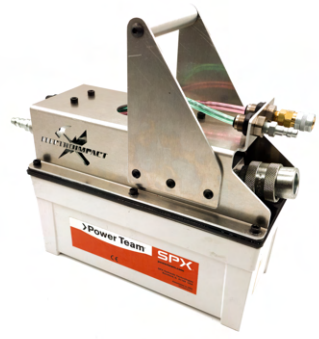


**SEAMLESS
COLDWORKING**



COLD WORKING CATALOG 2026



WWW.ELECTROIMPACT.COM

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4413 Chennault Beach Rd, Mukilteo,
Washington, United States



Introduction

SEAMLESS COLDWORKING INTRODUCTION

PATENT # 12420364

Coldworking, the process of introducing compressive stresses around fastener holes to extend fatigue life, has been in production for decades. The first widely adopted method was **sleeve coldworking**, developed by Boeing in the 1970s. This was followed by **split mandrel** coldworking in the 1980s, developed by Boeing and West Coast Industries.

The latest evolution is Electroimpact's **seamless coldworking**, introduced in the 2020s. All three are single-sided processes, meaning backside access isn't required, an advantage when structures are closed out or when a second operator isn't available to pass a mandrel through.

Sleeve Coldworking: Drawbacks

- Sleeves must be oriented so the split lies in a low-stress quadrant of the hole, a judgment call entirely dependent on the operator.
- Installing and removing sleeves is slow and creates FOD risk.
- The process is extremely difficult to automate.
- Sleeves are single-use and must be purchased, tracked, stored, distributed, and disposed of, adding cost and paperwork.

Split Mandrel Coldworking: Benefits and Limitations

Developed to eliminate sleeves and now widely used, split mandrels reduce consumables but introduce other issues:

- Limited to aluminum.
- Produces uneven expansion in four smaller zones instead of one.
- Mandrels see very high stress, can break, and may become stuck in the workpiece.

Seamless Coldworking: Advantages

Seamless coldworking addresses these limitations:

- No gaps in the tool, eliminating sleeve-orientation concerns and producing the **most uniform expansion** possible.
- **Minimal post-reaming** due to the absence of ridges, maintaining high compressive stress at the hole edge.
- **No sleeves required.**
- **Simple to automate.**
- Mandrels are robust, capable of coldworking titanium and highly resistant to breakage in aluminum.
- **Faster operation** with no sleeve handling.
- Compatible with bushing installation workflows.



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Introduction

SEAMLESS COLDWORKING CONT.

PATENT # 12420364

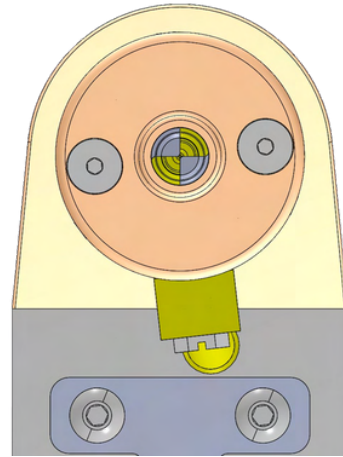
Recommended Materials: Titanium & Aluminum

Key Benefit:

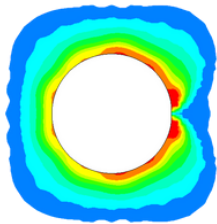
Leaves no internal ridge on coldworked holes

Why It Matters:

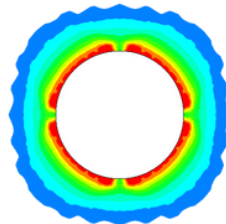
Traditional coldworking methods using split mandrels or sleeves leave small unworked areas due to the splits. This results in incomplete hole expansion and potential stress points.



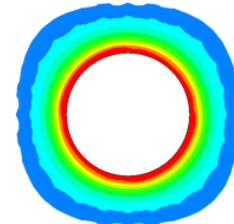
MANDREL ENTRY SIDE : TESTED ON 7050-T7451 ALUMINUM



SPLIT SLEEVE



**SPLIT
MANDREL**



**SEAMLESS
MANDREL**

Our design uses a **seamless mandrel with no gaps**, ensuring the **entire hole is fully coldworked**, providing:

- Uniform material strengthening
- No unworked “split zones”
- No need to consider grain or load direction
- No radial orientation lends to an ideal method to **automate**.

Result:

Stronger, cleaner, and more consistent holes with improved fatigue life.



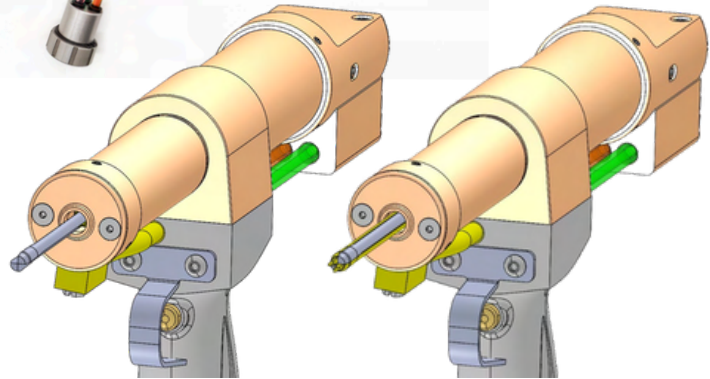
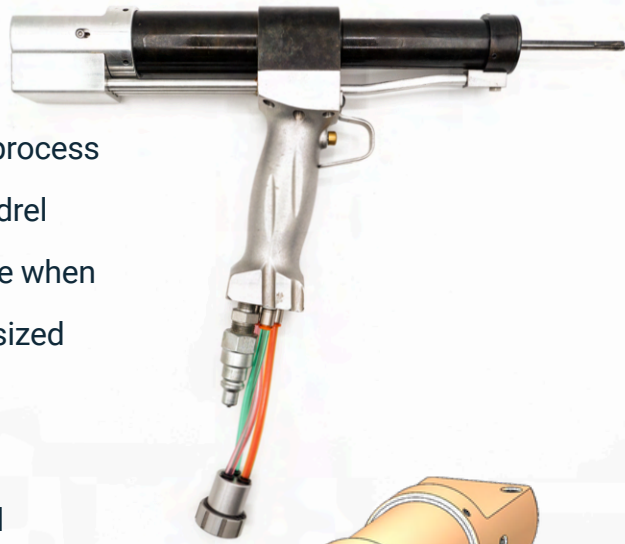
Introduction

SEAMLESS PULLER GUN

PATENT # 12420364

The key to the staged mandrel process is tightly machined sets of mandrel segments that slide into the hole when they are separated but are oversized when aligned.

To start only two of the mandrel segments are extended (grey). The pilot segments (yellow) are retracted back. The tool is inserted into the hole and the extended mandrel segments have clearance to move together and slide in.



Next the pilot mandrels advance through the hole. Due to an undercut in most of the length of the extended segments there is still clearance for the pilot mandrels. At the end of the stroke the pilot mandrel segments align with the already extended segments and the tip region have no undercut. The aligned segments form the oversized cold work diameter.

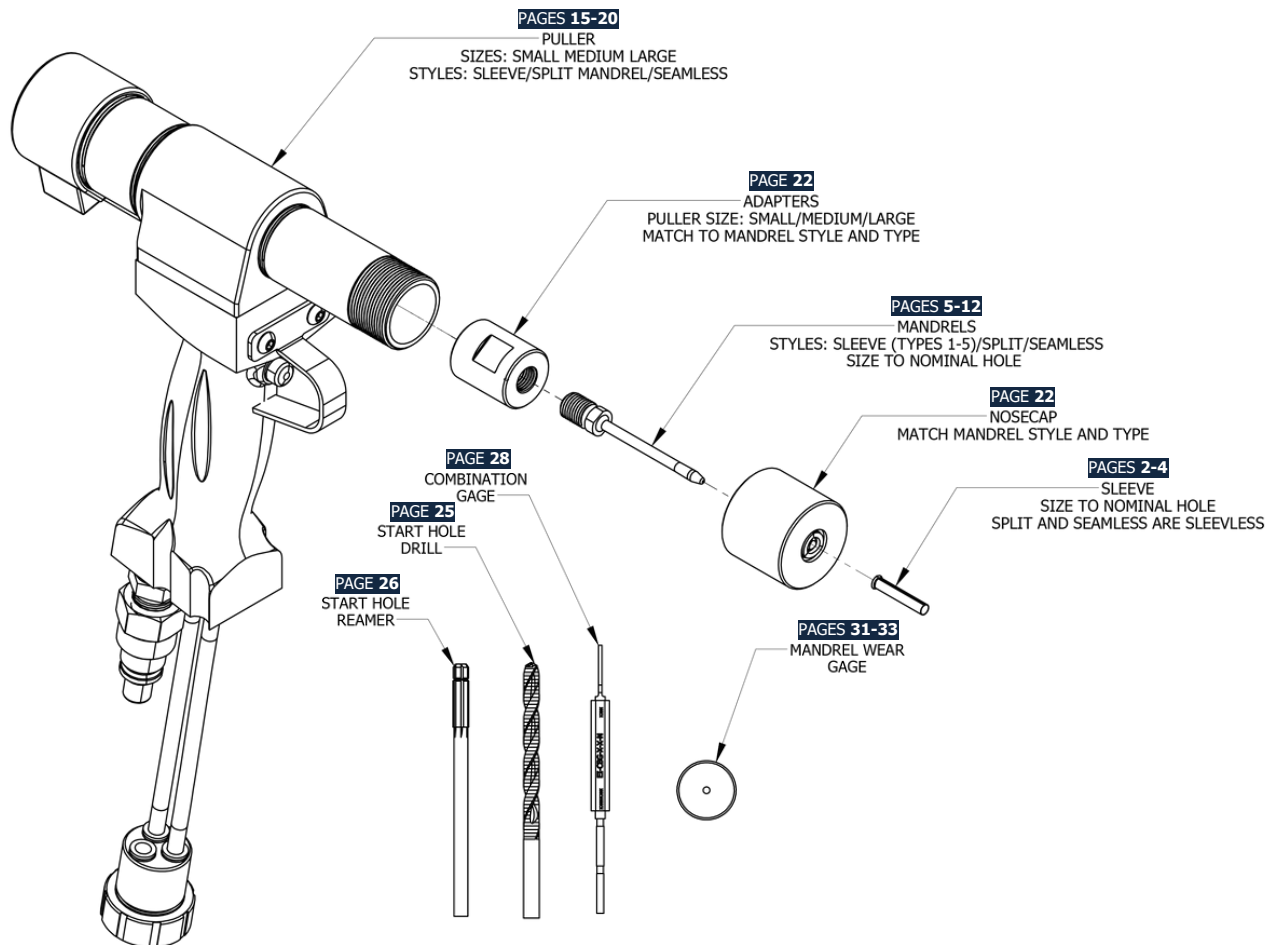
Lastly the whole mandrel assembly retracts back seamlessly as the segments are held in shape by the hole. The hole material yields locally and is strengthened against fatigue.

For aluminum, a Boelube system automatically coats the mandrel segments, for titanium a dry lubricant is applied to holes beforehand.



Contents

Split Sleeve Process	1
Sleeves	2-4
Mandrels	5-12
Pumps	13-14
Pullers	15-20
Puller Parts	21-23
Hose Assembly	24
Additional Tooling	25-27
Gages	28-33





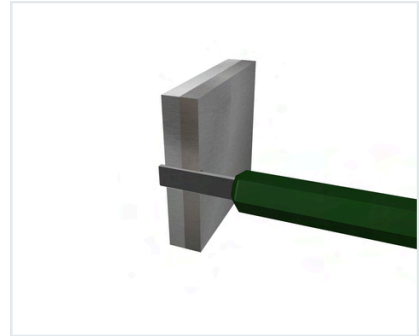
Split Sleeve Process



01 Drill starting hole



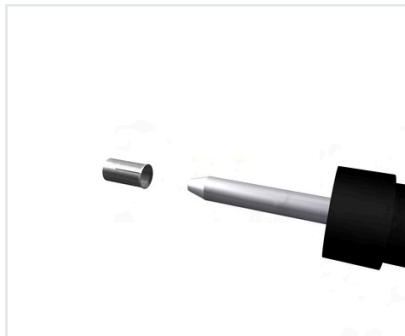
02 Ream starting hole



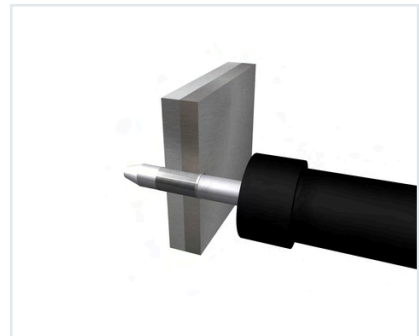
03 Check diameter with combination gauge



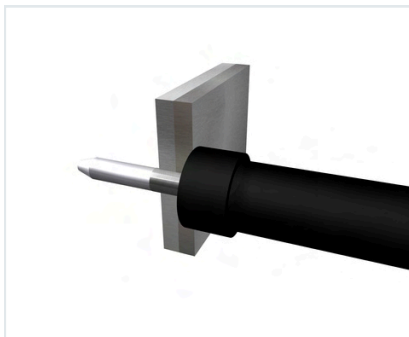
04 Inspect mandrel



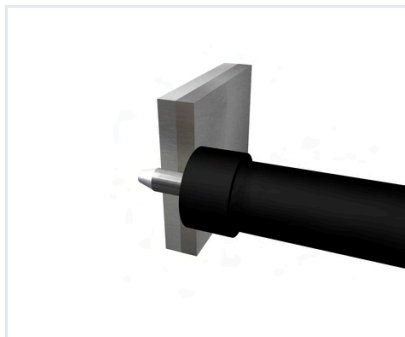
05 Slide split sleeve over mandrel



06 Insert mandrel and sleeve into hole



07 Place nose cap firmly against workpiece



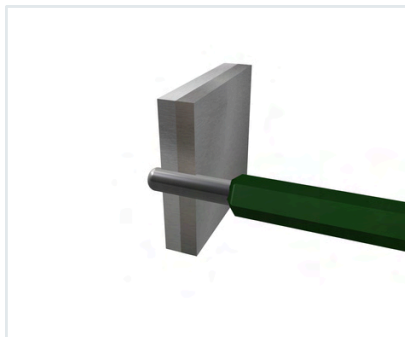
08 Expand hole by activating puller



09 Retract mandrel fully into the nose cap



10 Remove and discard used sleeve

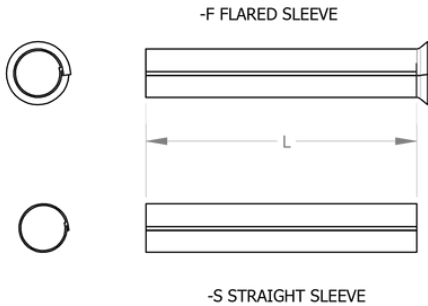


11 Verify hole size and finish ream



Sleeves

CHART SHOWS STANDARD SIZES,
SPECIALS AVAILABLE UPON REQUEST



SLEEVE INSTALLATION TOOL



LENGTH DASH NUMBER	SLEEVE LENGTH "L"
8	0.500
16	1.0
24	1.5
32	2.0
40	2.5
48	3.0

PART NUMBER SYSTEM

EI - CBS - X - X - X - XX - X

MANUFACTURED BY
ELECTROIMPACT

CBS TYPE SLEEVE

NOMINAL HOLE SIZE IN
1/32" INCREMENTS

F = FLARED SLEEVE
S = STRAIGHT SLEEVE

SLEEVE LENGTH "L" IN
1/16TH" INCREMENTS

N = NORMAL SLEEVE
S = SPECIAL SLEEVE

0 = NO OVERSIZE
1 = 1/64 OVERSIZE
2 = 1/32 OVERSIZE
3 = 3/64 OVERSIZE



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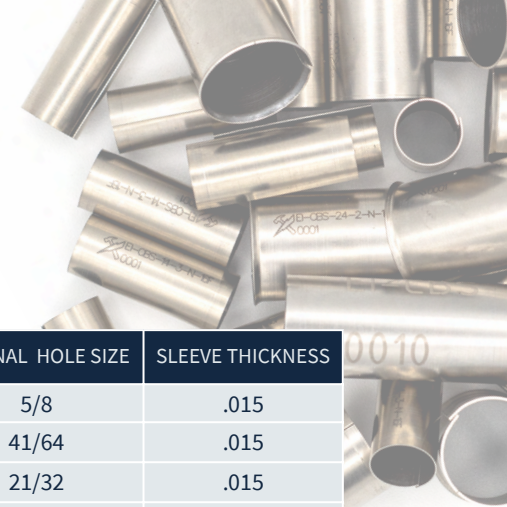
Sleeves

