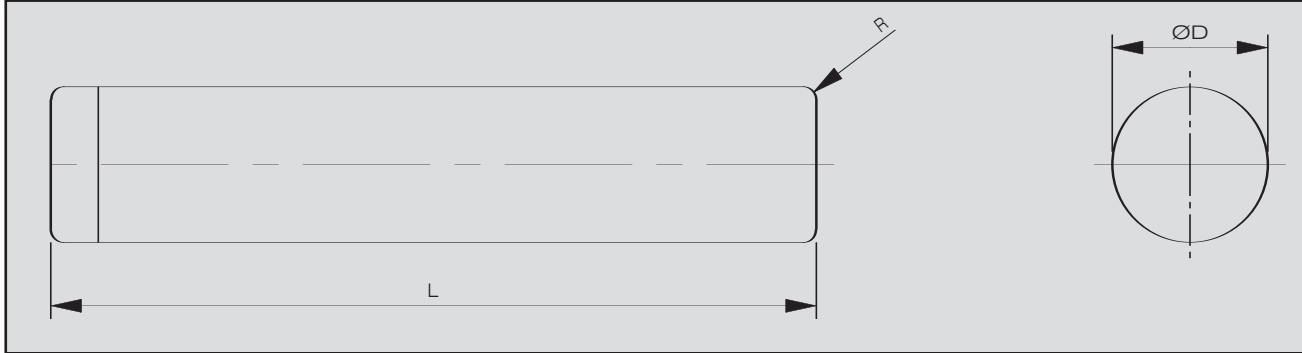


Oil-less Standard Die-set Press Fit Pin and Bush

Hales self-lubricating die components offer industry self-lubricating, maintenance-free performance resulting in overall cost savings and operational safety.



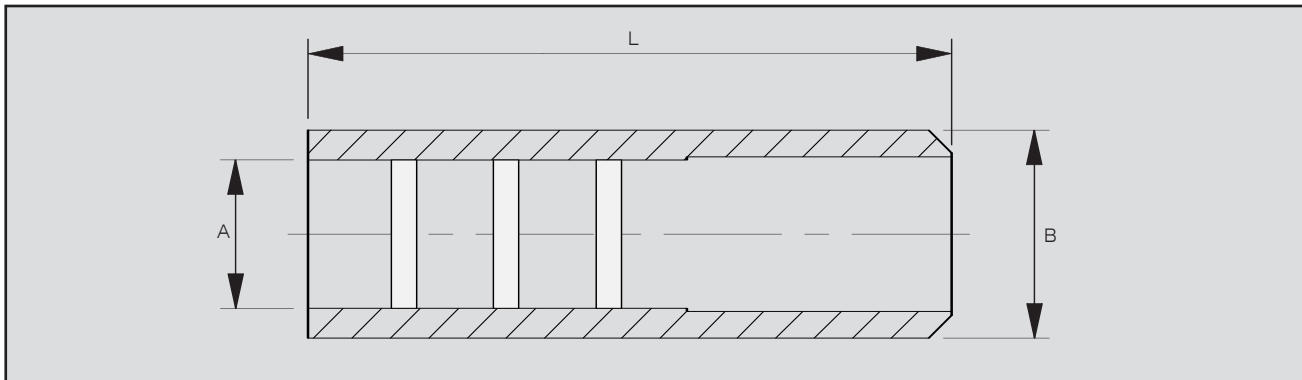
HALES STANDARD DIE SET GUIDE PINS
MATERIAL: HIGH CARBON CHROME BEARING STEEL



TOLERANCE	
D=	+0
	-0.0002"

HALES CODE	D	L										
HP .75 x L	0.7355	4.5	5.5	7	8							
HP 1 x L	0.9855	4.5	5.25	5.75	6.5	7	7.5	8	9	9 1/2	10	
HP 1.25 x L	1.2355	5.25	5.75	6.5	7	7.5	8	8.5	9.5	10	11	12
HP 1.5 x L	1.4855	5.75	6	6.5	7	7.5	8	8.5	9.5	10	11	12
HP 1.75 x L	1.7355	10	12									

HALES STANDARD DIE SET GUIDE BUSH
MATERIAL: HIGH CARBON CHROME BEARING STEEL WITH SOLID LUBRICANT



TOLERANCE	
A=	+0.0003
	-0
B=	+0.0003
	-0

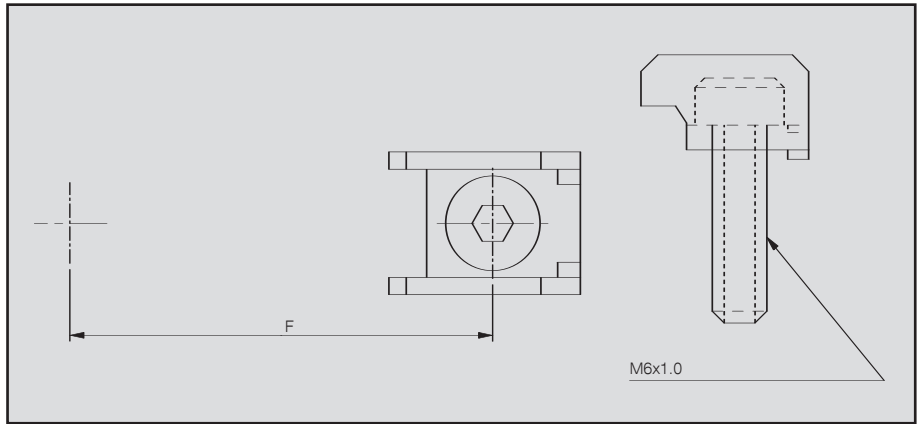
HALES CODE	A	B	L		
HB .75 x L	0.7356	1.1271	2.125	2.625	
HB 1 x L	0.9856	1.5021	3	3.5	
HB 1.25 x L	1.2356	1.7521	3	3.5	4.378
HB 1.5 x L	1.4856	2.0021	3.5	4.375	5.25
HB 1.75 x L	1.7356	2.5021	4.5	5.25	

