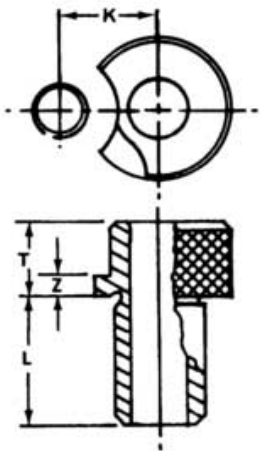
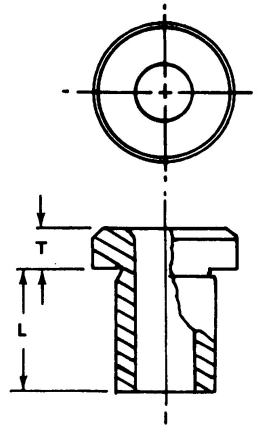


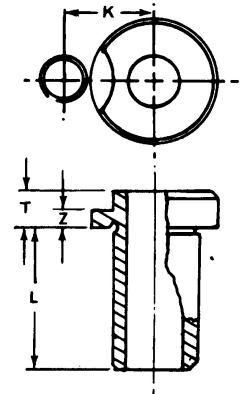
F & J Bushings Pty Ltd



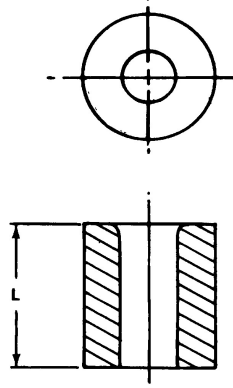
Slip Renewable Bushings are used with Liner Bushings when two or more operations are performed with the same jig. The O.D. is finish ground for a slip fit into the Liner Bush. The Knurled Head is milled so that with a 45 degree turn the Bush can be quickly & easily locked or removed without removing the Lock Screw.



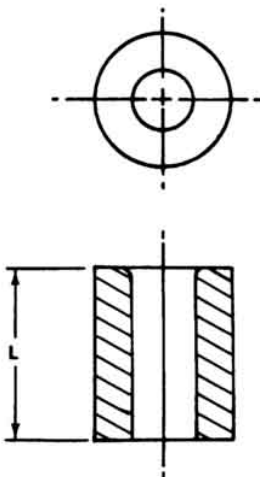
Headed Press Fit Bush is used when the number of parts to be produced does not necessitate the replacement of the Bushings during the life of the Jig. The O.D. of Press Fit Bushings can be supplied with grinding stock for fitting in the customer's plant or finish ground to a press fit size.



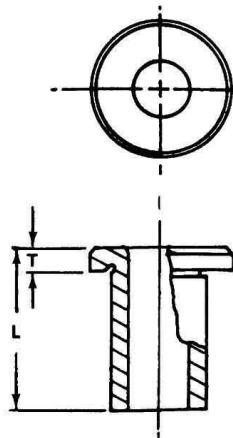
Fixed Renewable Bushings are used with Liner Bushings when the number of parts to be produced will require replacement of the Bushings during the life of the Jig. The O.D. is finish ground for a slip fit into the Liner Bush. The head has a milled recess for the Lock Screw to hold the Bushing in place.



Plain Press Fit Bush is identical with the Headed Press Fit Bush except for the omission of the head. They are used when the top of the Bushing is flush with the top of the Jig Plate or when the centre distance is too close for Bushings with heads.



Liner Bushings are pressed permanently into the Jig Plate to facilitate the use of renewable types of Drill Bushings. The Liner Bushings remain in place throughout the life of the Jig forming an accurate location for the Drill Bushings. The O.D. of Liner Bushings can be supplied with grinding stock for fitting in the customer's plant or finish ground to a press fit size.

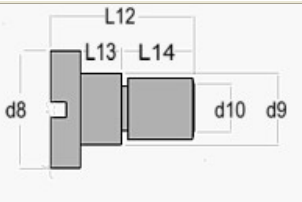


Headed Liner Bushings are identical with the Headless Liner Bushings except for the added head. These Liner Bushings can be used in the same manner as the headless type, but usually necessitate counter boring into the Jig to offset the head thickness. Whenever excessive pounding is involved, the Headed Liner is generally preferred.

