the plastic laminate fixture cures.



PART NO.	A I.D.		L LENGTH	L1 LENGTH
	NOM.	ACTUAL		
UDB-651041	#30	.1285 / .1295	1"	1/2
UDB-651049	#10	.1935 / .1945	1"	1/2
UDB-651053	1/4	.2500 / .2510	1"	1/2
UDB-651059	1/8	.1250 / .1260	2"	3/4
UDB-651060	#30	.1285 / .1295	2"	3/4
UDB-651061	3/16	.1875 / .1885	2"	3/4
UDB-651063	#10	.1935 / .1945	2"	3/4
UDB-651065	13/64	.2031 / .2041	2"	3/4
UDB-651067	7/32	.2187 / .2197	2"	3/4
UDB-651069	#1	.2280 / .2290	2"	3/4
UDB-651071	15/64	.2344 / .2354	2"	3/4
UDB-651073	1/4	.2500 / .2510	2"	3/4

PBT LEADER PINS



RING



L LENGTH	PIN PART NO.	RING PART NO.	SET PIN & RING PART NO.
1/2	UDB-652009	UDB-652017	UDB-652011
3/4	UDB-652013	UDB-652017	UDB-652019
1"	UDB-652015	UDB-652017	UDB-652021

UNITED's PBT LEADER PINS, RINGS & SETS
provide fast and easy alignment
of pierce blank templates in short run stamping.

DIAMOND PINS AVAILABLE ON REQUEST
ALLOY STEEL HEAT TREATED BLACK OXIDE FINISH

Headless, Threaded & Headed Retainer

UNITED Retainers for Locating Pins

HEADLESS RETAINERS for Lockscrew Locating Pins

HEADLESS RETAINERS FOR LOCKSCREW LOCATING PINS

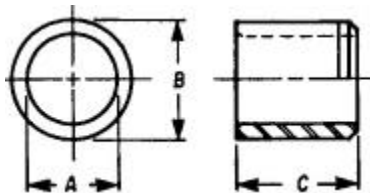


UNITED's
Headless Retainers are

- Hardened
- Precision Ground
- Concentric.

Match Locating Pin O.D. with Retainer I.D.

A I. D.	B UNGROUND	UNGROUND PART NO.	B GROUND	GROUND PART NO.	C
.3126 .3129	.520 .515	LU-32-8	.5017 .5014	L-32-8	1/2
.5002 .5005	.770 .765	LU-48-12	.7518 .7515	L-48-12	3/4
.7503 .7506	1.020 1.015	LU-64-16	1.0018 1.0015	L-64-16	1"
1.0004 1.0007	1.395 1.390	LU-88-22	1.3772 1.3768	L-88-22	1-3/8



HEADED RETAINERS for Lockscrew Locating

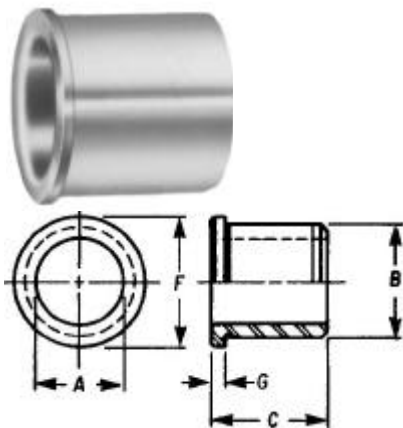
HEADED RETAINERS FOR LOCKSCREW LOCATING PINS

UNITED's
Headed Retainers are

- Hardened
- Precision Ground
- Concentric.

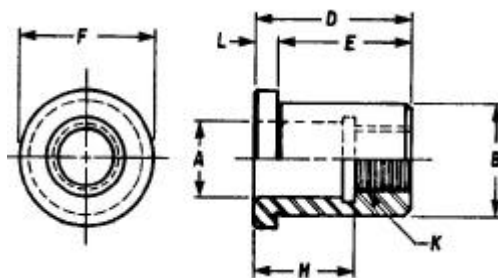
Match Locating Pin O.D. with Retainer I.D.

A I. D.	B UNGROUND	UNGROUND PART NO.	B GROUND	GROUND PART NO.	C	G	F
.3126 .3129	.520 .515	HLU-32-8	.5017 .5014	HL-32-8	1/2	3/32	5/8
.5002 .5005	.770 .765	HLU-48-12	.7518 .7515	HL-48-12	3/4	3/32	7/8
.7503 .7506	1.020 1.015	HLU-64-16	1.0018 1.0015	HL-64-16	1"	1/8	1-1/8
1.0004 1.0007	1.395 1.390	HLU-88-22	1.3772 1.3768	HL-88-22	1-3/8	1/8	1-1/2



THREADED RETAINERS for Threaded Locating Pins

THREADED RETAINERS FOR THREADED LOCATING PINS



Match
Locating Pin O.D. Thread
with Retainer I.D. Thread

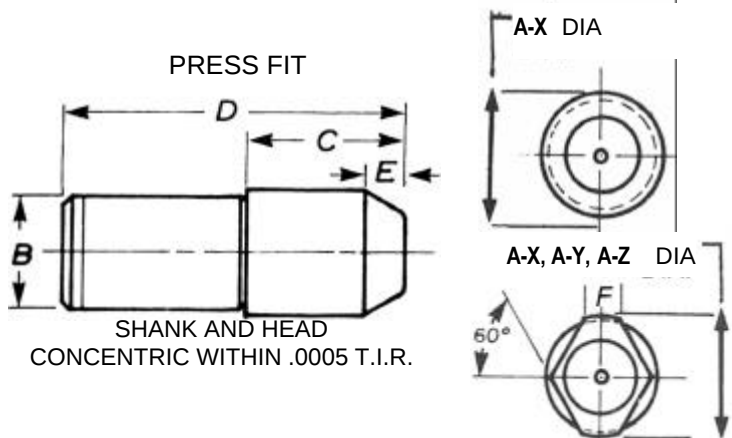
UNITED's
Threaded Retainers are

- Hardened
- Precision Ground
- Concentric.

A I. D.	UNGROUND PART NO.	B UNGROUND	GROUND PART NO.	B GROUND	D	E	F	H	K	L
.3126 .3128	UDB-622269	.457 .452	UDB-622268	.4392 .4389	3/4	21/32	9/16	1/2	1/4 - 28	3/32
.4376 .4378	UDB-622271	.707 .702	UDB-622270	.6893 .6890	1"	7/8	7/8	5/8	3/8 - 24	1/8
.5626 .5629	UDB-622273	.832 .827	UDB-622272	.8143 .8140	1-5/16	1-5/32	1"	3/4	1/2 - 20	5/32
.8751 .8754	UDB-622275	1.270 1.265	UDB-622274	1.2522 1.2518	1-3/4	1-1/2	1-9/16	1-1/8	3/4 - 16	1/4

Flangeless Locating Pins

Locating Pins
Flangeless



ROUND
X = CLOSE
TOLERANCE

DIAMOND
OR
RELIEVED
X = CLOSE
Y = MEDIUM
Z = LOOSE
TOLERANCE



ROUND



DIAMOND or RELIEVED

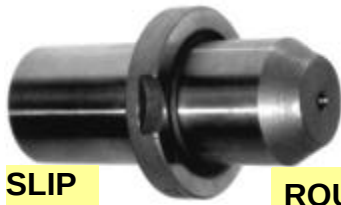
FLANGELESS LOCATING PINS - PRESS FIT - FOR ACCURATE LOCATING - BUSHINGS NOT REQUIRED

Counterboring is also not required. If you wish to use mating bushings, select from **UNITED's** broad range of Liners, plain or headed. **ROUND** and **DIAMOND PINS** are used together to locate from hole to hole in the workpiece. **RELIEVED PINS** locate radially around the hole or round pin and avoid binding when loading or unloading while maintaining accurate locations.

Select from First, Second or Third Types of Diamond Relieved Pin Part No.s (A-X CLOSE, A-Y MEDIUM, A-Z LOOSE) for your locations.

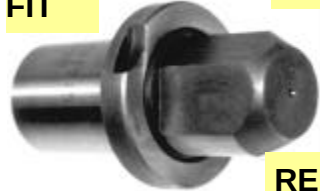
PILOT DIA NOM	A - X ROUND PILOT ACTUAL	X = CLOSE TOLERANCE ROUND PIN P/N	A - X RELIEVED PILOT ACTUAL	X = CLOSE TOLERANCE RELIEVED PIN P/N	A - Y RELIEVED PILOT ACTUAL	Y = MEDIUM TOLERANCE RELIEVED PIN P/N (-Y)	A - Z RELIEVED PILOT ACTUAL	Z = LOOSE TOLERANCE RELIEVED PIN P/N (-Z)	B DIA NOM. - ACTUAL	C	D	E	F (1/3 of A)
1/4	.2495-.2492	UDB-623500	.2493-.2490	UDB-623521	.2485-.2482	UDB-623521-Y	.2470-.2467	UDB-623521-Z	3/16 .1878-.1876	11/32	3/4	3/32	.080
5/16	.3120-.3117	UDB-623501	.3118-.3115	UDB-623522	.3110-.3107	UDB-623522-Y	.3095-.3092	UDB-623522-Z	1/4 .2503-.2501	13/32	7/8	3/32	.103
3/8	.3745-.3742	UDB-623502	.3743-.3740	UDB-623523	.3735-.3732	UDB-623523-Y	.3720-.3717	UDB-623523-Z	5/16 .3128-.3126	1/2	1"	1/8	.123
7/16	.4370-.4367	UDB-623503	.4368-.4365	UDB-623524	.4360-.4357	UDB-623524-Y	.4345-.4342	UDB-623524-Z	3/8 .3753-.3751	19/32	1-1/4	5/32	.144
1/2	.4995-.4992	UDB-623504	.4993-.4990	UDB-623525	.4985-.4982	UDB-623525-Y	.4970-.4967	UDB-623525-Z	7/16 .4378-.4376	21/32	1-3/8	5/32	.164
9/16	.5620-.5617	UDB-623505	.5615-.5610	UDB-623526	.5595-.5590	UDB-623526-Y	.5575-.5570	UDB-623526-Z	1/2 .5003-.5001	3/4	1-1/2	3/16	.184
5/8	.6240-.6237	UDB-623506	.6240-.6235	UDB-623527	.6220-.6215	UDB-623527-Y	.6200-.6195	UDB-623527-Z	9/16 .5628-.5626	27/32	1-3/4	7/32	.205
11/16	.6865-.6862	UDB-623507	.6865-.6860	UDB-623528	.6845-.6840	UDB-623528-Y	.6825-.6820	UDB-623528-Z	5/8 .6253-.6251	29/32	2"	7/32	.225
3/4	.7490-.7487	UDB-623508	.7490-.7485	UDB-623529	.7470-.7465	UDB-623529-Y	.7450-.7445	UDB-623529-Z	11/16 .6885-.6880	1"	2-1/8	1/4	.245
13/16	.8115-.8112	UDB-623509	.8115-.8110	UDB-623530	.8095-.8090	UDB-623530-Y	.8075-.8070	UDB-623530-Z	3/4 .7510-.7505	1-3/32	2-1/4	9/32	.266
7/8	.8740-.8737	UDB-623510	.8740-.8735	UDB-623531	.8720-.8715	UDB-623531-Y	.8700-.8695	UDB-623531-Z	13/16 .8135-.8130	1-5/32	2-1/2	9/32	.287
15/16	.9365-.9362	UDB-623511	.9365-.9360	UDB-623532	.9345-.9340	UDB-623532-Y	.9325-.9320	UDB-623532-Z	7/8 .8760-.8755	1-1/4	2-3/4	5/16	.308
1"	.9985-.9980	UDB-623512	.9980-.9972	UDB-623533	.9960-.9952	UDB-623533-Y	.9920-.9912	UDB-623533-Z	15/16 .9385-.9380	1-5/16	2-7/8	5/16	.327
1-1/8	1.1235-1.1230	UDB-623513	1.1230-1.1222	UDB-623534	1.1210-1.1202	UDB-623534-Y	1.1190-1.1182	UDB-623534-Z	1" 1.0010-1.0005	1-1/2	3-1/4	3/8	.369
1-1/4	1.2485-1.2480	UDB-623514	1.2480-1.2472	UDB-623535	1.2460-1.2452	UDB-623535-Y	1.2440-1.2432	UDB-623535-Z	1-1/8 1.1260-1.1255	1-11/16	3-5/8	7/16	.410
1-3/8	1.3735-1.3730	UDB-623515	1.3730-1.3722	UDB-623536	1.3710-1.3702	UDB-623536-Y	1.3690-1.3682	UDB-623536-Z	1-1/4 1.2510-1.2505	1-13/16	4"	7/16	.452
1-1/2	1.4985-1.4980	UDB-623516	1.4980-1.4972	UDB-623537	1.4960-1.4952	UDB-623537-Y	1.4940-1.4932	UDB-623537-Z	1-3/16 1.3760-1.3755	2"	4-1/4	1/2	.493
1-5/8	1.6235-1.6230	UDB-623517	1.6230-1.6222	UDB-623538	1.6210-1.6202	UDB-623538-Y	1.6190-1.6182	UDB-623538-Z	1-1/2 1.5010-1.5005	2-3/16	4-5/8	9/16	.534
1-3/4	1.7485-1.7480	UDB-623518	1.7480-1.7472	UDB-623539	1.7460-1.7452	UDB-623539-Y	1.7440-1.7432	UDB-623539-Z	1-5/8 1.6260-1.6255	2-5/16	5"	9/16	.575
1-7/8	1.8735-1.8730	UDB-623519	1.8730-1.8722	UDB-623540	1.8710-1.8702	UDB-623540-Y	1.8690-1.8682	UDB-623540-Z	1-3/16 1.7510-1.7505	2-1/2	5-1/4	5/8	.616
2"	1.9985-1.9980	UDB-623520	1.9980-1.9972	UDB-623541	1.9960-1.9952	UDB-623541-Y	1.9940-1.9932	UDB-623541-Z	1-7/8 1.8760-1.8755	2-11/16	5-1/2	11/16	.658
PILOT DIA-NOM	A - X METRIC ROUND PINS		A - X METRIC		A - Y DIAMOND RELIEVED PINS		A - Z		MM - ACTUAL	C	D	E	F
6mm	.2357-.2354	UDB-623600	.2355-.2352	UDB-623602	.2347-.2344	UDB-623602-Y	.2332-.2329	UDB-623602-Z	5mm .1972-.1970	11/32	3/4	3/32	1/16
8mm	.3145-.3142	UDB-623604	.3143-.3140	UDB-623606	.3135-.3132	UDB-623606-Y	.3120-.3117	UDB-623606-Z	6mm .2365-.2363	13/32	7/8	3/32	5/64
10mm	.3932-.3929	UDB-623608	.3930-.3927	UDB-623610	.3922-.3919	UDB-623610-Y	.3907-.3904	UDB-623610-Z	8mm .3153-.3151	1/2	1"	1/8	3/32
12mm	.4719-.4716	UDB-623612	.4717-.4714	UDB-623614	.4709-.4706	UDB-623614-Y	.4694-.4691	UDB-623614-Z	10mm .3940-.3938	21/32	1-3/8	5/32	1/8
14mm	.5507-.5504	UDB-623616	.5502-.5497	UDB-623618	.5482-.5477	UDB-623618-Y	.5462-.5457	UDB-623618-Z	12mm .4727-.4725	3/4	1-1/2	3/16	9/64
16mm	.6289-.6286	UDB-623620	.6289-.6284	UDB-623622	.6269-.6264	UDB-623622-Y	.6249-.6244	UDB-623622-Z	14mm .5515-.5513	27/32	1-3/4	7/32	15/16
18mm	.7077-.7074	UDB-623624	.7077-.7072	UDB-623626	.7057-.7052	UDB-623626-Y	.7037-.7032	UDB-623626-Z	16mm .6302-.6300	29/32	2"	7/32	11/64
20mm	.7864-.7861	UDB-623628	.7864-.7859	UDB-623630	.7844-.7839	UDB-623630-Y	.7824-.7819	UDB-623630-Z	18mm .7097-.7092	1-3/32	2-1/4	9/32	13/64