Standard Die Set Oil-less Demountable Guide Bushes



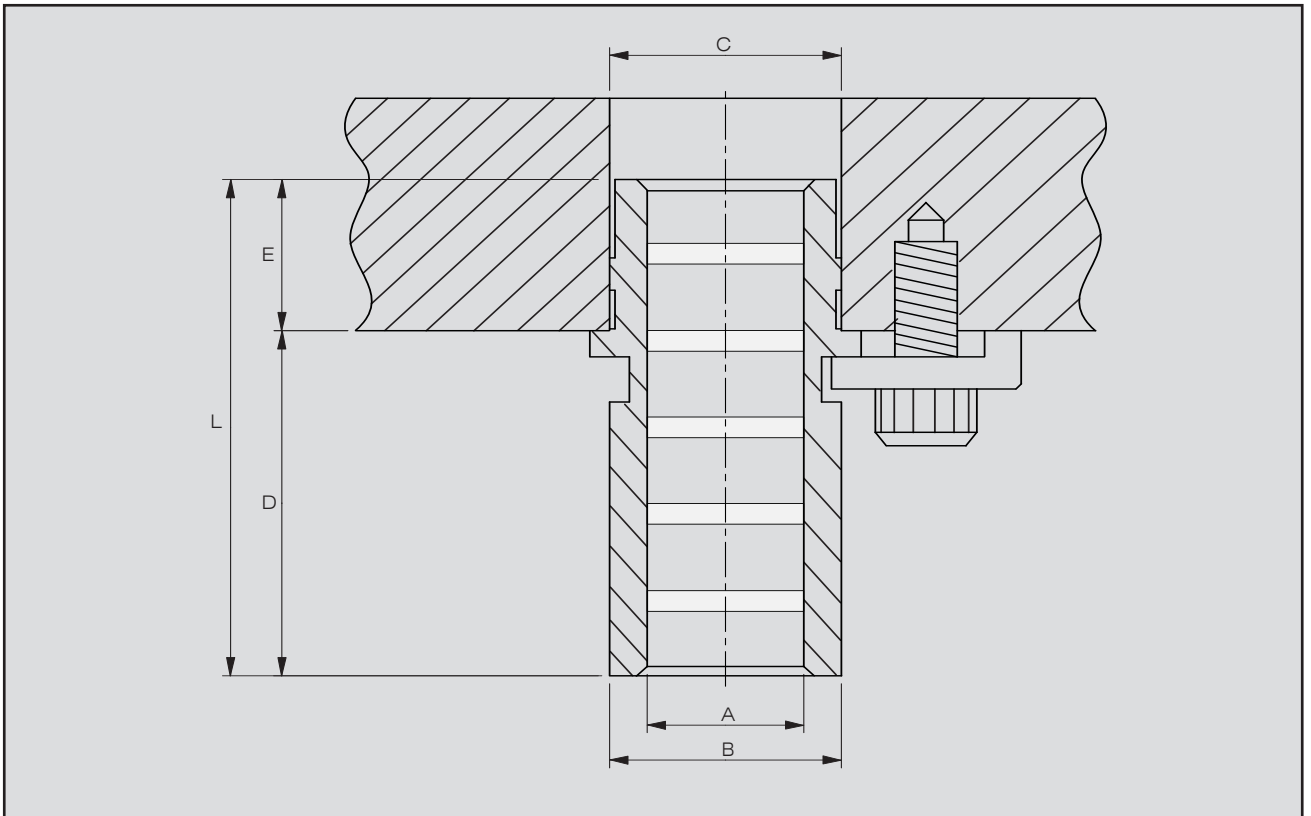
These bushes are a standard component in all Hales die-sets.
 MATERIAL: DEEP CORE STRENGTH CASE HARDENED MATERIAL WITH SOLID LUBRICANT

TOE CLAMP
 HALES PART NO. HRBTC



HALES CODE	A	B	C	D	E	L	F
HRB 2532	25.037	44.45	38.10	31.75	22.25	54.00	2740
HRB 2560	25.037	44.45	38.10	57.15	22.25	79.40	2740
HRB 3238	31.387	53.97	44.45	38.10	28.58	66.70	32.10
HRB 3261	31.387	53.97	44.45	60.33	28.58	88.90	32.10
HRB 3838	37.737	60.00	50.80	38.10	34.93	73.00	35.30
HRB 3870	37.737	60.00	50.80	69.85	34.93	104.80	35.30
HRB 3890	37.737	60.00	50.80	88.90	34.93	123.80	35.30
HRB 4576	44.087	66.68	57.15	76.18	41.30	117.50	38.50

TOLERANCE MM	
A=	+0.008
	-0
C=	+0.000
	-0.013



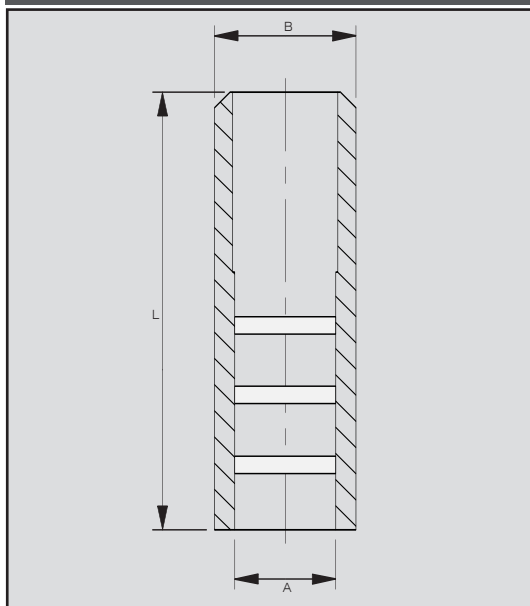
Oil-less Line-ream Pin and Bush Sets

No step boring.
 No jig boring.
 Just drill and ream.
 Use radial drill.
 Every size listed ex-stock.
 Oil-less graphite lubrication.