F & J Bushings Pty Ltd

PREFERRED METRIC STANDARD BUSHINGS

BORE LIMITS	LIMITS OF TOLERANCE FOR THE BORES OF DRILL BUSHES				LIMITS OF TOLERANCE FOR THE BORES OF REAMER BUSHES				CONCENTRICITY within 0.010mm Closer Concentricity held at a slightly higher cost. SPECIAL BUSHES made to customers requirements. Quotations on request.
	OVER	UP TO	HIGH +	LOW +	OVER	UP TO	HIGH +	LOW +	
	-	3	0.016	0.006	-	3	0.018	0.011	
3	6	0.022	0.010	3	6	0.023	0.015		
6	10	0.028	0.013	6	10	0.027	0.018		
10	18	0.034	0.016	10	18	0.031	0.021		
18	30	0.041	0.020	18	30	0.038	0.025		
30	50	0.050	0.025	30	50	0.046	0.030		
50	80	0.060	0.030	50	-	0.060	0.040		
80	120	0.071	0.036						

RETAINING	O/D of Bush with which Screw is to be used	L12	L13 +0.04 +0.02	L14	d8 (max)	d9	d10 Size of Thread	BSS Code	Indicate 'M' in BSS Code for use with headless liner Bush 
	8 - 10	15	3.0	9.0	13	7.5	M5	MS5	
	12 - 18	18	4.0	10.0	16	9.5	M6	MS6	
	22 - 42	22	5.5	11.5	20	12.0	M8	MS8	
	48 - 62	32	7.0	18.5	24	15.0	M10	MS10	
SCREWS	O/D of Bush with which Screw is to be used	L12	L13 +0.04 +0.02	L14	d8 (max)	d9	d10 Size of Thread	BSS Code	Indicate 'LM' in BSS Code for use with headed liner Bush
	8 - 10	18	6.0	9.0	13	7.5	M5	LMS5	
	12 - 18	22	8.0	10.0	16	9.5	M6	LMS6	
	22 - 42	27	10.5	11.5	20	12.0	M8	LMS8	
	48 - 62	38	13.0	18.5	24	15.0	M10	LMS10	

F & J Bushings Pty Ltd

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PREFERRED METRIC STANDARD BUSHINGS