Lock Screw Locating Pins - Slip Fit



SLIP FIT

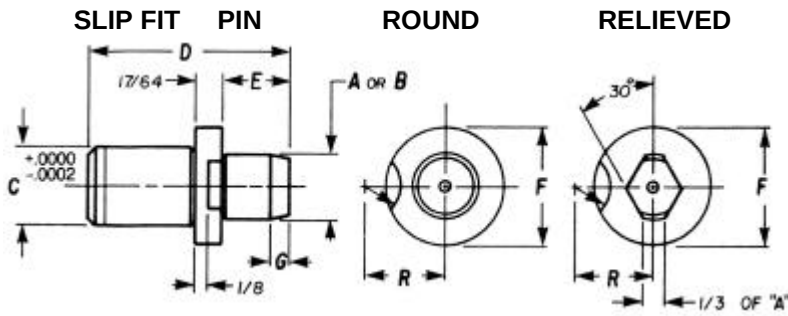
ROUND



RELIEVED

Locate Confidently

UNITED's SLIP FIT LOCK SCREW LOCATING PINS! Pins are offered in Two Pilot Diameters for each nominal size: the 'B' pilot diameter shown below is .001 smaller and is used for *less critical alignment*.



SECURED with LS-1 LOCK SCREWS and USED WITH HEADED (HL) OR HEADLESS (L) RETAINERS SHOWN IN CHART BELOW. HEAT TREATED - GROUND - BLACK OXIDE

PILOT DIA NOM	A PILOT DIA +.0000/-.0005	ROUND PIN PART NO.	RELIEVED PIN PART NO.	B PILOT DIA +.0000/-.0005	ROUND PIN PART NO.	RELIEVED PIN PART NO.	C +.0000/-.0002	D OAL	E PIN LENGTH	F FLANGE DIA	G PT. ANGLE	R RADIUS HEAD	Use Retainer
1/8	.1245	UDB-621481	UDB-621601	.1235	UDB-621480	UDB-621600	.3125	1-3/16	7/16	5/8	3/32	33/64	L-32-8 OR HL-32-8
9/64	.1401	UDB-621483	UDB-621603	.1391	UDB-621482	UDB-621602	Special Pin Diameters from 5/16 O.D. are available from .0937 thru .3200						
5/32	.1558	UDB-621485	UDB-621605	.1548	UDB-621484	UDB-621604							
11/64	.1714	UDB-621487	UDB-621607	.1704	UDB-621486	UDB-621606							
3/16	.1870	UDB-621489	UDB-621609	.1860	UDB-621488	UDB-621608							
13/64	.2026	UDB-621491	UDB-621611	.2016	UDB-621490	UDB-621610							
7/32	.2183	UDB-621493	UDB-621613	.2173	UDB-621492	UDB-621612							
15/64	.2339	UDB-621495	UDB-621615	.2329	UDB-621494	UDB-621614							
1/4	.2495	UDB-621497	UDB-621617	.2485	UDB-621496	UDB-621616							
17/64	.2651	UDB-621499	UDB-621619	.2641	UDB-621498	UDB-621618							
9/32	.2808	UDB-621501	UDB-621621	.2798	UDB-621500	UDB-621620							
19/64	.2964	UDB-621503	UDB-621623	.2954	UDB-621502	UDB-621622	Special Pin Diameters from 1/2 O.D. are available from .2000 thru .5100						
5/16	.3120	UDB-621505	UDB-621625	.3110	UDB-621504	UDB-621624							
5/16	.3120	UDB-621507	UDB-621627	.3110	UDB-621506	UDB-621626							
21/64	.3271	UDB-621509	UDB-621629	.3261	UDB-621508	UDB-621628							
11/32	.3428	UDB-621511	UDB-621631	.3418	UDB-621510	UDB-621630							
23/64	.3584	UDB-621513	UDB-621633	.3574	UDB-621512	UDB-621632							
3/8	.3740	UDB-621515	UDB-621635	.3730	UDB-621514	UDB-621634							
25/64	.3896	UDB-621517	UDB-621637	.3886	UDB-621516	UDB-621636							
13/32	.4053	UDB-621519	UDB-621639	.4043	UDB-621518	UDB-621638							
27/64	.4209	UDB-621521	UDB-621641	.4199	UDB-621520	UDB-621640							
7/16	.4365	UDB-621523	UDB-621643	.4355	UDB-621522	UDB-621642	Special Pin Diameters from 3/4 O.D. are available from .4000 thru .7510						
29/64	.4521	UDB-621525	UDB-621645	.4511	UDB-621524	UDB-621644							
15/32	.4678	UDB-621527	UDB-621647	.4668	UDB-621526	UDB-621646							
31/64	.4834	UDB-621529	UDB-621649	.4824	UDB-621528	UDB-621648							
1/2	.4990	UDB-621531	UDB-621651	.4980	UDB-621530	UDB-621650							
1/2	.4990	UDB-621533	UDB-621653	.4980	UDB-621532	UDB-621652							
33/64	.5146	UDB-621535	UDB-621655	.5136	UDB-621534	UDB-621654							
17/32	.5309	UDB-621537	UDB-621657	.5299	UDB-621536	UDB-621656							
35/64	.5459	UDB-621539	UDB-621659	.5449	UDB-621538	UDB-621658							
9/16	.5615	UDB-621541	UDB-621661	.5605	UDB-621540	UDB-621660							
37/64	.5771	UDB-621543	UDB-621663	.5761	UDB-621542	UDB-621662	Special Pin Diameters from 1" O.D. are available from .6000 thru 1.0100						
19/32	.5928	UDB-621545	UDB-621665	.5918	UDB-621544	UDB-621664							
39/64	.6084	UDB-621547	UDB-621667	.6074	UDB-621546	UDB-621666							
5/8	.6240	UDB-621549	UDB-621669	.6230	UDB-621548	UDB-621668							
41/64	.6396	UDB-621551	UDB-621671	.6386	UDB-621550	UDB-621670							
21/32	.6553	UDB-621553	UDB-621673	.6543	UDB-621552	UDB-621672							
43/64	.6709	UDB-621555	UDB-621675	.6699	UDB-621554	UDB-621674							
11/16	.6865	UDB-621557	UDB-621677	.6855	UDB-621556	UDB-621676							
45/64	.7021	UDB-621559	UDB-621679	.7011	UDB-621558	UDB-621678							
23/32	.7178	UDB-621561	UDB-621681	.7168	UDB-621560	UDB-621680							
47/64	.7334	UDB-621563	UDB-621683	.7324	UDB-621562	UDB-621682	Special Pin Diameters from 1" O.D. are available from .6000 thru 1.0100						
3/4	.7490	UDB-621565	UDB-621685	.7480	UDB-621564	UDB-621684							
3/4	.7490	UDB-621567	UDB-621687	.7480	UDB-621566	UDB-621686							
49/64	.7646	UDB-621569	UDB-621689	.7636	UDB-621568	UDB-621688							
25/32	.7802	UDB-621571	UDB-621691	.7793	UDB-621570	UDB-621690							
51/64	.7959	UDB-621573	UDB-621693	.7949	UDB-621572	UDB-621692							
13/16	.8115	UDB-621575	UDB-621695	.8105	UDB-621574	UDB-621694							
53/64	.8271	UDB-621577	UDB-621697	.8261	UDB-621576	UDB-621696							
27/32	.8428	UDB-621579	UDB-621699	.8418	UDB-621578	UDB-621698							
55/64	.8584	UDB-621581	UDB-621701	.8574	UDB-621580	UDB-621700							
7/8	.8740	UDB-621583	UDB-621703	.8730	UDB-621582	UDB-621702	Special Pin Diameters from 1" O.D. are available from .6000 thru 1.0100						
57/64	.8896	UDB-621585	UDB-621705	.8886	UDB-621584	UDB-621704							
29/32	.9053	UDB-621587	UDB-621707	.9043	UDB-621586	UDB-621706							
59/64	.9209	UDB-621589	UDB-621709	.9199	UDB-621588	UDB-621708							
15/16	.9365	UDB-621591	UDB-621711	.9355	UDB-621590	UDB-621710							
61/64	.9521	UDB-621593	UDB-621713	.9511	UDB-621592	UDB-621712							
31/32	.9678	UDB-621595	UDB-621715	.9668	UDB-621594	UDB-621714							
63/64	.9834	UDB-621597	UDB-621717	.9824	UDB-621596	UDB-621716							
1"	.9990	UDB-621599	UDB-621719	.9980	UDB-621598	UDB-621718							

Locate Precisely

Press Fit Locating Pins

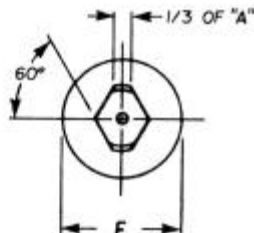
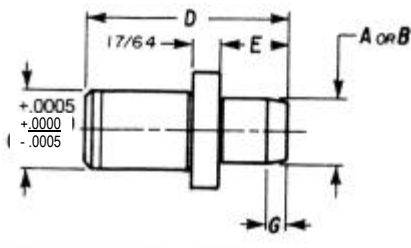
UNITED's Press Fit Locating Pins are offered in Two Pilot Diameters for each nominal size: the 'B' pilot diameter shown below is .001 smaller and is used for less critical alignment.