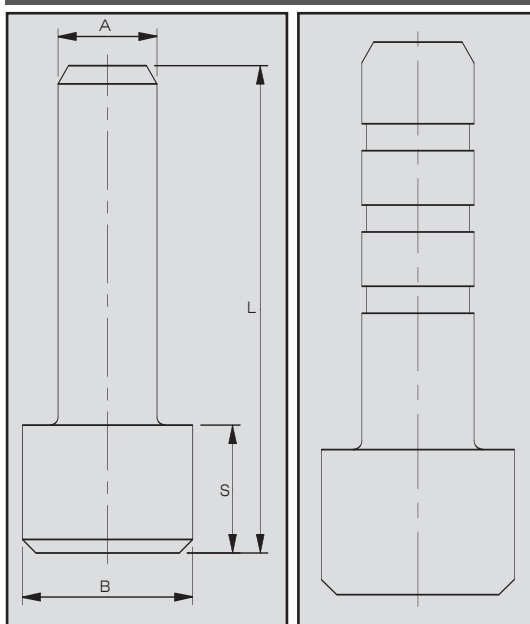
HALES CODE	A	B	C	L
EB-20:54	18.68	28.63	28	54
EB-20:70	"	"	35	70
EB-25:75	25.03	38.15	38	75
EB-25:90	"	"	48	90
EB-32:75	31.38	44.50	38	75
EB-32:90	"	"	48	90
EB-32:110	"	"	58	110
EB-38:90	37.73	50.85	48	90
EB-38:110	"	"	58	110
EB-38:135	"	"	76	135
EB-45:115	44.09	63.55	58	115
EB-45:135	"	"	76	135

HALES LINE-REAM BUSH



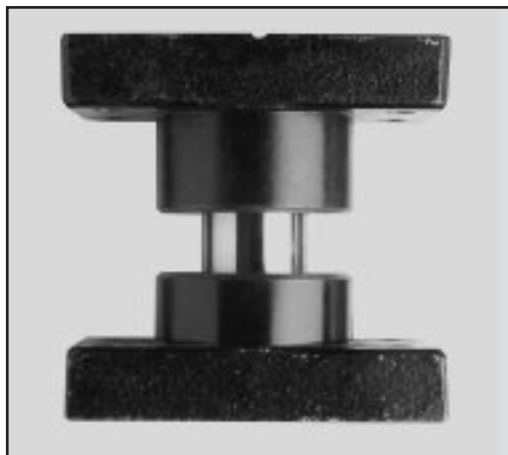
HALES CODE	A	B	S	L
EPH-20:80	18.68	28.63	25	82
EPH-20:100	"	"	"	100
EPH-20:125	"	"	"	125
EPH-20:175	"	"	"	175
EPH-25:100	25.03	38.15	38	100
EPH-25:125	"	"	"	125
EPH-25:150	"	"	"	150
EPH-25:175	"	"	"	175
EPH-25:200	"	"	"	200
EPH-32:100	31.38	44.50	45	100
EPH-32:125	"	"	"	125
EPH-32:150	"	"	"	150
EPH-32:175	"	"	"	175
EPH-32:200	"	"	"	200
EPH-32:215	"	"	"	215
EPH-32:225	"	"	"	225
EPH-38:175	37.73	50.85	50	175
EPH-38:200	"	"	"	200
EPH-38:225	"	"	"	225
EPH-38:250	"	"	"	255
EPH-45:225	44.09	63.55	63	225
EPH-45:250	"	"	"	250
EPH-45:280	"	"	"	280
EPH-45:305	"	"	"	305

HALES LINE-REAM PIN



This style from EPH-38:175 to larger sizes.