CHART SHOWS STANDARD SIZES,
SPECIALS AVAILABLE UPON REQUEST

PART NUMBER	NOMINAL HOLE SIZE	SLEEVE THICKNESS
EI-CBS-6-0-N-XX-X	3/16	0.006
EI-CBS-6-1-N-XX-X	13/64	0.006
EI-CBS-6-2-N-XX-X	7/32	0.006
EI-CBS-6-3-N-XX-X	15/64	0.006
EI-CBS-8-0-N-XX-X	1/4	0.008
EI-CBS-8-1-N-XX-X	17/64	0.008
EI-CBS-8-2-N-XX-X	9/32	0.008
EI-CBS-8-3-N-XX-X	19/64	0.008
EI-CBS-10-0-N-XX-X	5/16	0.008
EI-CBS-10-1-N-XX-X	21/64	0.008
EI-CBS-10-2-N-XX-X	11/32	.010
EI-CBS-10-3-N-XX-X	23/64	.010
EI-CBS-12-0-N-XX-X	3/8	.010
EI-CBS-12-1-N-XX-X	25/64	.010
EI-CBS-12-2-N-XX-X	13/32	.010
EI-CBS-12-3-N-XX-X	27/64	.010
EI-CBS-14-0-N-XX-X	7/16	.010
EI-CBS-14-1-N-XX-X	29/64	.010
EI-CBS-14-2-N-XX-X	15/32	.010
EI-CBS-14-3-N-XX-X	31/64	.010
EI-CBS-16-0-N-XX-X	1/2	.012
EI-CBS-16-1-N-XX-X	33/64	.012
EI-CBS-16-2-N-XX-X	17/32	.012
EI-CBS-16-3-N-XX-X	35/64	.012
EI-CBS-18-0-N-XX-X	9/16	.012
EI-CBS-18-1-N-XX-X	37/64	.012
EI-CBS-18-2-N-XX-X	19/32	.012
EI-CBS-18-3-N-XX-X	39/64	.012

LENGTH DASH NUMBER	SLEEVE LENGTH "L"
8	0.500
16	1.0
24	1.5
32	2.0
40	2.5
48	3.0

PART NUMBER	NOMINAL HOLE SIZE	SLEEVE THICKNESS
EI-CBS-20-0-N-XX-X	5/8	.015
EI-CBS-20-1-N-XX-X	41/64	.015
EI-CBS-20-2-N-XX-X	21/32	.015
EI-CBS-20-3-N-XX-X	43/64	.015
EI-CBS-22-0-N-XX-X	11/16	.015
EI-CBS-22-1-N-XX-X	45/64	.015
EI-CBS-22-2-N-XX-X	23/32	.015
EI-CBS-22-3-N-XX-X	47/64	.015
EI-CBS-24-0-N-XX-X	3/4	.015
EI-CBS-24-1-N-XX-X	49/64	.015
EI-CBS-24-2-N-XX-X	25/32	.018
EI-CBS-24-3-N-XX-X	51/64	.018
EI-CBS-26-0-N-XX-X	13/16	.018
EI-CBS-26-1-N-XX-X	53/64	.018
EI-CBS-26-2-N-XX-X	27/32	.018
EI-CBS-26-3-N-XX-X	55/64	.018
EI-CBS-28-0-N-XX-X	7/8	.018
EI-CBS-28-1-N-XX-X	57/64	.018
EI-CBS-28-2-N-XX-X	29/32	.018
EI-CBS-28-3-N-XX-X	59/64	.018
EI-CBS-30-0-N-XX-X	15/16	.018
EI-CBS-30-1-N-XX-X	61/64	.018
EI-CBS-30-2-N-XX-X	31/32	.018
EI-CBS-30-3-N-XX-X	63/64	.018
EI-CBS-32-0-N-XX-X	1.00	.018
EI-CBS-32-1-N-XX-X	1 1/64	.018
EI-CBS-32-2-N-XX-X	1 1/32	.018
EI-CBS-32-3-N-XX-X	1 3/64	.018





Sleeves

CHART SHOWS STANDARD SIZES,
SPECIALS AVAILABLE UPON REQUEST

PART NUMBER	NOMINAL HOLE SIZE	SLEEVE THICKNESS
EI-CBS-36-0-N-XX-X	1 1/8	.018
EI-CBS-36-1-N-XX-X	1 9/64	.018
EI-CBS-36-2-N-XX-X	1 5/32	.018
EI-CBS-36-3-N-XX-X	1 11/64	.018
EI-CBS-38-0-N-XX-X	1 3/16	.018
EI-CBS-38-1-N-XX-X	1 13/64	.018
EI-CBS-38-2-N-XX-X	1 7/32	.018
EI-CBS-38-3-N-XX-X	1 15/64	.018
EI-CBS-40-0-N-XX-X	1 1/4	.018
EI-CBS-40-1-N-XX-X	1 17/64	.018
EI-CBS-40-2-N-XX-X	1 9/32	.018
EI-CBS-40-3-N-XX-X	1 19/64	.018
EI-CBS-44-0-N-XX-X	1 3/8	.018
EI-CBS-44-1-N-XX-X	1 25/64	.018
EI-CBS-44-2-N-XX-X	1 13/32	.018
EI-CBS-44-3-N-XX-X	1 27/64	.018
EI-CBS-48-0-N-XX-X	1 1/2	.018
EI-CBS-48-1-N-XX-X	1 33/64	.018
EI-CBS-48-2-N-XX-X	1 17/32	.018
EI-CBS-48-3-N-XX-X	1 35/64	.018
EI-CBS-52-0-N-XX-X	1 5/8	.018
EI-CBS-52-1-N-XX-X	1 41/64	.018
EI-CBS-52-2-N-XX-X	1 21/32	.018
EI-CBS-52-3-N-XX-X	1 43/64	.018
EI-CBS-56-0-N-XX-X	1 3/4	.010
EI-CBS-56-1-N-XX-X	1 49/64	.010
EI-CBS-56-2-N-XX-X	1 25/32	.010
EI-CBS-56-3-N-XX-X	1 51/64	.010



LENGTH DASH NUMBER	SLEEVE LENGTH "L"
8	0.500
16	1.0
24	1.5
32	2.0
40	2.5
48	3.0

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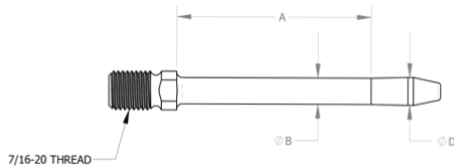


Mandrels

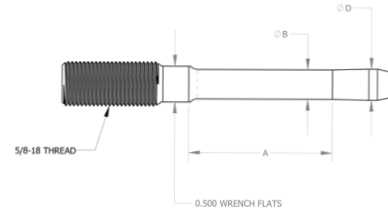
CHART SHOWS STANDARD SIZES,
SPECIALS AVAILABLE UPON REQUEST



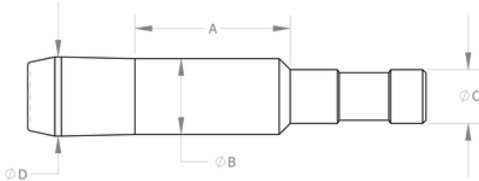
TYPE 1 CBM MANDRELS 5/32" THRU 35/64" HOLE SIZE



TYPE 2 CBM MANDREL 7/16" THRU 63/64" HOLE SIZE



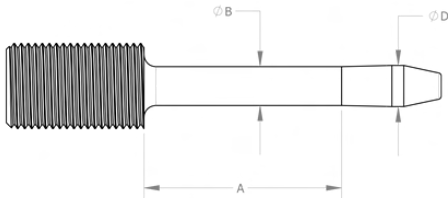
TYPE 3 CBM MANDRELS 1.00" THRU 1 51/64" HOLE SIZE



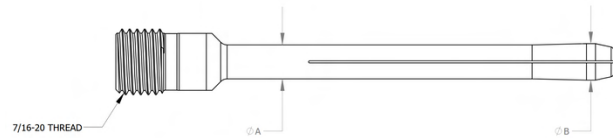
TYPE 4 CBM MANDRELS 1.00" THRU 1 49/64" HOLE SIZE



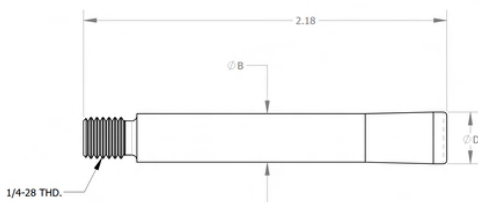
TYPE 5 CBM MANDRELS 7/16" THRU 63/64" HOLE SIZE



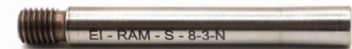
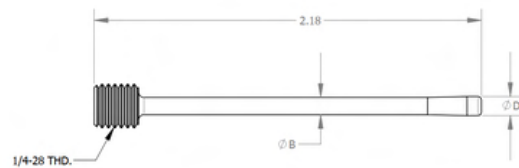
SPLIT MANDREL CALL FOR CUSTOM SIZING



RIGHT ANGLE MANDRELS 6-2 AND LARGER



RIGHT ANGLE MANDRELS 6-1 AND SMALLER





Mandrels

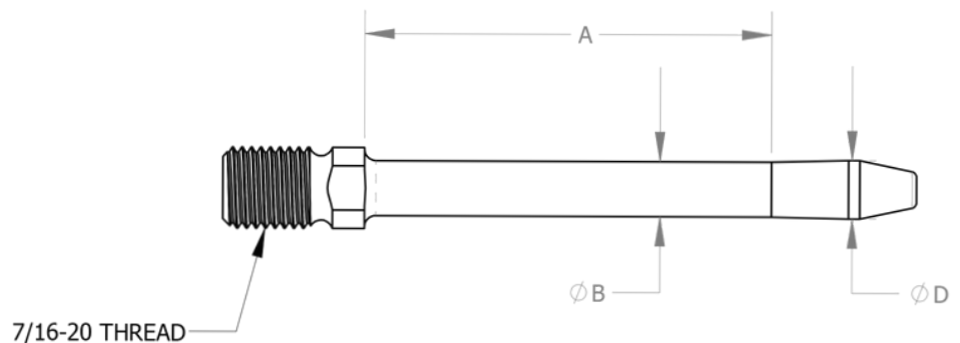
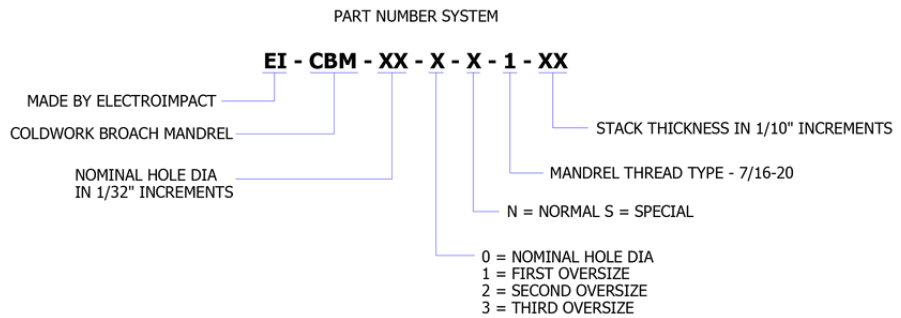
TYPE 1 CBM MANDRELS 5/32" THRU 35/64" HOLE SIZE



PART NUMBER	B"	D"
EI-CBM-4-2-N-1-XX	0.126	0.14
EI-CBM-4-3-N-1-XX	0.142	0.156
EI-CBM-6-0-N-1-XX	0.161	0.174
EI-CBM-6-1-N-1-XX	0.1766	0.1895
EI-CBM-6-2-N-1-XX	0.192	0.207
EI-CBM-6-3-N-1-XX	0.208	0.223
EI-CBM-8-0-N-1-XX	0.215	0.23
EI-CBM-8-1-N-1-XX	0.2311	0.246
EI-CBM-8-2-N-1-XX	0.2442	0.2617
EI-CBM-8-3-N-1-XX	0.2614	0.2789
EI-CBM-10-0-N-1-XX	0.2755	0.294
EI-CBM-10-1-N-1-XX	0.2916	0.31
EI-CBM-10-2-N-1-XX	0.3028	0.3223

PART NUMBER	B"	D"
EI-CBM-10-3-N-1-XX	0.3184	0.3379
EI-CBM-12-0-N-1-XX	0.3335	0.354
EI-CBM-12-1-N-1-XX	0.3496	0.37
EI-CBM-12-2-N-1-XX	0.3652	0.3867
EI-CBM-12-3-N-1-XX	0.3809	0.4024
EI-CBM-14-0-N-1-XX	0.395	0.418
EI-CBM-14-1-N-1-XX	0.4111	0.434
EI-CBM-14-2-N-1-XX	0.4242	0.4482
EI-CBM-14-3-N-1-XX	0.4394	0.4634
EI-CBM-16-0-N-1-XX	0.4445	0.4695
EI-CBM-16-1-N-1-XX	0.4601	0.485
EI-CBM-16-2-N-1-XX	0.4752	0.5012
EI-CBM-16-3-N-1-XX	0.4908	0.5168

PART NUMBER	A"
EI-CBM-X-X-N-1-8	1.375
EI-CBM-X-X-N-1-10	1.655
EI-CBM-X-X-N-1-15	2.155
EI-CBM-X-X-N-1-20	2.655
EI-CBM-X-X-N-1-25	3.155
EI-CBM-X-X-N-1-30	3.655
EI-CBM-X-X-N-1-35	4.155
EI-CBM-X-X-N-1-40	4.655
EI-CBM-X-X-N-1-45	5.155
EI-CBM-X-X-N-1-50	5.655
EI-CBM-X-X-N-1-55	6.155
EI-CBM-X-X-N-1-60	6.655
EI-CBM-X-X-N-1-65	7.155
EI-CBM-X-X-N-1-70	7.655
EI-CBM-X-X-N-1-75	8.155
EI-CBM-X-X-N-1-80	8.655





Mandrels

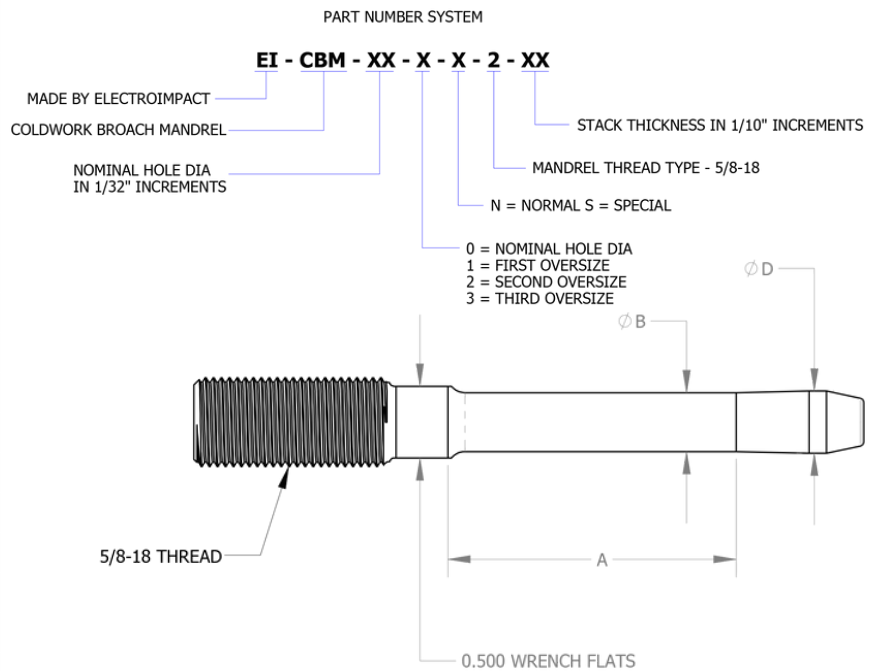
TYPE 2 CBM MANDREL 7/16" THRU 63/64" HOLE SIZE