PRESS FIT

PIN

ROUND

RELIEVED



ROUND

PRESS FIT

RELIEVED

IF MATING HEADED OR HEADLESS PRESS FIT BUSHINGS ARE REQUIRED FOR THE PILOT DIAMETER, SELECT FROM UNITED'S STANDARD LINE OF DRILL BUSHINGS.
HEAT TREATED - GROUND - BLACK OXIDE FINISH

PILOT DIA NOM	A PILOT DIA +.0000/-.0005	ROUND PIN PART NO.	RELIEVED PIN PART NO.	B PILOT DIA +.0000/-.0005	ROUND PIN PART NO.	RELIEVED PIN PART NO.	C +.0000 -.0005	D OAL	E PIN LENGTH	F FLANGE DIA	G PT. ANGLE
1/8	.1245	UDB-621241	UDB-621361	.1235	UDB-621240	UDB-621360	.3135 5/16	1-3/16	7/16	5/8	3/32
9/64	.1401	UDB-621243	UDB-621363	.1391	UDB-621242	UDB-621362	Special Pin Diameters from 5/16 O.D. are available from .0937 thru .3200				
5/32	.1558	UDB-621245	UDB-621365	.1548	UDB-621244	UDB-621364					
11/64	.1714	UDB-621247	UDB-621367	.1704	UDB-621246	UDB-621366					
3/16	.1870	UDB-621249	UDB-621369	.1860	UDB-621248	UDB-621368					
13/64	.2026	UDB-621251	UDB-621371	.2016	UDB-621250	UDB-621370					
7/32	.2183	UDB-621253	UDB-621373	.2173	UDB-621252	UDB-621372					
15/64	.2339	UDB-621255	UDB-621375	.2329	UDB-621254	UDB-621374					
1/4	.2495	UDB-621257	UDB-621377	.2485	UDB-621256	UDB-621376					
17/64	.2651	UDB-621259	UDB-621379	.2641	UDB-621258	UDB-621378					
9/32	.2808	UDB-621261	UDB-621381	.2798	UDB-621260	UDB-621380					
19/64	.2964	UDB-621263	UDB-621383	.2954	UDB-621262	UDB-621382					
5/16	.3120	UDB-621265	UDB-621385	.3110	UDB-621264	UDB-621384					
5/16	.3120	UDB-621267	UDB-621387	.3110	UDB-621266	UDB-621386	.5010 1/2	1-1/2	1/2	7/8	1/8
21/64	.3271	UDB-621269	UDB-621389	.3261	UDB-621268	UDB-621388	Special Pin Diameters from 1/2 O.D. are available from .2000 thru .5100				
11/32	.3428	UDB-621271	UDB-621391	.3418	UDB-621270	UDB-621390					
23/64	.3584	UDB-621273	UDB-621393	.3574	UDB-621272	UDB-621392					
3/8	.3740	UDB-621275	UDB-621395	.3730	UDB-621274	UDB-621394					
25/64	.3896	UDB-621277	UDB-621397	.3886	UDB-621276	UDB-621396					
13/32	.4053	UDB-621279	UDB-621399	.4043	UDB-621278	UDB-621398					
27/64	.4209	UDB-621281	UDB-621401	.4199	UDB-621280	UDB-621400					
7/16	.4365	UDB-621283	UDB-621403	.4355	UDB-621282	UDB-621402					
29/64	.4521	UDB-621285	UDB-621405	.4511	UDB-621284	UDB-621404					
15/32	.4678	UDB-621287	UDB-621407	.4668	UDB-621286	UDB-621406					
31/64	.4834	UDB-621289	UDB-621409	.4824	UDB-621288	UDB-621408					
1/2	.4990	UDB-621291	UDB-621411	.4980	UDB-621290	UDB-621410					
1/2	.4990	UDB-621293	UDB-621413	.4980	UDB-621292	UDB-621412	.7510 3/4	1-15/16	11/16	1-1/8	3/16
33/64	.5146	UDB-621295	UDB-621415	.5136	UDB-621294	UDB-621414	Special Pin Diameters from 3/4 O.D. are available from .4000 thru .7510				
17/32	.5309	UDB-621297	UDB-621417	.5299	UDB-621296	UDB-621416					
35/64	.5459	UDB-621299	UDB-621419	.5449	UDB-621298	UDB-621418					
9/16	.5615	UDB-621301	UDB-621421	.5605	UDB-621300	UDB-621420					
37/64	.5771	UDB-621303	UDB-621423	.5761	UDB-621302	UDB-621422					
19/32	.5928	UDB-621305	UDB-621425	.5918	UDB-621304	UDB-621424					
39/64	.6084	UDB-621307	UDB-621427	.6074	UDB-621306	UDB-621426					
5/8	.6240	UDB-621309	UDB-621429	.6230	UDB-621308	UDB-621428					
41/64	.6396	UDB-621311	UDB-621431	.6386	UDB-621310	UDB-621430					
21/32	.6553	UDB-621313	UDB-621433	.6543	UDB-621312	UDB-621432					
43/64	.6709	UDB-621315	UDB-621435	.6699	UDB-621314	UDB-621434					
11/16	.6865	UDB-621317	UDB-621437	.6855	UDB-621316	UDB-621436					
45/64	.7021	UDB-621319	UDB-621439	.7011	UDB-621318	UDB-621438					
23/32	.7178	UDB-621321	UDB-621441	.7168	UDB-621320	UDB-621440					
47/64	.7334	UDB-621323	UDB-621443	.7324	UDB-621322	UDB-621442					
3/4	.7490	UDB-621325	UDB-621445	.7480	UDB-621324	UDB-621444					
3/4	.7490	UDB-621327	UDB-621447	.7480	UDB-621326	UDB-621446	1.0010 1"	2-5/8	1"	1-1/2	9/32
49/64	.7646	UDB-621329	UDB-621449	.7636	UDB-621328	UDB-621448	Special Pin Diameters from 1" O.D. are available from .6000 thru 1.0100				
25/32	.7803	UDB-621331	UDB-621451	.7793	UDB-621330	UDB-621450					
51/64	.7959	UDB-621333	UDB-621453	.7949	UDB-621332	UDB-621452					
13/16	.8115	UDB-621335	UDB-621455	.8105	UDB-621334	UDB-621454					
53/64	.8271	UDB-621337	UDB-621457	.8261	UDB-621336	UDB-621456					
27/32	.8428	UDB-621339	UDB-621459	.8418	UDB-621338	UDB-621458					
55/64	.8584	UDB-621341	UDB-621461	.8574	UDB-621340	UDB-621460					
7/8	.8740	UDB-621343	UDB-621463	.8730	UDB-621342	UDB-621462					
57/64	.8896	UDB-621345	UDB-621465	.8886	UDB-621344	UDB-621464					
29/32	.9053	UDB-621347	UDB-621467	.9043	UDB-621346	UDB-621466					
59/64	.9209	UDB-621349	UDB-621469	.9199	UDB-621348	UDB-621468					
15/16	.9365	UDB-621351	UDB-621471	.9355	UDB-621350	UDB-621470					
61/64	.9521	UDB-621353	UDB-621473	.9511	UDB-621352	UDB-621472					
31/32	.9678	UDB-621355	UDB-621475	.9668	UDB-621354	UDB-621474					
63/64	.9834	UDB-621357	UDB-621477	.9824	UDB-621356	UDB-621476					
1"	.9990	UDB-621359	UDB-621479	.9980	UDB-621358	UDB-621478					

Threaded Locating Pins

Assure Concentricity

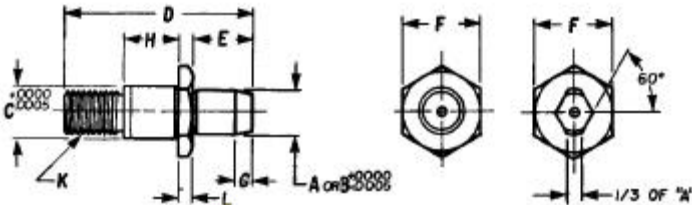
UNITED's THREADED LOCATING PINS!

THREADED LOCATING PINS



ROUND

RELIEVED



Pins offer a choice of Two Pilot Diameters for each nominal size: the 'B' pilot diameter shown below is *.001 smaller* and is used for *less critical alignment*.

Use these pins with threaded retainers and replacement is simplified. See page D30.

Mating head and headless press fit bushings may be selected from *UNITED's* standard drill bushing, types P and H.

SHADED SIZES SUBJECT TO SPECIAL CHARGE

A is standard.