Oil-less Bolt-on Pin and Bush Assemblies

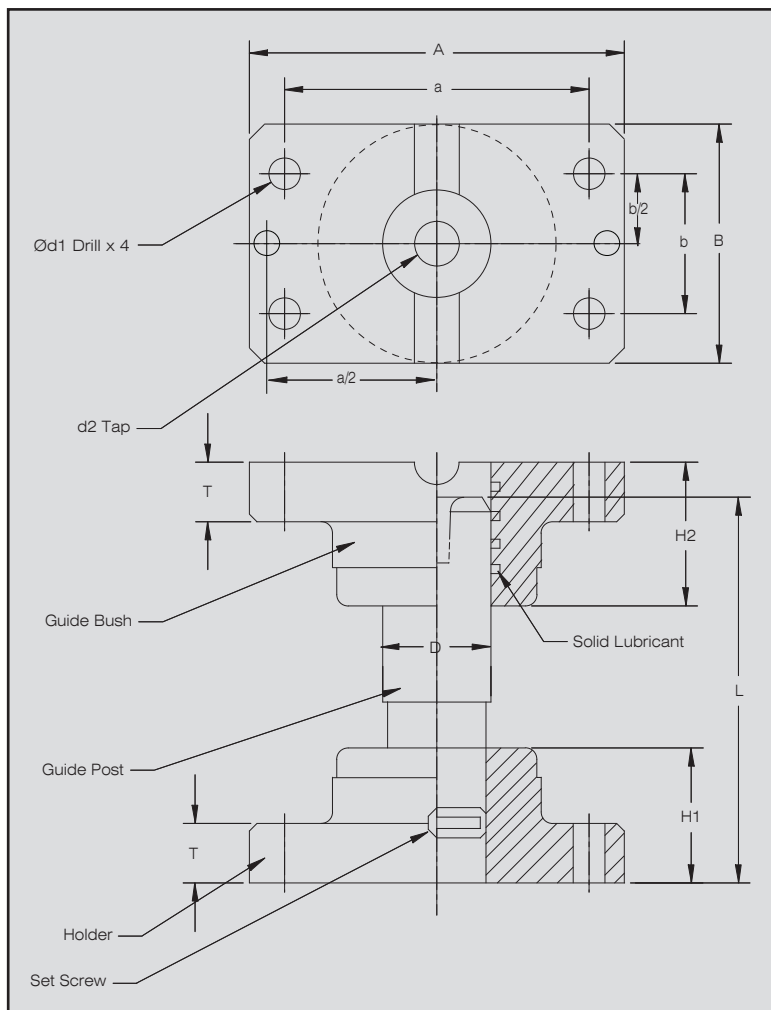


MATERIALS

Guide post: deep core strength, case hardened material.

Holder: automotive high alloyed iron.

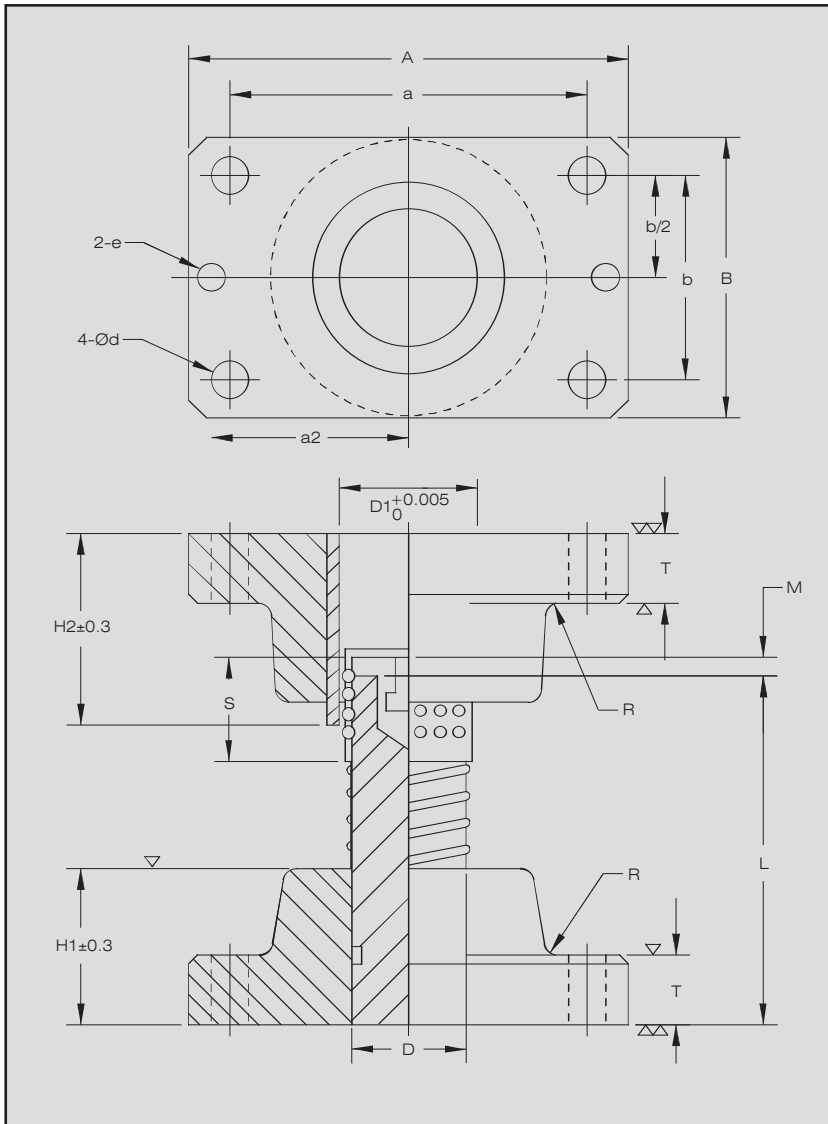
Guide Bush: automotive high alloyed iron with solid lubricant.



STD. NO.	ØD	L	A	B	H ₁	H ₂	a	b	T	Ød ₁	eH7	SCREW 8pcs	DOWEL 4pcs	
P-SGR-25X	80	80												
	100	25	100	84	48	30	45	66	30	20	9	+0.015 8.0	M8x35	8x30
	120		120											
P-SGR-32X	100		100											
	120	32	120	100	58	40	50	76	36	20	11	+0.015 8.0	M10x40	8x30
	140		140											
P-SGR-38X	120		120											
	140	38	140	130	75	50	60	100	44	25	11	+0.015 10.0	M10x45	10x40
	160		160											
P-SGR-50X	180		180											
	160		160											
	200	50	200	155	90	65	85	125	60	25	14	+0.015 10.0	M12x50	10x40
P-SGR-60X	250		250											
	200		200											
	250	60	250	190	120	75	100	150	80	30	18	+0.018 13.0	M16x60	13x50
P-SGR-80X	300		300											
	250		250											
	300	80	300	230	150	100	130	180	110	35	22	+0.018 16.0	M20x75	16x60
	350		350											

When assembling, two dowel pins are to be fitted in guide bush and holder.
Please Note: dowels and screws are included in assembly.

Bolt-on Ball Bearing Pin and Bush Assemblies



- Light smooth action.
- Helical design of cage and plunger design allows cage to freely rotate over the entire peripheral surface.
- Lubrication problems are almost entirely eliminated.
- Perfect precision alignment.