PART NUMBER	B"	D"
EI-CBM-14-0-N-2-XX	0.3950	0.4180
EI-CBM-14-1-N-2-XX	0.4111	0.4340
EI-CBM-14-2-N-2-XX	0.4242	0.4482
EI-CBM-14-3-N-2-XX	0.4394	0.4634
EI-CBM-16-0-N-2-XX	0.4445	0.4695
EI-CBM-16-1-N-2-XX	0.4601	0.4850
EI-CBM-16-2-N-2-XX	0.4752	0.5012
EI-CBM-16-3-N-2-XX	0.4908	0.5168
EI-CBM-18-0-N-2-XX	0.5070	0.5340
EI-CBM-18-1-N-2-XX	0.5226	0.5495
EI-CBM-18-2-N-2-XX	0.5377	0.5657
EI-CBM-18-3-N-2-XX	0.5533	0.5813
EI-CBM-20-0-N-2-XX	0.5610	0.5915
EI-CBM-20-1-N-2-XX	0.5766	0.6070
EI-CBM-20-2-N-2-XX	0.5942	0.6257
EI-CBM-20-3-N-2-XX	0.6098	0.6413
EI-CBM-22-0-N-2-XX	0.6230	0.6555
EI-CBM-22-1-N-2-XX	0.6386	0.6710

PART NUMBER	B"	D"
EI-CBM-22-2-N-2-XX	0.6537	0.6872
EI-CBM-22-3-N-2-XX	0.6693	0.7028
EI-CBM-24-0-N-2-XX	0.6820	0.7165
EI-CBM-24-1-N-2-XX	0.6976	0.7320
EI-CBM-24-2-N-2-XX	0.7062	0.7422
EI-CBM-24-3-N-2-XX	0.7218	0.7578
EI-CBM-26-0-N-2-XX	0.7390	0.7760
EI-CBM-26-1-N-2-XX	0.7546	0.7915
EI-CBM-26-2-N-2-XX	0.7677	0.8057
EI-CBM-26-3-N-2-XX	0.7833	0.8213
EI-CBM-28-0-N-2-XX	0.7980	0.8370
EI-CBM-28-1-N-2-XX	0.8130	0.8520
EI-CBM-28-2-N-2-XX	0.8357	0.8757
EI-CBM-28-3-N-2-XX	0.8513	0.8913
EI-CBM-30-0-N-2-XX	0.8580	0.8990
EI-CBM-30-1-N-2-XX	0.8736	0.9145
EI-CBM-30-2-N-2-XX	0.8920	0.9310
EI-CBM-30-3-N-2-XX	0.9080	0.9465

PART NUMBER	A"
EI-CBM-XX-X-N-2-10	2.0100
EI-CBM-XX-X-N-2-15	2.5100
EI-CBM-XX-X-N-2-20	3.0100
EI-CBM-XX-X-N-2-25	3.5100
EI-CBM-XX-X-N-2-30	4.0100
EI-CBM-XX-X-N-2-40	5.0100
EI-CBM-XX-X-N-2-50	6.0100
EI-CBM-XX-X-N-2-60	7.0100
EI-CBM-XX-X-N-2-70	8.0100
EI-CBM-XX-X-N-2-80	9.0100
EI-CBM-XX-X-N-2-10	2.0100
EI-CBM-XX-X-N-2-15	2.5100
EI-CBM-XX-X-N-2-20	3.0100
EI-CBM-XX-X-N-2-25	3.5100
EI-CBM-XX-X-N-2-30	4.0100
EI-CBM-XX-X-N-2-40	5.0100





Mandrels

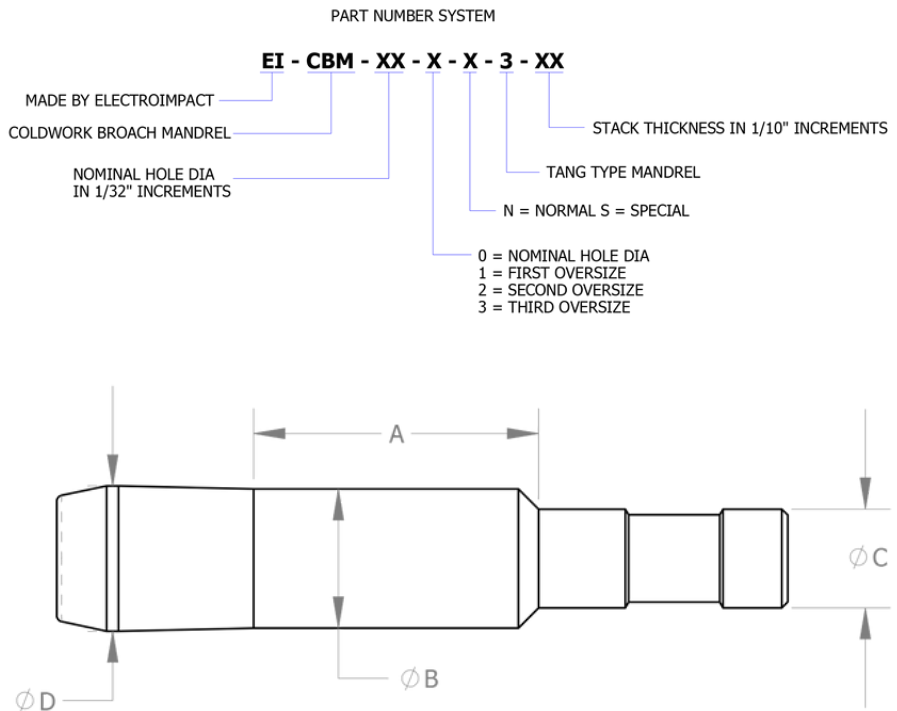
TYPE 3 CBM MANDRELS 1.00" THRU 1 51/64" HOLE SIZE



PART NUMBER	C"	B"	D"
EI-CBM-32-0-N-3-XX	0.960	0.9200	0.9655
EI-CBM-32-1-N-3-XX	0.975	0.9360	0.9815
EI-CBM-32-2-N-3-XX	0.990	0.9560	0.9975
EI-CBM-32-3-N-3-XX	0.990	0.9720	1.0135
EI-CBM-36-0-N-3-XX	0.990	1.0350	1.0800
EI-CBM-36-1-N-3-XX	0.990	1.0500	1.0960
EI-CBM-36-2-N-3-XX	0.990	1.0660	1.1120
EI-CBM-36-3-N-3-XX	0.990	1.0820	1.1280
EI-CBM-38-0-N-3-XX	0.990	1.0910	1.1425
EI-CBM-38-1-N-3-XX	0.990	1.1115	1.1585
EI-CBM-38-2-N-3-XX	0.990	1.1275	1.1745
EI-CBM-38-3-N-3-XX	0.990	1.1435	1.1905
EI-CBM-40-0-N-3-XX	0.990	1.1570	1.2080
EI-CBM-40-1-N-3-XX	0.990	1.1745	1.2240
EI-CBM-40-2-N-3-XX	0.990	1.1905	1.2400
EI-CBM-40-3-N-3-XX	0.990	1.2065	1.2560

PART NUMBER	C"	B"	D"
EI-CBM-44-0-N-3-XX	0.990	1.2700	1.3285
EI-CBM-44-1-N-3-XX	0.990	1.2955	1.3445
EI-CBM-44-2-N-3-XX	0.990	1.3115	1.3605
EI-CBM-44-3-N-3-XX	0.990	1.3275	1.3765
EI-CBM-48-0-N-3-XX	0.990	1.3820	1.4430
EI-CBM-48-1-N-3-XX	0.990	1.4025	1.4590
EI-CBM-48-2-N-3-XX	0.990	1.4185	1.4750
EI-CBM-48-3-N-3-XX	0.990	1.4345	1.4910
EI-CBM-52-0-N-3-XX	0.990	1.5185	1.5745
EI-CBM-52-1-N-3-XX	0.990	1.5345	1.5905
EI-CBM-52-2-N-3-XX	0.990	1.5505	1.6055
EI-CBM-52-3-N-3-XX	0.990	1.5665	1.6225
EI-CBM-56-0-N-3-XX	0.990	1.6700	1.7300
EI-CBM-56-1-N-3-XX	0.990	1.6850	1.7455
EI-CBM-56-2-N-3-XX	0.990	1.7000	1.7614
EI-CBM-56-3-N-3-XX	0.990	1.7160	1.7772

PART NUMBER	A"
EI-CBM-XX-X-N-3-10	2.857
EI-CBM-XX-X-N-3-15	3.357
EI-CBM-XX-X-N-3-20	3.857
EI-CBM-XX-X-N-3-25	4.357
EI-CBM-XX-X-N-3-30	4.857
EI-CBM-XX-X-N-3-35	5.357
EI-CBM-XX-X-N-3-40	5.857
EI-CBM-XX-X-N-3-45	6.357
EI-CBM-XX-X-N-3-50	6.857
EI-CBM-XX-X-N-3-55	7.357
EI-CBM-XX-X-N-3-60	7.857
EI-CBM-XX-X-N-3-65	8.357
EI-CBM-XX-X-N-3-70	8.857
EI-CBM-XX-X-N-3-75	9.357
EI-CBM-XX-X-N-3-80	9.857





Mandrels

2-PIECE MANDREL FOR LARGER HOLES

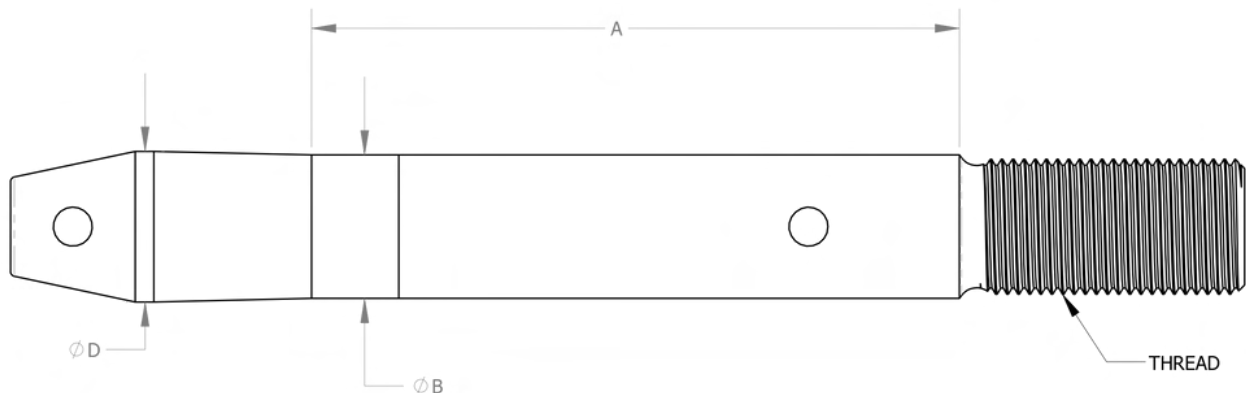
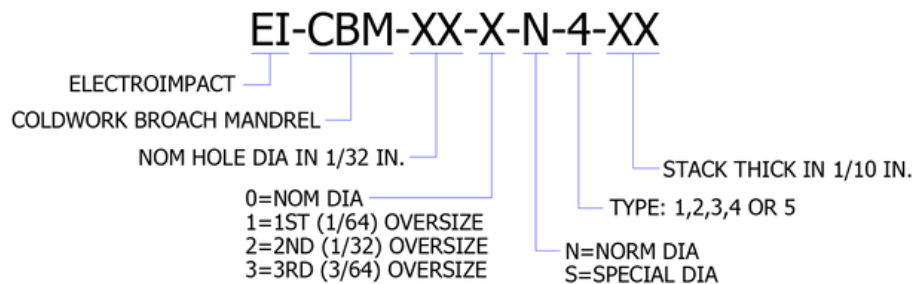
TYPE 4 CBM MANDRELS 1.00" THRU 1 49/64" HOLE SIZE



PART NUMBER	B"	D"	A"	THREAD
EI-CBM-32-0-N-4-30	0.9200	0.9655	4.16	7/8-14
EI-CBM-32-0-N-4-70	0.9200	0.9655	8.16	7/8-14
EI-CBM-32-1-N-4-30	0.9360	0.9815	4.15	7/8-14
EI-CBM-32-1-N-4-70	0.9360	0.9815	8.15	7/8-14
EI-CBM-36-0-N-4-30	1.0350	1.0800	4.12	7/8-14
EI-CBM-36-0-N-4-70	1.0350	1.0800	8.12	7/8-14
EI-CBM-36-1-N-4-30	1.0500	1.0960	4.11	7/8-14
EI-CBM-36-1-N-4-70	1.0500	1.0960	8.11	7/8-14
EI-CBM-38-0-N-4-30	1.0910	1.1425	4.1	7/8-14
EI-CBM-38-0-N-4-70	1.0910	1.1425	8.1	7/8-14
EI-CBM-38-1-N-4-30	1.1115	1.1585	4.09	7/8-14
EI-CBM-38-1-N-4-70	1.1115	1.1585	8.09	7/8-14
EI-CBM-40-0-N-4-30	1.1570	1.2080	4.08	7/8-14
EI-CBM-40-0-N-4-70	1.1570	1.2080	8.08	7/8-14
EI-CBM-40-1-N-4-30	1.1745	1.2240	4.07	7/8-14
EI-CBM-40-1-N-4-70	1.1745	1.2240	8.07	7/8-14

PART NUMBER	B"	D"	A"	THREAD
EI-CBM-44-0-N-4-30	1.2700	1.3285	4.04	7/8-14
EI-CBM-44-0-N-4-70	1.2700	1.3285	8.04	7/8-14
EI-CBM-44-1-N-4-30	1.2955	1.3445	4.03	7/8-14
EI-CBM-44-1-N-4-70	1.2955	1.3445	8.03	7/8-14
EI-CBM-48-0-N-4-30	1.3820	1.4430	3.1	7/8-14
EI-CBM-48-0-N-4-70	1.3820	1.4430	7.1	7/8-14
EI-CBM-48-1-N-4-30	1.4025	1.4590	3.99	7/8-14
EI-CBM-48-1-N-4-70	1.4025	1.4590	7.1	7/8-14
EI-CBM-52-0-N-4-30	1.5185	1.5745	3.99	1"-14
EI-CBM-52-0-N-4-70	1.5185	1.5745	7.99	1"-14
EI-CBM-52-1-N-4-30	1.5345	1.5905	3.99	1"-14
EI-CBM-52-1-N-4-70	1.5345	1.5905	7.99	1"-14
EI-CBM-56-0-N-4-30	1.6700	1.7300	3.94	1"-14
EI-CBM-56-0-N-4-70	1.6700	1.7300	7.94	1"-14
EI-CBM-56-1-N-4-30	1.6850	1.7455	3.94	1"-14
EI-CBM-56-1-N-4-70	1.6850	1.7455	7.94	1"-14

PART NUMBER	A"
EI-CBM-XX-X-N-4-30	4.16
EI-CBM-XX-X-N-4-40	5.16
EI-CBM-XX-X-N-4-50	6.16
EI-CBM-XX-X-N-4-60	7.16
EI-CBM-XX-X-N-4-70	8.16
EI-CBM-XX-X-N-4-80	9.16