B is .001 U/S

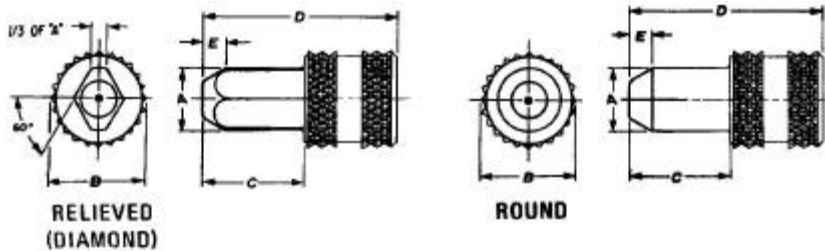
HEAT TREATED - GROUND - BLACK OXIDE

PILOT DIA NOM	A PILOT DIA +.0000 / -.0005	ROUND PIN PART NO.	RELIEVED PIN PART NO.	PILOT DIA NOM	B PILOT DIA +.0000 / -.0005	ROUND PIN PART NO.	RELIEVED PIN PART NO.	C +.0000 -.0005	D OAL	E PIN LENGTH	F FLANGE DIA	G PT. ANGLE	H BODY LENGTH	K THD SIZE	L COLLAR	Use Threaded Retainer
1/8	.1245	UDB-621001	UDB-621121	.1235	UDB-621000	UDB-621120		.3125	1-1/4	7/16	1/2	3/32	7/16	1/4 - 28	3/32	UDB-622268 OR UDB-622269
9/64	.1401	UDB-621003	UDB-621123	.1391	UDB-621002	UDB-621122										
5/32	.1558	UDB-621005	UDB-621125	.1548	UDB-621004	UDB-621124										
11/64	.1714	UDB-621007	UDB-621127	.1704	UDB-621006	UDB-621126										
3/16	.1870	UDB-621009	UDB-621129	.1860	UDB-621008	UDB-621128										
13/64	.2026	UDB-621011	UDB-621131	.2016	UDB-621010	UDB-621130										
7/32	.2183	UDB-621013	UDB-621133	.2173	UDB-621012	UDB-621132										
15/64	.2339	UDB-621015	UDB-621135	.2329	UDB-621014	UDB-621134										
1/4	.2495	UDB-621017	UDB-621137	.2485	UDB-621016	UDB-621136										
17/64	.2651	UDB-621019	UDB-621139	.2641	UDB-621018	UDB-621138										
9/32	.2808	UDB-621021	UDB-621141	.2798	UDB-621020	UDB-621140										
19/64	.2964	UDB-621023	UDB-621143	.2954	UDB-621022	UDB-621142										
5/16	.3120	UDB-621025	UDB-621145	.3110	UDB-621024	UDB-621144										
5/16	.3120	UDB-621027	UDB-621147	.3110	UDB-621026	UDB-621146		.4375	1-19/32	1/2	11/16	1/8	1/2	3/8 - 24	1/8	UDB-622270 OR UDB-622271
21/64	.3271	UDB-621029	UDB-621149	.3261	UDB-621028	UDB-621148										
11/32	.3428	UDB-621031	UDB-621151	.3418	UDB-621030	UDB-621150										
23/64	.3584	UDB-621033	UDB-621153	.3574	UDB-621032	UDB-621152										
3/8	.3740	UDB-621035	UDB-621155	.3730	UDB-621034	UDB-621154										
25/64	.3896	UDB-621037	UDB-621157	.3886	UDB-621036	UDB-621156										
13/32	.4053	UDB-621039	UDB-621159	.4043	UDB-621038	UDB-621158										
27/64	.4209	UDB-621041	UDB-621161	.4199	UDB-621040	UDB-621160										
7/16	.4365	UDB-621043	UDB-621163	.4355	UDB-621042	UDB-621162										
7/16	.4365	UDB-621045	UDB-621165	.4355	UDB-621044	UDB-621164		.5625	2-1/8	11/16	7/8	3/16	5/8	1/2 - 20	5/32	UDB-622272 OR UDB-622273
29/64	.4521	UDB-621047	UDB-621167	.4511	UDB-621046	UDB-621166										
15/32	.4678	UDB-621049	UDB-621169	.4668	UDB-621048	UDB-621168										
31/64	.4834	UDB-621051	UDB-621171	.4824	UDB-621050	UDB-621170										
1/2	.4990	UDB-621053	UDB-621173	.4980	UDB-621052	UDB-621172										
33/64	.5146	UDB-621055	UDB-621175	.5136	UDB-621054	UDB-621174										
17/32	.5309	UDB-621057	UDB-621177	.5299	UDB-621056	UDB-621176										
35/64	.5459	UDB-621059	UDB-621179	.5449	UDB-621058	UDB-621178										
9/16	.5615	UDB-621061	UDB-621181	.5605	UDB-621060	UDB-621180										
37/64	.5771	UDB-621063	UDB-621183	.5761	UDB-621062	UDB-621182										
19/32	.5928	UDB-621065	UDB-621185	.5918	UDB-621064	UDB-621184										
39/64	.6084	UDB-621067	UDB-621187	.6074	UDB-621066	UDB-621186										
5/8	.6240	UDB-621069	UDB-621189	.6230	UDB-621068	UDB-621188										
5/8	.6240	UDB-621071	UDB-621191	.6230	UDB-621070	UDB-621190		.8750	2-31/32	1"	1-1/4	9/32	1"	3/4 - 16	1/4	UDB-622274 OR UDB-622275
41/64	.6396	UDB-621073	UDB-621193	.6386	UDB-621072	UDB-621192										
21/32	.6553	UDB-621075	UDB-621195	.6543	UDB-621074	UDB-621194										
43/64	.6709	UDB-621077	UDB-621197	.6699	UDB-621076	UDB-621196										
11/16	.6865	UDB-621079	UDB-621199	.6855	UDB-621078	UDB-621198										
45/64	.7021	UDB-621081	UDB-621201	.7011	UDB-621080	UDB-621200										
23/32	.7178	UDB-621083	UDB-621203	.7168	UDB-621082	UDB-621202										
47/64	.7334	UDB-621085	UDB-621205	.7324	UDB-621084	UDB-621204										
3/4	.7490	UDB-621087	UDB-621207	.7480	UDB-621086	UDB-621206										
49/64	.7646	UDB-621089	UDB-621209	.7636	UDB-621088	UDB-621208										
25/32	.7802	UDB-621091	UDB-621211	.7793	UDB-621090	UDB-621210										
51/64	.7959	UDB-621093	UDB-621213	.7949	UDB-621092	UDB-621212										
13/16	.8115	UDB-621095	UDB-621215	.8105	UDB-621094	UDB-621214										
53/64	.8271	UDB-621097	UDB-621217	.8261	UDB-621096	UDB-621216										
27/64	.8428	UDB-621099	UDB-621219	.8418	UDB-621098	UDB-621218										
55/64	.8584	UDB-621101	UDB-621221	.8574	UDB-621100	UDB-621220										
7/8	.8740	UDB-621103	UDB-621223	.8730	UDB-621102	UDB-621222										
57/64	.8896	UDB-621105	UDB-621225	.8886	UDB-621104	UDB-621224										
29/32	.9053	UDB-621107	UDB-621227	.9043	UDB-621106	UDB-621226										
59/64	.9209	UDB-621109	UDB-621229	.9199	UDB-621108	UDB-621228										
15/16	.9365	UDB-621111	UDB-621231	.9355	UDB-621110	UDB-621230										
61/64	.9521	UDB-621113	UDB-621233	.9511	UDB-621112	UDB-621232										
31/32	.9678	UDB-621115	UDB-621235	.9668	UDB-621114	UDB-621234										
63/64	.9834	UDB-621117	UDB-621237	.9824	UDB-621116	UDB-621236										
1"	.9990	UDB-621119	UDB-621239	.9980	UDB-621118	UDB-621238										

Nurlock & Short Special Locating Pins

Nurlock & Short Press Fit Pins

UNITED'S NURLOCK LOCATING PINS are embedded in plastic or castable tooling.
UNITED'S type 'N' Nurlock Drill Bushings and Slot Locators are perfect mating bushings.



For Special
Applications
in
Plastic or
Castables.

NURLOCK LOCATING PINS



ROUND

NURLOCK



RELIEVED

HEAT TREATED

GROUND

BLACK OXIDE FINISH

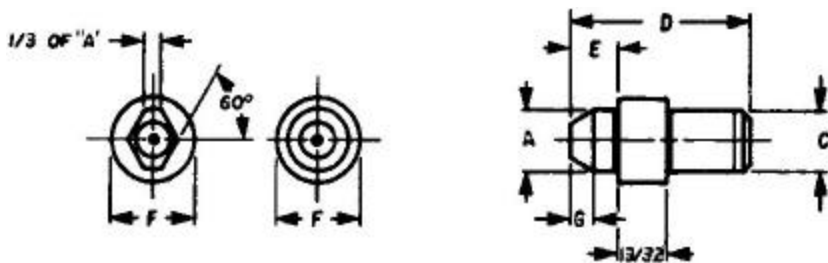
ALL ITEMS ARE SPECIAL

A PILOT DIA +.0000 / -.0002		ROUND	RELIEVED	B	C	D	E
NOM	ACTUAL	PART NO.	PART NO.				
3/32	.0923	UDB-674106	UDB-674144	3/8	7/16	13/16	3/32
1/8	.1235	UDB-674108	UDB-674146				
5/32	.1548	UDB-674110	UDB-674148				
3/16	.1860	UDB-674112	UDB-674150				
7/32	.2173	UDB-674114	UDB-674152	9/16	1/2	7/8	3/32
1/4	.2485	UDB-674116	UDB-674154				
1/4	.2480	UDB-674117	UDB-674155				
9/32	.2793	UDB-674119	UDB-674157				
5/16	.3105	UDB-674121	UDB-674159	11/16	11/16	1-3/16	1/8
11/32	.3418	UDB-674123	UDB-674161				
3/8	.3730	UDB-674125	UDB-674163				
3/8	.3730	UDB-674126	UDB-674164				
13/32	.4043	UDB-674128	UDB-674166	3/4	13/16	1-9/16	3/16
7/16	.4355	UDB-674130	UDB-674168				
15/32	.4668	UDB-674132	UDB-674170				
1/2	.4980	UDB-674134	UDB-674172				
1/2	.4980	UDB-674135	UDB-674173				
17/32	.5293	UDB-674137	UDB-674175				
9/16	.5605	UDB-674139	UDB-674177				
19/32	.5918	UDB-674141	UDB-674179				
5/8	.6230	UDB-674143	UDB-674181				

UNITED'S SHORT PRESS FIT LOCATING PINS are designed for specialized installations where UNITED'S standard Press Fit Locating Pins cannot be used. The Short Pins are offered in both Round and Relieved styles either with ground or unground pilots. Unground diameters have .010 — .015 grinding stock remaining on pilot O.D.

HEAT TREATED - GROUND - BLACK OXIDE FINISH

ALL ITEMS ARE SPECIAL



For Special
Close Fit
Applications.

SHORT PRESS FIT LOCATING PINS



ROUND

SHORT PRESS FIT



RELIEVED

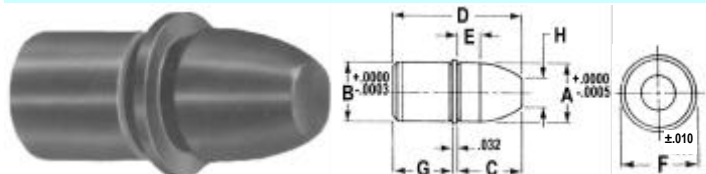
A PILOT DIA NOM	GROUND PILOT DIA ACTUAL	UNGROUND PILOT DIA ACTUAL	ROUND PIN PART NO. GROUND	ROUND PIN PART NO. UNGROUND	RELIEVED PIN PART NO. GROUND	RELIEVED PIN PART NO. UNGROUND	C +.0000 -.0005	D	E	F	G
1/4	.2490	.262	UDB-623000	UDB-623010	UDB-623020	UDB-623030	.5010	1-5/16	7/32	11/16	1/32
5/16	.3120	.324	UDB-623001	UDB-623011	UDB-623021	UDB-623031		1-3/8	9/32	7/8	3/32
3/8	.3740	.387	UDB-623002	UDB-623012	UDB-623022	UDB-623032		1-7/16	11/32		5/32
7/16	.4365	.449	UDB-623003	UDB-623013	UDB-623023	UDB-623033		1-1/2	13/32		7/32
1/2	.4990	.512	UDB-623004	UDB-623014	UDB-623024	UDB-623034	.7510	1-1/2	13/32	7/8	7/32
1/2	.4990	.512	UDB-623005	UDB-623015	UDB-623025	UDB-623035		1-7/8	15/32		7/32
9/16	.5615	.574	UDB-623006	UDB-623016	UDB-623026	UDB-623036					
5/8	.6240	.637	UDB-623007	UDB-623017	UDB-623027	UDB-623037					
11/16	.6865	.699	UDB-623008	UDB-623018	UDB-623028	UDB-623038					
3/4	.7490	.762	UDB-623009	UDB-623019	UDB-623029	UDB-623039					

Location Pins and Bushings

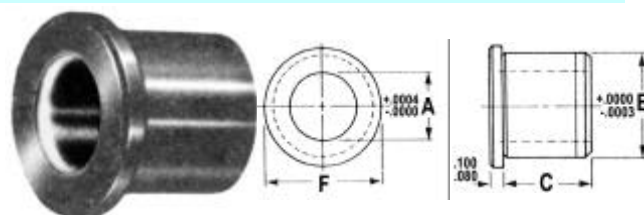
Precision Bullet Nose Dowels, Cone and Nose Pins & Bushings

BULLET NOSE DOWELS

LINERS FOR BULLET NOSE DOWELS



1144 Steel — RC-50-62 — BLACK OXIDE FINISH



Precision Pin matches Liner I.D. — Aligns two fixture components precisely.
Pins and Bushings are concentric within .0003 and .0005 T.I.R.

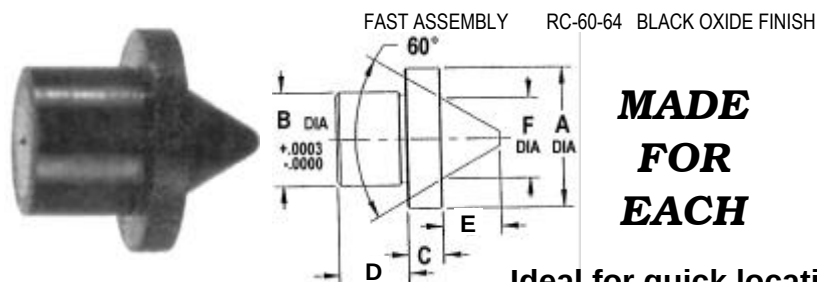
A PILOT DIAMETER NOM ACTUAL	DOWEL PART NO.	B -.0003	C	D	E MIN	F ±.010	G	H
1/4 .2499	UDB-677130	.2516	.375	.907	.125	.280	1/2	1/8
5/16 .3124	UDB-677135	.3141	.407	.939	.157	.344	1/2	5/32
3/8 .3749	UDB-677140	.3766	.500	1.032	.187	.407	1/2	3/16
1/2 .4999	UDB-677145	.5017	.562	1.094	.187	.532	1/2	1/4

**LIFE LONG
MATES!**

A I.D. SIZE NOM ACTUAL	LINER PART NO.	B	C	F ±.010
1/4 .2501	UDB-635180	.5017	3/8	.625
5/16 .3126	UDB-635185	.5017	3/8	.625
3/8 .3751	UDB-635190	.6267	1/2	.750
1/2 .5001	UDB-635195	.7518	5/8	.875

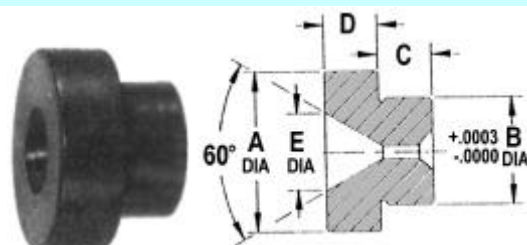
CONE PIN LOCATORS

MATCHING CONE BUSHING LOCATORS



FAST ASSEMBLY RC-60-64 BLACK OXIDE FINISH

**MADE
FOR
EACH**



Ideal for quick locating assembly with moderate accuracy.
Locating Pin accuracy prevents misalignment of either fixture part.