Pins and Bushes

D	D ₁	A	B	a	b	d	H ₁	H ₂	T	S	M	eH7	S.H. SCREW (8 OFF)	DOWELL (4 OFF)	
25	31	84	48	66	30	9	30	50	20	50	0 - 20	8		8Ø-35	8Ø-30
32	40	100	58	76	36	11	40	60	20	60	0 - 25	8	+0.015 0	10Ø-40	8Ø-30
38	48	130	75	100	44	11	50	70	25	70	0 - 29	10		10Ø-45	10Ø-40
50	60	155	90	125	60	14	65	90	25	90	0 - 42	10		12Ø-50	10Ø-40
60	70	190	120	150	80	18	75	100	30	100	0 - 59	13	+0.018 0	16Ø-60	13Ø-50

M: movable range of stopper.

Please Note: 60 Dia has fixed stopper.

PSR-BB	D	L										
PSR-BB	25	100	120		140	160	180					
PSR-BB	32		120		140	160	180	200				
PSR-BB	38				140	160	180	200	240			
PSR-BB	50						180	200	240	260	300	
PSR-BB	60							200	240	260	300	350

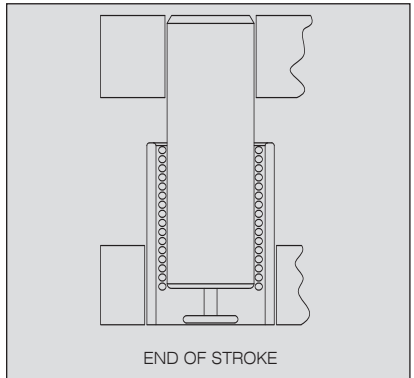
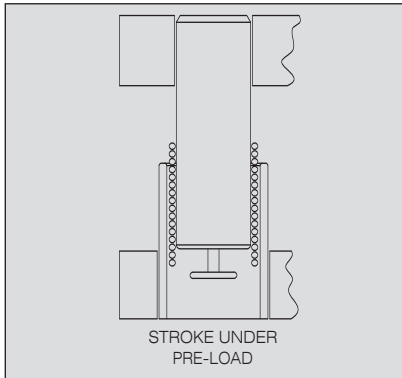
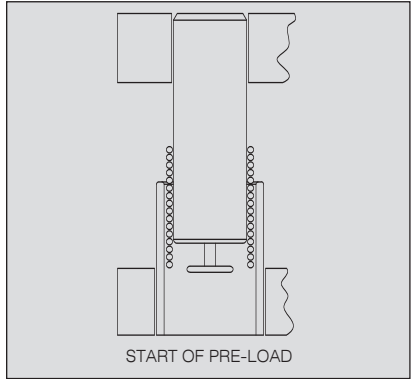
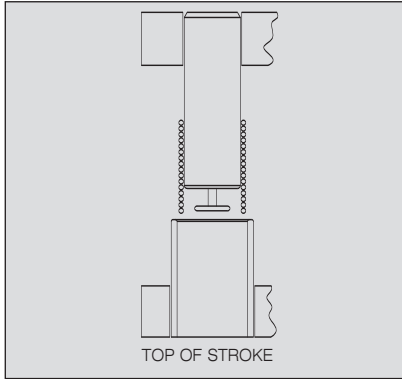
When assembling, two dowel pins are to be fitted in the guide bush and holder.

Please note: dowels and screws are included in assembly.

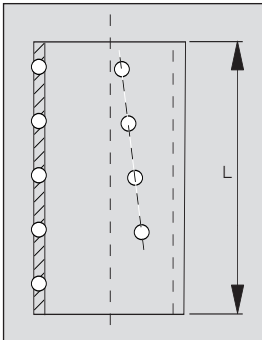
HBB Series



BALL BEARING PINS AND BUSHES OFFER DISTINCT ADVANTAGES



HBB HELICAL CAGE



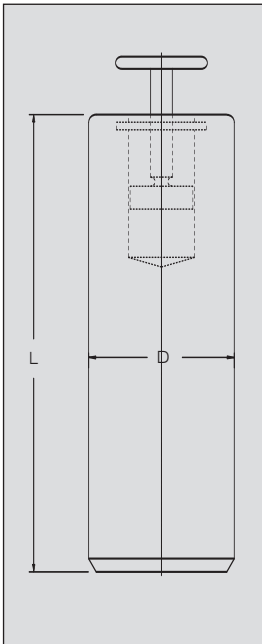
NOM. PIN. DIA.	LENGTHS
25	60, 75
32	75, 90
38	75, 90
45	90, 110
50	90, 110
60	90, 110

Difficulties of assembly and disassembly of diesets are eliminated.

Lubrication problems are almost entirely eliminated.

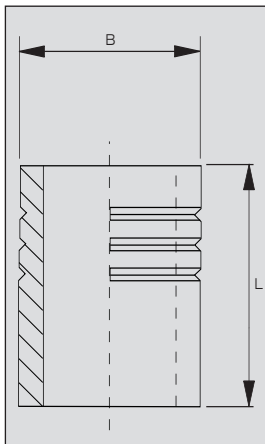
Perfect alignment increases die life.