Mandrels

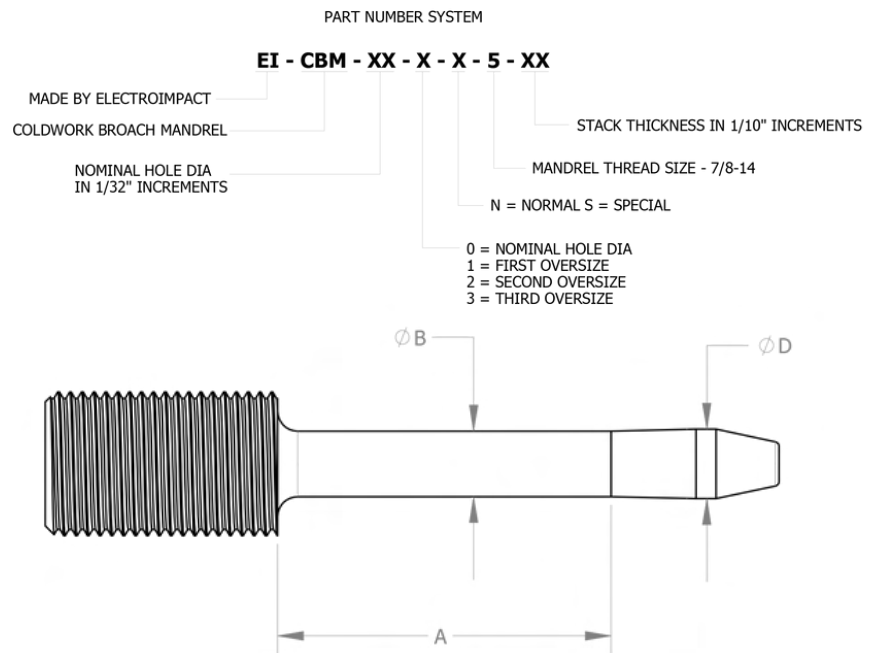
TYPE 5 CBM MANDRELS 7/16" THRU 63/64" HOLE SIZE



PART NUMBER	B"	D"
EI-CBM-14-0-N-5-XX	0.3950	0.4180
EI-CBM-14-1-N-5-XX	0.4111	0.4340
EI-CBM-14-2-N-5-XX	0.4242	0.4482
EI-CBM-14-3-N-5-XX	0.4394	0.4634
EI-CBM-16-0-N-5-XX	0.4445	0.4695
EI-CBM-16-1-N-5-XX	0.4601	0.4850
EI-CBM-16-2-N-5-XX	0.4752	0.5012
EI-CBM-16-3-N-5-XX	0.4908	0.5168
EI-CBM-18-0-N-5-XX	0.5070	0.5340
EI-CBM-18-1-N-5-XX	0.5226	0.5495
EI-CBM-18-2-N-5-XX	0.5377	0.5657
EI-CBM-18-3-N-5-XX	0.5533	0.5813
EI-CBM-20-0-N-5-XX	0.5610	0.5915
EI-CBM-20-1-N-5-XX	0.5766	0.6070
EI-CBM-20-2-N-5-XX	0.5942	0.6257
EI-CBM-20-3-N-5-XX	0.6098	0.6413
EI-CBM-22-0-N-5-XX	0.6230	0.6555
EI-CBM-22-1-N-5-XX	0.6386	0.6710

PART NUMBER	B"	D"
EI-CBM-22-2-N-5-XX	0.6537	0.6872
EI-CBM-22-3-N-5-XX	0.6693	0.7028
EI-CBM-24-0-N-5-XX	0.6820	0.7165
EI-CBM-24-1-N-5-XX	0.6976	0.7320
EI-CBM-24-2-N-5-XX	0.7062	0.7422
EI-CBM-24-3-N-5-XX	0.7218	0.7578
EI-CBM-26-0-N-5-XX	0.7390	0.7760
EI-CBM-26-1-N-5-XX	0.7546	0.7915
EI-CBM-26-2-N-5-XX	0.7677	0.8057
EI-CBM-26-3-N-5-XX	0.7833	0.8213
EI-CBM-28-0-N-5-XX	0.7980	0.8370
EI-CBM-28-1-N-5-XX	0.8130	0.8520
EI-CBM-28-2-N-5-XX	0.8357	0.8757
EI-CBM-28-3-N-5-XX	0.8513	0.8913
EI-CBM-30-0-N-5-XX	0.8580	0.8990
EI-CBM-30-1-N-5-XX	0.8736	0.9145
EI-CBM-30-2-N-5-XX	0.8920	0.9310
EI-CBM-30-3-N-5-XX	0.9080	0.9465

PART NUMBER	A"
EI-CBM-XX-X-N-5-10	2.010
EI-CBM-XX-X-N-5-15	2.510
EI-CBM-XX-X-N-5-20	3.010
EI-CBM-XX-X-N-5-25	3.510
EI-CBM-XX-X-N-5-30	4.010
EI-CBM-XX-X-N-5-35	4.510
EI-CBM-XX-X-N-5-40	5.010
EI-CBM-XX-X-N-5-50	6.010
EI-CBM-XX-X-N-5-60	7.010
EI-CBM-XX-X-N-5-70	8.010



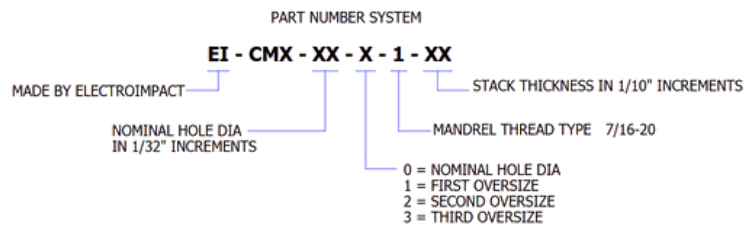
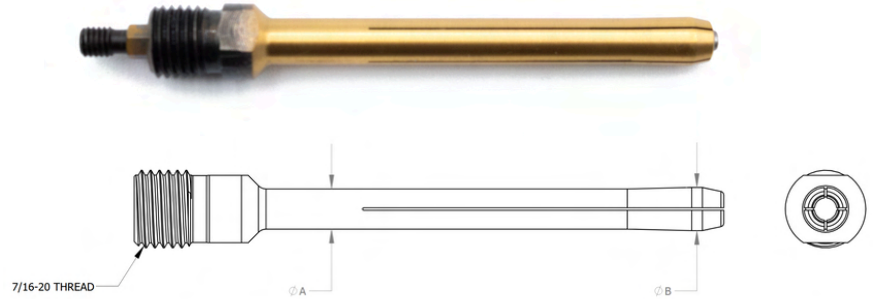


Mandrels

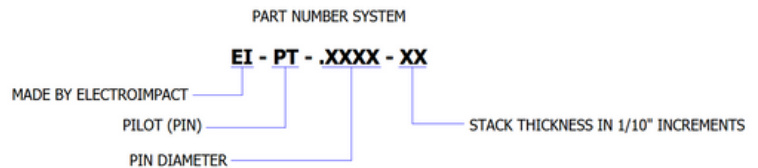
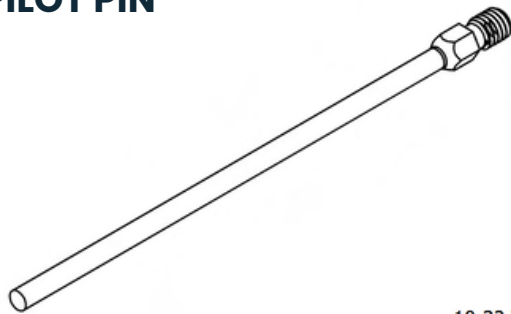
SPLIT MANDREL

CALL FOR CUSTOM SIZING

PART NUMBER	A"	B"
EI-CMX-08-0-1-XX	0.224	0.2402
EI-CMX-08-1-1-XX	0.239	0.256
EI-CMX-08-2-1-XX	0.254	0.2717
EI-CMX-10-0-1-XX	0.285	0.3042
EI-CMX-10-1-1-XX	0.3	0.3199
EI-CMX-10-2-1-XX	0.315	0.3357
EI-CMX-12-0-1-XX	0.346	0.3672
EI-CMX-12-1-1-XX	0.361	0.3829
EI-CMX-12-2-1-XX	0.376	0.3986
EI-CMX-14-0-1-XX	0.407	0.4311
EI-CMX-14-1-1-XX	0.422	0.4469
EI-CMX-14-2-1-XX	0.437	0.4626



PILOT PIN





Mandrels

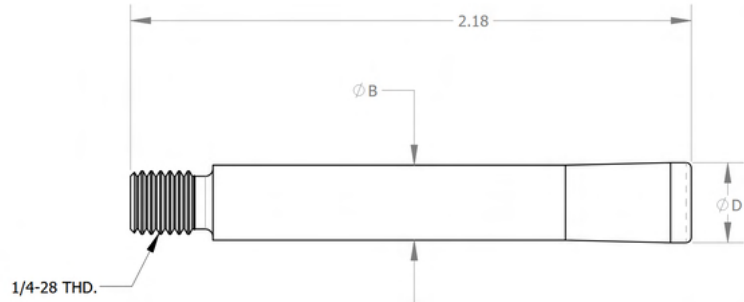
RIGHT ANGLE MANDREL

CALL FOR CUSTOM SIZING

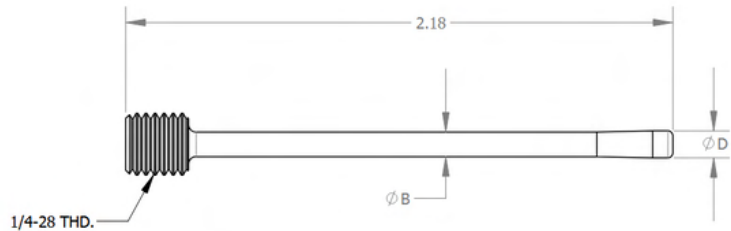
SIZE NUMBER	D +/- .0002"	B + .001/- .002"	MAX STACKUP
4-0-N	0.107	0.097	1.494
4-1-N	0.123	0.112	1.472
4-2-N	0.14	0.126	1.405
4-3-N	0.156	0.142	1.405
4-4-N	0.1654	0.152	1.419
6-0-N	0.174	0.161	1.427
6-1-N	0.1895	0.1766	1.43
6-2-N	0.207	0.192	1.383
6-3-N	0.223	0.208	1.383
8-0-N	0.23	0.215	1.383
8-1-N	0.246	0.2311	1.385
8-2-N	0.2617	0.2442	1.327
8-3-N	0.2789	0.2614	1.327
10-0-N	0.294	0.2755	1.305
10-1-N	0.31	0.2916	1.307
10-2-N	0.3223	0.3028	1.283
10-3-N	0.3379	0.3184	1.283
12-0-N	0.354	0.3335	1.261
12-1-N	0.37	0.3496	1.263



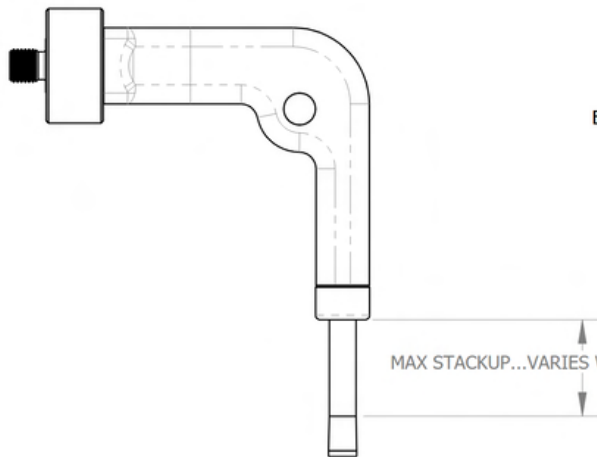
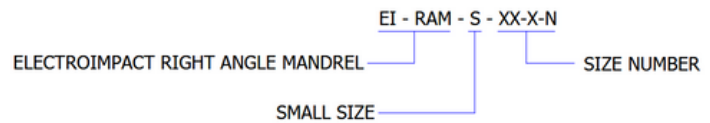
RIGHT ANGLE MANDRELS 6-2 AND LARGER



RIGHT ANGLE MANDRELS 6-1 AND SMALLER



LASER ENGRAVE PART NUMBER ON PART.





Pumps

MEDIUM HYDRAULIC POWERPACK PART NUMBER: EI-PUM-M

AIR DRIVEN HYDRAULIC PUMP

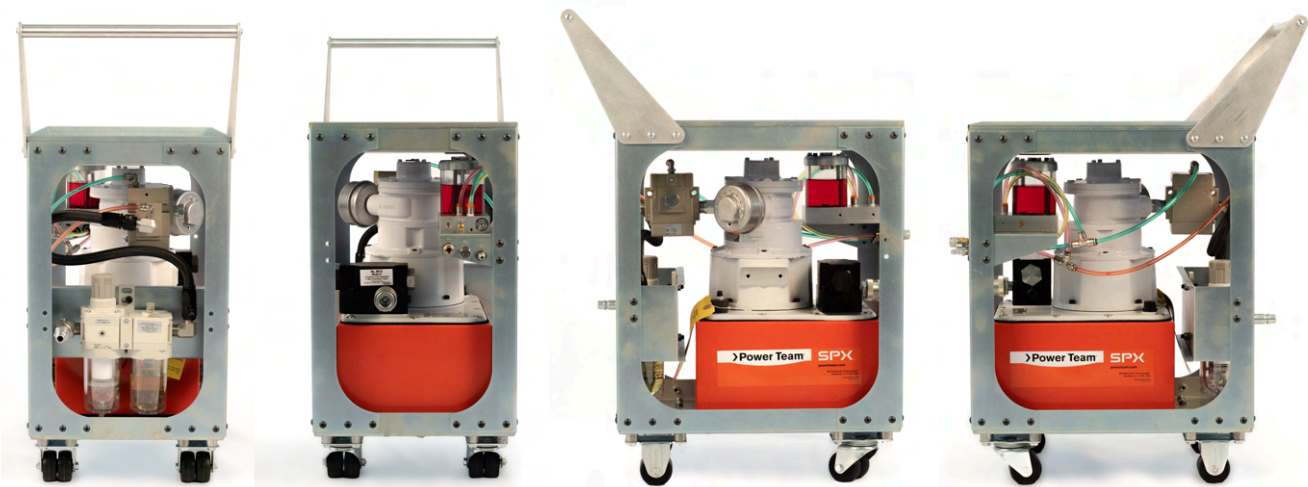
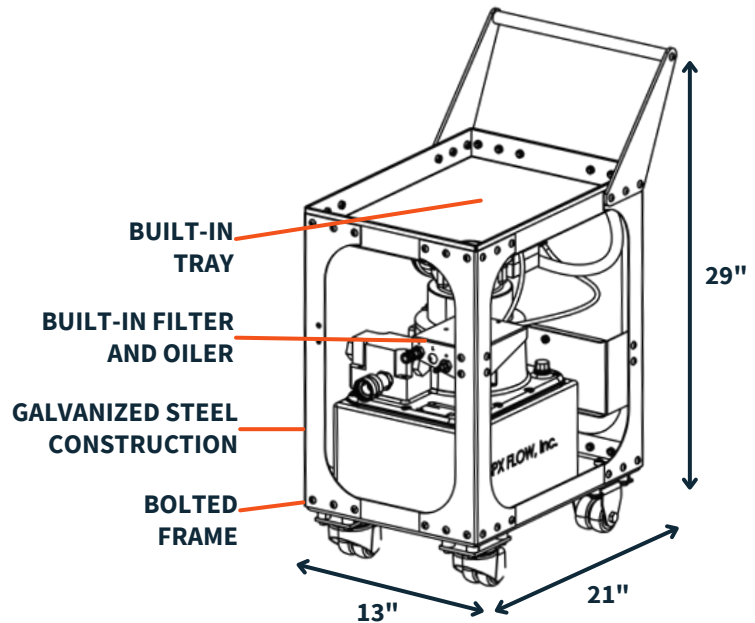
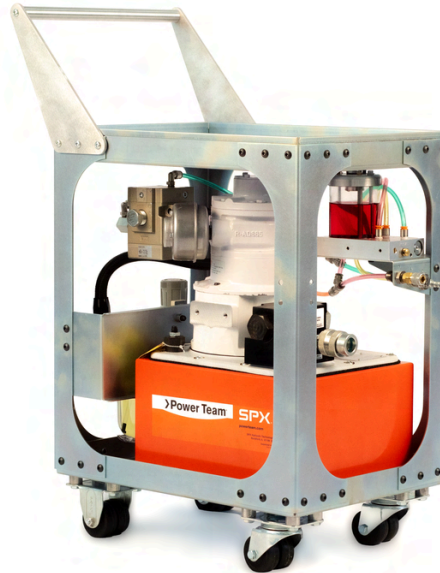
90 PSI AIR INPUT / 10,000 PSI OIL / OUTPUT WEIGHT 81 LB

HEIGHT 29" WIDTH 13" LENGTH 21"

OIL OUTPUT 46 CU. IN. MINUTE @10,000 PSI

This pump features heavy steel sheet construction to withstand real-world shop conditions.