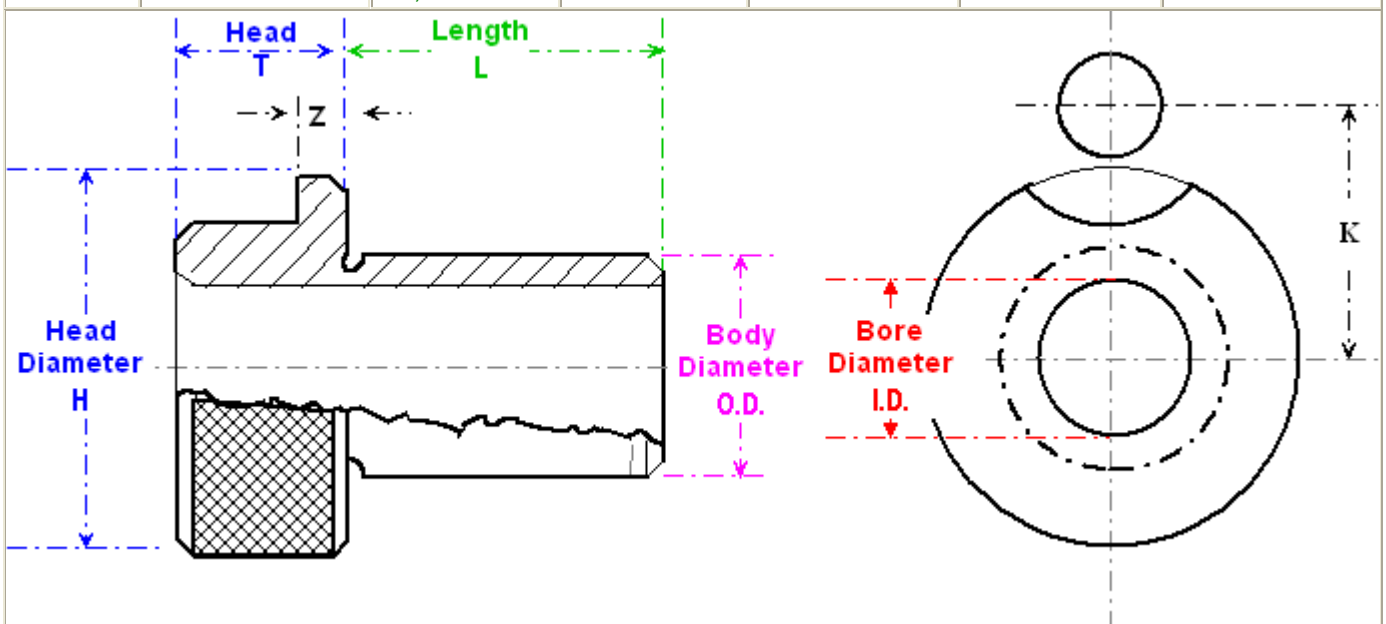
How to order 'F' & 'J' metric bushes

Select **TYPE**, **BORE**, **BODY DIAMETER** & **LENGTH** from the Chart.

e.g. **MFR 16X26X45** represents a **Metric Fixed Renewable** Bush, with **16mm bore**, **26mm Body diameter** & **45mm Length** under the head

FIXED (MFR) & SLIP (MSR) RENEWABLE BUSHES

BORE SIZE	BODY DIAMETER	LENGTH L	HEAD DIAMETER	HEAD THICKNESS	K DIMENSION	Z DIMENSION
0 - 4	8.006 - 8.013	10 or 16	15	8	11.5	3
3.7 - 6	10.006 - 10.013	12, 20 or 25	18	8	13	3
5.7 - 8	12.007 - 12.016	12, 20 or 25	22	10	16	4
7.7 - 10	15.007 - 15.016	16, 28 or 36	26	10	18	4
9.6 - 12	18.007 - 18.016	16, 28 or 36	30	10	20	4
11.5 - 15	22.008 - 22.020	20, 36 or 45	34	12	23.5	5.5
14.5 - 18	26.008 - 26.020	20, 36 or 45	39	12	26	5.5
17.5 - 22	30.008 - 30.020	25, 45 or 56	46	12	29.5	5.5
21.5 - 26	35.009 - 35.025	25, 45 or 56	52	12	32.5	5.5
25.5 - 30	42.009 - 42.025	30, 56 or 67	59	12	36	5.5
29 - 35	48.009 - 48.025	30, 56 or 67	66	16	41	7
34 - 42	55.011 - 55.030	30, 56 or 67	74	16	45	7
41 - 48	62.011 - 62.030	35, 67 or 78	82	16	49	7
47 - 55	70.011 - 70.030	35, 67 or 78	90	16	53	7
53 - 63	78.011 - 78.030	40, 78 or 105	100	16	58	7
61 - 70	85.013 - 85.035	40, 78 or 105	110	16	63	7
68 - 78	95.013 - 95.035	45, 89 or 112	120	16	68	7
76 - 85	105.013 - 105.035	45, 89 or 112	130	16	73	7



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PREFERRED METRIC STANDARD BUSHINGS

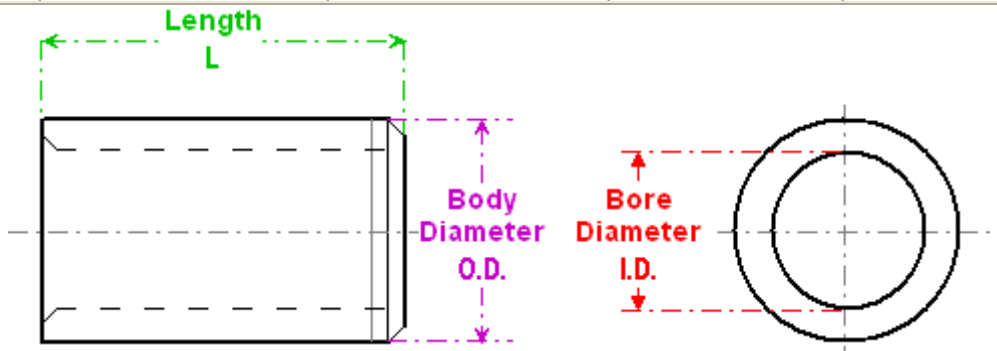
How to order 'F' & 'J' metric bushes

Select **TYPE**, **BORE**, **BODY DIAMETER** & **LENGTH** from the Charts.