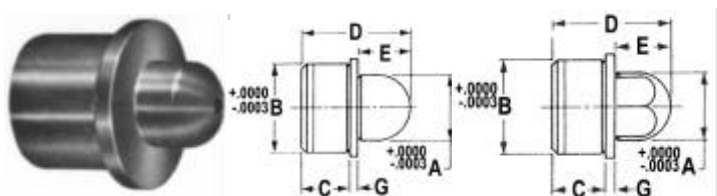
CONE PIN PART NO.	A DIA	B DIA	C HD LEN ±.015	D O.D. LEN	E PILOT	F PILOT DIA
UDB-635240	3/4	.5014	3/16	3/8	5/16	.438
UDB-635250	1"	.7515	3/16	9/16	1/2	.676

**TWO
OF A KIND!**

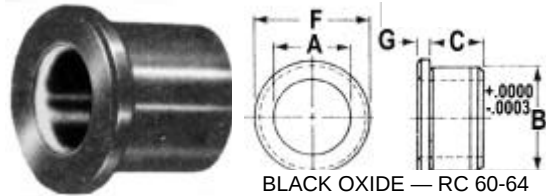
CONE BUSHING PART NO.	A DIA	B DIA	C O.D. LEN	D ±.015 HD LEN	E PILOT DIA	GAP BETWEEN HEADS WHEN ASSEMBLED
UDB-635270	3/4	.5014	1/4	1/4	.370	.059
UDB-635280	1"	.7515	3/8	3/8	.616	.052

BULLET NOSE PINS

LINERS FOR BULLET NOSE PINS



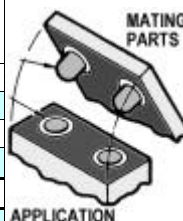
**FINE
FIT!**



BLACK OXIDE — RC 60-64

Allows both holes to be bored at the same time — Economical and Accurate.
Matching Press Fit O.D.s — Pilots are held to .0003 Tolerance.

A PILOT DIAMETER	ROUND PIN PART NO.	RELIEVED PIN PART NO.	B -.0003	C	D	E	F	G
1/4 .2499	UDB-677105	UDB-677106	.4078	3/8	21/32	7/32	9/16	1/16
5/16 .3124	UDB-677110	UDB-677111	.5017	3/8	23/32	9/32	5/8	1/16
3/8 .3748	UDB-677115	UDB-677116	.6267	1/2	7/8	5/16	3/4	1/16
1/2 .4998	UDB-677120	UDB-677121	.7518	1/2	31/32	13/32	7/8	1/16
5/8 .6248	UDB-677122	UDB-677122R	.8768	1/2	1-1/16	7/16	1"	1/8
3/4 .7498	UDB-677123	UDB-677124	1.0018	3/4	1-7/16	9/16	1-1/8	1/8
1" .9998	UDB-677125	UDB-677126	1.3771	3/4	1-5/8	3/4	1-1/2	1/8



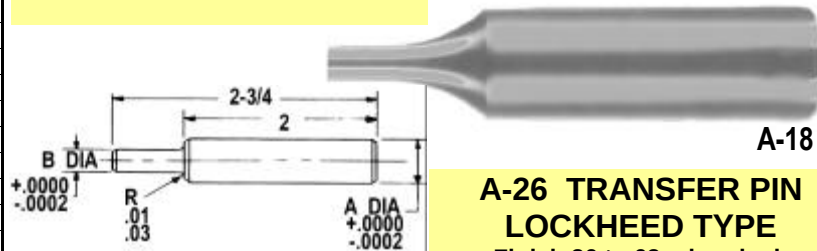
A I.D. SIZE NOM ACTUAL	LINER PART NO.	B -.0003	C	F	G
1/4 .2501	UDB-635155	.4078	7/16	9/16	1/16
5/16 .3126	UDB-635160	.5017	7/16	5/8	1/16
3/8 .3751	UDB-635165	.6267	7/16	3/4	1/16
1/2 .5001	UDB-635170	.7518	1/2	7/8	1/16
5/8 .6252	UDB-635171	.8768	1/2	1"	1/8
3/4 .7502	UDB-635173	1.0018	1/2	1-1/8	1/8
1" 1.0002	UDB-635175	1.3771	11/16	1-1/2	1/8

Transfer, Gauge, PBT Die Pins, Flangeless Locating Pins

Transfer & Gauge Pins
PBT, Flangeless Pins

A-18 PART NO.	A DIA +.0000 -.0002	B DIA +.0000 -.0002	A-18 PART NO.	A DIA +.0000 -.0002	B DIA +.0000 -.0002
UDB-903181	.4999	.0979	UDB-903192	.4999	.3124
UDB-903182	.4999	.1249	UDB-903193	.4999	.3749
UDB-903183	.4999	.1284	UDB-903194	.4999	.3769
UDB-903184	.4999	.1589	UDB-903195	.4999	.3779
UDB-903185	.4999	.1889	UDB-903196	.4999	.4374
UDB-903186	.4999	.1899	UDB-903280	.9999	.5624
UDB-903187	.4999	.1809	UDB-903281	.9999	.6249
UDB-903188	.4999	.1934	UDB-903282	.9999	.6874
UDB-903189	.4999	.1989	UDB-903283	.9999	.7499
UDB-903190	.4999	.2499	UDB-903284	.9999	.8749
UDB-903191	.4999	.2519			

A-18 TRANSFER PIN

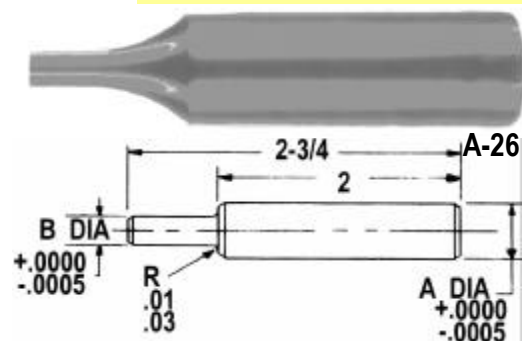


A-18

A-26 TRANSFER PIN LOCKHEED TYPE

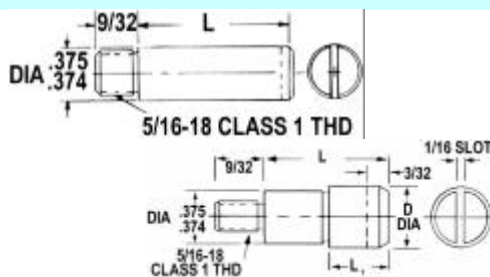
Finish 36 to 63 micro inch
Straight & round within .0005"
Diameters concentric within .0001"
T.I.R. — Ground on centers
Heat Treat R/C 55-60

A-26 PART NO.	A DIA +.0000 -.0005	B DIA +.0000 -.0005	A-26 PART NO.	A DIA +.0000 -.0005	B DIA +.0000 -.0005	A-26 PART NO.	A DIA +.0000 -.0005	B DIA +.0000 -.0005
UDB-903301	.5000	.0625	UDB-903317	.5000	.2500	UDB-903333	.5000	.3860
UDB-903302	.5000	.0700	UDB-903318	.5000	.2520	UDB-903334	.5000	.3906
UDB-903303	.5000	.0980	UDB-903319	.5000	.2570	UDB-903335	.5000	.4040
UDB-903304	.5000	.1250	UDB-903320	.5000	.2610	UDB-903336	.5000	.4063
UDB-903305	.5000	.1285	UDB-903321	.5000	.2720	UDB-903337	.5000	.4219
UDB-903306	.5000	.1440	UDB-903322	.5000	.2813	UDB-903338	.5000	.4375
UDB-903307	.5000	.1610	UDB-903323	.5000	.3125	UDB-903339	.5000	.4688
UDB-903308	.5000	.1695	UDB-903324	.5000	.3160	UDB-903340	1.0000	.5000
UDB-903309	.5000	.1850	UDB-903325	.5000	.3230	UDB-903341	1.0000	.5156
UDB-903310	.5000	.1875	UDB-903326	.5000	.3281	UDB-903342	1.0000	.5313
UDB-903311	.5000	.1890	UDB-903327	.5000	.3390	UDB-903343	1.0000	.5625
UDB-903312	.5000	.1910	UDB-903328	.5000	.3438	UDB-903344	1.0000	.5938
UDB-903313	.5000	.1935	UDB-903329	.5000	.3594	UDB-903345	1.0000	.6250
UDB-903314	.5000	.2090	UDB-903330	.5000	.3750	UDB-903346	1.0000	.7500
UDB-903315	.5000	.2130	UDB-903331	.5000	.3770	UDB-903347	1.0000	.8750
UDB-903316	.5000	.2210	UDB-903332	.5000	.3782	UDB-903348	1.0000	1.0000



A-26

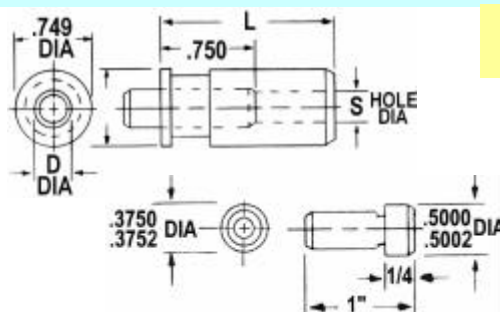
UNITED PART NO.	L	L ₁	D
UDB-506305	.9375		
UDB-506307	.6375		
UDB-506309	1.0625		
UDB-506311	1.0625	5/16	.500/.499
UDB-506313	1.0625	3/8	.500/.499



P.B.T. PIN TYPE I DOUGLAS



UNITED PART NO.	D	L	S
UDB-506201	1/4	2.250	1/8
UDB-506203	3/8	2.250	1/4
UDB-506205	3/8	1.250	1/4
UDB-506207	3/8	2.375	1/4
UDB-506221			

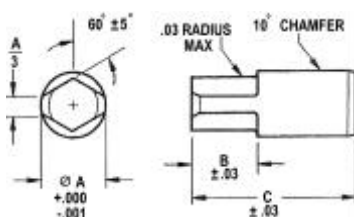


P.B.T. PIN TYPE II DOUGLAS LOCKING TYPE

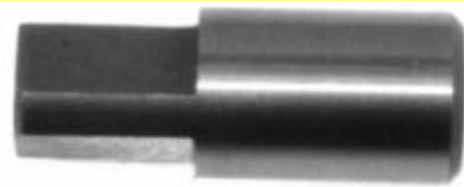


MAT 0-1 OIL HRD T.S. R/C-60-63
CONFORMS TO UT-7029

UNITED PART NO.	A +.000 -.001	B	C
UDB-702902	.250	1/4	3/4
UDB-702903	.375	3/8	1
UDB-702904	.500	1/2	1-1/4



FLANGELESS LOCATING PIN BOEING

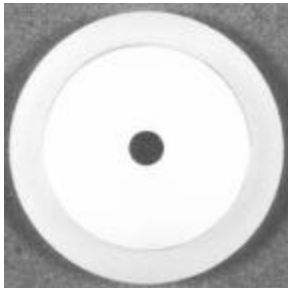


**Indexing Washers
Step Down Pins**

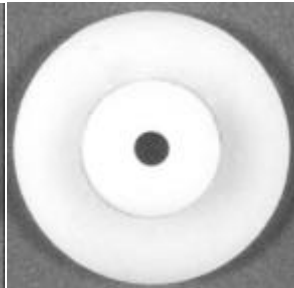
Indexing Shoulder Washers Plastic Step Down Pins

CUSTOM PRECISION DURABLE PLASTIC NYLON WHITE

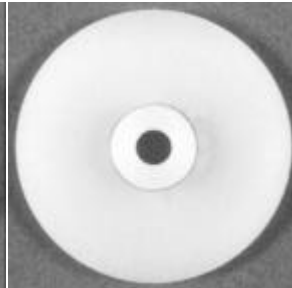
INDEXING SHOULDER WASHERS — Durable White Nylon — Precision Plastic