- Frame is bolted together for easy service.
- Top of frame has built-in tray to carry your puller, hose assembly and tools.
- Based on the industry standard SPX flow hydraulic pump.
- Pump has built-in filter and oiler.
- Oil outlet and pneumatic fittings are compatible with coldwork tools from other manufacturers.





Pumps

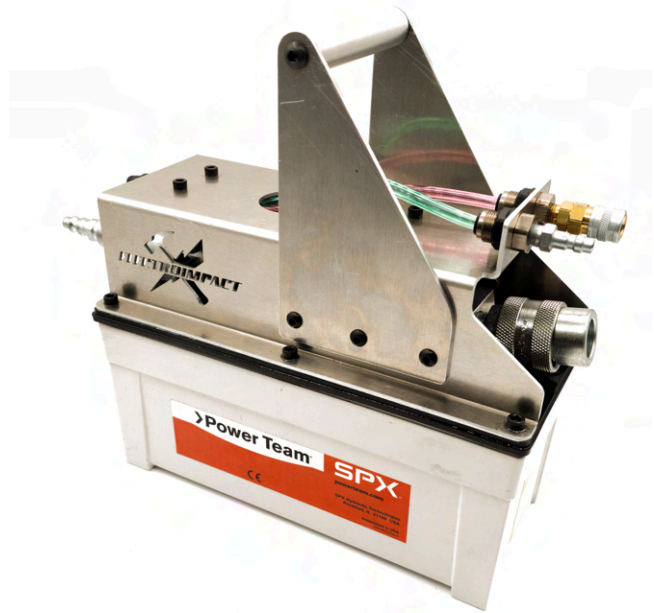
SMALL HYDRAULIC PUMP PART NUMBER: EI-PUM-S

AIR DRIVEN HYDRAULIC PUMP

90 PSI AIR INPUT / 10,000 PSI OIL OUTPUT / WEIGHT 20.5 LB

HEIGHT 10.12", LENGTH 13", WIDTH 5.12"

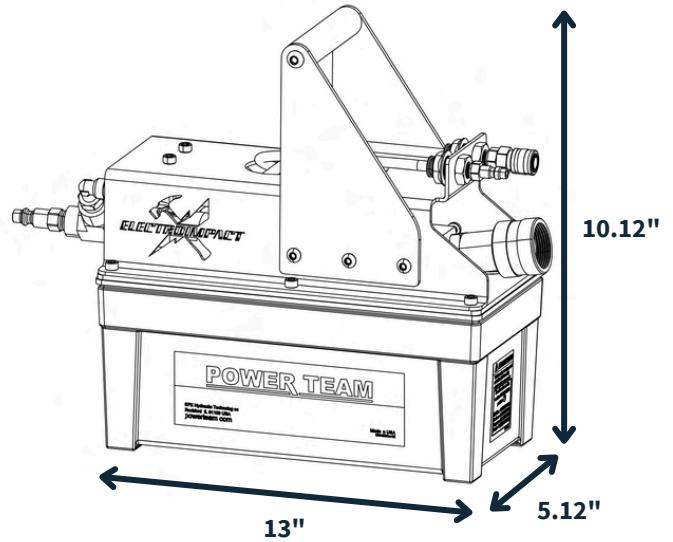
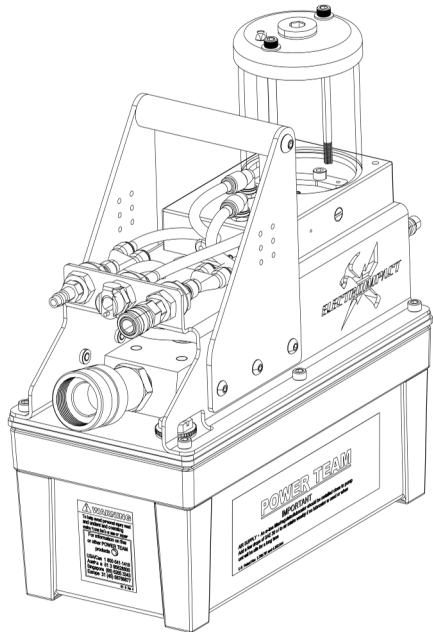
OIL FLOW 6 CU. IN/MIN @ 10,000 PSI



This pump is designed to be compact and lightweight, making it ideal for use in tight spaces such as within a wing or helicopter fuselage where larger, faster pumps are impractical.

- Output fittings are compatible with coldwork tools from other manufacturers.

INTEGRATED BOELUBE RESERVOIR AVAILABLE



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Pullers



SEAMLESS PULLER *PATENT # 12420364*

A NEW PROCESS OF COLD WORKING DEVELOPED BY EI. UNIFORM EXPANSION WITH NO SPLIT ZONES, PRODUCING STRONGER, CLEANER HOLES WITH IMPROVED FATIGUE LIFE.



UNIFORM HOLES



ALUMINUM AND TITANIUM



SLEEVELESS



EASY TO AUTOMATE



SPLIT MANDREL PULLER

SPLIT MANDREL REQUIRES NO SLEEVES AND WORKS IN ALL FORMS OF ALUMINUM.



PRODUCTION PROVEN PROCESS



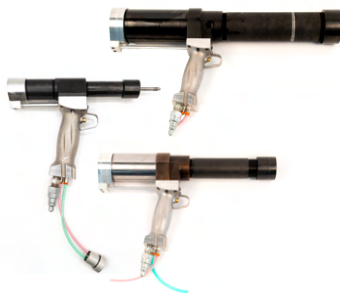
ALL FORMS OF ALUMINUM



SLEEVELESS



EASY TO AUTOMATE



SLEEVE TYPE PULLERS

SMALL, MEDIUM, AND LARGE SLEEVE TYPE PULLER GUNS. FOR STACKUPS UP TO 8". PULL FORCE UP TO 44,000 LB.



SPEC'ED INTO EVERY AIRCRAFT



ANY MATERIAL



SLEEVE TYPE CORDLESS PULLER

COMPACT AND POWERFUL, DESIGNED FOR PORTABILITY AND EASE OF USE WITHOUT SACRIFICING PERFORMANCE.



BATTERY POWERED



PERFECT FOR TIGHT SPACES



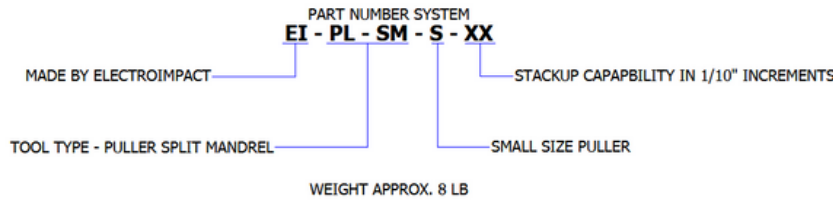
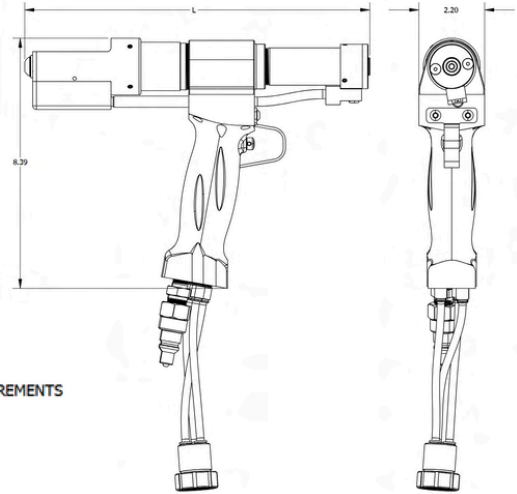
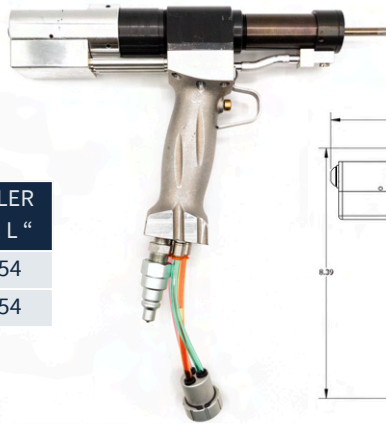
Pullers

SPLIT MANDREL PULLER GUN

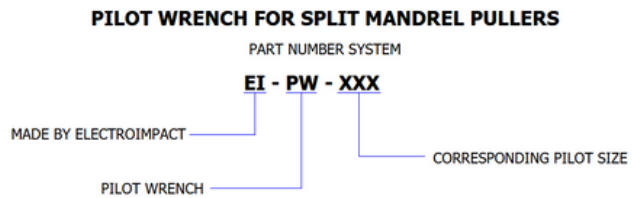
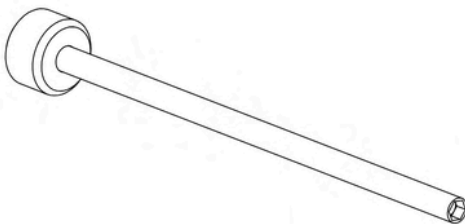
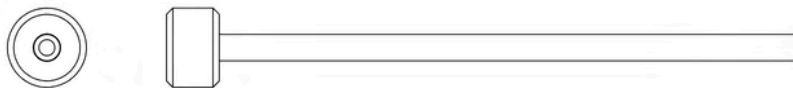
PULL FORCE 9,600 LB @10,000 PSI OIL PRESSURE

WEIGHT 5.5 - 8 LB (DEPENDING ON STACKUP)

STACKUP XX	STACKUP XX	STACKUP IN INCHES	PULLER DIM. L "
PL	-10	1"	11.54
PL	-20	2"	13.54



PILOT WRENCH FOR SPLIT MANDREL PULLERS



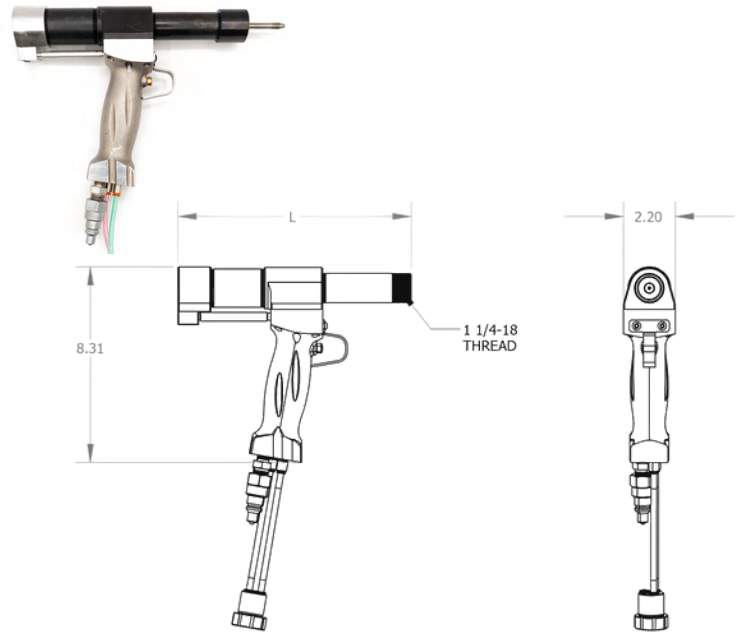


Pullers

SLEEVE TYPE COLDWORK PULLER GUN - SMALL

PULL FORCE 9780 LB @10,000 PSI OIL PRESSURE
WEIGHT APPROX. 8 LB (DEPENDING ON STACKUP)

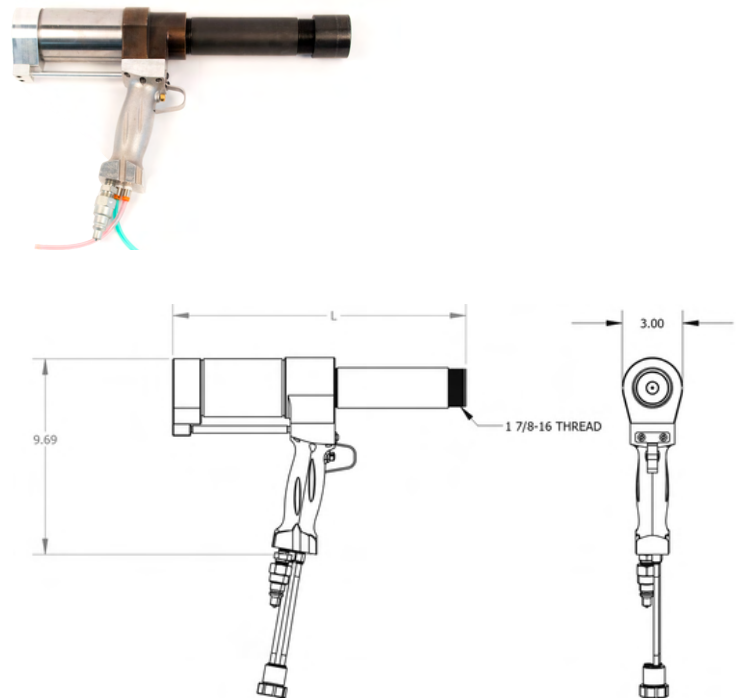
STACKUP XX	STACKUP IN INCHES	PULLER DIM. L "
-10	1"	7.89
-20	2"	9.89
-30	3"	11.89



SLEEVE TYPE COLDWORK PULLER GUN - MEDIUM

PULL FORCE 30,900 LB @10,000 PSI OIL PRESSURE
WEIGHT APPROX. 15 LB (DEPENDING ON STACKUP)

STACKUP XX	STACKUP IN INCHES	PULLER DIM. L "
-10	1"	10.54
-20	2"	12.54
-30	3"	14.54
-40	4"	16.54
-50	5"	18.54
-60	6"	20.54



PART NUMBER SYSTEM

EI - PL - X - XX

MADE BY ELECTROIMPACT

TOOL TYPE - PULLER

STACKUP CAPABILITY IN 1/10" INCREMENTS

SIZE PULLER



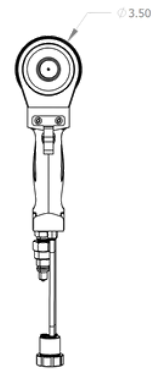
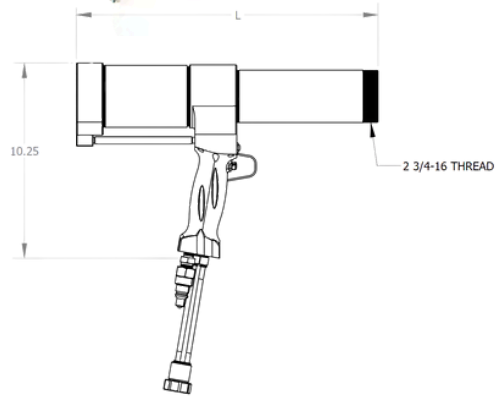
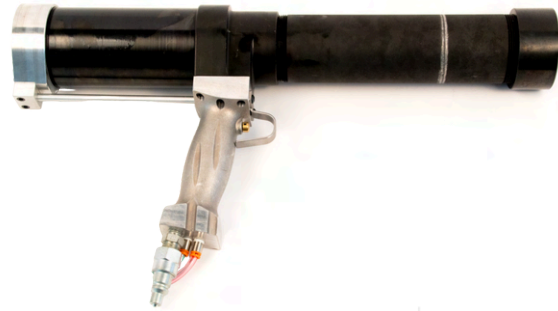
Pullers