e.g. 'MPP 12X18X25' represents a **Metric Plain Press** Bush, with **12mm bore**, **18mm Body diameter** & **25mm Length** (For Headed Bushings 'L' indicates length under the head)

PLAIN PRESS (MPP) & HEADED PRESS (MHP) FIT BUSHES

BORE SIZE	BODY DIAMETER	LENGTH L	HEAD DIAMETER	HEAD THICKNESS
0 - 3.5	6.008 - 6.016	8, 12 or 16	9	2.5
3.5 - 5	8.010 - 8.019	8, 12 or 16	11	2.5
5 - 6	10.010 - 10.019	10, 16 or 20	13	3
6 - 8	12.012 - 12.023	10, 16 or 20	15	3
8 - 10	15.012 - 15.023	12, 20 or 25	18	3
10 - 12	18.012 - 18.023	12, 20 or 25	22	4
12 - 15	22.015 - 22.028	16, 28 or 36	26	4
15 - 18	26.015 - 26.028	16, 28 or 36	30	4
18 - 22	30.015 - 30.028	20, 36 or 45	34	5
22 - 26	35.017 - 35.033	20, 36 or 45	39	5
26 - 30	42.017 - 42.033	25, 45 or 56	46	5
30 - 35	48.017 - 48.033	25, 45 or 56	52	5
35 - 42	55.020 - 55.039	30, 56 or 67	59	5
42 - 48	62.020 - 62.039	30, 56 or 67	66	6
48 - 55	70.020 - 70.039	30, 56 or 67	74	6
55 - 63	78.020 - 78.039	35, 67 or 78	82	6
63 - 70	85.023 - 85.045	35, 67 or 78	90	6
70 - 78	95.023 - 95.045	40, 78 or 105	100	6
78 - 85	105.023 - 105.045	40, 78 or 105	110	6



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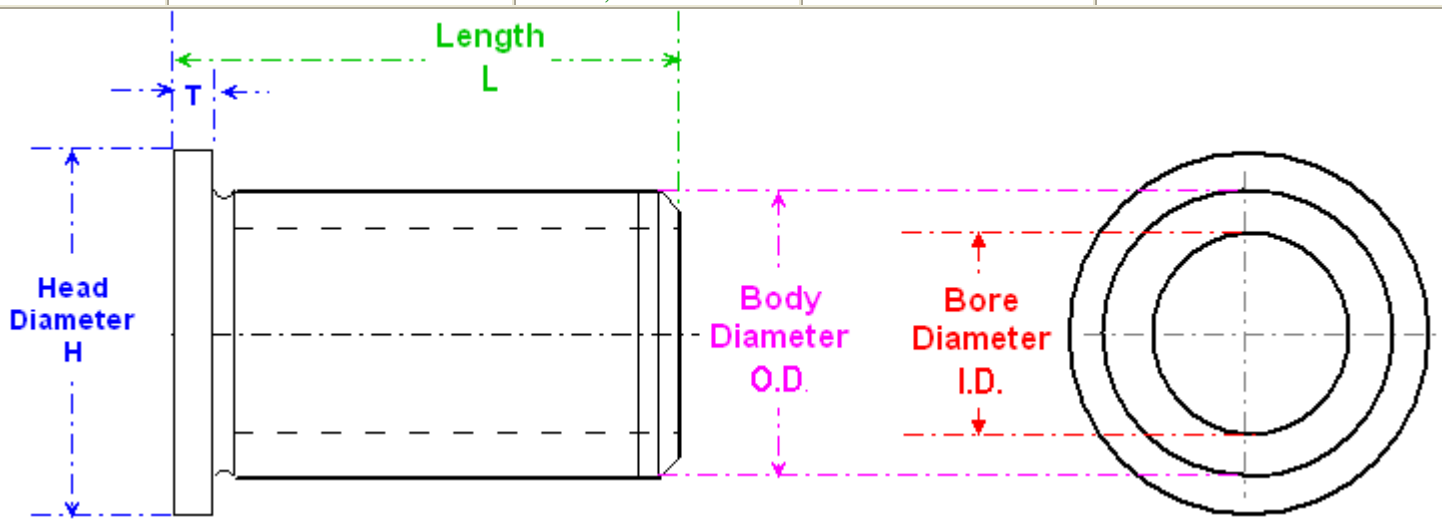
How to order 'F' & 'J' metric bushes