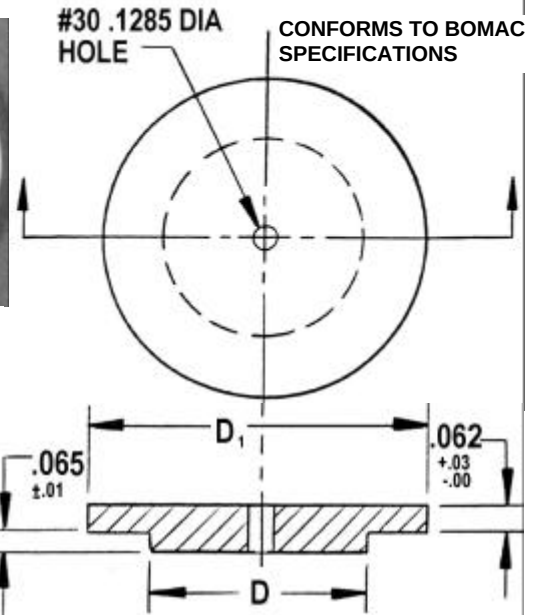
UDB-517815 .995



UDB-517805 .620

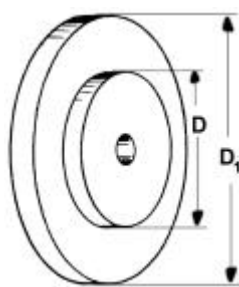


UDB-517809 .495

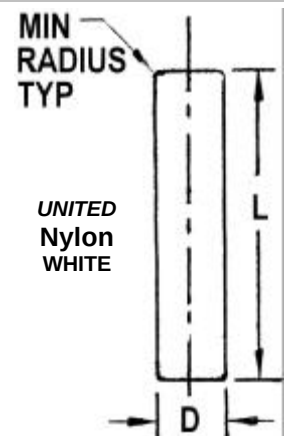
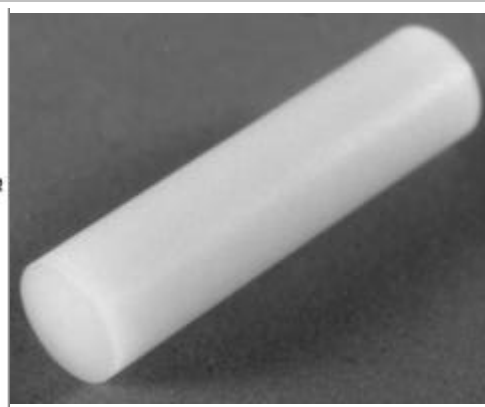
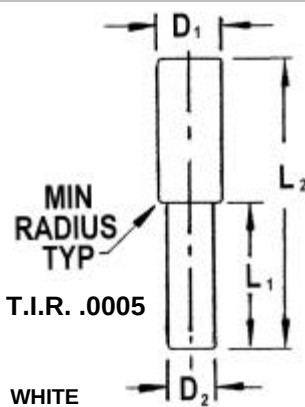
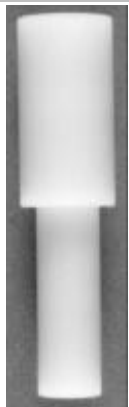


UNITED PART NO.	D DIA	+ .000 - .005	D ₁ ± .030
UDB-517819	.191		0.75
UDB-517817	.307		1.00
UDB-517807	.370		1.00
UDB-517809	.495		1.00
UDB-517803	.557		1.00
UDB-517805	.620		1.00
UDB-517811	.745		1.00
UDB-517813	.870		1.00
UDB-517815	.995		1.25

**UNITED
CUSTOM
PRECISION
DURABLE
NYLON
WHITE
PLASTIC**



PLASTIC STEP DOWN PINS — To Transfer Hole Locations from Masters to Laminates



UNITED PART NO.	D ₁ ± .001	D ₂ ± .001	L ₁ ± .06	L ₂ ± .06
UDB-954501	.124	.097	.75	1.50
UDB-954503	.192	.097	.75	1.50
UDB-954505	.192	.124	.75	1.50
UDB-954507	.192	.127	.75	1.50
UDB-954509	.249	.124	.75	1.50
UDB-954511	.249	.127	.75	1.50
UDB-954513	.249	.192	.75	1.50
UDB-954515	.256	.124	.75	1.50
UDB-954517	.256	.127	.75	1.50
UDB-954519	.256	.192	.75	1.50
UDB-954521	.256	.249	.75	1.50
UDB-954523	.311	.124	.75	1.50
UDB-954525	.311	.127	.75	1.50
UDB-954527	.311	.192	.75	1.50
UDB-954529	.311	.249	.75	1.50
UDB-954531	.374	.124	.75	1.50
UDB-954533	.374	.127	.75	1.50
UDB-954535	.374	.192	.75	1.50
UDB-954537	.374	.249	.75	1.50

**OUR EXCITING
NEW
TOUGH
DURABLE
PRECISION
WHITE
NYLON
LOCATING and
TRANSFER PINS**

ACCURATE—COST EFFECTIVE!

UNITED PART NO.	D ± .001	L ± .06
UDB-954551	.374	1.50
UDB-954553	.342	1.50
UDB-954555	.311	1.50
UDB-954557	.280	1.50
UDB-954559	.249	1.50
UDB-954561	.217	1.50
UDB-954563	.192	1.50
UDB-954565	.127	1.50
UDB-954567	.124	1.50
UDB-954569	.092	1.50

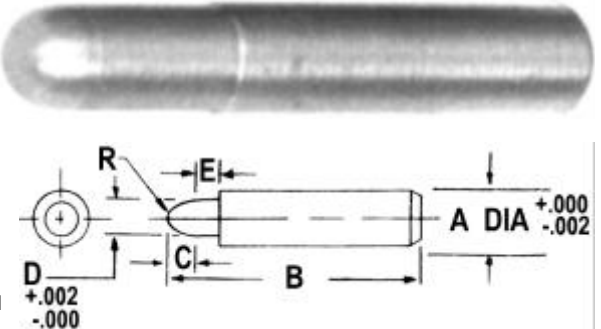
Form Block - Hydropress - Terminal Jig Pins

**Pins-Form Block,
Hydropress, Terminal**

UNITED	A	B	C	D	E	R
UDB-903211	.125	1-9/32	.15	.115	.19	1/32
UDB-903212	.125	1-17/32	.15	.115	.19	1/32
UDB-903213	.187	1-5/16	.18	.178	.19	1/16
UDB-903214	.187	1-17/32	.15	.115	.19	1/32
UDB-903215	.187	1-9/16	.18	.178	.19	1/16
UDB-903216	.187	1-15/16	.18	.178	.19	1/16
UDB-903217	.187	2-11/32	.15	.178	.19	1/16
UDB-903218	.250	2-3/8	.18	.240	.19	3/32
UDB-903219	.250	2-1/2	.18	.240	.32	3/32
UDB-903220	.250	1-1/2	.18	.240	.32	3/32

BULLET NOSE FORM BLOCK LOCATING PINS

LOCKHEED TYPE



ALL ITEMS ARE
ALLOY STEEL,
HARDENED AND
GROUND WITH
BLACK OXIDE FINISH

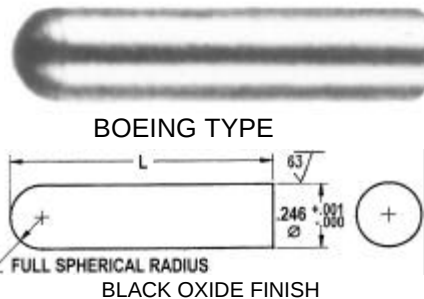
HYDROPRESS BLOCK LOCATING PINS

TYPE I

CONFORMS TO
UT-7031

MAT 4340
RC-38-42

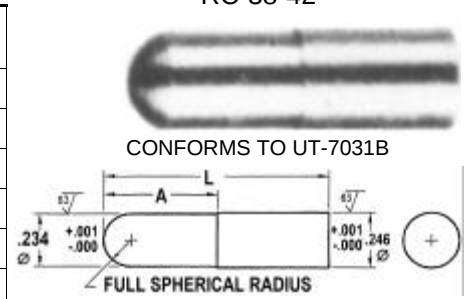
UNITED PART NO.	L
UDB-703112	1.00
UDB-703113	1.50
UDB-703114	2.25
UDB-703115	.75
UDB-703116	1.25
UDB-703117	2.00



TYPE II

MAT 4340
RC-38-42

UNITED PART NO.	L	A
UDB-703101	.75	.38
UDB-703102	1.00	.50
UDB-703103	1.25	.38
UDB-703104	1.50	.50
UDB-703105	1.75	.75
UDB-703106	2.00	1.00



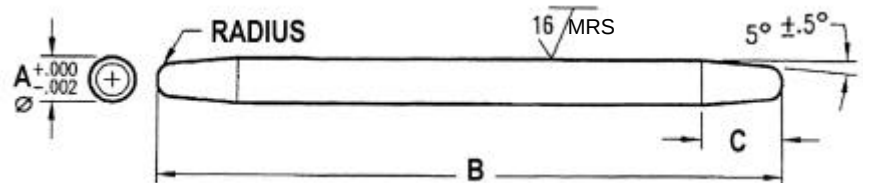
DOUBLE TAPER ALIGNMENT PINS

UNITED PART NO.	A	B	C	R
UDB-732218-.218-4	.218	4	.50	.06
UDB-732250-.250-4	.250	4	.50	.06
UDB-732281-.281-4	.281	4	.50	.09
UDB-732312-.3125-3.5	.3125	3.5	.50	.09
UDB-732328-.328-3.5	.328	3.5	.50	.09
UDB-732343-.343-5	.343	5	.50	.09
UDB-732406-.406-4	.406	4	.50	.12
UDB-732418-.418-5	.418	5	.50	.12
UDB-732468-.468-3.5	.468	3.5	.50	.12
UDB-732498-.498-12	.498	12	.50	.12
UDB-732718-.718-7	.718	7	.62	.16
UDB-732867-.8675-3.75	.8675	3.75	.75	.19
UDB-732874-.874-6.25	.874	6.25	.75	.19
UDB-732101-1.015-6.25	1.015	5.25	.75	.25
UDB-732112-1.124-3.75	1.124	3.75	.75	.25
UDB-732112-1.124-6.25	1.124	6.25	.75	.25

CONFORMS TO UT-7032

BOEING TYPE

**USED FOR ALIGNMENT IN MATING PARTS
ASSISTS IN RETAINING PARTS IN A FIXED POSITION**



MAT A-2 TOOL STEEL - RC-58-67 GROUND FINISH

PRICES ON REQUEST

**SPECIFY LENGTH IN INCHES.
SPECIFY O.D. IN THOUSANDTHS.**

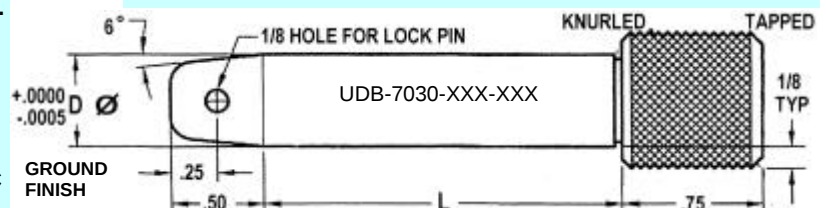
CONFORMS TO
UT-7030

MAT
02 TOOL STEEL
RC-58-62

1/2" and Under
O.D.s ground to +.0000 / -.0005
Tapped 10-24 NC x .50 Deep

Over 1/2" O.D.s ground to
+.0000 / -.0005. Tapped 1/4-20 NC
x .50 Deep

UDB-7030+D+L TERMINAL JIG PINS



Tooling Balls

Locate Best With Balls

Hardened Ground Steel — 360° Preferences

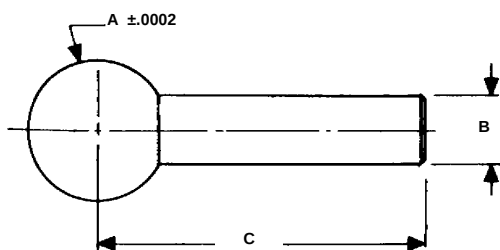
UNITED's Tooling Balls provide a precision reference point for critical machining. The precision balls are held within plus or minus .0002 in ball diameter and in the location from the ball to centerline. **UNITED** Tooling Balls are rugged, precise and guaranteed for normal wear.

STANDARD TOOLING BALLS



ADJUSTABLE TYPE
Excellent referencing in construction and locations for jigs, fixtures and tools.