HBB GUIDE PIN



POST. DIA. D	LENGTHS
25mm	130, 150
+0.020	180, 200
+0.015	150, 170
+0.025	190, 200
+0.020	220, 240
38mm	150, 180
+0.030	200, 240
+0.025	260, 280
45mm	180, 200
+0.030	220, 240
+0.025	260, 280
50mm	200, 220
+0.035	240, 260
+0.030	280, 300
60mm	200, 220
+0.035	240, 260
+0.030	280, 300

HBB BUSING



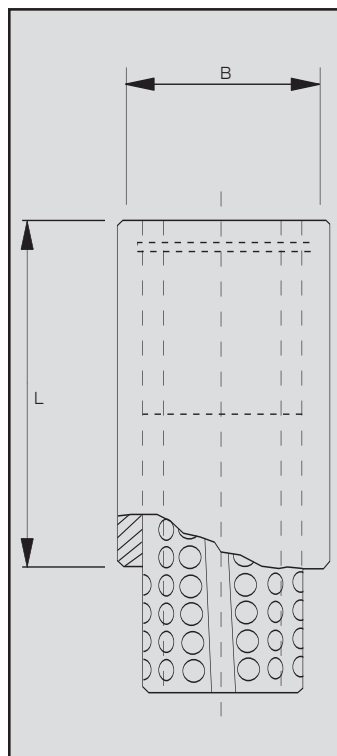
POST DIA. A	O.D. B	LENGTH
25	45	60
	0	80
	-0.007	
32	55	80
	0	100
	-0.008	
38	64	80
	0	100
	-0.008	
45	74	100
	0	120
	-0.008	
50	83	100
	0	120
	-0.010	
60	95	100
	0	120
	-0.010	

EBB Series

The EBB bush and cage is designed to be fitted inside the top bolster as the ball cage is captive inside the bush. The advantage of this design is to eliminate any foreign bodies entering the sensitive ball cage area causing damage. Due to its very simple design, the EBB series has an appreciable price advantage.

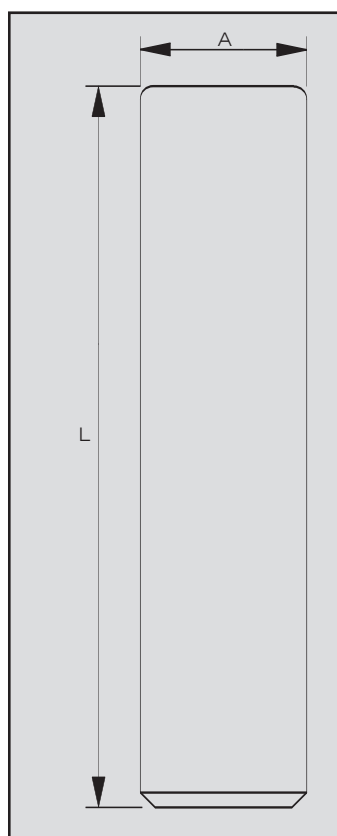
EBB

HALES CODE	B	L	
EBB 1 x L	1.9855	3.43	4.43
EBB 1.25 x L	2.235	3.93	4.93
EBB 1.5 x L	2.485	4.18	5.18
EBB 1.75 x L	2.985	4.43	5.43
EBB 2 x L	3.235	5.00	6.00



EBP

HALES CODE	A	L
EBP 1 x L	.9855	4.5, 5.25, 5.75, 6.5, 7, 7.5, 8, 8.5, 9, 10
EBP 1.25 x L	1.2355	5.25, 5.75, 6.5, 7, 7.5, 8, 8.5, 10
EBP 1.5 x L	1.4855	6, 6.75, 7.5, 8.5, 10, 11, 12
EBP 1.75 x L	1.7355	7.5, 8.5, 9.5, 10, 11, 12
EBP 2 x L	1.9855	7.5, 8.5, 9.5, 10, 11, 12



A1 Series

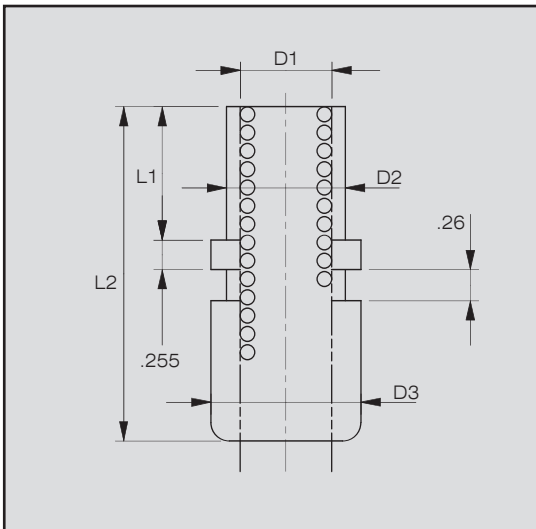


Designed to leave the guide pin, which eliminates the use of longer pins and bushes, which can be costly.

Ball cage is designed to circulate around pin and bush, giving even wear and longer life.

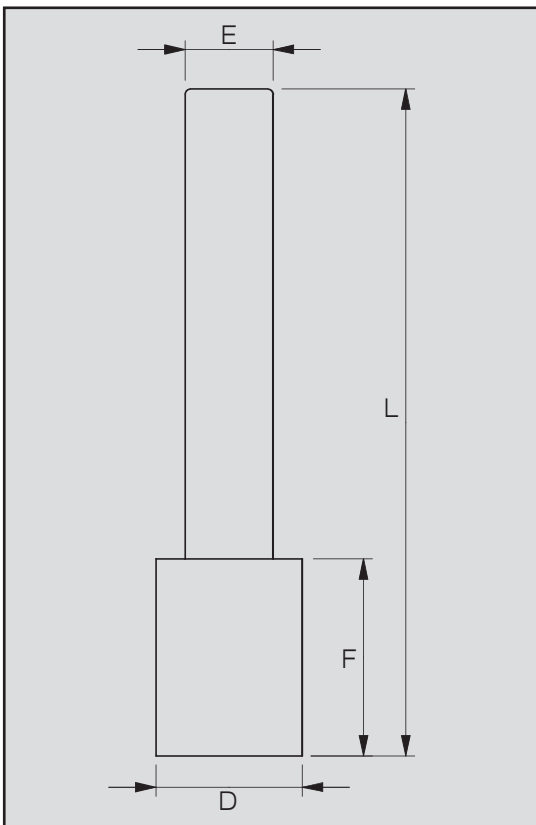
A1 Series are completely interchangeable with all popular mass produced pin and bush assemblies.

A1 Series can be fitted into Hales standard die set without any modification.