Select **TYPE**, **BORE**, **BODY DIAMETER** & **LENGTH** from the Charts.

e.g. 'ML 35X48X45' represents a Metric Liner Bush, with 35mm bore, 48mm Body diameter & 45mm Length (For Headed Bushings 'L' indicates length under the head)

LINER (ML) & HEADED LINER (MHL) BUSHES

BORE SIZE	BODY DIAMETER	LENGTH L	HEAD DIAMETER	HEAD THICKNESS
10	15.012 - 15.023	12, 20 or 25	18	3
12	18.012 - 18.023	12, 20 or 25	22	4
15	22.015 - 22.028	16, 28 or 36	26	4
18	26.015 - 26.028	16, 28 or 36	30	4
22	30.015 - 30.028	20, 36 or 45	34	5
26	35.017 - 35.033	20, 36 or 45	39	5
30	42.017 - 42.033	25, 45 or 56	46	5
35	48.017 - 48.033	25, 45 or 56	52	5
42	55.020 - 55.039	30, 56 or 67	59	5
48	62.020 - 62.039	30, 56 or 67	66	6
55	70.020 - 70.039	30, 56 or 67	74	6
62	78.020 - 78.039	35, 67 or 78	82	6
70	85.023 - 85.045	35, 67 or 78	90	6
78	95.023 - 95.045	40, 78 or 105	100	6
85	105.023 - 105.045	40, 78 or 105	110	6
95	115.023 - 115.045	45, 89 or 112	120	6
105	125.023 - 125.045	45, 89 or 112	130	6



HOW TO ORDER 'F & J' IMPERIAL SIZE BUSHES

Select **BODY** diameter, **LENGTH** & **BORE** from the chart below.

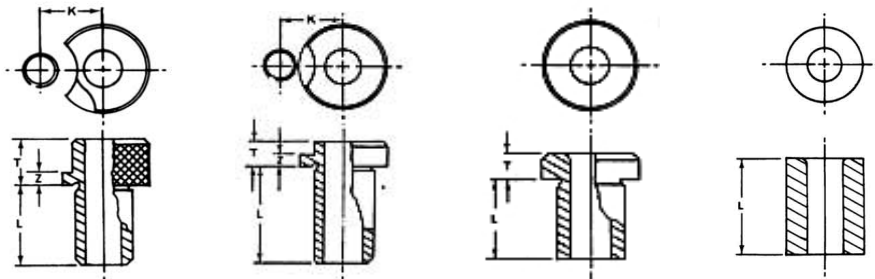
e.g. To order a **SLIP** type bush with $\frac{1}{2}$ inch dia body & $\frac{3}{4}$ inch length (under head) with a $\frac{1}{4}$ inch bore.

Order bush – '**B3-S1/4 D**' (F & J Standard)

When fitting: A minimum interference fit is essential for Liners & Press Fit Bushes.

This will prevent any unnecessary closing of the bore.

F & J Symbol	ASA Symbols		Hole Size	Drill Limits	Reamer Limits	Body Diameter			Length L	Head Diameter			K	Head Thickness - T				Z
	Prefix	Prefix				Slip:Fixed	Press	Liner		S:F	H	HL		Slip	Fixed	Press	Liner	
	S:F:P:F:	L or HL																
A1	20 - 5	32 - 5	No 55 To 5/32	+0.0001	+0.0006	0.3125"	0.3137"	0.5012"	5/16	9/16	27/64	5/8	1/2	3/8	1/4	1/8	1/8	1/8
A2	20 - 8	32 - 8		+0.0004	+0.0009	0.3123"	0.3133"	0.5008"	1/2									
A3	20 - 12	32 - 12						3/4										
A4	20 - 16	32 - 16						1										
B1	32 - 5	48 - 5	5/32 To 5/16	+0.0001	+0.0006	0.5000"	0.5012"	0.7515"	5/16	13/16	39/64	7/8	5/8	7/16	1/4	3/16	1/8	1/8
B2	32 - 8	48 - 8							1/2									
B3	32 - 12	48 - 12							3/4									
B4	32 - 16	48 - 16							1									
B5	32 - 22	48 - 22							1 3/8									
B6	32 - 28	48 - 28							1 3/4									
C1	48 - 8	64 - 8	5/16 To 1/2	+0.0002	+0.0008	0.7500"	0.7515"	1.0018"	1/2	1	59/64	1	3/4	7/16	1/4	7/32	1/8	1/8
C2	48 - 12	64 - 12							3/4									
C3	48 - 16	64 - 16							1									
C4	48 - 22	64 - 22							1 3/8									
C5	48 - 28	64 - 28							1 3/4									
C6	48 - 34	64 - 34							2 1/8									
D1	64 - 8	88 - 8	1/2 To 3/4	+0.0002	+0.0008	1.0000"	1.0018"	1.3768"	1/2	1	16/64	1	59/64	7/16	3/8	5/16	1/8	3/16
D2	64 - 12	88 - 12							3/4									
D3	64 - 16	88 - 16							1									
D4	64 - 22	88 - 22							1 3/8									
D5	64 - 28	88 - 28							1 3/4									
D6	64 - 34	88 - 34							2 1/8									
D7	64 - 40	88 - 40							2 1/2									