Set at any height and lock in with set screw.



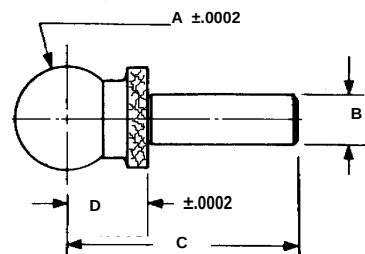
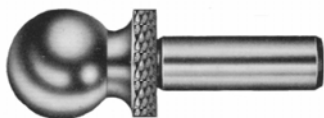
* PRESS FIT +.0003 -.0000	* SLIP FIT +.0000 -.0004	BALL A	SELECT SHANK * B PRESS OR SLIP	LENGTH C
UDB-926705	UDB-926706	.2500	.1250	.563
UDB-926710	UDB-926711	.3750	.1875	.750
UDB-926715	UDB-926716	.5000	.2500	.940
UDB-926720	UDB-926721	.5000	.2500	1.500
UDB-926724	UDB-926725	.5000	.2500	2.875
UDB-926726	UDB-926727	.5000	.3125	1.500
UDB-926730	UDB-926731	.5000	.3750	1.500
UDB-926735	UDB-926736	.6250	.3125	1.063
UDB-926740	UDB-926741	.7500	.3750	1.250
UDB-926745	UDB-926746	.8750	.4375	1.440
UDB-926750	UDB-926751	1.0000	.5000	1.625

* .0002 T.I.R. BALL TO SHANK

SHOULDER TOOLING BALLS

Without Tapped Shanks

Knurled Shoulder



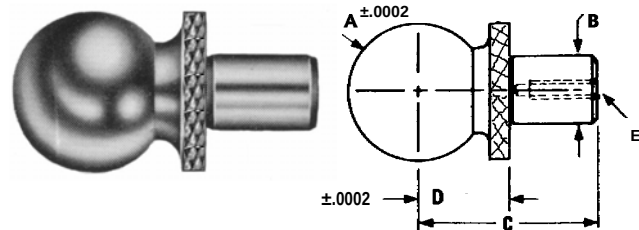
The center of construction ball accurately locates other fixture factors.

PRESS FIT +.0003 -.0000	SLIP FIT +.0000 -.0004	BALL A	SELECT SHANK B PRESS OR SLIP	LENGTH C	SHOULDER TO BALL D
UDB-926805	UDB-926806	.2500	.1250	.560	.2000
UDB-926810	UDB-926811	.3750	.1875	.750	.3000
	UDB-926977	.5000	.2500	.625	.3125
UDB-926815	UDB-926816	.5000	.2500	.940	.4000
UDB-926818	UDB-926819	.5000	.2500	1.125	.5000
UDB-926820	UDB-926821	.5000	.2500	1.375	.5000
	UDB-926981	.5000	.2500	1.500	.5000
UDB-926822	UDB-926823	.5000	.2500	1.625	1.000
UDB-926824	UDB-926825	.5000	.2500	1.875	1.2500
	UDB-926982	.5000	.3125	1.500	.5000
	UDB-926983	.5000	.3750	1.500	.5000
UDB-926826	UDB-926827	.6250	.3125	1.050	.4500
UDB-926830	UDB-926831	.7500	.3750	1.250	.5000
UDB-926835	UDB-926836	1.0000	.5000	1.625	.7000

TOOLMAKER'S CONSTRUCTION BALLS

With Tapped Shanks — Knurled Shoulder

A precise height reference shoulder locates ball in 3 thread dimensions.



The Construction Ball can be pulled into a hole or bushing from below without applying pressure on the ball by using a cap screw in the internally tapped shank.

UNITED PART NO.	BALL A	SHANK B +.0000 -.0004	LENGTH C	SHOULDER TO BALL D	THRD x DEPTH E
UDB-926870	.5000	.2500	.875	.5000	6-32 x 1/4 D.P.
UDB-926875	.5000	.2500	.625	.3125	6-32 x 1/4 D.P.
UDB-926979	.5000	.3125	.940	.5000	6-32 x 5/16 D.P.
UDB-926984	.5000	.2500	.940	.5000	6-32 x 5/16 D.P.

See page D42 for Tooling Ball Pads.

UNITED's proprietary welding method combined with **UNITED's** exclusive shank design produces precise dimensions while retaining brilliant finishes of balls and shanks. **IN THE EVENT AN ABNORMALLY HEAVY LATERAL PRESSURE IS APPLIED, THE BALL WILL UNIQUELY DROP OFF PRIOR TO BENDING THE SHANK OR DISTORTING THE TOOLING BALL'S TOLERANCES.** Thus inspection error is prevented!

UNITED Has the Best Ball!

Precision Ground-Luster Finish-Single Ball Construction
Tool Steel RC-58-62

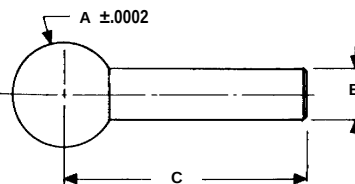
Send us your specific requirements.

One Piece Construction
Tooling Balls

ONE PIECE CONSTRUCTION

PRESS FIT +.0003 -.0000 PART NO.	SLIP FIT +.0000 -.0004 PART NO.	A ±.0002 BALL	SELECT B SHANK O.D. PRESS OR SLIP	C LENGTH
UDB-826705	UDB-826706	.2500	.1250	9/16
UDB-826710	UDB-826711	.3750	.1875	3/4
UDB-826715	UDB-826716	.5000	.2500	15/16
UDB-826720	UDB-826721	.5000	.2500	1-1/2
UDB-826725	UDB-826726	.5000	.3125	1-1/2
UDB-826730	UDB-826731	.5000	.3750	1-1/2

Tough and
Durable



STANDARD TOOLING BALLS

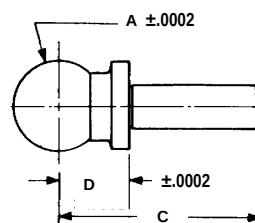
Strong Solid One-Piece



ONE PIECE CONSTRUCTION

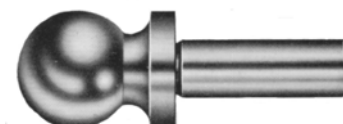
PRESS FIT +.0003 -.0000 PART NO.	SLIP FIT +.0000 -.0004 PART NO.	A ±.0002 BALL	SELECT B SHANK O.D. PRESS OR SLIP	C LENGTH	D ±.0002 SHOULDER TO BALL
UDB-826805	UDB-826806	.2500	.1250	9/16	.200
UDB-826810	UDB-826811	.3750	.1875	3/4	.300
UDB-826815	UDB-826816	.5000	.2500	15/16	.400
UDB-826820	UDB-826821	.5000	.2500	1-3/8	.500
UDB-826825	UDB-826826	.5000	.2500	1-1/2	.500
UDB-826830	UDB-826831	.7500	.3750	1-1/4	.500

Shoulder provides precise
base to center line, assuring
exact location.



SHOULDER TOOLING BALLS

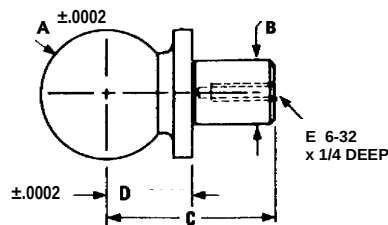
Strong Solid One-Piece — No-Knurl



ONE PIECE CONSTRUCTION

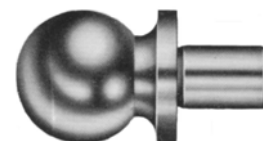
UNITED PART NO.	A BALL ±.0002	B SHANK O.D. +.0000 -.0004 SLIP FIT	C LENGTH	D SHOULDER TO BALL ±.0002
UDB-826875	.5000	.2500	5/8	.3125
UDB-826885	12 mm ± .010	6 mm + .000 - .010	22 mm ± .005	12 mm

Tapped hole for
screw mounting.



TOOLMAKER'S CONSTRUCTION BALLS

Strong Solid One-Piece — No-Knurl



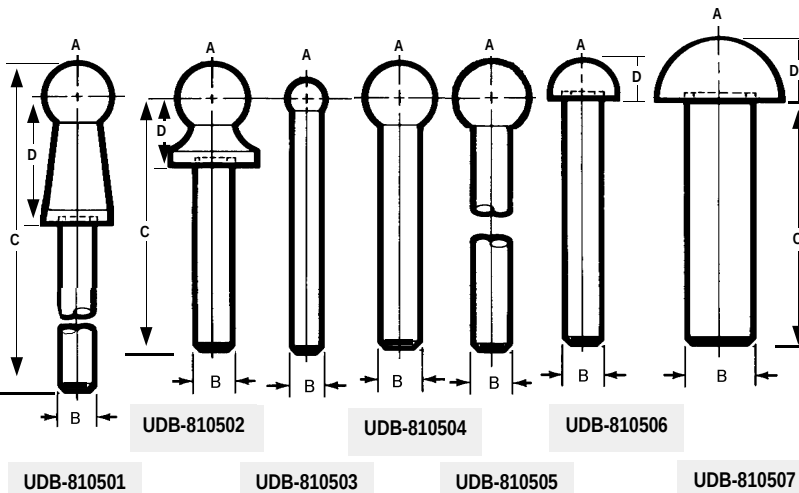
UNITED'S SUPREME LONG SHANK DESIGN

With Close Tolerances — Ideal for

SUPREME LONG SHANK INSPECTION BALLS

UDB-810508 KIT OF ALL 7 BALLS

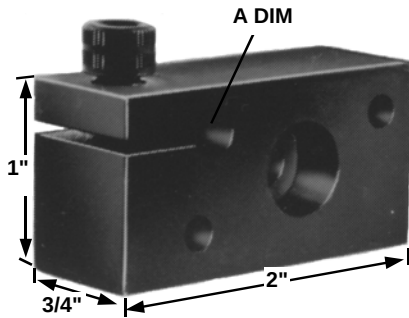
UNITED PART NO.	A ±.0002 Ball Dia.	B +.0001 -.0002 Shank Dia.	C Length	D ±.0002 Shoulder to Ball
UDB-810508	KIT of all 7 Long Shank Supreme Inspection Balls..			
UDB-810501	.5000	.2497	2-1/2	1.000
UDB-810502	.5000	.2497	2	.5000
UDB-810503	.2500	.1872	2	—
UDB-810504	.5000	.2497	2	—
UDB-810505	.5000	.2497	4	—
UDB-810506	.5000	.2497	2	.2500
UDB-810507	1.000	.4997	2	.5000



Tooling Ball Pads

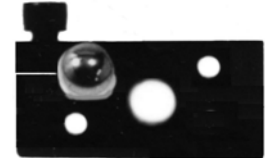
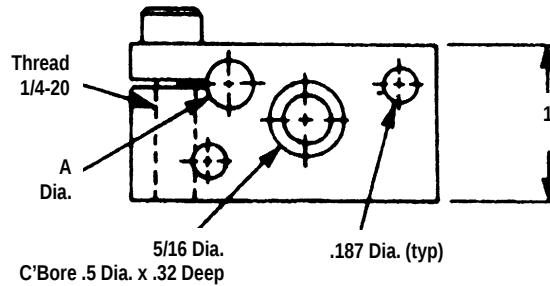
Three Distinct Accurate Pads

RECTANGULAR TOOLING PAD



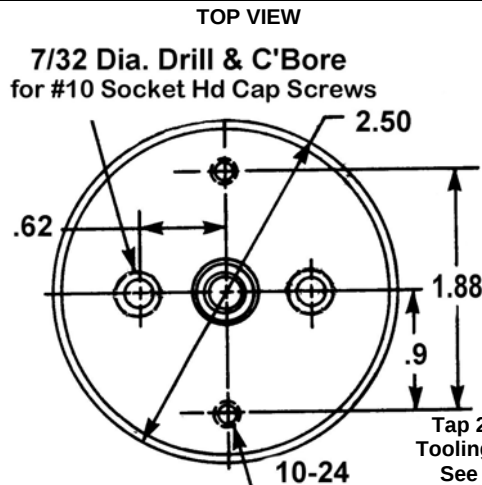
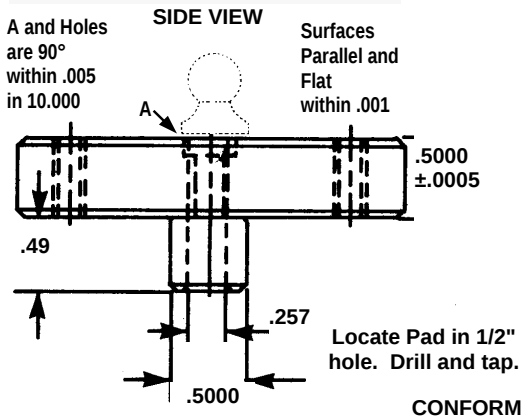
UNITED Pads were designed for easy insertion and removal of tooling balls. Provided with drilled holes for mounting by cap screws and dowels, the Tooling Ball is adjusted to the exact position required and then locked securely in place by a cap screw without marring the shank of the tooling ball.