SLEEVE TYPE COLDWORK PULLER GUN - LARGE

PULL FORCE 44,000 LB @10,000 PSI OIL PRESSURE

WEIGHT 19.9 - 33.1 LB (DEPENDING ON STACKUP)

STACKUP XX	STACKUP IN INCHES	PULLER DIM. L"
-10	1"	11.89
-20	2"	13.89
-30	3"	15.89
-40	4"	17.89
-50	5"	19.89
-60	6"	21.89
-70	7"	23.89
-80	8"	25.89



PART NUMBER SYSTEM

EI - PL - X - XX

MADE BY ELECTROIMPACT

TOOL TYPE - PULLER

STACKUP CAPABILITY IN 1/10" INCREMENTS

SIZE PULLER



Pullers

SLEEVE TYPE CORDLESS PULLER GUN

PULL FORCE 4,500 LB

ACCEPTS TYPE 1 MANDRELS

USES THE SAME NOSE CAPS AS SLEEVE PULLER

FULLY COMPATIBLE WITH DEWALT 20V BATTERIES

L X W X H: 7.188" X 8.500" X 3.000"

MATERIAL	PART NUMBER	MAX SLEEVE LENGTH		
2000 Series AL	7000 Series AL	TI-6AL-4V	EI-CBS-4-2-N-XX-X	13
			EI-CBS-4-3-N-XX-X	13
			EI-CBS-4-4-N-XX-X	13
			EI-CBS-6-0-N-XX-X	13
			EI-CBS-6-1-N-XX-X	13
			EI-CBS-6-2-N-XX-X	12
			EI-CBS-6-3-N-XX-X	12
			EI-CBS-8-0-N-XX-X	12
			EI-CBS-8-1-N-XX-X	13
			EI-CBS-8-2-N-XX-X	12
	EI-CBS-8-3-N-XX-X	12		
	EI-CBS-10-0-N-XX-X	11		
	EI-CBS-10-1-N-XX-X	11		
	EI-CBS-10-2-N-XX-X	11		
	EI-CBS-10-3-N-XX-X	11		
	EI-CBS-12-0-N-XX-X	11		
	EI-CBS-12-1-N-XX-X	11		
	EI-CBS-12-2-N-XX-X	10		
	EI-CBS-12-3-N-XX-X	10		
	EI-CBS-14-0-N-XX-X	9		

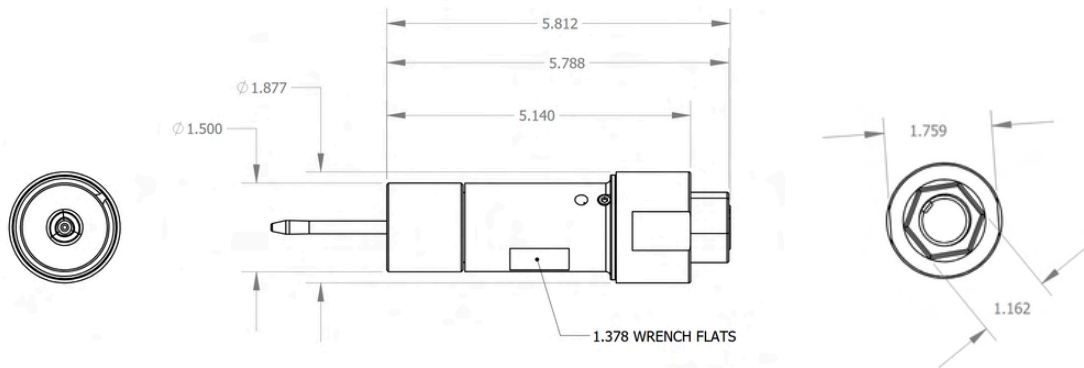




Pullers

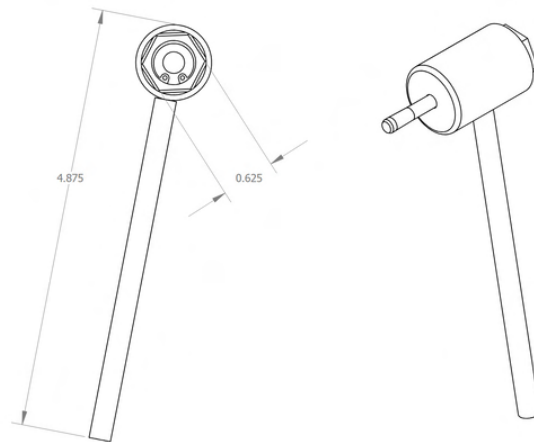
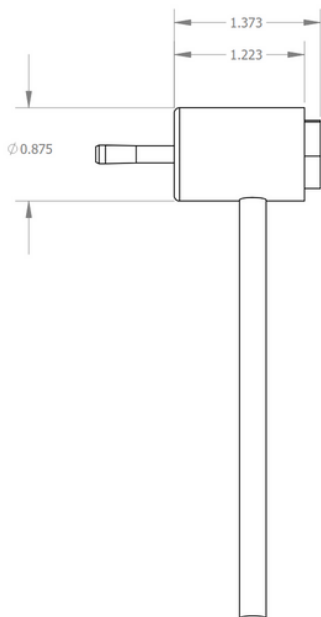
SLEEVE TYPE HAND PULLER

WORKS WITH TYPICAL MANDRELS AND NOSE CAPS

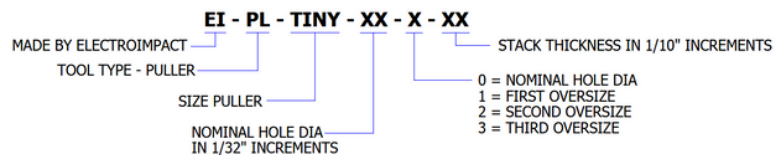


TINY PULLER

SPECIFY MANDREL WHEN ORDERING.



PART NUMBER SYSTEM



4413 Chennault Beach Rd,
Mukilteo, Washington,
United States

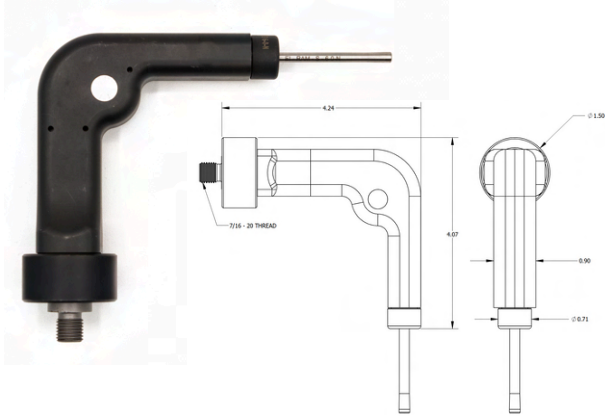
sales@electroimpact.com
electroimpact.com
+1 425-348-8090

Electroimpact Proprietary
& Confidential



Puller Parts

SLEEVE TYPE RIGHT ANGLE ADAPTER - SMALL



PART NUMBER SYSTEM

EI - RA - S

MANUFACTURED BY ELECTROIMPACT

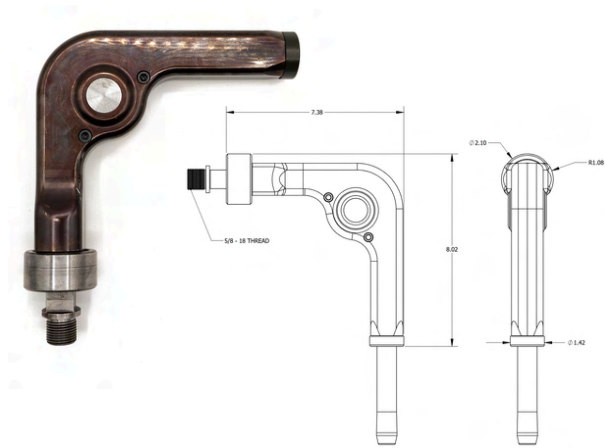
RIGHT ANGLE (ADAPTER)

SMALL SIZE

FOR USE WITH SMALL SLEEVE PULLERS
FOR INCREASED ACCESS IN HARD TO REACH AREAS

WEIGHT APPROX. 2 LB

SLEEVE TYPE RIGHT ANGLE ADAPTER - MEDIUM



PART NUMBER SYSTEM

EI - RA - M

MANUFACTURED BY ELECTROIMPACT

RIGHT ANGLE (ADAPTER)

MEDIUM SIZE

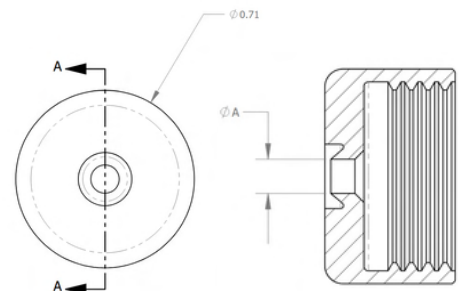
FOR USE WITH MEDIUM SLEEVE PULLERS
FOR INCREASED ACCESS IN HARD TO REACH AREAS

WEIGHT APPROX. 8 LB

RIGHT ANGLE NOSE CAPS

SIZE NUMBER	DIM. A +/- .002"
4-0-N	0.113
4-1-N	0.129
4-2-N	0.146
4-3-N	0.162
4-4-N	0.1714
6-0-N	0.18
6-1-N	0.1955
6-2-N	0.213
6-3-N	0.229

SIZE NUMBER	DIM. A +/- .002"
8-0-N	0.236
8-1-N	0.252
8-2-N	0.2677
8-3-N	0.2849
10-0-N	0.3
10-1-N	0.316
10-2-N	0.3283
10-3-N	0.3439
12-0-N	0.36
12-1-N	0.376



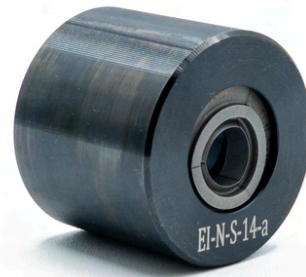
PART NUMBER: **EI - RAN - S - XX-X-N**

RIGHT ANGLE NOSECAP, SMALL

SIZE NUMBER



Puller Parts



NOSE CAPS

SMALL NOSECAP	MANDREL SIZES	SLEEVE SIZES
EI-N-S-4	EI-CBM-4	EI-CBS-4
EI-N-S-6	EI-CBM-6	EI-CBS-6
EI-N-S-8	EI-CBM-8	EI-CBS-8
EI-N-S-10	EI-CBM-10	EI-CBS-10
EI-N-S-12	EI-CBM-12	EI-CBS-12
EI-N-S-14	EI-CBM-14	EI-CBS-14
EI-N-S-16	EI-CBM-16	EI-CBS-16

MEDIUM NOSECAP	MANDREL SIZES	SLEEVE SIZES
EI-N-M-18	EI-CBM-18	EI-CBS-18
EI-N-M-20	EI-CBM-20	EI-CBS-20
EI-N-M-22	EI-CBM-22	EI-CBS-22
EI-N-M-24	EI-CBM-24	EI-CBS-24
EI-N-M-26	EI-CBM-26	EI-CBS-26
EI-N-M-28	EI-CBM-28	EI-CBS-28
EI-N-M-30	EI-CBM-30	EI-CBS-30

LARGE NOSECAP	MANDREL SIZE	SLEEVE SIZE
EI-N-M-32	EI-CBM-32	EI-CBS-32
EI-N-M-36	EI-CBM-36	EI-CBS-36
EI-N-M-38	EI-CBM-38	EI-CBS-38
EI-N-M-40	EI-CBM-40	EI-CBS-40
EI-N-M-44	EI-CBM-44	EI-CBS-44
EI-N-M-48	EI-CBM-48	EI-CBS-48
EI-N-M-52	EI-CBM-52	EI-CBS-52
EI-N-M-56	EI-CBM-56	EI-CBS-56

ADAPTERS

ADAPTER	MANDREL	PULLER SIZE	"L" ADDED TO PULLER
0005-03-0011	TYPE 1	S	-
0005-03-0012	TYPE 2	S	2.00"
EI-CHUCK-S-.XXX	TYPE 3	S	1.00"
0005-04-0008	TYPE 2	M	-
0005-04-0007	TYPE 5	M	-
EI-CHUCK-M-.XXX	TYPE 3	M	1.45"
0005-05-0006	TYPE 5	L	-
EI-CHUCK-L-.XXX	TYPE 3	L	2.00"



NOSE CAP WRENCHES

ASM NUMBER
EI-NCW-S
EI-NCW-M
EI-NCW-L
EI-NCW-XL





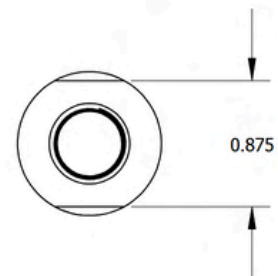
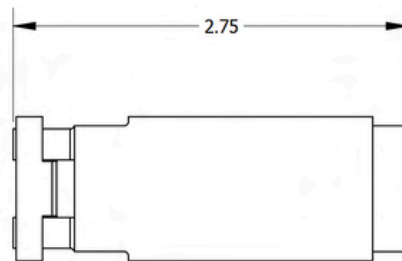
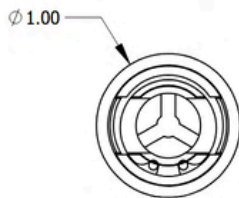
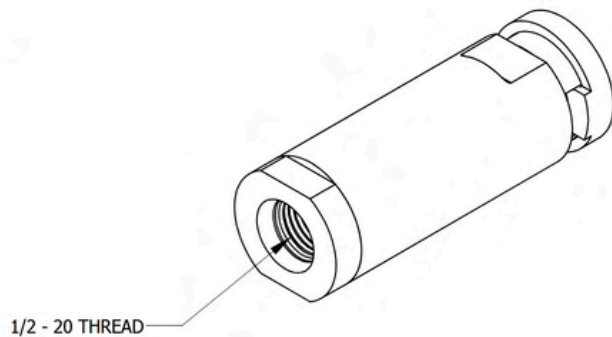
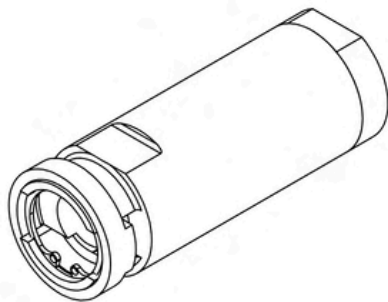
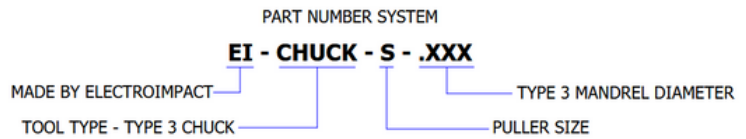
Puller Parts

TYPE 3 CHUCKS

WORKS WITH TYPE 3 MANDRELS. MANDREL IS INSERTED FROM THE BACKSIDE OF THE WORK AND INDEXED BY THE CHUCK. THE PULLER CYCLES RELEASING THE MANDREL AT THE END OF THE RETURN STROKE.