HOW TO ORDER 'F & J' IMPERIAL SIZE BUSHES

Select **BODY** diameter, **LENGTH** & **BORE** from the chart below.

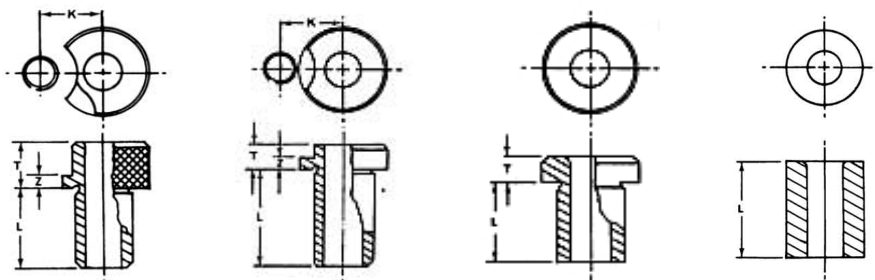
e.g. To order a **SLIP** type bush with $\frac{1}{2}$ inch dia body & $\frac{3}{4}$ inch length (under head) with a $\frac{1}{4}$ inch bore.

Order bush – '**B3-S1/4 R**' (F & J Standard)

When fitting: A minimum interference fit is essential for Liners & Press Fit Bushes.

This will prevent any unnecessary closing of the bore.

F & J Symbol	ASA Symbols		Hole Size	Drill Limits	Reamer Limits	Body Diameter			Length L	Head Diameter			K	Head Thickness - T				Z
	Prefix	Prefix				Slip:Fixed	Press	Liner		S: F	H	HL		Slip	Fixed	Press	Liner	
	S:F:P:F:	L or HL																
E1	88 - 12	112 - 12	3/4 To 1			1.3750"	1.3768"	1.7521"	3/4	1 13/16	1 39/64	1 7/8	1 7/64	7/16	3/8	3/8	1/8	3/16
E2	88 - 16	112 - 16																
E3	88 - 22	112 - 22																
E4	88 - 28	112 - 28																
E5	88 - 34	112 - 34																
E6	88 - 40	112 - 40																
F1	112 - 16	144 - 16	1 To 1 3/8			1.7500"	1.7521"	2.2524"	1	2 5/16	1 63/64	2 3/8	1 25/64	5/8	3/8	3/8	1/8	3/16
F2	112 - 22	144 - 22																
F3	112 - 28	144 - 28																
F4	112 - 34	144 - 34																
F5	112 - 40	144 - 40																
F6	112 - 48	144 - 48																
G1	144 - 16	176 - 16	1 3/8 To 1 3/4			2.2500"	2.2524"	2.7524"	1	2 13/16	2 31/64	2 7/8	1 41/64	5/8	3/8	3/8	1/8	3/16
G2	144 - 22	176 - 22																
G3	144 - 28	176 - 28																
G4	144 - 34	176 - 34																
G5	144 - 40	176 - 40																
G6	144 - 48	176 - 48																