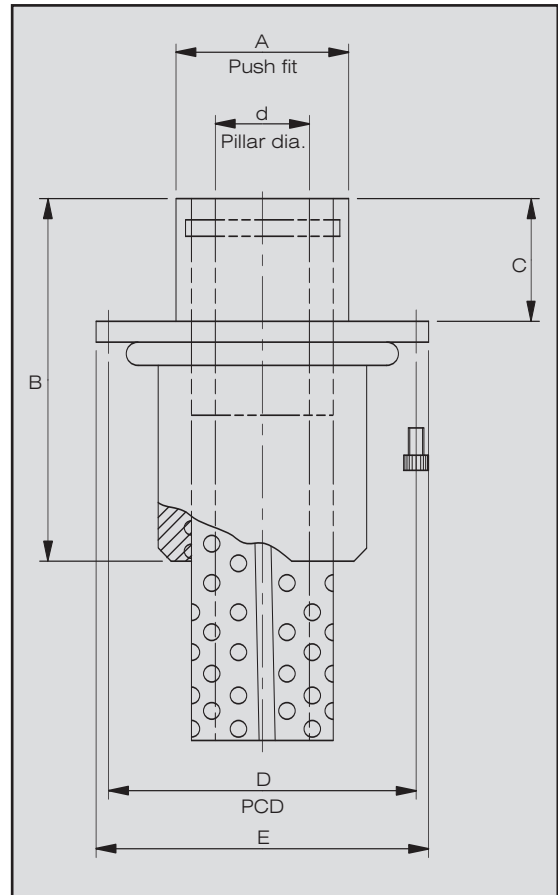
A1 SERIES PIN BUSH AND CAGE ASSEMBLY

HALES BUSH NO.	D1	D2		D3	D4	L1	L2
		HOLE	BUSH				
		+0 +.0010	+0 +0				
A1-1"	1.274	1.500	1.875	2.275	1.218	3.437	
A1-1.25"	1.524	1.750	2.125	2.525	1.218	3.937	
A1-1.5"	1.774	2.000	2.375	2.775	1.437	4.187	



NOM PIN DIA	D	E	F	L
	+0.0000	+0.0000	+0.020	+0.030
	-0.0002	-0.0002		-0.000
1"	.9855	.900	1.250	4.5, 5.75, 6.5, 7, 7.5, 8
1.25"	1.2355	1.150	1.500	5.75, 6.5, 7, 7.5, 8, 8.5
1.5"	1.4855	1.400	1.500	6, 6.5, 7, 7.5, 8, 8.5, 9.5

Exacta Ball Bushes



Preloaded for high precision applications.

Captive ball cage.

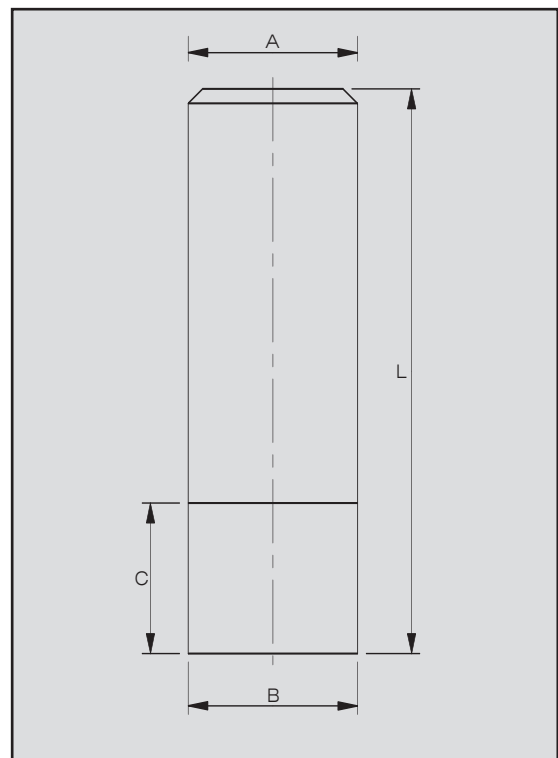
Recommended for high-speed operations.

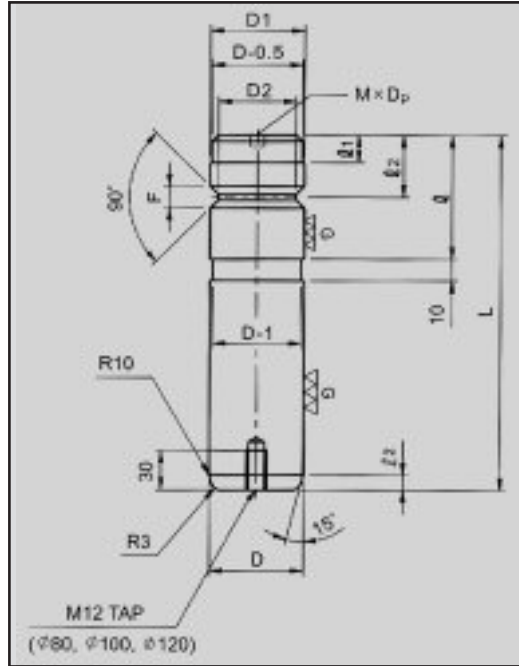
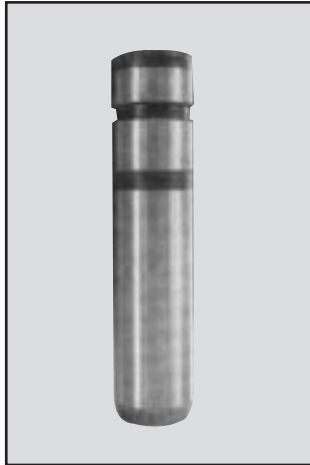
Flanged mounting.

Spiro-helical ball pattern for extended life.