ASM NUMBER	ASM NUMBER
EI-CHUCK-S-.120	EI-CHUCK-S-.220
EI-CHUCK-S-.130	EI-CHUCK-S-.230
EI-CHUCK-S-.140	EI-CHUCK-S-.240
EI-CHUCK-S-.150	EI-CHUCK-S-.250
EI-CHUCK-S-.160	EI-CHUCK-S-.260
EI-CHUCK-S-.170	EI-CHUCK-S-.270
EI-CHUCK-S-.180	EI-CHUCK-S-.280
EI-CHUCK-S-.190	EI-CHUCK-S-.290
EI-CHUCK-S-.200	EI-CHUCK-S-.300
EI-CHUCK-S-.210	EI-CHUCK-S-.310
	EI-CHUCK-S-.320





Hose Assembly

HOSE ASSEMBLY SLEEVE TYPE PULLER

CONNECTS PULLER TO POWERPACK
RATED FOR 10,000 PSI SERVICE



QUICK-CHANGE INTERFACE



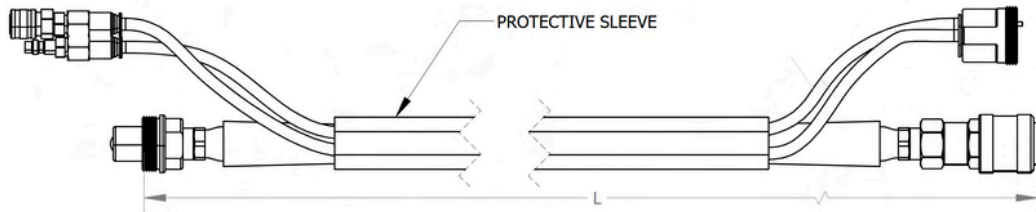
PART NUMBER SYSTEM

EI - H - XX

MADE BY ELECTROIMPACT

HOSE LENGTH IN FEET (STANDARD LENGTHS 10,20,30, 50 FT)

SLEEVE TYPE HOSE ASSEMBLY



PUMP END - CONNECTS TO OTHER MANUFACTURER'S PUMPS

PULLER GUN END - CONNECTS TO EI PULLERS



Additional Tooling

START DRILL



EI-SD-XX-X-N

ELECTROIMPACT START DRILL
SIZE NUMBER IN
THE FORM OF -X-X-N

PART NUMBER	PART NUMBER	PART NUMBER
EI-SD-4-0-N	EI-SD-18-0-N	EI-SD-32-2-N
EI-SD-4-1-N	EI-SD-18-1-N	EI-SD-32-3-N
EI-SD-4-2-N	EI-SD-18-2-N	EI-SD-36-0-N
EI-SD-4-3-N	EI-SD-18-3-N	EI-SD-36-1-N
EI-SD-4-4-N	EI-SD-20-0-N	EI-SD-36-2-N
EI-SD-6-0-N	EI-SD-20-1-N	EI-SD-36-3-N
EI-SD-6-1-N	EI-SD-20-2-N	EI-SD-38-0-N
EI-SD-6-2-N	EI-SD-20-3-N	EI-SD-38-1-N
EI-SD-6-4-N	EI-SD-22-0-N	EI-SD-38-2-N
EI-SD-8-0-N	EI-SD-22-1-N	EI-SD-38-3-N
EI-SD-8-1-N	EI-SD-22-2-N	EI-SD-40-0-N
EI-SD-8-2-N	EI-SD-22-3-N	EI-SD-40-1-N
EI-SD-8-3-N	EI-SD-24-0-N	EI-SD-40-2-N
EI-SD-10-0-N	EI-SD-24-1-N	EI-SD-40-3-N
EI-SD-10-1-N	EI-SD-24-2-N	EI-SD-44-0-N
EI-SD-10-2-N	EI-SD-24-3-N	EI-SD-44-1-N
EI-SD-10-3-N	EI-SD-26-0-N	EI-SD-44-2-N
EI-SD-12-0-N	EI-SD-26-1-N	EI-SD-44-3-N
EI-SD-12-1-N	EI-SD-26-2-N	EI-SD-48-0-N
EI-SD-12-2-N	EI-SD-26-3-N	EI-SD-48-1-N
EI-SD-12-3-N	EI-SD-28-0-N	EI-SD-48-2-N
EI-SD-14-0-N	EI-SD-28-1-N	EI-SD-48-3-N
EI-SD-14-1-N	EI-SD-28-2-N	EI-SD-52-0-N
EI-SD-14-2-N	EI-SD-28-3-N	EI-SD-52-1-N
EI-SD-14-3-N	EI-SD-30-0-N	EI-SD-52-2-N
EI-SD-16-0-N	EI-SD-30-1-N	EI-SD-52-3-N
EI-SD-16-1-N	EI-SD-30-2-N	EI-SD-56-0-N
EI-SD-16-2-N	EI-SD-30-3-N	EI-SD-56-1-N
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	EI-SD-32-1-N	EI-SD-56-3-N



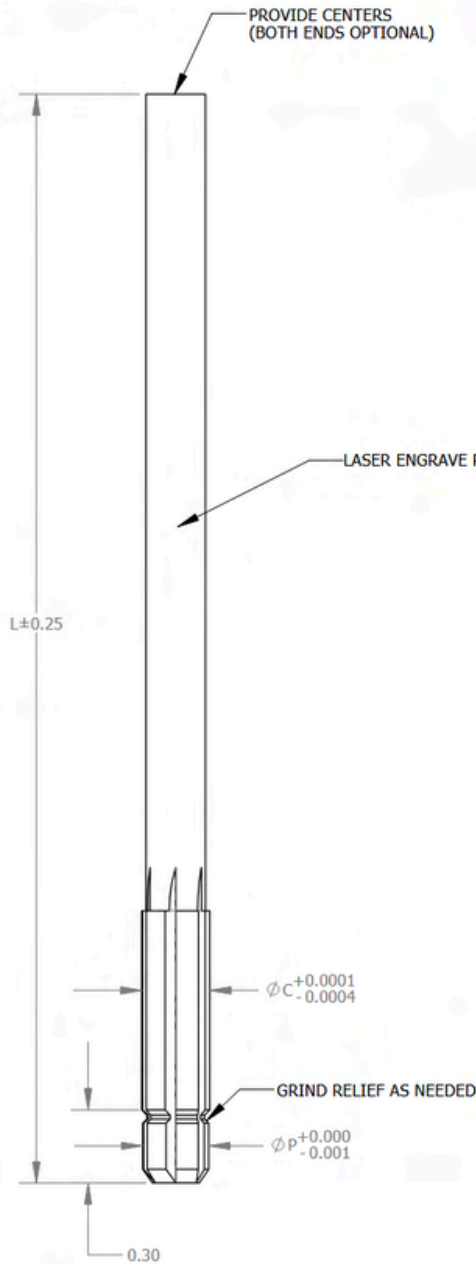
LASER ENGRAVE PART NUMBER HERE



Additional Tooling

START REAMER

STRAIGHT FLUTE RIGHT HAND CUT
REAMER WITH NON-CUTTING PILOT



EI-R-XX-X-N-X

ELECTROIMPACT REAMER

SIZE NUMBER IN FORM OF -XX-X-N

S=STANDARD REAMER
CT=CARBIDE TIPPED REAMER FOR HOLES IN TI



Additional Tooling

START REAMER

STRAIGHT FLUTE RIGHT HAND CUT

REAMER WITH NON-CUTTING PILOT



EI-R-XX-X-N-X

ELECTROIMPACT REAMER

S=STANDARD REAMER

CT=CARBIDE TIPPED REAMER FOR HOLES IN TI

SIZE NUMBER IN FORM OF -XX-X-N

PART NUMBER	P	C	L
EI-R-4-0-N-X	0.1005	0.1150	3.5
EI-R-4-1-N-X	0.1150	0.1300	3.5
EI-R-4-2-N-X	0.1275	0.1450	4.0
EI-R-4-3-N-X	0.1460	0.1620	4.5
EI-R-4-4-N-X	0.1560	0.1710	4.5
EI-R-6-0-N-X	0.1650	0.1790	4.5
EI-R-6-1-N-X	0.1790	0.1940	5.0
EI-R-6-2-N-X	0.1950	0.2110	5.0
EI-R-6-4-N-X	0.2120	0.2270	6.0
EI-R-8-0-N-X	0.2200	0.2370	6.0
EI-R-8-1-N-X	0.2370	0.2530	6.0
EI-R-8-2-N-X	0.2549	0.2680	6.0
EI-R-8-3-N-X	0.2710	0.2850	6.0
EI-R-10-0-N-X	0.2825	0.2990	6.0
EI-R-10-1-N-X	0.3010	0.3150	6.0
EI-R-10-2-N-X	0.3150	0.3300	6.0
EI-R-10-3-N-X	0.3310	0.3460	6.0
EI-R-12-0-N-X	0.3470	0.3610	7.0
EI-R-12-1-N-X	0.3584	0.3770	7.0
EI-R-12-2-N-X	0.3760	0.3930	7.0
EI-R-12-3-N-X	0.3927	0.4080	7.0
EI-R-14-0-N-X	0.4052	0.4230	7.0
EI-R-14-1-N-X	0.4242	0.4390	7.0
EI-R-14-2-N-X	0.4337	0.4520	7.0
EI-R-14-3-N-X	0.4521	0.4670	7.0
EI-R-16-0-N-X	0.4636	0.4760	7.0
EI-R-16-1-N-X	0.4793	0.4920	8.0
EI-R-16-2-N-X	0.4911	0.5070	8.0
EI-R-16-3-N-X	0.5108	0.5230	8.0

PART NUMBER	P	C	L
EI-R-18-0-N-X	0.5302	0.5390	8.0
EI-R-18-1-N-X	0.5459	0.5550	8.0
EI-R-18-2-N-X	0.5502	0.5700	8.0
EI-R-18-3-N-X	0.5699	0.5850	8.0
EI-R-20-0-N-X	0.5895	0.5990	8.0
EI-R-20-1-N-X	0.5928	0.6150	8.0
EI-R-20-2-N-X	0.6240	0.6330	9.0
EI-R-20-3-N-X	0.6396	0.6480	9.0
EI-R-22-0-N-X	0.6486	0.6610	9.0
EI-R-22-1-N-X	0.6552	0.6770	9.0
EI-R-22-2-N-X	0.6709	0.6920	9.0
EI-R-22-3-N-X	0.6880	0.7080	9.0
EI-R-24-0-N-X	0.7021	0.7200	9.0
EI-R-24-1-N-X	0.7178	0.7360	9.0
EI-R-24-2-N-X	0.7334	0.7510	9.5
EI-R-24-3-N-X	0.7490	0.7670	9.5
EI-R-26-0-N-X	0.7667	0.7840	9.5
EI-R-26-1-N-X	0.7864	0.8000	9.5
EI-R-26-2-N-X	0.7959	0.8130	9.5
EI-R-26-3-N-X	0.8115	0.8280	9.5
EI-R-28-0-N-X	0.8271	0.8430	9.5
EI-R-28-1-N-X	0.8428	0.8590	10.0
EI-R-28-2-N-X	0.8651	0.8810	10.0
EI-R-28-3-N-X	0.8848	0.8960	10.0
EI-R-30-0-N-X	0.8896	0.9030	10.0
EI-R-30-1-N-X	0.9052	0.9190	10.0
EI-R-30-2-N-X	0.9209	0.9350	10.0
EI-R-30-3-N-X	0.9365	0.9510	10.0
EI-R-32-0-N-X	0.9521	0.9670	10.0
EI-R-32-1-N-X	0.9678	0.9830	10.0

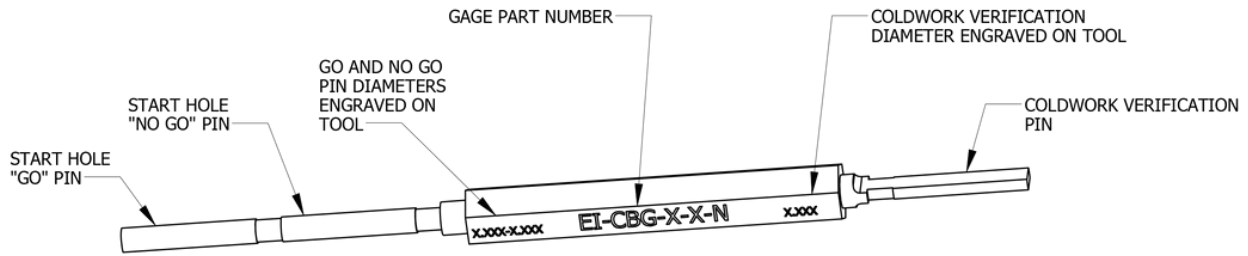
PART NUMBER	P	C	L
EI-R-32-2-N-X	0.9834	0.9990	10.0
EI-R-32-3-N-X	0.9990	1.0150	10.5
EI-R-36-0-N-X	1.0615	1.0770	11.0
EI-R-36-1-N-X	1.0771	1.0930	11.0
EI-R-36-2-N-X	1.0928	1.1090	11.0
EI-R-36-3-N-X	1.1084	1.1250	11.0
EI-R-38-0-N-X	1.1240	1.1380	11.0
EI-R-38-1-N-X	1.1396	1.1540	11.0
EI-R-38-2-N-X	1.1553	1.1700	11.0
EI-R-38-3-N-X	1.1709	1.1860	11.0
EI-R-40-0-N-X	1.1865	1.2010	11.5
EI-R-40-1-N-X	1.2021	1.2170	11.5
EI-R-40-2-N-X	1.2178	1.2330	11.5
EI-R-40-3-N-X	1.2334	1.2490	11.5
EI-R-44-0-N-X	1.2959	1.3180	12.0
EI-R-44-1-N-X	1.3271	1.3380	12.0
EI-R-44-2-N-X	1.3376	1.3540	12.0
EI-R-44-3-N-X	1.3573	1.3700	12.0
EI-R-48-0-N-X	1.4163	1.4290	12.5
EI-R-48-1-N-X	1.4360	1.4450	12.5
EI-R-48-2-N-X	1.4521	1.4610	12.5
EI-R-48-3-N-X	1.4678	1.4770	12.5
EI-R-52-0-N-X	1.5458	1.5610	13.0
EI-R-52-1-N-X	1.5615	1.5770	13.0
EI-R-52-2-N-X	1.5771	1.5930	13.0
EI-R-52-3-N-X	1.5927	1.6090	13.0
EI-R-56-0-N-X	1.6865	1.6980	13.5
EI-R-56-1-N-X	1.7021	1.7130	13.5
EI-R-56-2-N-X	1.7177	1.7280	13.5
EI-R-56-3-N-X	1.7333	1.7440	13.5



Gages

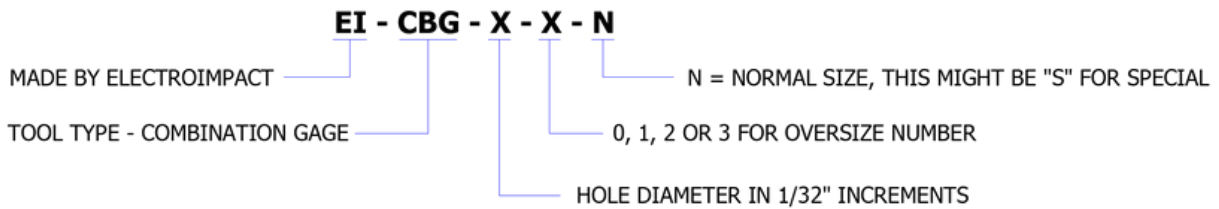
COMBINATION GAGE

Coldworking is an input - variable controlled process, since it is difficult to measure the amount of coldwork in a hole. If the mandrel, start hole and sleeve size are correct, coldworking will have the desired fatigue life extending effect.



This gage has a go-no go combination pin on one end to check that the start hole is the right diameter. The other end has a pin with the sides cut off - the pin is slightly larger than the "No-go" pin on the other end. This verifies that the hole actually got coldworked. The sides of the pin are cut off so the pin can go into a hole that still has the ridge from the sleeve pressed into it, which prevents a full diameter pin from going into the hole.