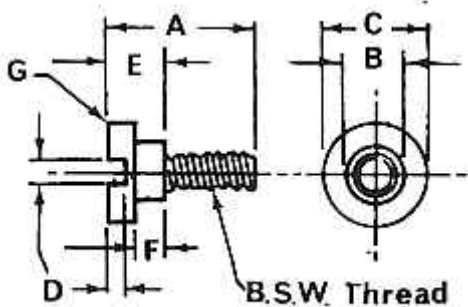


SUPPLEMENTARY SIZES	F & J Symbol	ASA Symbols		Hole Size	Drill Limits	Reamer Limits	Body Diameter	Length L	Head Diameter	Head Thickness T		
		Prefix										
		H : P										
PRESS FIT TYPES	Z1	10 - 5	0	To 1/16	+0.0001	+0.0006	0.1569"	5/16	15/64	3/32		
	Z2	10 - 8			+0.0004	+0.0009	0.1567"	1/2				
	CONCENTRICITY within 0.0005" T.I.R. as per ASA and British Standards.	Y1	13 - 5		3/64 To 3/32	+0.0001	+0.0006	0.2040"	5/16	19/64	3/32	
		Y2	13 - 8			+0.0004	+0.0009	0.2037"				1/2
	Closer Concentricity held at a slightly higher cost.	X1	16 - 5	7/64	To 9/64	+0.0001	+0.0006	0.2509"	5/16	23/64	1/8	
		X2	16 - 8			+0.0004	+0.0009	0.2506"				1/2
SPECIAL BUSHES made to customers requirements.		W1	26 - 5		13/64 To 1/4	+0.0001	+0.0006	0.4074"	5/16	9/16	3/16	
		W2	26 - 8			+0.0004	+0.0009	0.4070"				1/2
		W3	26 - 12									3/4
Quotations on request.		V1	40 - 8	21/64	To 13/32	+0.0002	+0.0008	0.6265"	.1/2	13/16	3/16	
	V2	40 - 12		+0.0005		+0.0012	0.6260"	.3/4				
	V3	40 - 16						1				
Quotations on request.	U1	56 - 12	33/64	To 5/8	+0.0002	+0.0008	0.8765"	.3/4	1 1/8	1/4		
	U2	56 - 16			+0.0005	+0.0012	0.8760"				1	
	U3	56 - 22									1 3/8	
	T1	76 - 12	49/64	To 7/8	+0.0002	+0.0010	1.1893"	.3/4	1 7/16	5/16		
		T2	76 - 16			+0.0007	+0.0015				1.1887"	1
		T3	76 - 22									1 3/4
	S1	100 - 16	1 1/64	To 3/16	+0.0003	+0.0012	1.5646"	.1	1 13/16	3/8		
		S2	100 - 22			+0.0009	+0.0018				1.5639"	1 3/8
		S3	100 - 28									1 3/4
R1	128 - 16	1 25/64	To 1 9/16	+0.0004	+0.0012	2.0021"	.1	2 1/4	3/8			
	R2	128 - 22			+0.0010	+0.0018				2.0014"	1 3/8	
	R3	128 - 28									1 3/4	

RETAINING SCREWS

FOR SLIP & FIXED RENEWABLE BUSHES

	Dimensions	Size		
		1	2	3
A	Overall Length	5/8	7/8	1
B	Shoulder Diameter	3/8	3/8	7/16
C	Head Diameter	5/8	5/8	3/4
D	Slot	1/16	3/32	1/8
E	Thickness	1/4	3/8	3/8
F	Shoulder Length	0.1380" 0.1320"	0.2000" 0.1940"	0.2000" 0.1940"
G	Radius	1/32	1/32	1/32
	Thread Size B.S.W.	5/16	5/16	3/8



F & J Bushings - Castable Bush Quotation / Order form

Please PRINT this page, Enter your Details and Fax to: (03) 9870 6710

Tick Box Of Required Body Type and fill in the appropriate Fields Below.

'B' = ' _____ ' (Bore Diameter)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
'OD' = ' _____ ' (Outer Diameter)		
'L' = ' _____ ' (Overall Length)		
Quantity Required = ' _____ '		
Please Quote ' __ '		
Order Request ' __ '		

Comments: _____.

Name: _____.

Address: _____.

State: _____ **Postcode:** _____.

Country: _____ . (If Outside Australia).

Phone: _____ **Fax:** _____.

E-Mail: _____.

F & J Bushings Pty Ltd - P.O. Box 389, Ringwood, Vic 3134 Australia

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