UNITED PART NO.	A +.0005 DIA. -.0000
UDB-919075-25	.2500
UDB-919075-31	.3125
UDB-919075-37	.3750



BLACK OXIDE FINISH

ROUND TOOLING PAD



UNITED PART NO.	A +.0005 DIA. -.0000
UDB-919078	.2500
UDB-919079	.3125
UDB-919080	.3750

CONCENTRIC WITHIN .002 T.I.R. BLACK OXIDE FINISH

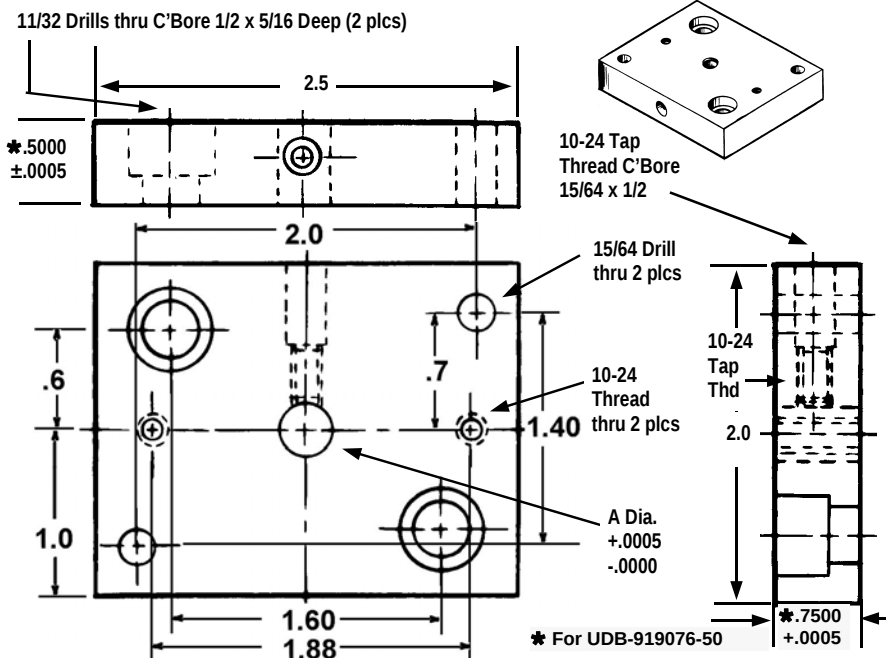
TOOLING PAD



UNITED PART NO.	A +.0005 DIA. -.0000
UDB-919076-25	.2500
UDB-919076-31	.3125
UDB-919076-37	.3750
*UDB-919076-50	.5000

CONFORMS TO CTS 136A - 1 & 2

BLACK OXIDE FINISH

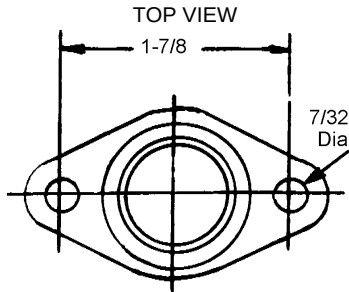


Tooling Ball Covers and Premium Tooling Balls

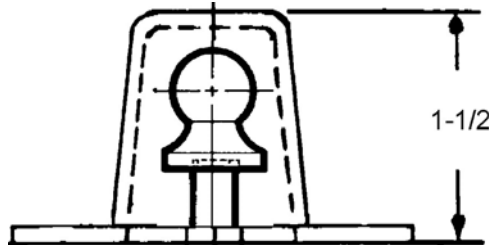
Premium Tooling
Balls and Covers

Protects your Precision Measuring Tooling Ball

CONSTRUCTION TOOLING BALL COVERS



REF STD-132A, T-53026, CTS-137AB



UDB-653041



DIE CAST ZINC ALLOY

Also used with Short Construction Tooling Balls

INSTALLED VIEW

UNITED TOOLING BALL SET 810508

LONG SHANK PREMIUM TOOLING BALLS



UDB-810501



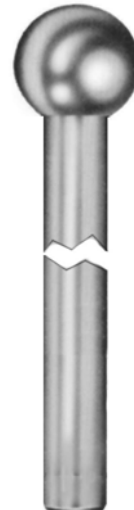
UDB-810502



UDB-810503



UDB-810504



UDB-810505



UDB-810506



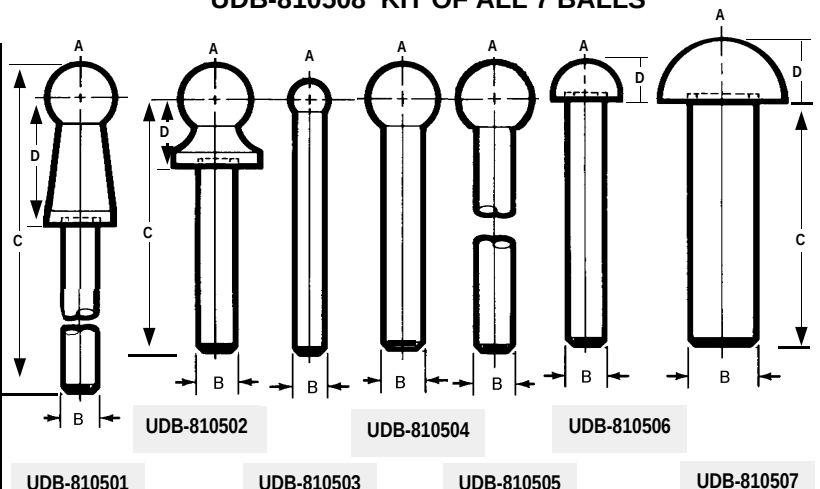
UDB-810507

**UNITED'S SUPREME LONG SHANK
DESIGN**
With Close Tolerances — Ideal for

SUPREME LONG SHANK INSPECTION BALLS

UDB-810508 KIT OF ALL 7 BALLS

UNITED PART NUMBER	Ball Dia. A $\pm .0002$	Shank Dia. B $+ .0001$ - .0002	Length C	Shoulder to Ball D $\pm .0002$
UDB-810508	KIT of all 7 Long Shank Supreme Inspection Balls..			
UDB-810501	.5000	.2497	2-1/2	1.000
UDB-810502	.5000	.2497	2	.5000
UDB-810503	.2500	.1872	2	
UDB-810504	.5000	.2497	2	
UDB-810505	.5000	.2497	4	
UDB-810506	.5000	.2497	2	.2500
UDB-810507	1.000	.4997	2	.5000



Die Pad Retainers Cap & Lock Screws

Die Pad Retainers, Bushings and Screws

LOCK SCREWS

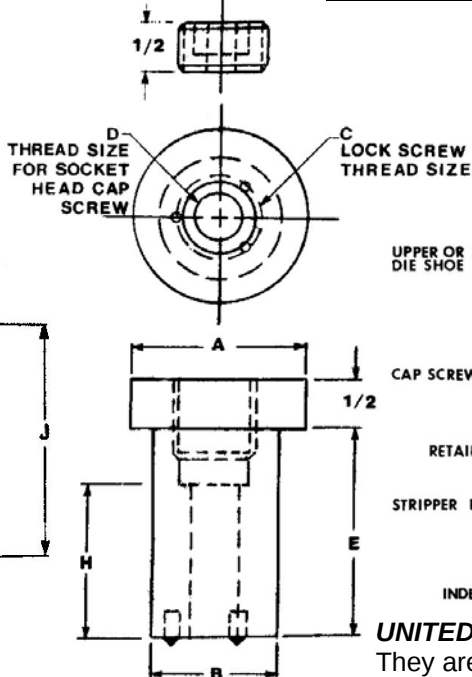
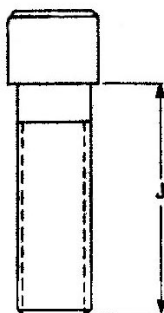


DIE PAD LOCK SCREWS		
PART NO.	F	G
UDB-970500	7/8 - 14	3/8
UDB-970505	1 - 14	1/2

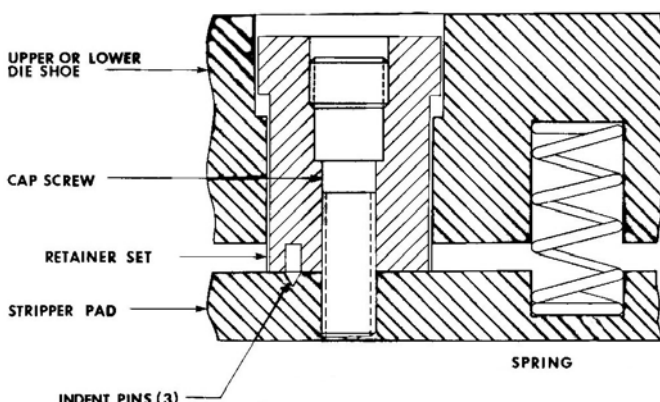
UNITED

DIE PAD RETAINERS are furnished complete as shown.

SOCKET HEAD CAP SCREWS



Includes Lock Screw, Cap Screw, Retainer with indent pins.



RETAINERS



Each RETAINER consists of a hard Bushing Retainer Sleeve with three indent pins, an alloy steel Cap Screw and a Lock Screw with National Fine threads.

UNITED DIE PAD RETAINERS hold die pads firmly. They are stronger and handle heavier loads than stripper bolts.

USED FOR PRODUCTION DIE STAMPING—Available in outside body diameters of 1-1/4" and 1-3/8" and lengths up to 6" long. Each retainer uses the same size hex cap and lock series to facilitate insertion and removal with the same wrench.

COMPLETE DIE PAD RETAINERS INCLUDE ALL PARTS SHOWN

A = 1-5/8	B = 1-1/4	C = 7/8 - 14	D = 1/2 - 13
PART NO.	E	H	J
UDB-986000	1	3/8	1-1/4
UDB-986005	1-1/4	5/8	1-1/2
UDB-986010	1-1/2	7/8	1-3/4
UDB-986015	1-3/4	1-1/8	2
UDB-986020	2	1-3/8	2-1/4
UDB-986025	2-1/4	1-5/8	2-1/2
UDB-986030	2-1/2	1-7/8	2-3/4
UDB-986035	2-3/4	2-1/8	3
UDB-986040	3	2-3/8	3-1/4
UDB-986045	3-1/4	2-5/8	3-1/2
UDB-986050	3-1/2	2-7/8	4
UDB-986055	4	3-1/8	4
UDB-986060	4	3-3/8	4-1/2
UDB-986065	4-1/2	3-7/8	5
UDB-986070	5	4-3/8	5-1/2
UDB-986075	5-1/2	4-7/8	6
UDB-986080	6	5-1/2	6-1/2

A = 1-3/4	B = 1-3/8	C = 1 - 14	D = 5/8 - 11
PART NO.	E	H	J
UDB-986100	1	1/4	1-1/4
UDB-986105	1-1/4	1/2	1-1/2
UDB-986110	1-1/2	3/4	1-3/4
UDB-986115	1-3/4	1	2
UDB-986120	2	1-1/4	2-1/4
UDB-986125	2-1/4	1-1/2	2-1/2
UDB-986130	2-1/2	1-3/4	2-3/4
UDB-986135	2-3/4	2	3
UDB-986140	3	2-1/4	3-1/4
UDB-986145	3-1/4	2-1/2	3-1/2
UDB-986150	3-1/2	2-3/4	4
UDB-986155	4	3	4
UDB-986160	4	3-1/4	4-1/2
UDB-986165	4-1/2	3-3/4	5
UDB-986170	5	4-1/4	5-1/2
UDB-986175	5-1/2	4-3/4	6
UDB-986180	6	5-1/4	6-1/2

UNITED'S DIE PAD RETAINER

- Absorbs Side Thrust
- Reduces Stress
- Distributes Load Over Wider Area
- Reduces Number of Ball Points Per Die