HALES CODE	d	A	B	C	D	E
EXBB 0.750	0.750	1.125	2.937	0.937	2.000	2.375
EXBB 1.00	1.000	1.5000	3.437	1.218	2.312	2.687
EXBB 1.250 S	1.2500	1.7500	3.937	1.218	2.656	3.000
EXBB 1.250	1.2500	1.7500	3.937	1.687	2.656	3.000
EXBB 1.500	1.5000	2.000	4.187	1.875	2.968	3.437

HALES CODE	A	B	C	L
EXP0.750 X L	0.750	.7355	1.250	5.5
EXP1 X L	1.000	.9855	1.500	6, 6.5, 7.5
EXP1.25 X L	1.250	1.2355	2.000	6, 6.5, 7.5, 8.5
EXP1.50 X L	1.500	1.4855	2.000	7.5, 8.5, 9.5





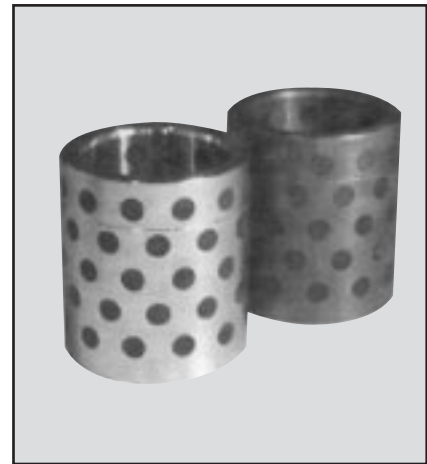
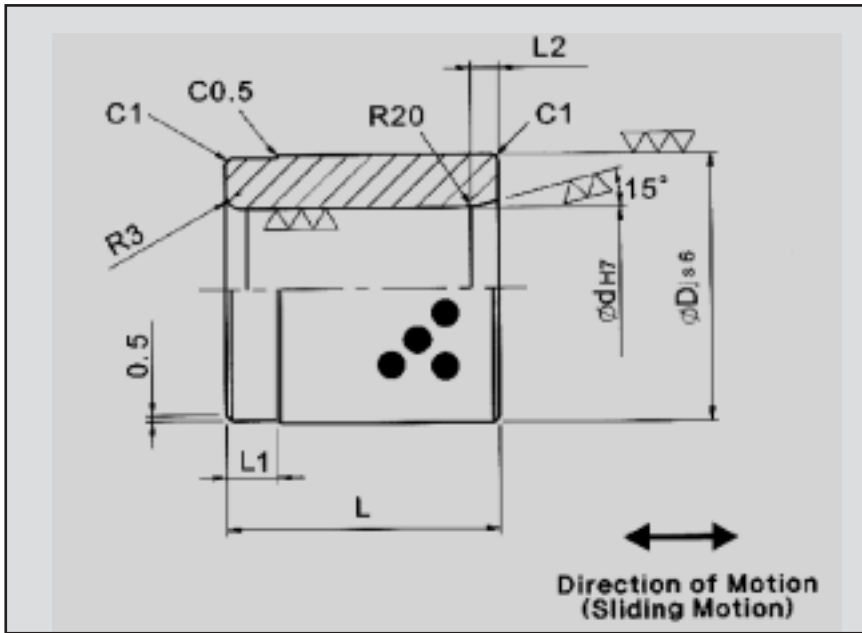
Material: SM45C
Hardness: HRC50-

Product Code	D	D1	p6	D2	l	l1	l2	F	L	MxDp	
LPG	25	-0.005 -0.015	25	+ 0.035 + 0.022	21	30	5	5	8	80 100 120	M8 × 25
	30	-0.005 -0.015	30	+ 0.035 + 0.022	26	40	5	5	8	100 120 140	
	40	-0.005 -0.015	40	+ 0.042 + 0.026	36	50	5	5	8	120 140 160	M10 × 25
	50	-0.005 -0.015	50	+ 0.042 + 0.026	45	70	10	10	10	160 200 250	
	60	-0.005 -0.015	60	+ 0.051 + 0.032	55	90	10	10	12	200 250 300	M12 × 25
	65	-0.010 -0.025	65	+ 0.051 + 0.032	60	100	10	10	12	250 300 350	
	80	-0.010 -0.025	80	+ 0.051 + 0.032	75	120	10	10	12	250 300 350	M16 × 30
	100	-0.010 -0.025	100	+ 0.059 + 0.037	95	150	10	10	12	300 350 400	
	120	-0.010 -0.025	120	+ 0.059 + 0.037	114	180	10	10	16	350 400 450	

How to Order:

Product Code - D x L

Example: LPG - 50 x 200



Material:
 SP: #500SP(CAC304+Graphite)
 F: #500F(GC250+Graphite)

Product Code	ID	OD	Length		
	d	D	L	L1	L2
LGB	30 $\begin{smallmatrix} +0.021 \\ 0 \end{smallmatrix}$	50 ± 0.008	50	10	5
	35 $\begin{smallmatrix} +0.025 \\ 0 \end{smallmatrix}$	60 ± 0.0095	55	15	
	38 \cdot		60	10	
	40 \cdot	70 ± 0.0095		75	15
	50 \cdot	75 ± 0.0095	60, 90		20
	60 $\begin{smallmatrix} +0.030 \\ 0 \end{smallmatrix}$	80 ± 0.011		90	
	80 \cdot	100 ± 0.011	80, 120	25	
		110 ± 0.011	120		
	100 $\begin{smallmatrix} +0.035 \\ 0 \end{smallmatrix}$	120 ± 0.0125	100, 150		
		130 ± 0.0125	150		
	120 \cdot	140 ± 0.0125	180		
		150 ± 0.0125			

How to Order:

Product Code - d x D x L - Material

Example: LPG - 60 x 80 x 600 - SP