PART NUMBER SYSTEM





Gages

COMBINATION GAGE SIZES

PART NUMBER	NO GO	GO	COLDWORK VERIFY
EI-CBG-4-0-N	0.1150	0.1130	0.116
EI-CBG-4-1-N	0.1300	0.1280	0.131
EI-CBG-4-2-N	0.1460	0.1440	0.147
EI-CBG-4-3-N	0.1620	0.1600	0.163
EI-CBG-4-4-N	0.1710	0.1690	0.172
EI-CBG-6-0-N	0.1800	0.1770	0.181
EI-CBG-6-1-N	0.1950	0.1920	0.196
EI-CBG-6-2-N	0.2120	0.2090	0.213
EI-CBG-6-3-N	0.2280	0.2250	0.229
EI-CBG-8-0-N	0.2380	0.2350	0.239
EI-CBG-8-1-N	0.2540	0.2510	0.255
EI-CBG-8-2-N	0.2690	0.2660	0.270
EI-CBG-8-3-N	0.2860	0.2830	0.287
EI-CBG-10-0-N	0.3000	0.2970	0.301
EI-CBG-10-1-N	0.3160	0.3130	0.317
EI-CBG-10-2-N	0.3310	0.3280	0.332
EI-CBG-10-3-N	0.3470	0.3440	0.348
EI-CBG-12-0-N	0.3620	0.3590	0.363
EI-CBG-12-1-N	0.3780	0.3750	0.379
EI-CBG-12-2-N	0.3940	0.3910	0.395
EI-CBG-12-3-N	0.4090	0.4060	0.410
EI-CBG-14-0-N	0.4240	0.4210	0.425
EI-CBG-14-1-N	0.4400	0.4370	0.441

PART NUMBER	NO GO	GO	COLDWORK VERIFY
EI-CBG-14-2-N	0.4530	0.4500	0.454
EI-CBG-14-3-N	0.4680	0.4650	0.469
EI-CBG-16-0-N	0.4770	0.4740	0.478
EI-CBG-16-1-N	0.4930	0.4900	0.494
EI-CBG-16-2-N	0.5080	0.5050	0.509
EI-CBG-16-3-N	0.5240	0.5210	0.529
EI-CBG-18-0-N	0.5400	0.5370	0.541
EI-CBG-18-1-N	0.5560	0.5530	0.557
EI-CBG-18-2-N	0.5710	0.5680	0.572
EI-CBG-18-3-N	0.5860	0.5830	0.587
EI-CBG-20-0-N	0.6000	0.5970	0.601
EI-CBG-20-1-N	0.6160	0.6130	0.617
EI-CBG-20-2-N	0.6340	0.6310	0.635
EI-CBG-20-3-N	0.6490	0.6460	0.650
EI-CBG-22-0-N	0.6620	0.6590	0.663
EI-CBG-22-1-N	0.6780	0.6750	0.679
EI-CBG-22-2-N	0.6930	0.6900	0.694
EI-CBG-22-3-N	0.7090	0.7060	0.710
EI-CBG-24-0-N	0.7210	0.7180	0.722
EI-CBG-24-1-N	0.7370	0.7340	0.738
EI-CBG-24-2-N	0.7520	0.7490	0.753
EI-CBG-24-3-N	0.7680	0.7650	0.769



Gages

COMBINATION GAGE SIZES

PART NUMBER	NO GO	GO	COLDWORK VERIFY
EI-CBG-26-0-N	0.7850	0.7820	0.786
EI-CBG-26-1-N	0.8010	0.7980	0.802
EI-CBG-26-2-N	0.8140	0.8110	0.815
EI-CBG-26-3-N	0.8290	0.8260	0.83
EI-CBG-28-0-N	0.8440	0.8410	0.845
EI-CBG-28-1-N	0.8600	0.8570	0.861
EI-CBG-28-2-N	0.8820	0.8790	0.883
EI-CBG-28-3-N	0.8970	0.8940	0.898
EI-CBG-30-0-N	0.9040	0.9010	0.905
EI-CBG-30-1-N	0.9200	0.9170	0.921
EI-CBG-30-2-N	0.9360	0.9330	0.937
EI-CBG-30-3-N	0.9520	0.9490	0.953
EI-CBG-32-0-N	0.9680	0.9650	0.969
EI-CBG-32-1-N	0.9840	0.9810	0.985
EI-CBG-32-2-N	1.0000	0.9970	1.001
EI-CBG-32-3-N	1.0160	1.0130	1.017
EI-CBG-36-0-N	1.0780	1.0750	1.079
EI-CBG-36-1-N	1.0940	1.0910	1.095
EI-CBG-36-2-N	1.1100	1.1070	1.111
EI-CBG-36-3-N	1.1260	1.1230	1.127
EI-CBG-38-0-N	1.1400	1.1360	1.141
EI-CBG-38-1-N	1.1560	1.1520	1.157

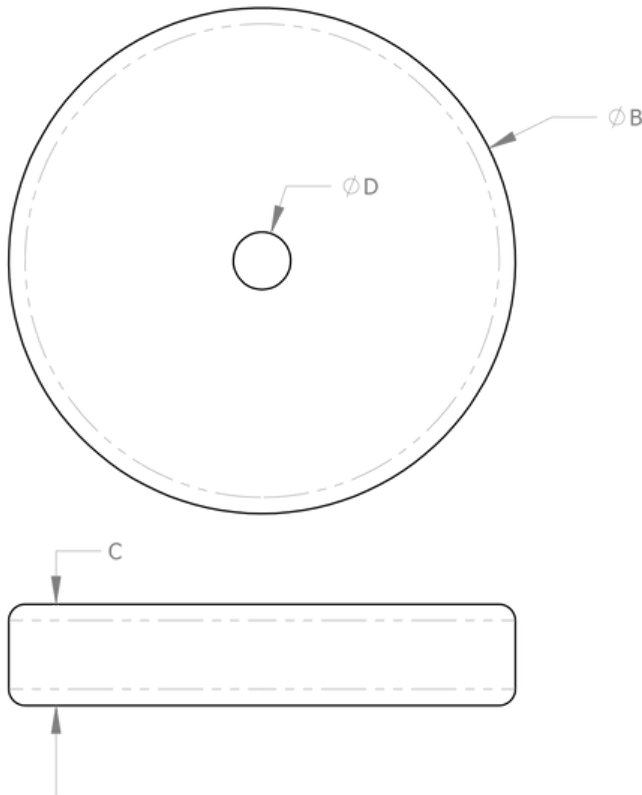
PART NUMBER	NO GO	GO	COLDWORK VERIFY
EI-CBG-38-2-N	1.1720	1.1680	1.173
EI-CBG-38-3-N	1.1880	1.1840	1.189
EI-CBG-40-0-N	1.2030	1.1990	1.204
EI-CBG-40-1-N	1.2190	1.2150	1.22
EI-CBG-40-2-N	1.2350	1.2310	1.236
EI-CBG-40-3-N	1.2510	1.2470	1.252
EI-CBG-44-0-N	1.3200	1.3160	1.321
EI-CBG-44-1-N	1.3400	1.3360	1.341
EI-CBG-44-2-N	1.3560	1.3520	1.357
EI-CBG-44-3-N	1.3720	1.3680	1.373
EI-CBG-48-0-N	1.4310	1.4270	1.432
EI-CBG-48-1-N	1.4470	1.4430	1.448
EI-CBG-48-2-N	1.4630	1.4590	1.464
EI-CBG-48-3-N	1.4790	1.4750	1.48
EI-CBG-52-0-N	1.5630	1.5590	1.564
EI-CBG-52-1-N	1.5790	1.5750	1.58
EI-CBG-52-2-N	1.5950	1.5910	1.596
EI-CBG-52-3-N	1.6110	1.6070	1.612
EI-CBG-56-0-N	1.7000	1.6960	1.701
EI-CBG-56-1-N	1.7150	1.7110	1.716
EI-CBG-56-2-N	1.7300	1.7260	1.731
EI-CBG-56-3-N	1.7460	1.7420	1.747



Gages

WEAR GAGE

Wear gages are used to verify that mandrels are not worn too small to still be useable. If a mandrel goes thru the wear gage, it must be discarded.



PART NUMBER SYSTEM

EI - WG - X - X - N - XXXX

MADE BY ELECTROIMPACT ————
TOOL TYPE - WEAR GAGE ————
NOMINAL HOLE SIZE IN 1/32" INCREMENTS ————
ACTUAL HOLE SIZE IN WEAR GAGE ————
N = NORMAL S = SPECIAL ————
OVERSIZE NUMBER - 0, 1, 2, OR 3 ————



Gages

WEAR GAGE SIZES

PART NUMBER	D	C	B
EI-WG - 4-0-N - 0.1064"	0.1064	0.1875	0.9375
EI-WG - 4-1-N - 0.1224"	0.1224	0.1875	0.9375
EI-WG - 4-2-N - 0.1394"	0.1394	0.1875	0.9375
EI-WG - 4-3-N - 0.1554"	0.1554	0.3750	0.9375
EI-WG - 4-4-N - 0.1648"	0.1648	0.3750	0.9375
EI-WG - 6-0-N - 0.1734"	0.1734	0.3750	0.9375
EI-WG - 6-1-N - 0.1889"	0.1889	0.3750	0.9375
EI-WG - 6-2-N - 0.2064"	0.2064	0.3750	0.9375
EI-WG - 6-3-N - 0.2224"	0.2224	0.3750	0.9375
EI-WG - 8-0-N - 0.2294"	0.2294	0.3750	0.9375
EI-WG - 8-1-N - 0.2454"	0.2454	0.5625	1.1250
EI-WG - 8-2-N - 0.2611"	0.2611	0.5625	1.1250
EI-WG - 8-3-N - 0.2783"	0.2783	0.5625	1.1250
EI-WG - 10-0-N - 0.293"	0.2930	0.5625	1.1250
EI-WG - 10-1-N - 0.309"	0.3090	0.5625	1.1250
EI-WG - 10-2-N - 0.3213"	0.3213	0.5625	1.1250
EI-WG - 10-3-N - 0.3369"	0.3369	0.5625	1.1250
EI-WG - 12-0-N - 0.353"	0.3530	0.5625	1.1250
EI-WG - 12-1-N - 0.369"	0.3690	0.7500	1.3750
EI-WG - 12-2-N - 0.3857"	0.3857	0.7500	1.3750
EI-WG - 12-3-N - 0.4014"	0.4014	0.7500	1.3750
EI-WG - 14-0-N - 0.417"	0.4170	0.7500	1.3750
EI-WG - 14-1-N - 0.433"	0.4330	0.7500	1.3750

PART NUMBER	D	C	B
EI-WG - 14-2-N - 0.4472"	0.4472	0.7500	1.3750
EI-WG - 14-3-N - 0.4624"	0.4624	0.7500	1.3750
EI-WG - 16-0-N - 0.4685"	0.4685	0.7500	1.3750
EI-WG - 16-1-N - 0.484"	0.4840	0.7500	1.3750
EI-WG - 16-2-N - 0.5002"	0.5002	0.7500	1.3750
EI-WG - 16-3-N - 0.5158"	0.5158	0.9375	1.7500
EI-WG - 18-0-N - 0.533"	0.5330	0.9375	1.7500
EI-WG - 18-1-N - 0.5485"	0.5485	0.9375	1.7500
EI-WG - 18-2-N - 0.5647"	0.5647	0.9375	1.7500
EI-WG - 18-3-N - 0.5803"	0.5803	0.9375	1.7500
EI-WG - 20-0-N - 0.5898"	0.5898	0.9375	1.7500
EI-WG - 20-1-N - 0.6053"	0.6053	0.9375	1.7500
EI-WG - 20-2-N - 0.624"	0.6240	0.9375	1.7500
EI-WG - 20-3-N - 0.6396"	0.6396	0.9375	1.7500
EI-WG - 22-0-N - 0.6538"	0.6538	0.9375	1.7500
EI-WG - 22-1-N - 0.6693"	0.6693	0.9375	1.7500
EI-WG - 22-2-N - 0.6855"	0.6855	0.9375	1.7500
EI-WG - 22-3-N - 0.7011"	0.7011	0.9375	1.7500
EI-WG - 24-0-N - 0.7148"	0.7148	0.9375	1.7500
EI-WG - 24-1-N - 0.7303"	0.7303	0.9375	1.7500
EI-WG - 24-2-N - 0.7405"	0.7405	0.9375	1.7500
EI-WG - 24-3-N - 0.7561"	0.7561	0.9375	1.7500



Gages

WEAR GAGE SIZES

PART NUMBER	D	C	B
EI-WG -26-0-N- 0.7743"	0.7743	0.9375	1.7500
EI-WG -26-1-N- 0.7898"	0.7898	0.9375	1.7500
EI-WG -26-2-N-0.804"	0.8040	0.9375	1.7500
EI-WG -26-3-N- 0.8196"	0.8196	0.9375	1.7500
EI-WG - 28-0-N-0.8353"	0.8353	1.1250	2.1250
EI-WG -28-1-N- 0.8503"	0.8503	1.1250	2.1250
EI-WG - 28-2-N-0.874"	0.8740	1.1250	2.1250
EI-WG - 28-3-N-0.8896"	0.8896	1.1250	2.1250
EI-WG - 30-0-N- 0.8973"	0.8973	1.1250	2.1250
EI-WG - 30-1-N- 0.9128"	0.9128	1.1250	2.1250
EI-WG - 30-2-N-0.9293"	0.9293	1.1250	2.1250
EI-WG - 30-3-N-0.9448"	0.9448	1.1250	2.1250
EI-WG -32-0-N- 0.9638"	0.9638	1.1250	2.1250
EI-WG - 32-1-N-0.9798"	0.9798	1.1250	2.1250
EI-WG - 32-2-N-0.9958"	0.9958	1.1250	2.1250
EI-WG - 32-3-N-1.0118"	1.0118	1.1250	2.1250
EI-WG - 36-0-N-1.0783"	1.0783	1.1250	2.1250
EI-WG - 36-1-N-1.0943"	1.0943	1.1250	2.1250
EI-WG - 36-2-N-1.1103"	1.1103	1.1250	2.1250
EI-WG - 36-3-N-1.1263"	1.1263	1.1250	2.1250

PART NUMBER	D	C	B
EI-WG - 38-0-N-1.1408"	1.1408	1.3125	2.5000
EI-WG - 38-1-N-1.1568"	1.1568	1.3125	2.5000
EI-WG - 38-2-N-1.1728"	1.1728	1.3125	2.5000
EI-WG - 38-3-N-1.1888"	1.1888	1.3125	2.5000
EI-WG - 40-0-N-1.2063"	1.2063	1.3125	2.5000
EI-WG - 40-1-N-1.2223"	1.2223	1.3125	2.5000
EI-WG - 40-2-N-1.2383"	1.2383	1.3125	2.5000
EI-WG - 40-3-N-1.2543"	1.2543	1.3125	2.5000
EI-WG - 44-0-N-1.3268"	1.3268	1.3125	2.5000
EI-WG - 44-1-N-1.3428"	1.3428	1.3125	2.5000
EI-WG - 44-2-N-1.3588"	1.3588	1.3125	2.5000
EI-WG - 44-3-N-1.3748"	1.3748	1.3125	2.5000
EI-WG - 48-0-N-1.4413"	1.4413	1.3125	2.5000
EI-WG - 48-1-N-1.4573"	1.4573	1.3125	2.5000
EI-WG - 48-2-N-1.4733"	1.4733	1.3125	2.5000
EI-WG - 48-3-N-1.4893"	1.4893	1.3125	2.5000
EI-WG - 52-0-N-1.5728"	1.5728	1.5000	4.0000
EI-WG - 52-1-N-1.5888"	1.5888	1.5000	4.0000
EI-WG - 52-2-N-1.6038"	1.6038	1.5000	4.0000
EI-WG - 52-3-N-1.6208"	1.6208	1.5000	4.0000
EI-WG - 56-0-N-1.7283"	1.7283	1.5000	4.0000
EI-WG - 56-1-N-1.7438"	1.7438	1.5000	4.0000
EI-WG - 56-2-N-1.7597"	1.7597	1.5000	4.0000
EI-WG - 56-3-N-1.7755"	1.7755	1.5000	4.0000



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